Arts, Science & Engineering Calendar, 1978/’80 / McMaster University / Faculty of Business / Faculty of Humanities / Faculty of Social Sciences / Faculty of Engineering / Faculty of Science

Second Printing, October 1978
McMaster University
Arts, Science & Engineering
CALENDAR
1978-1980
Hamilton, Ontario

Second Printing, October 1978

The following changes have NOT been made in this second printing:
1. promotions, appointments, resignations or death of faculty or staff
2. changes to the term or session in which courses are offered.

The 1979-80 Timetable should be consulted to determine
1. if a course is to be offered in 1979-80, and
2. the term in which a course is to be offered.

Using the Calendar

We have tried to arrange the information in this Calendar in the sequence most appropriate for use by a prospective or new student.

On the next page is the Table of Contents, a list of our publications, and the offices you may need to contact for more information. The Sessional Dates which say when the University is in session and give the various deadlines that apply follow. These are followed by sections which set out the Admission Requirements, and the Application and Registration Procedures.

The regulations concerning Examinations and the requirements for obtaining degrees appear in the section entitled Academic Regulations. Fees, the procedures for paying fees, and information about financial assistance are in the section called Financial Information.

At McMaster, undergraduate degree programmes are offered by six faculties: Business, Engineering, Health Sciences, Humanities, Science and Social Sciences. The programmes offered by the Faculty of Health Sciences are described in other calendars. The programme descriptions specify which courses have to be taken in order to obtain a Bachelor's degree. All first-year programmes appear together on pages 20 to 21. The programmes for upper Years are grouped within the Faculties that offer them and appear from page 22 to 55.

After consulting the programmes you will note that some courses are required and that you may also choose electives. At this stage you will probably wish to look at the courses offered by the University. These are described in pages 67 to 140. Courses are listed by the teaching departments of the University in alphabetic sequence.

Other Publications

UNDERGRADUATE STUDIES
McMaster Divinity College Calendar
School of Nursing Calendar
M.D. Programme Calendar
Post-Graduate Medical Programme Calendar
School of Social Work booklet
Year I Handbook
all of the above publications are available from the Office of the Registrar

GRADUATE STUDIES
Calendar of the School of Graduate Studies/available from the School of Graduate Studies
Faculty of Business M.B.A. programme booklet/available from the Faculty of Business

CERTIFICATE AND PROFESSIONAL STUDIES
Professional designations, certificate and correspondence programmes/available from the School of Adult Education

GENERAL INTEREST NON-CREDIT STUDIES
Brochures about non-credit programmes and special offerings/available from the School of Adult Education
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### "Directory for Correspondence"

*Mailing address: McMaster University,*

Hamilton, Ontario, L8S 4L8

Telephone: Area code 416, Number 525-9140

The following University officers may be addressed using the appropriate postal code.

**Admission to undergraduate studies**

Assistant Registrar (Admissions and Liaison)

Gilmour Hall (L8S 4L6) (ext. 4034, 4796)

**Financial aid**

Director

Student Financial Aid

Divinity College (L8S 4K1) (ext. 4317)

**Scholarships and Prizes**

Academic Awards Officer

Gilmour Hall (L8S 4L6) (ext. 4789)

**Schedules and reservations**

Assistant Registrar (Schedules)

Gilmour Hall (L8S 4L6) (ext. 4453)

**Transcripts and records**

Assistant Registrar (Records)

Gilmour Hall (L8S 4L6) (ext. 4457)

**On-campus housing for men**

Dean of Men

Commons Building (L8S 4K1) (ext. 4223)

**On-campus housing for women**

Dean of Women

Divinity College (L8S 4K1) (ext. 4371)

**Off-campus housing**

Housing Service

Commons Building (L8S 4K1) (ext. 4347)

**Employment opportunities**

Student Placement Office

Hamilton Hall (L8S 4K1) (ext. 4253)

**Advice on personal problems**

Director of Student Counselling Services

Hamilton Hall (L8S 4K1) (ext. 4711)

**Advice for overseas students**

Overseas Students Adviser

Divinity College (L8S 4K1) (ext. 4748)

**Grievances**

Secretary of the Senate

Gilmour Hall, 107 (ext. 4370)
**Sessional Dates**

### DATES FOR 1978-79 WINTER SESSION

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<td></td>
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<tr>
<td>Thursday, May 25 to Saturday, May 27</td>
<td>Spring Convocations.</td>
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<tr>
<td>Friday, June 30</td>
<td>Last day for applications for Deferred Examinations arising from April Examinations.</td>
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<td>Monday, August 14 to Thursday, August 17</td>
<td>Deferred Examinations arising from April Examinations.</td>
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<td>Tuesday, September 5 to Saturday, September 9</td>
<td>Completion of registration.</td>
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<td>Monday, September 11 to Friday, September 22</td>
<td>Classes begin.</td>
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<td>Saturday, October 7 to Monday, October 9</td>
<td>Last day for applications for Deferred Examinations arising from Summer Session Examinations.</td>
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<td>Friday, October 13</td>
<td>Thanksgiving Day—No classes.</td>
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<td>Friday, October 27</td>
<td>First-term classes end.</td>
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<tr>
<td>Monday, December 11 to Friday, December 22</td>
<td>(i) Final Examinations in first-term courses.</td>
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<td></td>
<td>(ii) Deferred Examinations arising from Summer Session Examinations.</td>
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<td>(iii) Mid-Year Tests in Year I courses.</td>
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<tr>
<td><strong>1979</strong></td>
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<tr>
<td>Wednesday, January 3</td>
<td>Classes begin for second term, and for courses offered from January to June.</td>
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<tr>
<td>Monday, January 15</td>
<td>First-day registration.</td>
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<td>Thursday, February 15</td>
<td>Last day for withdrawing from a second-term course.</td>
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<tr>
<td>Monday, February 26 to Saturday, March 3</td>
<td>Last day for withdrawing from courses offered from January to June.</td>
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<tr>
<td>Friday, March 9</td>
<td>Classes end.</td>
<td></td>
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<tr>
<td>Friday, April 6 to Tuesday, April 10</td>
<td>(i) Final Examinations.</td>
<td></td>
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<tr>
<td>Saturday, April 28</td>
<td>(ii) Deferred Examinations arising from December Examinations.</td>
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<td>Friday, April 13 to Thursday, May 24</td>
<td>Good Friday—No examinations.</td>
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<td>Saturday, May 26 to Monday, June 25</td>
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### DATES FOR 1979-80 WINTER SESSION

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<td>Thursday, May 24 to Saturday, May 26</td>
<td>Last day for application for Deferred Examinations arising from April Examinations.</td>
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<td>Friday, June 29</td>
<td>Deferred Examinations arising from April Examinations.</td>
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<td>Monday, August 13 to Thursday, August 16</td>
<td>Completion of registration.</td>
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<td>Tuesday, September 4 to Saturday, September 8</td>
<td>Classes begin.</td>
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<td>Monday, September 10 to Friday, September 21</td>
<td>Last day for changing registration in or replacing first-term and full-year courses.</td>
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<td>Saturday, October 6 to Monday, October 8</td>
<td>Last day for registration.</td>
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<tr>
<td>Monday, October 15</td>
<td>No classes.</td>
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<td>Friday, October 26</td>
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<td>Autumn Convocation.</td>
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<td></td>
<td>First-term classes end.</td>
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<tr>
<td></td>
<td>(i) Final Examinations in first-term courses.</td>
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<tr>
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<td>(ii) Deferred Examinations arising from Summer Session Examinations.</td>
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<td>(iii) Mid-Year Tests in Year I courses.</td>
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<tr>
<td><strong>1980</strong></td>
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<td>Monday, January 7</td>
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<td>Wednesday, January 16</td>
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<td>Friday, February 15</td>
<td>Last day for registration.</td>
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<tr>
<td>Monday, March 3 to Saturday, March 8</td>
<td>Last day for changing registration in second-term courses.</td>
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<tr>
<td>Monday, March 10</td>
<td>Last day for withdrawing from a full-year course.</td>
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<tr>
<td>Friday, April 4 to Monday, April 14</td>
<td>Last day for withdrawing from a second-term course.</td>
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<tr>
<td>Saturday, May 31 to Thursday, May 29</td>
<td>Last day for withdrawing from courses offered from January to June.</td>
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<td>Monday, June 23 to Friday, June 27</td>
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<td></td>
<td>Classes end.</td>
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<td></td>
<td>(i) Final Examinations.</td>
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<thead>
<tr>
<th>Date (Monday)</th>
<th>Event</th>
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</table>
| May 8         | Classes begin.  
| May 19        | Last day for registration and changes of registration. |
| May 22        | Victoria Day—No classes. |
| May 26        | Last day for withdrawing from a course offered only in the first half of the Session. |
| June 26       | Second-term evening courses begin. |
| July 14       | Last day for withdrawing from second-term or full session courses in the Summer (Evening) Session. |
| August 7      | Classes will be held. |
| August 11     | Summer Session classes end. |
| August 14     | Deferred Examinations arising from Summer Session Examinations. |
| August 17     | April Examinations. |
| October 27    | Last day for application for Deferred Examinations arising from Summer Session Examinations. |
| November 10   | Autumn Convocation. |
| December 11   | Deferred Examinations arising from Summer Session Examinations. |
| December 22   |  |

### DATES FOR 1979 SUMMER (EVENING) SESSION

<table>
<thead>
<tr>
<th>Date (Monday)</th>
<th>Event</th>
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</thead>
</table>
| May 7         | Classes begin.  
| May 18        | Last day for registration and changes of registration. |
| May 21        | Victoria Day—No classes. |
| May 25        | Last day for withdrawing from a course offered in the first half of the Session. |
| June 25       | Second-term evening classes begin. |
| July 13       | Last day for withdrawing from second-term or full session courses in the Summer (Evening) Session. |
| August 6      | Classes will be held. |
| August 10     | Summer Session classes end. |
| August 13     | Deferred Examinations arising from Summer Session Examinations. |
| August 16     | Last day for application for Deferred Examinations arising from Summer Session Examinations. |
| October 26    | Autumn Convocation. |
| November 9    | Deferred Examinations arising from Summer Session Examinations. |
| December 10   |  |
| December 21   |  |

### DATES FOR 1978 SUMMER (DAY) SESSION

<table>
<thead>
<tr>
<th>Date (Monday)</th>
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</table>
| July 3        | Classes begin.  
| July 4        | Last day for registration and changes of registration. |
| July 7        | Last day for withdrawing from a course offered only in the first half of the Session. |
| July 24       | Second-term day classes begin. |
| July 28       | Last day for withdrawing from a course offered only in the second half or offered for the duration of the Summer (Day) Session. |
| August 7      | Classes will be held. |
| August 11     | Summer Session Examinations. |
| August 14     | Deferred Examinations arising from April Examinations. |
| August 17     | Last day for application for Deferred Examinations arising from Summer Session Examinations. |
| October 27    | Autumn Convocation. |
| November 10   | Deferred Examinations arising from Summer Session Examinations. |
| December 11   |  |
| December 22   |  |

### DATES FOR 1979 SUMMER (DAY) SESSION

<table>
<thead>
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<th>Date (Monday)</th>
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| July 2        | Classes begin.  
| July 3        | Last day for registration and changes of registration. |
| July 6        | Last day for withdrawing from a course offered only in the first half of the Session. |
| July 23       | Second-term day classes begin. |
| July 27       | Last day for withdrawing from a course offered only in the second half or offered for the duration of the Summer (Day) Session. |
| August 6      | Classes will be held. |
| August 10     | Summer Session Examinations. |
| August 13     | Deferred Examinations arising from April Examinations. |
| August 16     | Last day for application for Deferred Examinations arising from Summer Session Examinations. |
| October 26    | Autumn Convocation. |
| November 9    | Deferred Examinations arising from Summer Session Examinations. |
| December 10   |  |
| December 21   |  |
APPLICATION PROCEDURES

McMaster University

Over 10,000 full-time students attend McMaster University, and of these over 1,100 are pursuing advanced degrees offered through the School of Graduate Studies. In addition, over 3,000 part-time students are registered in the Winter Session from September to April, and 2,500 in the Summer Session. Summer Evening courses are taught in the period of May to August, and Day courses during July and August.

The University was named after Senator McMaster who bequeathed funds to endow “A Christian School of Learning.” McMaster University, which grew out of educational work initiated by Baptists in central Canada as early as the 1830’s, was founded in 1887. After its initial years in Toronto, the University was moved to Hamilton in 1930. The University became non-denominational in 1957, but the historic Baptist connection has been continued through the separately incorporated McMaster Divinity College.

Undergraduate teaching is conducted through the faculties of Business, Engineering, Health Sciences, Humanities, Science, and Social Sciences. The Schools of Physical Education and Social Work are part of the Faculty of Social Sciences. The innovative programmes in the Health Sciences (Medicine and Nursing) are described in separate calendars. The School of Graduate Studies publishes a calendar describing the varied programmes leading to Doctoral and Master’s Degrees.

The academic programmes are supported by some fine and even unique facilities. The Library of almost 1,000,000 volumes has a variety of special collections such as the papers of the philosopher, the late Bertrand Russell. The computing facilities include two CDC 6400 computers, an HP 3000, an IBM 370 and a number of mini-computers; one of the CDC 6400 computers is used totally for undergraduate teaching. The work of the Science and Engineering Faculties is supported by sophisticated facilities such as the Nuclear Reactor and the Van De Graaff Accelerator.

The University is located on an attractive campus beside the Royal Botanical Gardens at the eastern end of Lake Ontario. The campus is reserved for pedestrian traffic. Over 2,000 students live on the campus in the residences which cater to a variety of life styles.

Access to downtown Hamilton and the activities that a large city has to offer is easy. As part of the extensive downtown redevelopment, new facilities, which support the cultural life of the city have been constructed in recent years. These include an Art Gallery and Hamilton Place, an auditorium which seats over 2,000 persons and includes a studio theatre. A new city library is being constructed; in it McMaster University in cooperation with Mohawk College will operate a Downtown Information Centre which includes teaching facilities.

Application Procedures

Important dates

Because of the large number of applications we receive, we have to establish deadlines. You should apply by the dates below, otherwise we cannot guarantee that your application can be considered. Many of our programmes have a limited number of places so it is in your own interest to apply early.

- April 15: Summer evening courses
- May 26: Summer day courses
- July 15: Winter Session courses commencing in September.
- November 30: Winter Session courses commencing in January

Former McMaster students

If you have previously registered at McMaster, but did not attend last year, you should write to the Dean of Studies of the appropriate Faculty to seek readmission, unless five years have passed since your last registration.

If five years have passed since you last registered at McMaster, you will be required to follow the current regulations and curriculum. You must obtain and complete an application form from the Admissions Office (Gilmour Hall, Room 110: Telephone 525-9140 extensions 4796, 4797, and 4798). Your application will be considered by the appropriate Faculty committee.

New students

McMaster University has undergraduate programmes in Business, Engineering, Engineering and Management, the Humanities, Music, Nursing, Physical Education, the Sciences, the Social Sciences, and Social Work. These programmes are described in this calendar.

You should consult the Admission Requirements (which appear in the next chapter) for the programme of your choice. If your qualifications do not fit the requirements exactly, you should write to Harold Bridle, Assistant Registrar (Liaison and Admissions), Room 110, Gilmour Hall—Telephone 525-9140 extension 4034.

Nursing and Medicine

If you wish to enter either Nursing or Medicine, you should obtain a Nursing or Medicine calendar and the appropriate application form from the Health Sciences Registry (McMaster University Medical Centre, Room 2E5: Telephone 525-9140 extension 2114).

Enquiries

If you have enquiries, please speak to:

- Edie Rochkin or Liz McCallum, Admissions Officers (525-9140 extension 4796) about admission, procedures, admission requirements and the status of your application.
- Norma Ward or Chris Jewell, Liaison Officers (525-9140 extension 4787) about visits to the University, brochures, university programmes and suitable Level 5 (Grade 13) programmes.
- Doug Allaby (525-9140 extension 4317) about Financial Aid, Canada Student Loans, and OSAP.
- Olga Tynowski (525-9140 extension 4789) about Scholarships.
- Sheila Scott (525-9140 extension 4371) about Women’s Residences.
- Brian Harrison (525-9140 extension 4223) about Men’s Residences.
Academic counselling for those offered admission

If you are offered admission, you will receive a kit with information about the University and also about the counselling and registration procedures. You will be asked to confirm that you will attend. When we receive your acceptance of the offer, we shall send a full Registration Kit.

Each Faculty also makes arrangements for students to visit the University and meet with a Faculty adviser to set up their programmes. Though attendance at summer counselling and preregistration sessions is not compulsory, you are strongly advised to use this opportunity to plan your academic programme. If you cannot attend one of these sessions, counselling will be provided at the time of registration.

Application procedures

The application procedures differ according to whether:

i) you wish to enter a degree programme or not,
ii) you wish to be a full-time or part-time student,
iii) you wish to enter Year I or receive credit for University level work already completed, and
iv) you are registered in an Ontario secondary school now.

You may determine the procedure you have to use by answering each of the questions below in sequence until you are directed to the procedure you must follow.

Do you wish to receive grades in the courses you take?  
NO  
FOLLOW PROCEDURE E

Do you wish to study as a part-time student (i.e. take less than 24 units)?  
YES  
FOLLOW PROCEDURE D

NO  
FOLLOW PROCEDURE D

Do you wish to study for an undergraduate (bachelor's) degree?  
NO  
FOLLOW PROCEDURE D

YES  
FOLLOW PROCEDURE D

Do you already have an undergraduate degree?  
YES  
FOLLOW PROCEDURE D

NO  
FOLLOW PROCEDURE C

Are you seeking to enter Year I?  
YES  
FOLLOW PROCEDURE A

NO  
FOLLOW PROCEDURE B

Are you now taking one or more Ontario Level 5 (Grade 13) subjects?  
YES  
FOLLOW PROCEDURE A

NO  
FOLLOW PROCEDURE B
PROCEDURE A:

For applicants who are now taking one or more Ontario Level 5 (Grade 13) subjects in day school and wish to enter a full-time degree programme.

Preprinted application forms (OUAC 101) are available from your guidance office. You should choose one of the following programmes and complete the form:

<table>
<thead>
<tr>
<th>Programme</th>
<th>OUAC Programme Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business I</td>
<td>MB</td>
</tr>
<tr>
<td>Engineering I</td>
<td>ME</td>
</tr>
<tr>
<td>Humanities I</td>
<td>MH</td>
</tr>
<tr>
<td>Music I</td>
<td>MM</td>
</tr>
<tr>
<td>Natural Sciences I</td>
<td>MS</td>
</tr>
<tr>
<td>Physical Education I</td>
<td>MR</td>
</tr>
<tr>
<td>Social Sciences I</td>
<td>ML</td>
</tr>
</tbody>
</table>

Send the form and the application fee to the Application Centre. We shall acknowledge every application.

PROCEDURE B:

For applicants who wish to enter Year 1 of a full-time degree programme, but who are not now taking one or more Ontario Level 5 (Grade 13) subject in day school.

Obtain an application form (OUAC 105) from the Admissions Office (Gilmour Hall, Room 110: Telephone 525-9140 extensions 4796, 4797, 4798). You should choose one of the following programmes and complete the form:

<table>
<thead>
<tr>
<th>Programme</th>
<th>OUAC Programme Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business I</td>
<td>MB</td>
</tr>
<tr>
<td>Engineering I</td>
<td>ME</td>
</tr>
<tr>
<td>Humanities I</td>
<td>MH</td>
</tr>
<tr>
<td>Music I</td>
<td>MM</td>
</tr>
<tr>
<td>Natural Sciences I</td>
<td>MS</td>
</tr>
<tr>
<td>Physical Education I</td>
<td>MR</td>
</tr>
<tr>
<td>Social Sciences I</td>
<td>ML</td>
</tr>
</tbody>
</table>

Send the form and the application fee to the Application Centre. You should provide transcripts of marks and/or certificates from any secondary school or post-secondary institution you have attended.

If you
i) do not have the required Ontario Level 5 (Grade 13) standing or its equivalent; AND
ii) will be 21 or older in the calendar year in which you plan to start your University courses; AND
iii) have not attended secondary school as a full-time student for at least two years,

you may qualify for entry as a Special Student. If so, write to the Admissions Office.

PROCEDURE C:

For applicants who seek to enter a full-time degree programme above Year 1.

Obtain an application form (OUAC 105) from the Admissions Office (Gilmour Hall, Room 110: Telephone 525-9140 extensions 4796, 4797, 4798). You should choose one of the degree programmes listed in pages 21 to 55 of this calendar, and complete the form. Send the form and the application fee to the Application Centre.

PROCEDURE D:

For applicants who wish to enter as
i) part-time students, or
ii) non-degree students (Occasional or Continuing), or
iii) second-degree candidates.

Obtain a McMaster application form from the Admissions Office (Gilmour Hall, Room 110: Telephone 525-9140 extensions 4796, 4797, 4798). You will be provided with more information procedures at that time.

PROCEDURE E:

For applicants who wish to register as “Listeners”. (A listener may attend classes, but does not write assignments or examinations. Neither will a Listener receive a grade for the course.)

Write, visit, or telephone the School of Adult Education in order to register as a Listener. (Gilmour Hall, Room 121: Telephone 525-9140 extension 4321).

Application to the School of Social Work

Admission to the Combined Pass Arts and Social Work Programme is by selection of applicants who have completed, or are completing their first year. Year 1 students at McMaster who are interested should apply directly to the School of Social Work. Students wishing to apply for transfer from another university are asked to apply both to the University, through the Assistant Registrar (Admissions) and to the School of Social Work. Application to the School of Social Work should be made before March 1. Applicants transferring from another university must clearly indicate on the application form which specific Arts programme they wish in conjunction with their Social Work programme.
ADMISSION REQUIREMENTS

Admission Requirements

The University reserves the right to change any information contained in this section at any time without notice.

The University Senate may limit enrolment in programmes where the available resources indicate the need, so that admission to some Year I programmes is by selection. This means, therefore, that possession of the minimum admission requirements does not guarantee admission.

The admission requirements are set out in the following sequence:

A) Admission from Ontario secondary schools.
B) Admission from Ontario colleges of applied arts and technology.
C) Admission from other Canadian provinces.
D) Admission from other countries.
E) Special Students (Mature Students).
F) Students transferring from other universities.
G) Graduates applying for a second undergraduate degree.
H) Graduates not proceeding to a second undergraduate degree or to an advanced degree.
I) Occasional Students.

If your academic background does not fit exactly into the requirements outlined below, write to the Assistant Registrar (Admissions) well before the Session for a ruling on your application.

A) Admission from Ontario secondary schools

We know that a variety of experimental programmes is offered in Ontario secondary schools and welcome applicants from these programmes. If you are such an applicant and do not meet exactly the subject requirements outlined below, you should write to the Assistant Registrar (Admissions) who will ensure that your application is carefully considered.

EARLY ADMISSION FROM ONTARIO SECONDARY SCHOOLS

If you have already on the first attempt attained standing in each of the Level 5 (Grade 13) credits required to enter the programme of your choice at McMaster University, you may be granted Early Admission; this may also be granted to an applicant who expects to require such standing later in the year. The offer of Early Admission, however, will be withdrawn if you do not complete the requirements for regular admission (in the next paragraph) before the registration period in September.

REGULAR ADMISSION FROM ONTARIO SECONDARY SCHOOLS

To be even considered for admission you must satisfy not only the general requirements of the University but also the subject requirements for the specific programme you wish to enter.

For an applicant from an Ontario secondary school there are the three following requirements:

i) a Secondary School Honour Graduation Diploma with acceptable standing on the first attempt; AND
ii) a "weighted average" of at least 60.0% (64.0% in Engineering) is needed in the Level 5 (Grade 13) work done for the Diploma; AND
iii) the subject requirements for the appropriate programme must be satisfied.

The "weighted" average is computed as in the example below:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mark</th>
<th>Credits</th>
<th>Marks x Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject A</td>
<td>66</td>
<td>1</td>
<td>66</td>
</tr>
<tr>
<td>Subject B</td>
<td>70</td>
<td>1</td>
<td>70</td>
</tr>
<tr>
<td>Subject C</td>
<td>80</td>
<td>1.5</td>
<td>120</td>
</tr>
<tr>
<td>Subject D</td>
<td>56</td>
<td>0.5</td>
<td>28</td>
</tr>
<tr>
<td>Subject E</td>
<td>72</td>
<td>1</td>
<td>72</td>
</tr>
<tr>
<td>Subject F</td>
<td>60</td>
<td>1</td>
<td>60</td>
</tr>
</tbody>
</table>

"Weighted average" = 416 ÷ 6 = 69.3%.

Grade 13 Music is acceptable as a credit and the mark obtained is included in the average for admission. Alternatively, the applicant may submit certificates from a recognized conservatory of music in Grade 4 theory, or in Grade 9 practical and Grade 3 theory.
Mathematics, and one Level 5 credit of Physics, and one Level 5 credit of Chemistry. (Students in this group take the Engineering I programme).

or 2. a) Overall weighted average of at least 70.0% in six credits offered for the Secondary School Honour Graduation Diploma, and

b) At least 72.0% in two credits of Level 5 Mathematics (which should include Calculus). Those lacking Level 5 Chemistry or Physics must present Chemistry and Physics at secondary school senior levels. Further details on this category of admission should be obtained from your guidance department. (Students in this group take an adapted Engineering I programme determined in consultation with the Associate Dean of Engineering).

The Faculty strongly recommends that potential applicants take a senior high school course in English designed to improve their basic reading and writing abilities.

Admission to the Bachelor of Engineering part-time programme does not guarantee transfer privileges to the first year of the Bachelor of Engineering full-time programme.

As a general policy, applicants from Ontario Colleges of Applied Arts and Technology who have achieved a first-class honours standing in the last two years of a three-year technology programme will be considered for admission to the second year of a relevant Engineering programme.

**Humanities I**

**Required:** 1) Level 5 English
2) Another Level 5 language (if you have not met this requirement, you may be admitted on the understanding that you take a language other than English in Year I.)
3) Additional Level 5 work to qualify for a Secondary School Honour Graduation Diploma with a minimum overall average of 60.0%.

If you intend to take Art 1B6 or Art 1D6, you must submit to the chairman of the Department of Art and Art History in the spring a portfolio to show your interests and ability. Drawings are especially helpful in making this assessment. The portfolio should contain drawings from nature in several media, for example, a self portrait or a still life or a landscape. Late applications will be considered if places are available in the class.

**Music I**

The academic requirements are the same as for Humanities I.

In addition, there are the following audition requirements:

1) performance of two or three varied pieces of the candidate's choice, including one from the 20th century. (The minimum acceptable level should be regarded as approximately equivalent to the Royal Conservatory of Music, Toronto, Grade 9; the performance may last up to 30 minutes.);
2) ear tests;
3) short written examination, testing rudiments; and
4) interview;
5) demonstration of basic keyboard skills, including scales, chords, Harmonization of a simple melody. Those applicants unable to meet minimum musical standards will be expected to register in Music 1Q01/ Basic Keyboard Skills. (Those applying for Music I will be informed of arrangements for these tests.)

**Natural Sciences I**

Natural Sciences I provides a basis for degree programmes in Science. There is considerable flexibility in the Science programmes, which are described in pages 38 to 48.

**Required:** 1) Level 5 Calculus.
2) Level 5 Physics or a second Level 5 Mathematics.
3) One Level 5 credit of Biology, or Chemistry, or another Mathematics.
4) A weighted average of at least 60.0% in the three subjects specified above.
5) Additional Level 5 work to qualify for a Secondary School Honour Graduation Diploma with an overall average of at least 60.0%.

As skills in reading and writing are important, we strongly recommend that you take an appropriate senior high school English course. Since skill in Mathematics is necessary for those taking Science programmes, we recommend that you take additional credits in Level 5 Mathematics.

**Physical Education I**

Admission is by selection, and an overall average of more than 60.0% will probably be required.

There are no specific Level 5 (Grade 13) subject areas which are required for admission to Physical Education I. Mathematics, at least to Level 4 (Grade 12), is required. It is recommended that applicants take at least one of Level 5 (Grade 13) Biology, Chemistry, or Physics, and, when available, Level 5 Physical Education.

**Social Sciences I**

The Faculty of Social Sciences does not require specific Level 5 (Grade 13) subjects for admission. You must have passed Mathematics, at least to Level 4 (Grade 12), although applicants who are not able to comply may nevertheless be considered.

The Faculty strongly recommends that potential applicants take a senior high school course in English designed to improve their basic reading and writing abilities.

Applicants who might be interested in concentrating in Economics, Psychology, or Geography, from Social Sciences I, are strongly advised to include Mathematics in their Level 5 (Grade 13) programmes.

**B) Admission from Ontario Colleges of Applied Arts and Technology**

Applicants from colleges of applied arts and technology or Ryerson Polytechnical Institute are considered on their merits and some credits may be given.

Normally, applicants with first-class honours standing in the last two years of a three-year technology programme will be considered for admission to the second year of a relevant Engineering or Science programme. Normally, applicants with second-class honours standing in the three years of a three-year diploma programme will be considered for admission to Year II of a relevant Humanities or Social Sciences programme.

**C) Admission from other Canadian provinces**

Candidates from other provinces of Canada may be admitted on the basis of qualifications recognized as equivalent to the Level 5 (Grade 13) subjects in Ontario. Such candidates should make early application for admission.

If you are in this category, you should follow the subject requirements listed above for the programme you wish to enter.

<table>
<thead>
<tr>
<th>Province</th>
<th>Qualifications Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta</td>
<td>Grade 12</td>
</tr>
<tr>
<td>British Columbia</td>
<td>Year I university</td>
</tr>
<tr>
<td>Manitoba</td>
<td>Grade 12</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>Year I university</td>
</tr>
<tr>
<td>Newfoundland</td>
<td>Year I Memorial University of Newfoundland</td>
</tr>
<tr>
<td>Northwest Territories</td>
<td>Grade 12</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>Grade 12</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td>Year I University of Prince Edward Island</td>
</tr>
<tr>
<td>Quebec</td>
<td>Appropriate CEGEP standing (General Course) or Senior High School Leaving Certificate (Grade 12)</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>Grade 12</td>
</tr>
</tbody>
</table>
ADMISSION REQUIREMENTS

D) Admission from other countries

GREAT BRITAIN AND THE WEST INDIES

Required: 1) Five G.C.E. subjects at least two of which must be at the Advanced Level.
2) Advanced Level subjects appropriate for the programme desired (e.g., two of Mathematics, Chemistry, and Physics for Engineering I); Mathematics (pure or applied) and one other science for Natural Sciences I.
3) An average of at least 'D' in the two Advanced Level subjects.

HONG KONG

Required: 1) Five subjects in the G.C.E. or University of Hong Kong Matriculation at least two of which must be at the Advanced Level.
2) Advanced Level subjects appropriate for the programme desired (e.g., two of Mathematics, Chemistry, and Physics for Engineering I); Mathematics (pure or applied) and one other science for Natural Sciences I.
3) An average of at least 'D' in the two Advanced Level subjects.
4) Standing satisfactory to McMaster University in the University of Michigan English Language Test. Details of the test will be sent upon receipt of a formal application for admission.

UNITED STATES

Minimum entrance requirements for students from the United States are high school graduation, plus one year of college-level work completed with standing satisfactory to the University. The attention of such students is specially directed to the subject requirements for matriculation in Ontario. Exceptionally, applicants with very high standings may be admitted from high school graduation.

OTHER COUNTRIES

Students from other countries should send official matriculation certificates well in advance of the session. Certificates in a language other than English should be accompanied by noted translations. Each application is considered on an individual basis. Applicants are strongly advised not to come to the University until they have been informed of their acceptance.

Applicants whose native language is not English will be required to obtain standings satisfactory to the University in the University of Michigan English Language Test. Details of this test will be sent upon receipt of a formal application for admission.

E) Special students (mature students)

I) FULL-TIME STUDY

If you do not meet the normal admission requirements, you may be admitted "on probation" to full-time study provided you satisfy all of the following three conditions:

1) you are at least 21 years old or will be in the calendar year in which you propose to start university study; AND
2) you have not attended school on a full-time basis for at least two years; AND
3) you obtain a satisfactory standing on a scholastic aptitude test (held in June and August) and are considered qualified by the appropriate Faculty Admissions Committee.

The writing of the test will be waived for those who have completed satisfactorily a professional designation or certificate programme at McMaster University or the equivalent. Information concerning the date of final application and other details may be obtained from the Assistant Registrar (Admissions).

II) PART-TIME STUDY

If you do not meet the normal admission requirements, you may be considered for admission as a part-time student "on probation" provided you are at least 21 years old (or will be in the calendar year in which you propose to start university study) and you have not attended school on a full-time basis for at least two years. Admission is not automatic, but is at the discretion of the Faculty to which you are seeking admission.

If you are admitted, you may register as a "Special Student" and may take up to six units of work or one seven-unit course per session, the Winter Session extends from September to April and the Summer Session from May to August. Normally, these first courses shall be Year I courses.

After you have taken 12 to 14 units your performance will be reviewed:

1) if you obtain marks of at least 50% in all courses and achieve a weighted average of at least 60.0%, you may be granted clear admission. This means that you may register as either a full-time or a part-time student in a degree programme, or as an "Occasional Student" if you do not wish to work towards a degree;
2) if you obtain marks of less than 50% in all the courses, you will be required to discontinue studies at McMaster.
3) if your performance lies between the two levels specified above, you may continue to take up to six units of work or one seven-unit course per session as a "Special Student" until you achieve University Standing on one "Year of Work" (approximately 30 units) or fail more than 40% of the units required for a "Year of Work" in your programme. This means that for a Year of 30 units, you may have up to 42 units of attempts to attain University Standing and may fail no more than 12 units. After achieving University Standing you may register as either a full-time or part-time student in a degree programme, or as an Occasional Student if you do not wish to work towards a degree.

F) Students transferring from other universities

If you wish to transfer to McMaster University, you will obtain credit only for courses in which you have achieved at least a "C" (third-class honour) standing. In some cases, a higher average may be required.

If your native language is not English, you must obtain standing satisfactory to the University in the University of Michigan English Language Test. Details of this test will be sent upon receipt of a formal application for admission.

A student transferring to McMaster University must satisfy the Residence Requirements set out in the Academic Regulations (see "Academic Regulations: Residence Requirements"). The University will not accord to students transferring to McMaster privileges which would not be granted by their own universities.

G) Graduates applying for a second undergraduate degree

Admission is by selection.

If you have a first degree you may apply to take a second degree in the same discipline or in another discipline. The requirements are set out in the Academic Regulations (see "Academic Regulations: Double credit toward a second undergraduate degree"). Application forms are obtainable from the Assistant Registrar (Admissions).

Graduates of other universities must supply an official up-to-date transcript with the completed application.
H) Continuing students: graduates not proceeding to a second degree or an advanced degree

A Continuing student is a university graduate who is not proceeding to an advanced degree, but wishes to take one or more undergraduate classes (or, exceptionally, certain graduate classes). Continuing students, whether they have been registered previously at McMaster University or not, normally must re-apply for each session on an application form obtainable from the Assistant Registrar (Admissions).

Applicants will be expected to have at least a "C" (third-class honour) average, with no failures, in the work of their final year (or the equivalent, in the case of a degree taken in part-time studies), and academic records which are satisfactory to the Department and the Dean concerned.

Continuing students in regular session are required to take a minimum of 24 units of work to qualify as "full-time students" for the purposes of the Ontario Student Awards Program (see "Financial Assistance"). Acceptance as a Continuing student carries no implications with respect to acceptance in the School of Graduate Studies. Students who plan to proceed to a graduate degree should apply directly to the Dean of Graduate Studies.

I) Occasional students: non-graduates attending undergraduate classes for other than degree credit

Occasional students are those who:
1) do not hold a university degree, and
2) wish to take undergraduate courses, and
3) are or will be at least 21 in the calendar year in which they plan to take university courses.

An Occasional student may take up to 12 units of work in courses at the discretion of the Dean of Studies and instructor(s) concerned in the period September 1 to August 31.

The status of an Occasional student is reviewed after the completion of five courses, and a decision may be made at that time by the student as to whether he or she wishes to enter a degree programme or to continue as an Occasional student.

Registration

Registration procedure

YEAR I REGISTRATION

The purpose of Registration is to select the programme and courses you wish to take. This is done before or at the beginning of the Session. Counselling is available and in some cases is compulsory.

Information about how to register is normally sent by mail. If you are a new student and plan to start classes in September, you will normally receive this information between June and August after you have been admitted.

Regulations

APPROVAL OF PROGRAMMES

Your programme and course selection must be approved by the Dean of Studies of your Faculty. Similarly, you must obtain approval from the Dean for any change, including the dropping of courses.

EXTRA WORK

If you wish to take more than the normal number of courses prescribed for a year, you may do so only with the permission of the appropriate Dean of Studies. Normally, a second-class weighted average in the work of the previous 12 months will be required if extra work is to be permitted. Additional academic fees will be assessed when the additional work is approved to clear an academic deficiency.

SELECTION OF ELECTIVES

If you are registered above Year I, you can take only six units of Year I work in any Year, except where special permission has been obtained from the Deans of Studies.

CANCELLATION OF A COURSE

If you cancel a course during the Change of Registration period, it will not show on your record. After that the course will show on your record, and the grade will be recorded as 'CAN' (canceled) up to and including the last date for withdrawing from the class. The relevant dates are:

First-term courses
1978-79 October 13, 1978
1979-80 October 15, 1979

Full-session courses
1978-79 January 15, 1979
1979-80 January 16, 1980

Second-term courses
1978-79 February 15, 1979
1979-80 February 15, 1980

After these dates you will remain registered in the courses(s) whether or not you attend, and you will receive no refund of fees. The course(s) will be included in the count when assessing whether you have exceeded the maximum number of attempts permissible for the Year in which you are registered, and you will be assigned a mark.

WITHDRAWAL FROM THE UNIVERSITY

If you wish to withdraw from the University, you must consult the appropriate Dean of Studies. Your identity card must be surrendered at the Office of the Registrar. Fees are not refunded unless this procedure is followed.

Your record in the courses being taken will be handled as outlined in the section immediately above entitled "CANCELLATION OF A COURSE".
Academic Regulations

Since the academic regulations are continually reviewed, we reserve the right to change the regulations in this section of the Calendar. The University also reserves the right to cancel the academic privileges of a student at any time should the student's scholastic record or conduct warrant so doing.

Residence requirements

In order to obtain a four-Year (Honours, Major, etc.), first undergraduate degree, you must complete at least two of the Years (approximately 60 units of work) beyond Year I at McMaster University.

In order to obtain a three-Year, first undergraduate degree you may satisfy the residence requirements either:

i) by completing at least two Years (approximately 60 units of work) at McMaster University, which may include Year I, or

ii) by completing Year III (approximately 30 units of work) at McMaster University, including at least 18 units of work beyond Year I in the specialist subject.

The work used to satisfy the residence requirements must be completed at McMaster University; work taken at another University on a Letter of Permission will not count toward the minimum residence requirements. The appropriate Dean of Studies may waive these requirements in special cases and may take into account high academic standing and place of residence, among other considerations.

All the work for a second undergraduate degree must be completed at McMaster University.

LETTERS OF PERMISSION

If you wish to attend another university to take courses which will carry credit towards a McMaster degree, you must get permission ahead of time. To do this you must seek a 'Letter of Permission' from your Dean of Studies. This is a privilege and you should take note of any conditions that might apply. Courses taken in this way cannot be used to satisfy the minimum residence requirements, and will probably delay graduation if they are the last courses for the degree.

Examinations

Examinations are held in December and April for the Winter Session, and in August for the Summer Session. Deferred examinations are conducted in April and August for Winter Session courses, and in December for Summer Session courses.

It is the responsibility of students to be present on the day and hour when an examination is scheduled. If you fail to appear at the scheduled time you will be considered to have defaulted the examination. Examinations are not rescheduled for the purposes of travel.

The mid-year tests in December for Year I courses and examinations for two and three-unit courses are normally of two hours duration. Examinations for courses of four or more units will normally be three hours.

The University-administered examinations held in April, August, and December are organized by the Office of the Registrar. Other examinations are normally held at an earlier time and are arranged by departments and/or faculties.

Tests and examinations may be scheduled in the morning, afternoon or evening, Monday through Saturday.

If you are a part-time student and your employer requires you to be away from the Hamilton area when you are to write an examination, you may apply for a deferred examination privilege. Your application must be supported by a letter of explanation from an executive of your company.

If you miss an examination because of illness, you must submit a medical certificate from the Student Health Services or a doctor to the Office of the Registrar. The certificate must define both the disability and the period of absence, and must be submitted by the end of the examination period.

If you miss an examination for any other reason, you must report immediately to the Examinations Section of the Office of the Registrar.

A deferred examination privilege may be granted if you fail to write a final examination for a certifiable medical or compassionate reason.

Grading system

The grade and marks for a course are determined by combining the marks obtained on class work, assignments, tests, and examinations.

Since September 1974 the grading scale has been as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A first class</td>
<td>90-100</td>
</tr>
<tr>
<td>B second class</td>
<td>80-89</td>
</tr>
<tr>
<td>C third class</td>
<td>70-79</td>
</tr>
<tr>
<td>D credit</td>
<td>60-69</td>
</tr>
<tr>
<td>E conditional</td>
<td>50-59</td>
</tr>
<tr>
<td>F failure</td>
<td>less than 40</td>
</tr>
</tbody>
</table>

Under circumstances defined below, credit may be given for courses in which a student has obtained an 'E' grade. Grades of at least "D" must be obtained in O-group courses of Honours and Major programmes, in R-group courses of Pass programmes, and in courses which are repetitions or replacements.

Before a failing final mark is submitted to the Registrar by a department, the examination paper will be re-read. You retain credit for all courses with a grade of "D" or better unless you choose to refuse credit. (See "Attempts", below.)

Deans' honour list

You may be named to the Deans' Honour List if your work in any Year is outstanding. To qualify you must attain at least 90 per cent of the grade points obtainable on the block of work for the Year of your programme.

In this calculation a grade of 'A' carries 3 points, 'B' 2 points, and 'C' one point. The calculation is performed as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Points</th>
<th>Units</th>
<th>Points x Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3 x 6</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>B</td>
<td>2 x 3</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>A</td>
<td>3 x 3</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>A</td>
<td>3 x 6</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>B</td>
<td>2 x 6</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>A</td>
<td>3 x 6</td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

The total number of points obtainable is 3 x 30 = 90. To qualify for the Deans' Honour List 90% of 90 points, 81 points, would be necessary. In the example above the student would, therefore, be named to the Deans' Honour List.

Academic regulations

The regulations governing programmes in Business, Engineering, Engineering & Management, and Physical Education appear in the appropriate Faculty sections of this Calendar.

UNIVERSITY STANDING

A "Year" is defined as the block of work approved by a Faculty, and specified in the programme descriptions in this Calendar.

You must obtain University Standing in the work of each Year in order to be eligible to continue at or graduate from the University. To obtain University Standing you
1) must have obtained an overall weighted average of at least 55.0% in the work of the Year, and
2) must have obtained a mark of at least 40% in each of the courses used to complete the Year; and
3) may have marks in the range 40-49% in no more than 20% of the units used to complete the Year, or in one course of not more than eight units, whichever is greater; and
4) must not have exceeded the maximum number of "attempts" allowed (See "Attempts", below).

This means that for someone whose Year comprises 30 units
i) the maximum number of attempts is 42 units,
ii) grades of 'D' or higher must be obtained on 24 units,
iii) grades of 'E' or higher must be obtained on the remaining 6 units, and
iv) the overall weighted average must be 55.0% or higher.

The overall weighted average is calculated as in the example below:

<table>
<thead>
<tr>
<th>Mark</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>66</td>
<td>6</td>
</tr>
<tr>
<td>55</td>
<td>8</td>
</tr>
<tr>
<td>72</td>
<td>4 x 4</td>
</tr>
<tr>
<td>45</td>
<td>6</td>
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<tr>
<td>63</td>
<td>3</td>
</tr>
<tr>
<td>60</td>
<td>3</td>
</tr>
<tr>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

Weighted average = 1763 + 30 = 58.8%

ATTEMPTS

You may repeat or replace up to 40% of a Year's work in order to achieve University Standing in a Year, but no course may be repeated more than once. The results of all courses attempted will appear on your transcript. Likewise, a course repeated to satisfy a prerequisite requirement will count as an attempt.

Each Faculty may set regulations governing whether you may continue in a programme in the event that you need to repeat or replace courses to achieve programme standing.

If you have grades of "D" or better on at least 60% of the unit load for your Year, you may repeat or replace courses with grades of "E" or "F". Similarly, if you have obtained credit in all courses of a Year, but do not have an overall weighted average of 55.0%, you may repeat or replace courses. In both cases you may repeat or replace the courses by attending Summer School or by deferring an equivalent amount of work of the following Year. In exceptional cases with the permission of your Dean of Studies, you may take these courses in addition to the work of the following Year, in which case extra fees will be charged.

REFUSAL OF CREDIT

You may refuse credit for a course which you have passed or in which you have been granted credit by writing to the Registrar within a month of receiving your grade report. The course may be repeated or replaced, but this will count against the maximum number of attempts permitted to obtain University Standing. The results of courses in which you have refused credit will appear on your transcript.

FAILED YEAR

You will have failed the Year and be ineligible to continue at the University without permission of the appropriate Dean of Studies, or to graduate from the University, if you do not:

1) obtain a grade of "D" or better in at least 60% of the unit load of the Year on the first attempt; or
2) achieve University Standing after making use of the opportunity provided for raising overall standing by repeating or replacing courses.

REPEATING A YEAR

If you do not achieve University Standing on the first occasion, you will be permitted to repeat the Year only if reasons satisfactory to the appropriate Dean of Studies can be given. If permission to repeat a Year is given, you will be "On Probation".

REQUIREMENT TO WITHDRAW

If you become ineligible to continue on a second occasion, you are required to withdraw from studies at the University for at least 12 months. Thereafter, application for re-admission may be made to the appropriate Dean of Studies.

CONTINUANCE IN PROGRAMME

Year I must be complete before you take Year III work.
Year II must be complete before you take Year IV work.
Year III must be complete before you take Year V work.

Graduation

When you register in your graduating Year you should file a Graduation Information Card with the Registrar before March 1.

Graduation Information Cards may be obtained at registration or from the Receptionist, Office of the Registrar.

Graduands must take the degree at the Convocation immediately following the completion of the appropriate degree work.

Programme regulations

HONOURS PROGRAMMES

In order to enter or proceed in an Honours programme, a weighted average of at least 70.0% ('B' standing) must be obtained in the designated courses of Year I or the Q-group ('qualifying') courses of Year II or Year III.

If you fail to obtain this average, you may be permitted to proceed to the next Year of the Honours programme "On Probation", subject to the approval of the department(s) concerned. If you fail to obtain the necessary percentage a second time, you must transfer to a Major or Pass programme.

Graduation Standing (either First Class or Second Class) is awarded on the average of the Year III and Year IV Q-group standings.

If you fail to obtain second-class standing, but have third-class standing, you may receive a Major Degree at the next ensuing Convocation, whether or not there is a corresponding major programme. Where there is no corresponding major programme, the Graduation Standing will be unspecified. If you fail to obtain a third-class Q-group average, you may receive an Ordinary Degree at the next ensuing Convocation whether or not there is a corresponding Pass programme.

MAJOR PROGRAMMES

In order to enter or proceed in a Major programme, a weighted average of at least 60.0% ('C' standing) must be obtained in the designated courses of Year I or the Q-group ('qualifying') courses of Year II or Year III.

If you fail to obtain this average, you may be permitted to proceed to the next Year of the Major programme "On Probation", subject to the approval of the department(s) concerned. If you fail to obtain the necessary percentage a second time, you must transfer to a Pass Programme.

Graduation Standing (either First Class, Second Class, or Third Class) is awarded on the average of the Year III and Year IV Q-group standings.

If you fail to obtain third-class standing, you may receive an Ordinary Degree at the next ensuing Convocation, whether or not there is a corresponding Pass programme.

PASS PROGRAMMES

In Pass programmes you must obtain a mark of at least 55 in the designated Year I course to enter Year II, an average of at least 55.0% in the R-group courses of Year II, and a weighted average of at least 55.0% in at least 24 units of the subjects of concentration in Years II and III in order to graduate.

Ordinarily, the subject named in the programme title defines the area of concentration. The exceptions to this are:
TRANSFER BETWEEN PROGRAMMES

If you are registered in Year III of an Honours or Major programme and wish to transfer to a Pass programme in order to be eligible for graduation at the next convocation, you must apply to the appropriate Dean of Studies by March 1. If permission is granted, go to the Receptionist in the Office of the Registrar and complete a Graduation Information Card.

If you wish to transfer from Pass to Major, or Pass to Honours, or Major to Honours programme, you must have maintained at least the minimum standing in the specialist component (Q-group) of work subsequent to Year I. Normally you will be required to take additional course work to obtain specialist background equivalent to that of students already registered in the Major or Honours programme. Initial application for assessment of the practicability of transfer shall be made to the appropriate Dean of Studies.

Second undergraduate degrees

Credit for courses taken towards a first undergraduate degree may be applied to a second undergraduate degree. All the additional work to obtain the second degree must be taken at McMaster.

Credit from the first two degrees cannot be applied to a third undergraduate degree. To obtain a third undergraduate degree all the work to obtain it must be taken at McMaster.

For admission to the second degree programme you must hold a first degree. The minimum admission requirements and programme of study for the second degree depend on both the second and first degrees and whether they are in the same subject.

MAJOR DEGREE FOLLOWING ORDINARY DEGREE IN SAME SUBJECT

For entry to a major degree programme in the Faculty of Science a "C" average in the specialist component in the last two years of the Ordinary (Pass) degree programme is required.

If admitted, you must take at least one year (at least 30 units) of work specified by the department(s); normally this will include the Year IV specialist courses and courses from Years II and III to provide specialist background equivalent to that of students already in the programme.

HONOURS DEGREE FOLLOWING MAJOR OR ORDINARY DEGREE IN SAME SUBJECT

For entry a "B" average in the specialist component in each of the last two years of the Ordinary or Major degree programme is required.

If admitted, you must take at least one year (at least 30 units) of work specified by the department(s); normally this will include the Year IV specialist courses and courses from Years II and III to provide specialist background equivalent to that of students already in the programme.

SECOND DEGREE IN ANOTHER SUBJECT

For admission to the second degree you must meet the admission requirements for the programme you wish to enter (e.g., "B" standing in specified courses for entry to an Honours programme).

If the second degree is an Ordinary (Pass) degree, you must complete at least one year (at least 30 units) of work specified by the department offering the programme. If the second degree is a Major or Honours degree, the minimum is two Years (at least 60 units).

For the second degree you must meet the programme and standing requirements (e.g., "B" standing in specified courses for an Honours degree, "C" standing for a Major degree, etc.).

The foregoing regulations cover the ordinary cases. Special situations will be dealt with in accordance with past practice and the spirit of these regulations. Students who have irregular cases should consult the appropriate Dean of Studies.

Appeal procedures

To ensure that students are treated fairly in the administration of University regulations, the Senate has established formal appeal procedures, which may culminate in a hearing before the Senate Board for Student Appeals. However, before a student follows the formal procedures, he is advised first to pursue any complaint informally. Experience has shown that many complaints can be resolved more quickly in this manner. It is recommended that action be taken expeditiously and, if the formal procedures are to be used, the first step should be taken within 30 days of the alleged grievance arising.

If a student has a grievance which is academic in nature, he should communicate with his instructor, the Department Chairman, and his Dean of Studies, before following the formal procedures. If a student wishes to raise a question about another matter, he should consult those Faculty members or officials of the University who may be able to help and, in any case, the Dean of Students, or the Dean of Appeal for basis of Work. If a complaint cannot be resolved by the informal procedures outlined above, a student may initiate a formal appeal by following the procedures detailed below. Advice and information about these procedures may be obtained from the Secretary of the Senate, University Hall, room 203.

NATURE OF APPEALS

Appeals related to academic standing have been defined by Senate to be of three kinds:

1) those involving solely a "substantive academic judgment" regarding the contents of assignments (e.g., examination papers, essays, etc.);
2) those related to grades and academic standing, such as when an instructor is alleged not to have followed the marking scheme previously outlined;
3) those related to the application of regulations governing degree or programme requirements and to other administrative decisions. The procedures for each kind appear below:

PROCEDURE FOR APPEALS INVOLVING "SUBSTANTIVE ACADEMIC JUDGMENT"

A student should write within 30 days of receiving the grade report to his Dean of Studies to seek a review and state the reason for his request. The Dean of Studies will ask the Department Chairman to make an enquiry to ensure that all term work was included, that marks were added correctly, etc. Afterwards, the Dean will inform the student in writing of the findings.

If the student remains unsatisfied, he may request of the Dean of Studies that there be a formal re-reading of the paper. With this request he must send $10, which will be refunded in the event that there is a significant change in academic standing. At the request of the Dean of Studies, the Department Chairman will arrange for the re-reading of the paper by someone other than the original examiner, and afterwards will report the result to the Faculty Reviewing Committee. This committee will advise the student of its decision, which shall be final. The decision may result in a mark being lowered.
PROCEDURES FOR APPEALS OF GRADES OR STANDING NOT INVOLVING "SUBSTANTIVE ACADEMIC JUDGMENT"

A student should write within 30 days of receiving the grade report to his Dean of Studies to seek a review and state the reason for his request. The Dean of Studies will ask the Department Chairman to make an enquiry, and afterwards inform the student in writing of the findings.

If, after further discussion with the Dean of Studies (and possibly the Dean of the Faculty), a student still believes that he has suffered an injustice, he may appeal in writing to the Senate Board for Student Appeals, the decision of which shall be final.

PROCEDURE FOR APPEALS INVOLVING DEGREE OR PROGRAMME REGULATIONS

A student should discuss the matter (orally or in writing) with his Dean of Studies. If the student wishes to make an appeal, he should do so in writing, within 15 days after the beginning of the next academic session, to the Senate Board for Student Appeals, the decision of which shall be final.

PROCEDURE FOR APPEALS NOT RELATED TO ACADEMIC STANDING

A student should write to the Dean of his Faculty and state the reason for his request. The Dean will meet with the student to discuss the grievance and may suggest another means for resolving the issue. If the student wishes to pursue a formal appeal, the Dean will refer the case to the Senate Board for Student Appeals.

SENIOR BOARD FOR STUDENT APPEALS

The Board was established by Senate to decide all cases of student appeals from rulings of other bodies on matters of academic standing, except those involving solely "substantive academic judgment", as noted above. Other allegations of injustice, including allegations of sex discrimination, may be appealed to the Board, although it is possible that some of these appeals may involve matters that do not lie entirely within the authority of Senate and may require action by the Board of Governors. In such cases, students will be so notified.

Hearings conducted by the Senate Board for Student Appeals conform to the accepted procedures of "due process" and are normally open. "Due process" means that the party against whom the allegations of injustice have been made has the full right and opportunity to hear and answer these allegations, to examine evidence, question witnesses, etc. After each appeal, a report is made to the Senate. If the Senate does not have full authority to rectify an injustice, a recommendation rather than a decision may be communicated to the Senate, which may in turn refer the matter to the Board of Governors of the University for action.

Academic Dishonesty

In 1976 the Senate defined Academic Dishonesty and established procedures for dealing with alleged cases of dishonesty. The document containing procedures may be examined in the Office of the Secretary of Senate. Academic Dishonesty is defined as follows:

"Academic dishonesty is not qualitatively different from other types of dishonesty. It consists of misrepresentation in an attempt to deceive. In an academic setting this may take any number of forms such as copying or the use of unauthorized aids in tests, examinations and laboratory reports; plagiarism; the submission of work that is not one's own or for which previous credit has been obtained, unless the previously submitted work has been presented as such to the instructor of the second course and has been deemed acceptable for credit by the instructor of that course; aiding and abetting another student's dishonesty, and giving false information, for the purpose of gaining admission, credits, etc."
**Financial Information**

**UNDERGRADUATE FEE SCHEDULE AND PAYMENT DATES**

Please make all cheques payable to "McMaster University". The University reserves the right to amend fees after the printing of this list.

<table>
<thead>
<tr>
<th>Business/Commerce</th>
<th>Standard Fees</th>
<th>Supplementary Fees</th>
<th>Payable in Full in August</th>
<th>Payable in August</th>
<th>Payable in January</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUMANITIES/SOCIAL SCIENCES</td>
<td>$680.00</td>
<td>$80.50</td>
<td>$760.50</td>
<td>$550.00</td>
<td>$215.50</td>
</tr>
<tr>
<td>All other programmes</td>
<td>685.00</td>
<td>80.50</td>
<td>765.50</td>
<td>550.00</td>
<td>220.50</td>
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<tr>
<td>Social Work</td>
<td>690.00</td>
<td>80.50</td>
<td>770.50</td>
<td>550.00</td>
<td>225.50</td>
</tr>
<tr>
<td>Music, Physical Education</td>
<td>690.00</td>
<td>80.50</td>
<td>770.50</td>
<td>550.00</td>
<td>230.50</td>
</tr>
<tr>
<td>SCIENCE (All Programmes)</td>
<td>695.00</td>
<td>80.50</td>
<td>775.00</td>
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<tr>
<td>ENGINEERING Engineering</td>
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<td>835.50</td>
<td>600.00</td>
<td>240.50</td>
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<tr>
<td>Eng. &amp; Management Yrs. I, II &amp; V</td>
<td>745.00</td>
<td>90.50</td>
<td>835.50</td>
<td>600.00</td>
<td>240.50</td>
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<tr>
<td>Eng. &amp; Management Yrs. II &amp; IV</td>
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<td>90.50</td>
<td>770.50</td>
<td>550.00</td>
<td>225.50</td>
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<tr>
<td>HEALTH SCIENCES Nursing</td>
<td>670.00</td>
<td>90.50</td>
<td>760.50</td>
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<tr>
<td>Medicine</td>
<td>1,312.50</td>
<td>58.50</td>
<td>1,371.00</td>
<td>462.00</td>
<td>457.00</td>
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<tr>
<td>(per semester 1st &amp; 2nd term)</td>
<td>437.50</td>
<td>24.50</td>
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<tr>
<td>3rd term</td>
<td>437.50</td>
<td>19.50</td>
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</tbody>
</table>

Please note that an amount of $5 is added to fees not paid in full in August. Also note that a minimum late payment fee of $1 plus $1 for each additional day up to a maximum of 10% of the amount owing, is payable on fees outstanding after Registration unless arrangements are made in advance with the Chief Accountant. Included in the above fees is an assessment of $3.00 per year for the support of the Ontario Public Interest Research Group (see "General Information: Student government and activities"). This fee is refundable only within the first three weeks after registration upon application by the student through the OPIRG office in Room 115 Wentworth House.

Fees cover tuition, campus health care services, student organizations, athletics, laboratories, registration, library, examinations, and diplomas, and are payable by all students attending McMaster University. The preceding fees do not cover Ontario Health Insurance Plan, which is the personal responsibility of the student.

The University reserves the right to assess supplementary fees or charges in certain courses or programmes to recover in part or in full the cost of providing course materials, and accommodation and transportation for field trips, and the costs of breakages.

Upon receiving official acceptance by the Registrar's Office and upon completion of registration, a student is responsible for the full payment of all academic fees as defined and specified in this Calendar.

Refusal to pay fees or any part of the fees may result in the student being refused admission to the University or being requested to withdraw from the University and all privileges suspended until such times as the fees or any part of the fees are paid in full, or acceptable arrangements for payment are made with the Business Office or the Dean of Students. Academic results, transcripts, or the right to graduate, will be withheld if acceptable arrangements are not made for the payment of any outstanding fees or miscellaneous accounts.

**PREPAYMENT OF ACADEMIC FEES**

In order to simplify and expedite registration in September, the University has established a system of paying academic and residence fees in advance.

All students must pay full fees for the session, or the first installment of fees, according to the fee schedule on or before August 18. Students must fill in the fee prepayment form and send it together with a cheque, which may be post-dated to August 18, to the Business Office. By doing so, you will reduce the time needed to complete Registration in September. Late payment of fees will result in the levy of an extra fee as outlined above (see "Payment dates for academic fees").

Students who are expecting to receive financial assistance under the Ontario Student Assistance Program or are to be recipients of scholarships, bursaries or other awards, may arrange fee deferments on the day of registration, provided they can show satisfactory evidence that such awards have been granted. All fees are payable upon receipt of financial assistance. Any known differences between the amount of scholarship, etc., and first installment must be paid by August 18. Students being sponsored by Outside organizations, e.g. Vocational Rehabilitation, R.C.M.P., etc., are requested to bring copies of fee authorizations at the time of registration. Delays may be granted in certain other special circumstances, provided that the student can show satisfactory evidence of ability to pay at a later date.

**Notes:** A full-time student for the purpose of fees is defined as one taking 24 or more units during an academic session. Students are responsible for fees for each academic session and no fee credits can be transferred from one academic session to another.

1. Payment of academic fees does not mean acceptance to the University or approval of Student's registration. Academic requirements have to be fulfilled before registration is completed.
2. New students may not forward academic fees to the Business Office in Room 115 Wentworth House.
3. Fees are payable in April.
Office until they have received their permits to register. Students should not send residence fees unless notification of acceptance has been received.

MISCELLANEOUS REGULATIONS

Failure to comply with payment dates will result in a late payment fee. Students at least must have made satisfactory financial arrangements with the Chief Accountant before their registration can be completed. (See "Payment dates for academic fees")

REFUNDS ON WITHDRAWAL FROM THE UNIVERSITY (BASED ON TUITION FEES OF $685.00 PER SESSION)

<table>
<thead>
<tr>
<th></th>
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<td>Sept. 11-Sept. 17</td>
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<td>$3.00</td>
<td>$7.50</td>
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<td>Sept. 18-Sept. 25</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>Sept. 26-Oct. 1</td>
<td>621.00</td>
<td>24.00</td>
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<td>-</td>
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<td>Oct. 2-Oct. 8</td>
<td>583.00</td>
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<tr>
<td>Oct. 9-Oct. 15</td>
<td>545.00</td>
<td>6.00</td>
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<td>Oct. 16-Oct. 22</td>
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<td>Dec. 11-Jan. 1</td>
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<td>-</td>
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<tr>
<td>Jan. 2-Jan. 7</td>
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<td>Jan. 8-Jan. 14</td>
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<td>117.00</td>
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<td>(2) Jan. 15-Jan. 21</td>
<td>78.00</td>
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<td>Jan. 22-Jan. 28</td>
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<td>-</td>
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<td>-</td>
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</tr>
</tbody>
</table>

(1) Refund in full if withdrawn before September 17.
(2) Last day for cancellation of registration without failure by default, January 15, 1979.
(3) Changes or registration will be permitted until September 30 without penalty.
(4) Full charge assumed immediately.
(5) Second instalment set at $210.50. Initial payment including $5.00 part payment fee is $550.00

NOTE: Where total fees differ by $5.00 or $10.00, the schedule is adjusted accordingly. Above figures based on 1978-79.

RESIDENCE AND FOOD SERVICE FEES

REGULAR SESSION 1977-78

Residence fees in 1977-78 for students living on campus, for the period September 6 to the end of the spring examinations, were as follows:

- Residences—room and board $1650.00
- Apartments—one-bedroom (per person) room only $974.00
- -four-bedroom (per person) room only $925.00
- -six bedroom (per person) room only $902.00
- -Food Plan only $723.00

The University reserves the right to use the rooms during vacation periods, and the charges do not include the use of the room or the cost of meals during these periods, unless definite arrangements to the contrary are made.

It is not normally possible to allow mid-year withdrawals.

Students will be assessed for unwarranted breakage.

MAY TO SEPTEMBER 1977

Shared room—per week (no meals) $30
Single room—per week (no meals) $38

Meals will be provided on a cash basis at the current student rate. The University reserves the right to change the amount of residence fees after publication.

(For food services for students not living on campus, please see "General information: Food service").

No student shall be eligible for any examination, examination results, certificate, diploma, or degree, until fees and other accounts owed to the University are paid.

At any date after fees become due, a student's academic privileges may be cancelled for non-payment.

No caution deposits are required, but students will be assessed for any unwarranted breakage.

Any cheque not accepted and returned by the bank must be covered and include an additional administrative charge.

Amounts of $5 will be assessed for N.S.F. cheques, and $2 for cheques issued on non-chequing accounts or payments stopped by the students.

FINANCIAL INFORMATION

PAYMENT DATES FOR RESIDENCE FEES

<table>
<thead>
<tr>
<th>Payable in full</th>
<th>Payable by Payable by</th>
</tr>
</thead>
<tbody>
<tr>
<td>by Aug. 18/78</td>
<td>Aug. 18/78 Jan. 1979</td>
</tr>
<tr>
<td>Residences—room and board</td>
<td>$1560.00</td>
</tr>
<tr>
<td>Apartments—one-bedroom</td>
<td>928.00</td>
</tr>
<tr>
<td>-four-bedroom</td>
<td>881.00</td>
</tr>
<tr>
<td>-six-bedroom</td>
<td>859.00</td>
</tr>
<tr>
<td>Food Plan only</td>
<td>666.00</td>
</tr>
</tbody>
</table>

A complete schedule of residence charges and payment dates may be obtained upon application to the Dean of Women or the Dean of Men.

Residence fees should not be paid with academic fee payments, except when the residence application has been accepted in writing.

Full payment of fees must be completed by January.

Please note that an amount of $5 is added to fees not paid in August.
FINANCIAL INFORMATION

Part-time degree student fees

Please make all cheques payable to “McMaster University”. Fees are subject to change.

FEES (INCLUDING EXAMINATIONS)

(Based on 1977-78 fees)

<table>
<thead>
<tr>
<th></th>
<th>Payable in full</th>
<th>Payable on or before registration</th>
<th>Payable on or before Dec. 15/ registration</th>
<th>Payable by Feb. 28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-unit courses</td>
<td>$50.</td>
<td>$50.</td>
<td>$50.</td>
<td>$50.</td>
</tr>
<tr>
<td>Three-unit courses</td>
<td>75.</td>
<td>75.</td>
<td>75.</td>
<td>75.</td>
</tr>
<tr>
<td>Four-unit courses</td>
<td>100.</td>
<td>100.</td>
<td>100.</td>
<td>100.</td>
</tr>
<tr>
<td>Five-unit courses</td>
<td>125.</td>
<td>125.</td>
<td>125.</td>
<td>125.</td>
</tr>
<tr>
<td>Six-unit courses</td>
<td>150.</td>
<td>150.</td>
<td>150.</td>
<td>150.</td>
</tr>
</tbody>
</table>

Note: Failure to file registration before the due date will result in a $10.00 late registration fee.

Full payment of fees must be completed by December 15, 1978 for the September registrant, and February 28, 1979 for the January registrant. Please note that an installment charge of $5 is added to cover administrative costs of deferred payments. A post-dated cheque must be deposited at the time of registration for the unpaid amount.

No registration is complete until the fee has been paid and the registration form endorsed.

In addition to students for credit, “listener” students not seeking credit may be admitted at one-half of the ordinary fee upon application to the School of Adult Education.

A husband and wife attending the same course as “listeners” may pay the reduced rate of one “listener” fee, plus half of the fee for another “listener”.

Persons aged 65 and over may register in any courses without payment of tuition fees. Admission requirements must be met if courses are to be taken for degree credit.

REFUNDS

Students who are forced by illness or other personal reasons to withdraw from courses are entitled to a partial refund of their fees. These refunds will be paid according to a schedule, and will be determined by the date on which notices of withdrawal are received at the office of the Dean of the appropriate Faculty. Only students whose written notices of withdrawal are received at this office by the end of the first week of lectures will be entitled to a full refund of fees. Four weeks should be allowed for processing of refund cheques.

An example of the refund schedule for a six-unit course in the winter session, 1978-79 is given below.

<table>
<thead>
<tr>
<th>Date of Withdrawal</th>
<th>Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 17 inclusive</td>
<td>$150.00</td>
</tr>
<tr>
<td>September 18-September 25</td>
<td>141.00</td>
</tr>
<tr>
<td>September 26-October 1</td>
<td>132.00</td>
</tr>
<tr>
<td>October 2-October 8</td>
<td>123.00</td>
</tr>
<tr>
<td>October 9-October 15</td>
<td>114.00</td>
</tr>
<tr>
<td>October 16-October 22</td>
<td>105.00</td>
</tr>
<tr>
<td>October 23-October 29</td>
<td>96.00</td>
</tr>
<tr>
<td>October 30-November 5</td>
<td>88.00</td>
</tr>
<tr>
<td>November 6-November 12</td>
<td>80.00</td>
</tr>
<tr>
<td>November 13-November 19</td>
<td>72.00</td>
</tr>
<tr>
<td>November 20-November 26</td>
<td>64.00</td>
</tr>
<tr>
<td>November 27-December 3</td>
<td>56.00</td>
</tr>
<tr>
<td>December 4-December 10</td>
<td>48.00</td>
</tr>
<tr>
<td>December 11-January 1</td>
<td>40.00</td>
</tr>
<tr>
<td>January 2-January 7</td>
<td>32.00</td>
</tr>
<tr>
<td>January 8-January 14</td>
<td>24.00</td>
</tr>
<tr>
<td>January 15-January 21</td>
<td>16.00</td>
</tr>
<tr>
<td>January 22-January 28</td>
<td>8.00</td>
</tr>
<tr>
<td>January 29-end</td>
<td>0</td>
</tr>
</tbody>
</table>

Miscellaneous Fees

As a guide, the following fees were in effect for the 1977-78 academic year.

Tuition fees for students taking
23 units or less / per six units ........................................ $150.00

Insurance and campus health service
( optional for part-time [day] students) ..................................... 7.50

McMaster Student Union Fee for
part-time [day] students / per unit ...................................... 75

Fees for extra classes / six units ....................................... 150.00

Transcripts, up to 10 copies ordered and processed at the same time ................. 2.00

Failure to file an advance registration by students in course before the due date ........ 25.00

Administrative fee for students reinstated following
Cancellation for non-payment of fees ...................................... 25.00

Installment charge
(see “Payment dates for academic fees”) ................................... 5.00

Formal examination re-read procedure .................................. 10.00

Duplicate Income Tax Certificate ........................................ 2.00

Fee for special examinations / per paper .................................. 25.00

Expenses

To a certain extent, expenses are controlled by the student (e.g., clothing, amusement, and living expenses). The essential costs for a typical student in Year 1 not living at home will vary from $2,500 to $3,000, depending upon the amount the student chooses to pay for room and board.

INSURANCE OF PERSONAL PROPERTY ON UNIVERSITY PREMISES

The University cannot assume any responsibility for the personal property of any employees, faculty members, or students, nor does the University carry any insurance that would cover their personal property.

In most cases, personal fire insurance policies provide an automatic 10% extension covering property away from home. It is suggested that insurance policies be inspected to be certain that this is the case.

DEATH AND DISMEMBERMENT INSURANCE

The University considers that the purchase of insurance coverage for death and dismemberment is the individual responsibility of its students. It must be remembered that the greater part of a student’s day is usually devoted to activities not related to a University course. There are various insurance plans available, some of which also include the basic Government of Ontario provisions. Although the University does not specifically endorse any one of these plans, it has no objection to the explanatory brochures and literature being posted on bulletin boards or distributed in appropriate places.

ACCIDENT INSURANCE COVERAGE

The supplementary health services fee of $7.50 includes reimbursement of expenses up to $1,000.00 resulting from an accident incurred during the academic year, where such expenses are not recoverable under the Ontario Health Insurance Plan. These expenses may include X-Ray, ambulance, dental treatment, prescribed drugs, wheelchairs or similar appliances. Reimbursement is not made for accident expenses to dental plates, crowns, fillings, glass frames, lenses or similar. Accident should be reported to Student Health within ten days.

Student financial aid

Commencing in September, 1978, the Ontario government will introduce a new financial aid program to help students meet the costs of post-secondary education. To be known as the Ontario Student Assistance Program (OSAP), it will include a number of
financial aid plans, each designed to assist a particular segment of the student population.

Components of the new OSAP are the following:

ONTARIO STUDY GRANT PLAN

A plan primarily to help full-time students from less affluent families to complete undergraduate work without having to incur significant debt. Grants under this plan are available for study at recognized post-secondary institutions in Canada.

Assistance through the Ontario Study Grant Plan is limited to the first eight academic terms of a student's post-secondary studies. After that, at the professional or graduate levels of study, a student is expected to assume more responsibility for educational costs or to turn to student loan plans for assistance.

CANADA STUDENT LOANS PROGRAMME

A plan to provide loans to full-time students for completion of any level of study at recognized post-secondary institutions anywhere in the world. Maximum aid under this plan is approximately two-thirds of standard costs at an Ontario institution.

ONTARIO STUDENT LOANS PLAN

A plan to help students who are not covered by the Canada Student Loans Program. This includes part-time students and also full-time students whose needs are not fully met by the Canada Student Loans Program. Provincial loans are available for study at recognized post-secondary institutions in Ontario.

ONTARIO SPECIAL BURSARY PROGRAM

A plan to help through grants particularly needy part-time students. This plan is for study at recognized post-secondary institutions in Ontario only and a student receiving assistance under it is ineligible to participate in any other OSAP plan.

To be eligible for assistance under all OSAP plans, a student must be a Canadian citizen or landed immigrant and fulfill certain requirements for residency in Ontario. The amount of assistance awarded is determined by a need-testing procedure and loans are interest free as long as the borrower continues to meet the “course load” requirements of the plan plus another six months.

For information and applications contact

Student Financial Aid Office
Divinity College, Room 229
McMaster University
1280 Main Street West
Hamilton, Ontario
L8S 4K1

Telephone: (416) 525-9140, extension 4319

ACADEMIC AWARDS

McMaster University has a number of scholarships, prizes, and medals available for award to students who meet the terms and general conditions governing the awards. Full information is contained in a separate brochure available upon request from the Academic Awards Officer, Office of the Registrar.
Degrees and Programmes

McMaster University offers the following undergraduate degrees:

**Faculty of Business**

- B.Com. ........................................... 4

**Faculty of Engineering**

- B.Eng. ........................................... 4
- B.Eng.Mgt. ........................................... 5

All Engineering and Engineering Management programmes are fully accredited by the Association of Professional Engineers in the Province of Ontario. The qualification, Professional Engineer, is granted in the minimum time of two years of professional employment following completion of the Engineering Degree.

Courses offered in the Engineering and Management programme will be subject to credit towards the C.A. professional qualification. Further information should be obtained from the Faculty of Business.

**Faculty of Health Sciences**

- B.Sc. (Nursing) ........................................... 4
- M.D. .............................................. see below

The M.D. (Doctor of Medicine) degree is taken after at least three years of undergraduate study, and is of three years duration.

All Health Sciences programmes are described in separate calendars.

**Faculty of Humanities**

- B.A. ........................................... 3
- B.A. (Honours) ........................................... 4
- Mus. Bac ........................................... 4

**Faculty of Science**

- B.Sc. ........................................... 3
- B.Sc. (Major) ........................................... 4
- B.Sc. (Honours) ........................................... 4

**Faculty of Social Sciences**

- B.A. ........................................... 3
- B.A. (Honours) ........................................... 4
- B.A./B.S.W. ........................................... 4
- B.P.E. ........................................... 4

Honours programmes involve specialized work in one or more departments, and at least second-class standing in specified courses required. In the major programmes at least third-class standing in specified courses is required.

**General plan of programmes**

In Year I, you register in one of Business I, Engineering I, Humanities I, Music I, Natural Sciences I, Physical Education I, or Social Sciences I. The Curricula for the various Year I programmes follow this section.

After completion of Year I, you may enter one of the programmes described in this calendar depending upon the Year I programme completed, the courses taken, and the standing attained.

If you are entering Year I, you should read carefully the requirements below for admission to the programme which you are considering entering after Year I so that you may choose proper electives and options.

**Year I programmes**

**BUSINESS I**

- 6 units: Economics 1A6 or 1B6
- 6-9 units: Mathematics

Students who have taken Level 5 Calculus must take either Mathematics 1M3 and 1L3, or Mathematics 1A6 and 1L3.

Students who have Level 5 Mathematics but not Level 5 Calculus must take Mathematics 1K3 in the first term and Mathematics 1M3 and 1L3 in the second term.

- 6 units: Sociology 1A6 or Psychology 1A6

Electives to total 30 units.

**ENGINEERING I**

- 31 units
  - Applied Mathematics 1C7
  - Chemistry 1A7
  - Engineering 1C4
  - Mathematics 1A6
  - Physics 1A7

- 6 units: Liberal studies elective Engineering 1A0
- total 37 units

†Students intending to enter Engineering and Management should take Economics 1A6 or 1B6

**ADAPTED ENGINEERING I CURRICULUM**

The programme of each student admitted on the selective engineering admission basis (See "Admission: Area requirements for admission from Level 5 [Grade 13]; Engineering I") will be determined by the Associate Dean of Engineering in consulta-
tion with appropriate members of the Faculties of Science and Engineering.

The curriculum for the adapted Engineering I programme shall have four units of Engineering Design, a minimum of thirteen units of Mathematics and Applied Mathematics, and a minimum of seven units each of Chemistry and Physics as in the regular Engineering I curriculum. Up to three additional units will be available and assignable for self-study and tutorial requirements in Chemistry, Physics, Mathematics and Applied Mathematics.

A minimum of three units Liberal Studies elective should be taken in the second term.

**HUMANITIES I**

18 units
Three first year six-unit courses in Humanities subjects, i.e., Art and Art History, Classical Civilization, Dramatic Arts, English, languages other than English, History, Music*, Philosophy.

12 units
Elective. (Students who have obtained an average of at least 80% in Grade 13 may take six units extra elective.)

**total 30 units**

*Students intending to enter Honours Music should register in Music I.

**Note:** No Humanities I student may take more than six units of work in any single discipline except that a Humanities I student may take both Art 1B6 and 1D6, nor may any Humanities I student take more than 18 units of work in languages other than English or more than twelve units of beginners' language courses.

**MUSIC I**

16 units
Q Music 1B4, 1C6, 1D2, 1E4

2 units
R Music 1G2

12 units
E Elective, excluding Music.

**total 30 units**

**NATURAL SCIENCES I**

6 units
Mathematics 1A6 or 1C6 or 1F6

16-22 units
i/Chemistry 1A7 or 1C8
ii/Physics 1A7 or 1B7 or 1C8
iii/Mathematics 1B4 or Applied Mathematics 1C6
iv/Biology 1B6 or 1C6 or 1D6 or 1E6
v/Geology 1A6
vi/Psychology 1A6

6 units
One six-unit course in Humanities or Social Sciences or Science. (Geography 1A6 or Materials 1A6 may be elected.)

**total 28-34 units**

**Note:** With the permission of a Dean of Studies, well-prepared students may be permitted to elect a sixth course. The choice in the programme that a First Year student may elect is considerable and should be made carefully with the requirements of a specific year II programme in mind. A suitable choice of first year options will allow successful students to enter any one of several year II programmes. Students who complete Natural Sciences I with high standing but who lack a year I course required for entry into the desired Year II programme may be permitted entry to that programme after consultation with a Dean of Studies and the appropriate Departmental Chairman.

**PHYSICAL EDUCATION I**

12 units
Physical Education 1A6, 1C3 and 1E3

18 units
Elective†

**total 30 units**

†Students may take 16 units elective if Mathematics 1B4 is chosen.

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**SOCIAL SCIENCES I**

**12 units of**
Anthropology 1A3, 1Z3
Economics 1A6 or 1B6
Geography 1A6 and/ or 1B6
Political Science 1A6
Psychology 1A6
Religious Studies 1B6, 1C6, 1D6, 1E6, 1F6, or 1Z6

Sociology 1A6

**18 units**
Elective†

*Students may take more than 12 units of work in the Faculty of Social Sciences if they wish subject to the conditions outlined in the paragraph which follows.

†Normally, a student will take only six units in any one discipline (excluding Mathematics). In special circumstances, a student may be permitted to take up to 12 units in one discipline. The student is also strongly advised to take at least six units of work outside the Faculty of Social Sciences. Students may take 18 units elective if Mathematics 1B4 is chosen.

For Nursing, see the Calendar of the School of Nursing.

**ELECTIVE COURSES AVAILABLE TO YEAR I STUDENTS**

The following is a partial list of courses available as electives to Year I students, provided that the student has met the prerequisites and provided any enrolment limitations are not exceeded. Normally, a student may select up to six units in any particular subject (excluding Mathematics of which up to 12 units may be taken). A brief description of each course is included under the appropriate Department within the section headed "Work by Departments".

**Anthropology** 1A3, 1Z3
**Economics** 1B6, 1C6, 1D6, 1E6, 1F6, 1G6
**Chemistry** 1A7, 1B7, 1C8
**Chinese** 126
**Classical Civilization** 1A6
**Dramatic Arts** 1A6
**Economics** 1A6, 1B6
**English** 1A6, 1B6
**French** 1A6, 1B6, 1Y3, 1Z6
**Geography** 1A6, 1B6
**Geology** 1A6, 1B6
**German** 1A6, 1B6, 1Z6
**Greek** 1A6, 1D6, 1Z6
**History** 1A6, 1B6, 1C6, 1L6
**Humanities** 1B6
**Italian** 1A6, 1Z6, 1Z26
**Latin** 1A6, 1Z6
**Linguistics** 1A6
**Mathematics** 1A6, 1B4, 1C6, 1F6, 1K3, 1L3, 1M3
**Music** 1A6
**Philosophy** 1B6, 1D6
**Physics** 1A7, 1B7, 1C8
**Political Science** 1A6
**Psychology** 1A6
**Religious Studies** 1B6, 1C6, 1D6, 1E6, 1F6, 1Z6
**Russian** 1B6, 1Z6
**Sociology** 1A6
**Spanish** 1A6, 1Z6
**Ukrainian** 126
The Faculty of Business

The Faculty of Business offers a four-year Commerce programme leading to the Bachelor of Commerce degree, and, together with the Faculty of Engineering, a five-year programme leading to the Bachelor of Engineering and Management degree.

In the Commerce programme, first-year students are required to establish a foundation in economics, mathematics, and sociology or psychology. The remainder of the work taken must be selected from Social Science, Humanities, or Science.

Beyond the Year I level, all students are required to take a block or core of Business courses, and to supplement this required coverage by electing the remainder of their programme from any of the Engineering courses. In Year II, the Faculty requires 18 Business units of the year's 30-unit requirement; in Year III 18 Business units; and in Year IV, 12 Business units. This coverage will afford a basic understanding of accounting, statistics, management science, finance, marketing, production, and management. Students have the opportunity of specializing in at least one of the above functional areas through a wide choice of Business electives. Many students, however, take a significant portion of their elective work in non-Business courses. The opportunity exists for either specializing in a particular area of Business or completing a general programme.

The Engineering and Management programme is a joint offering of the Faculty of Engineering and the Faculty of Business. Over five years, it provides a full programme in Chemical, Civil, Electrical, Engineering Physics, or Mechanical, Engineering, and the full core requirement of a Bachelor of Commerce. It is, therefore, ideal for young engineers seeking careers in Canadian industry, business, or government, where economic and behavioural problems to be solved may become as important as the technical ones.

Upon graduation, the student will be awarded the degree of Bachelor of Engineering and Management. This degree is fully accredited by the Association of Professional Engineers of the Province of Ontario. Full details relating to the joint programme in Chemical, Civil, Electrical, Engineering Physics, or Mechanical, Engineering, and the full core requirement of a Bachelor of Commerce can be found in the Faculty of Engineering section.

Full details relating to the five-year Engineering and Management programme, including detailed course descriptions and academic requirements, are provided in the Faculty of Engineering section.

PROFESSIONAL ACCOUNTING DESIGNATIONS

The Institute of Chartered Accountants of Ontario requires students to complete 45 units of designated course work in order to satisfy their academic prequalification requirements. Students may complete the entire 45 units of course work during the four-year Bachelor of Commerce programme through the appropriate selection of elective courses.

The Society of Management Accountants course of study leading to the designation R.I.A. can be substantially fulfilled by an appropriate selection of elective courses. Students interested in the above professional accounting programmes are advised to obtain information at the office of the Associate Dean of the Faculty of Business.

Programme for the B.Com. Degree

COMMERCE

Admission:
Year II Commerce is a limited enrolment programme, to a maximum of 300 students. Priority is given to students who have attained, ON THEIR FIRST ATTEMPT, an overall weighted average of 65% in the courses designated as required in Business I (see "Year I Programme: Business I"), an overall weighted average of 60% in the block of work designated for Year I AND at least 60% in each prerequisite course.

Students from other universities or from other faculties within McMaster University may be considered for transfer into Commerce II. All documentation required to complete the admission application must be received by the Registrar by June 15.

Students with excellent academic records who have not satisfied all the requirements by June 15 may be granted admission to Commerce II.

YEAR II: 30 units
See below for academic regulations regarding continuance in programme.
R/Commerce 2A3, 2B3, 2D3, 2E3, Economics 2G3*, 2H3*.
E/ Six to 12 units elective from any year, provided the prerequisites are satisfied.
*Students may substitute Economics 2L6 for Economics 2G3 and Economics 2M6 for Economics 2H3, and should do so, if they intend to take a considerable portion of their senior division work in Economics.

YEAR III: 30 units
R/Commerce 3B3, 3D3, 3E3, 3K3, and six additional units from Commerce.
E/ Electives must be chosen beyond Year I to make a total of 30 units.

YEAR IV: 30 units
R/Commerce 4B3 and nine additional units in Commerce to be selected from fourth-year offerings.
E/18 units elective. All non-Commerce courses must be selected from beyond the Year I level.

Students are advised not to exceed a work load of 15 units per term. Students desiring to take more than 15 units per term must obtain permission from the office of the Associate Dean of the Faculty of Business.

Continuation in the programme

In the four-year programme leading to the degree Bachelor of Commerce, the minimum requirement is a weighted average of 60.0% in all courses and a weighted average of 65.0% in the required courses for each Year. A student who fails to obtain the required percentage a second time will be ineligible to continue in the Commerce programme. Graduation standing is calculated on the basis of the average of the overall weighted averages in Years III and IV combined.
The Faculty of Engineering

An engineer, as originally defined, meant an "ingenious person". The engineer today is concerned with the creation of devices, systems, and structures, for human use. In this role of creator and of innovator, the engineer more than ever finds resourcefulness and capacity for invention at the heart of the practice of engineering. We are challenged to advance from heedless exploitation of our world to an era of exercising beneficial control of the environment, and the useful management of both the products and wastes of our industrial society. Engineering education at McMaster provides a host of choices which lead to this creative and fulfilling role in society.

Four-year programmes are offered leading to the Bachelor of Engineering Degree in the following fields of specialization:

- Ceramic Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Engineering Physics
- Mechanical Engineering
- Metallurgical Engineering

The first year of the four-year programmes and some of the work required for the second year is available in part-time evening studies. Students interested in part-time studies should obtain information on courses available from the Associate Dean of Engineering.

In addition, and in conjunction with the Faculty of Business, five-year programmes leading to the Bachelor of Engineering and Management Degree are offered in:

- Chemical Engineering and Management
- Civil Engineering and Management
- Electrical Engineering and Management
- Engineering Physics and Management
- Mechanical Engineering and Management

All Engineering and Engineering and Management programmes are accredited by the Association of Professional Engineers in the province of Ontario. The qualification, Professional Engineer, is granted in the minimum time of two years of professional employment following the completion of the Engineering Degree. Courses offered in the Engineering and Management programme will be subject to credit towards the Charted Accountant professional qualification; further information should be obtained from the Faculty of Business.

At McMaster, Engineering students take a common first year comprising Mathematics, Physics, Chemistry, Applied Mathematics, Engineering Design and a liberal studies elective. The liberal studies elective is chosen from appropriate courses available in the areas of Humanities or Social Sciences. Students interested in the Engineering and Management programme must take Economics 1A6 or 1B6 as their elective in Year I.

Note: Programmes offered by the Faculty of Engineering include two types of elective courses, which are governed by regulations, as follows:

Liberal studies electives are broadening courses which are not in subjects that are cognate with Engineering programmes (with the exception of Economics 1A6 or 1B6 for Engineering and Management programmes). The Associate Dean of Engineering must authorize each student's liberal studies elective courses from an approved list, published each spring and available from his office.

Technical electives are Engineering or Applied Science courses in subjects relevant to the particular Engineering programme. Both the appropriate Department Chairman and the Associate Dean of Engineering must approve each student's technical elective courses.

ACADEMIC REGULATIONS

ENGINEERING STANDING

In the four-year program leading to the degree Bachelor of Engineering and in the five-year program leading to the degree Bachelor of Engineering and Management, the minimum requirement for completion of the block of work defined for a Year is a weighted average of 60.0% with no F grades and not more than 20% of the Year unit load in the E grade range. The final marks of the courses in a Year Block used in the calculations of the weighted average shall be those marks obtained in the first attempt of the Year Block. This requirement is termed Engineering Standing.

CLEARANCE OF DEFICIENCIES

A student who achieves Engineering Standing is allowed to repeat work to clear deficiencies and prerequisites.

FAILED YEAR ENGINEERING

A student who fails to achieve Engineering Standing in a Year has failed that Year.

A first year student in this category is required to withdraw from Engineering for a minimum of 16 months. Re-admission to Engineering may be granted upon application to the Associate Dean of Engineering in January of the year for which re-admission is desired.

Students in other Years of an engineering program who fail to make Engineering Standing for the first time may repeat that year in which Engineering Standing has not been obtained. Credit will be retained only in those courses in which a grade of C or higher has been obtained. All other work shall be repeated.

PROBATIONARY STANDING

A student who fails to achieve Engineering Standing may be granted the privilege of Probationary Standing by the Faculty of Engineering Examinations Review Committee. This privilege will not be granted on more than one occasion during undergraduate engineering studies.

REQUIRED TO WITHDRAW FROM ENGINEERING

A student who fails to achieve Engineering Standing on two occasions or who has a total of two failed years, engineering and any other programme, is required to withdraw from further work in any Engineering programme. Although a student in this category may apply for re-admission after one year of practical work experience, re-admission is not guaranteed. Two attempts to complete one of the engineering professional programmes is considered fair and adequate.

WORK LOAD

The Faculty of Engineering has set a maximum of 38 units of work and a minimum of 34 units unless special approval has been given by the Associate Dean of Engineering. A student with a first class standing in the previous year's work may be granted permission to undertake one additional term course without an increase in fees. A student is expected to carry a minimum work load of 34 units.

REGISTRATION

A student is required to register in the Year for which work is being completed. Work of the next year may be undertaken with the permission of the Associate Dean of Engineering provided that prerequisite and corequisite requirements are fulfilled and scheduling conflicts do not exist.

In the event that the weighted average of the work completed the previous year is unsatisfactory, registration in any work of the next year will not be allowed.
PREREQUISITE REQUIREMENTS

A minimum of a D grade is required in the prerequisite work for all engineering and applied mathematics courses, while a minimum of a C grade is required in the prerequisite work for Commerce courses.

A student who has achieved Engineering Standing will be allowed to repeat work in order to complete prerequisite requirements. This work will be marked UPGRADE in the student's academic record.

All prerequisite and corequisite requirements for a course must be fulfilled.

PROGRAMME REQUIREMENTS

It is the student's responsibility to ensure that the program of work undertaken meets the degree requirements for that program. All program changes must be made through the Office of the Associate Dean of Engineering.

HONOURS STANDING

Honours standing at graduation will be granted to a student who has obtained first-class standing in the final Year and one previous Year.

Programmes for the B.Eng. Degree

Prerequisite requirements for courses listed for each programme are specified with the course description under "Work by Departments".

CERAMIC ENGINEERING

Admission:
Completion of Engineering I, with a weighted average of at least 60.0%.

YEAR II: 38 units
R/ Applied Mathematics 2J5, Chemistry 2A4, 2T4, Engineering 2A5, 2O4, 2P4, English 2E6, Materials 2F3, Metallurgy 2C3.

YEAR III: 37 units
R/ Applied Mathematics 3M3, Ceramics 404 or 4P4; Chemistry 2F3; Chemical Engineering 3O4, Engineering 3P3; Geology 2B4; Materials 3B2, 3D6, 3E6, 3G2.

Attention is drawn to Ceramics 4A1, which requires an essay based on employment in the summer between Years III and IV.

YEAR IV: 35-37 units
R/ Ceramics 4A1, 4K4, 4L4, 4O4* or 4P4*; Chemical Engineering 4P3, Materials 4E3.

E/ Six units liberal studies elective. Senior division Engineering I electives to make a total of 35 to 37 units.

*Ceramics 4P4 and 4O4 can be taken in either Year III or IV, but both courses are required.

Ceramic engineering students are urged to consider Chemical Engineering 4N4 as a technical elective and should discuss this with the Chairman prior to the end of Year III.

CHEMICAL ENGINEERING

Admission:
Completion of Engineering I, with a weighted average of at least 60.0%.

YEAR II: 35 units
R/ Applied Mathematics 2J5; Chemical Engineering 2C3, 2D4, 2F4; Chemistry 2M4; Engineering 2A5, 2R4; English 2E6.

YEAR III: 36-38 units
R/ Applied Mathematics 3M3; Chemical Engineering 3A4, 3B3, 3D4, 3E3, 3H4; Chemistry 208.

E/ Seven to nine units technical electives.

YEAR IV: 36-38 units
R/ Chemical Engineering 4A5, 4K4, 4N4, 4P3, 4R4, and 4W4 or 4Y4.

E/ Six units liberal studies elective; six to eight units technical electives.

The following areas and courses are suggested as technical electives:

YEAR III—Biomedical Engineering: Biochemistry 2E4, Biology 1B3 or 1B6, Engineering 4X3, Engineering Physics 3X4; Computer Applications: Applied Mathematics 2N3, 3B6, 3H3, Environmental Engineering: Biochemistry 2E4, Biology 1D6, Chemical Engineering 4V3, Civil Engineering 4C3, Engineering 4U3; Management: Commerce 2A3, 2B3, 3B3, Economics 2G3, 2H3, 3V3; Process Engineering: Chemistry 2F3, Engineering 203 (or 204), 3M3, 3N3, 3P3, 3G3, Materials 4D3, Metallurgy 3C3, Physics 3T3.

YEAR IV—Same as Year III, plus Biomedical Engineering: Chemical Engineering 4T3, Electrical Engineering 4U4, Engineering Physics 4Y3; Computer Applications: Applied Mathematics 4K3; Environmental Engineering: Biochemistry 3G6, Biology 3E3, 4Y3; Management: Commerce 3D3, 3F3, 3G3, 3K3, Economics 3B3, 3H3, 3S3, 3W3; Nuclear Engineering: Engineering Physics 4D4, 4E6, 4F6; Process Engineering: Ceramics 4O4, 4P4; Chemistry 3Q3, 3U6, Chemical Engineering 4S3, Metallurgy 4C4.

CIVIL ENGINEERING AND ENGINEERING MECHANICS

Admission:
Completion of Engineering I, with a weighted average of at least 60.0%.

YEAR II: 38 units

YEAR III: 36 units
R/ Applied Mathematics 3U4; Civil Engineering 3A3, 3B3, 3C4 (for 1978-79 only), 3G4, 3J4, 3K3, 3M4, 3O4; Engineering 2W4, 3P3.

YEAR IV: 34-36 units
E/ Six units liberal studies elective, 28 to 30 units chosen from Year IV Civil Engineering courses, or other technical electives.

In selecting technical electives, Civil Engineering students shall include a minimum of one course from each of four of the five groups in the following listing. Exceptions to the above guideline can be made with approval of Chairman of the Department. Students are advised that some final year elective courses include a major project counting for more than 50% of the final grade. Students should avoid incurring too great a load of project work in any one term.

Group A: Civil Engineering 4G4, 4S3
Group B: Civil Engineering 4A4, 4I4, 4M3, Engineering 4U3
Group C: Civil Engineering 4D4, 4F3, 4H3
Group D: Civil Engineering 4K3, 4N4, 4P3, 4R4, 4Y4
Group E: Civil Engineering 4B3, 4C3, 4J3

COMPUTER ENGINEERING

Admission:
Completion of Engineering I with a weighted average of at least 60.0%.

YEAR II: 37 units
R/ Applied Mathematics 2H3, 2J5, 2L3; Electrical Engineering 2B3, 2D3, 2K3, 2H3; Engineering 2O4, 2R4; English 2E6.

YEAR III: 39 units
R/ Applied Mathematics 3A3, 3D3, 3W5; Electrical Engineering 3B4, 3C5, 3F4, 3G4, 3H3, 3K4; Engineering 2W4.

YEAR IV: 37-38 units
R/ Applied Mathematics 3C3, 3X3, 4E6, 4W3; Electrical Engineering 3N3.

E/ Six units liberal studies elective; 13 to-14 units of Electrical Engineering 4A4, 4B4, 4C4, 4E3, 4G3, 4H3, 4K4, 4L3.
ELECTRICAL ENGINEERING

Admission:
Completion of Engineering I, with a weighted average of at least 60.0%.

YEAR II: 38 units
R/ Applied Mathematics 2J5, 2M3; Electrical Engineering 2B3, 2D3, 2X3, 2H3; Engineering 2Q4, 2R4, 2W4; English 2E6.

YEAR III: 38 units
R/ Applied Mathematics, 3W5, 3X3; Electrical Engineering 3B4, 3C5, 3F4, 3G4, 3H3, 3K4, 3N3, 3S3.

YEAR IV: 36-38 units
R/ 16 units of Electrical Engineering Year IV courses.
E/ Six units liberal studies elective; 14-16 units technical electives.
The following groups of courses are recommended to students who wish to specialize in the areas indicated. Students with first class standing in Year III, or with the permission of the Department may substitute Electrical Engineering 4J4 for any one of the listed classes. Conflict-free timetabling is not guaranteed.

1. Electronics and Communications: Electrical Engineering 4A4, 4B4, 4C4, 4G3, 4H3, 4K4, 4L3 or 4M3. Engineering physics 4B3 or Engineering 3Q3, Engineering Physics 4K3.


4. Biomedical Engineering: Electrical Engineering 4A4, 4B4, 4C4, 4F3 or 4M3, 4H3, 4U4. Engineering 4X3, Engineering Physics 4Y3, Biology 1B3.


ENGINEERING PHYSICS

Admission:
Completion of Engineering I, with a weighted average of at least 60.0%.

YEAR II: 37 units
R/ Applied Mathematics 2J5, 2M3; Engineering 2Q3, 2P4, 2W4; Engineering Physics 2A7; English 2E6; Physics 2C5.

YEAR III: 37-38 units
R/ Applied Mathematics 3B6, Applied Mathematics 3F4 or Mathematics 3Q4; Chemical Engineering 3Q4 or Mechanical Engineering 3Q4; Engineering Physics 3E5; Physics 3B6, 3M6.
E/ Six units liberal studies elective (which may be deferred to Year IV); or technical electives to make a total of 37 to 38 units.

YEAR IV: 36-38 units
R/ Engineering Physics 4C2, 4U4; Physics 4B4; at least 10 units from Engineering Physics 4B3, 4D4, 4G3, 4K3, 4S4, 4W3. Physics 4D6.
E/ Six units liberal studies elective; if not completed in Year III; technical electives to make a total of 36 to 38 units.

The following areas and courses are suggested as technical electives.


YEAR IV—Biomedical Engineering: Engineering Physics 4X3, Engineering Physics 4Y3; Computer Systems: Engineering Physics 4W3, Physics 4D6; Lasers and Electro-Optics: Engineering Physics 4G3, 4K3, 4S4; Nuclear Engineering:

MECHANICAL ENGINEERING

Admission:
Completion of Engineering I, with a weighted average of at least 60.0%.

YEAR II: 38 units
R/ Applied Mathematics 2J5, 2M3; Engineering 2A5, 2P4, 2Q4, 2W4; English 2E6; Mechanical Engineering 2A4, 2B3.

YEAR III: 37 units
R/ Applied Mathematics 3V6; Engineering 2Q3, 3M3, 3N3, Mechanical Engineering 3A3, 3C3, 3D3, 3E4, 3M2, 3O4, 3R3.

YEAR IV: 38-39 units
R/ Mechanical Engineering 4C3, 4G3, 4M4, 4P2, 4Q3, 4R2, 4S3.
E/ Six units liberal studies elective; four technical electives from the list below.

Electives must be chosen so that the number of units taken in any one term does not exceed 21.

Students are encouraged to attend Departmental seminars.

METALLURGICAL ENGINEERING

Admission:
Completion of Engineering I, with a weighted average of at least 60.0%.

YEAR II: 38 units
R/ Applied Mathematics 2J5, Chemistry 2A4, 2T4; Engineering 2A5, 2P4, 2Q4; English 2E6; Materials 2F3; Metallurgy 2C3.

YEAR III: 35 units
R/ Applied Mathematics 3V6; Chemistry 3Q3; Chemical Engineering 3Q4; Engineering 3P3; Materials 3B2, 3D6, 3E6, 3G2; Metallurgy 3C3.

Attention is drawn to Metallurgy 4A1, which requires an essay based on employment in the summer between Years III and IV.

YEAR IV: 36 units
R/ Engineering 3M3, Materials 4E3; Metallurgy 4A1, 4C4, 4K4, 4L4.
E/ Six units liberal studies elective; additional technical electives to make a total of 36 units.

Programmes for the B. Eng. Mgt. Degree

Prerequisite requirements for courses listed for each programme are specified with the course description under "Work by Department".

1Commerce electives required in Year V of the Engineering and Management programmes must be selected from the following: Commerce 3A3, 3L3 and all Year IV Commerce courses except Commerce 4B3. Engineering electives as indicated under Departments.

Students who may wish to proceed to the McMaster M.B.A. programme are advised to select Commerce 2E3 as a technical elective.

CHEMICAL ENGINEERING AND MANAGEMENT

Admission:
Completion of Engineering I, including Economics 1A6, or 1B6, with a weighted average of at least 60.0%.
CIVIL ENGINEERING AND MANAGEMENT

Admission:
Completion of Engineering I, including Economics 1A6 or 1B6, with a weighted average of at least 60.0%

YEAR II: 39 units
R/ Applied Mathematics 2J5, 2M3; Civil Engineering 2A2. 2B3; Commerce 2A3, 2B3; Economics 2G3, 2H3; Engineering 2P4; English 2E6.

YEAR III: 39 units
R/ Applied Mathematics 3U4; Civil Engineering 2C4, 2D3, 3K3, 3M4, 3Q4; Commerce 3K3; Engineering 2A4, 2W4; Psychology 1A6 or Sociology 1A6.

YEAR IV: 36-39 units
R/ Applied Mathematics 3M3; Civil Engineering 3A4, 3B3, 3Q4; Engineering 3D4; Chemistry 2F3 (or 2F4); Engineering 2D3 or 2P4.

YEAR V: 36 units
R/ Chemical Engineering 4A5, 4N4, 4P3, 4R4, 4W4; Commerce 4B3; Engineering 5A1.
E/ Nine units Commerce electives; one of Chemical Engineering 4S3, 4V3; Civil Engineering 4C3; Engineering 4U3.

ELECTRICAL ENGINEERING AND MANAGEMENT

Admission:
Completion of Engineering I, including Economics 1A6 or 1B6, with a weighted average of at least 60.0%

YEAR II: 36 units
R/ Applied Mathematics 2J5, Chemical Engineering 2D4, 2F4; either Chemical Engineering 2C3 or Commerce 3H3; Commerce 2A3, 2B3; Economics 2G3, 2H3; Engineering 2R4; English 2E6.

YEAR III: 35-37 units
R/ Chemical Engineering 3D4; Chemistry 2O8; Commerce 3G3, 3K3; Engineering 2A5; Psychology 1A6 or Sociology 1A6; two of Chemical Engineering 3E3, 3F3, Chemistry 2F3 (or 2F4); Engineering 203 or 204.

YEAR IV: 36-38 units
R/ Applied Mathematics 3M3; Chemical Engineering 3A4, 3B3, 3O4, 4K4; Commerce 3B3, 3D3, 3E3, 3F3.
E/ Six to eight units of electives from liberal studies or approved technical electives list.

YEAR V: 36 units
R/ Chemical Engineering 4A5, 4N4, 4P3, 4R4, 4W4; Commerce 4B3; Engineering 5A1.
E/ Nine units Commerce electives.†

ENGINEERING PHYSICS AND MANAGEMENT

Admission:
Completion of Engineering I, including Economics 1A6 or 1B6, with a weighted average of at least 60.0%

YEAR II: 38 units
R/ Applied Mathematics 2J5, 2M3, Commerce 2A3, 2B3; Economics 2G3, 2H3; Engineering 2P4, 2P5, 2R4; English 2E6; Physics 2C5, 3B6.

YEAR III: 38 units
R/ Applied Mathematics 3B6; Commerce 3B3, 3G3, 3K3; English 2E6; Physics 2C5, 3B6; Sociology 1A6 or Psychology 1A6.

YEAR IV: 36-37 units
R/ Applied Mathematics 3F4 or Mathematics 3Q4; Chemical Engineering 3O4 or Mechanical Engineering 3C4; Commerce 3D3, 3E3, 3F3, Engineering Physics 3E3; Physics 3M6; Engineering Physics 4C2.
E/ Six to seven units from approved technical electives or three to four units from approved technical electives with three units from liberal studies.

YEAR V: 40 units
R/ Commerce 4B3; Engineering Physics 4U4; Physics 4B4; Engineering 5A1; a minimum of 10 units selected from Engineering Physics 4B3, 4D4, 4G3, 4K3, 4S4, 4W3, and Physics 4D6.
E/ Nine units Commerce electives and nine units technical electives.

MECHANICAL ENGINEERING AND MANAGEMENT

Admission:
Completion of Engineering I, including Economics 1A6 or 1B6, with a weighted average of at least 60.0%

YEAR II: 39 units
R/ Applied Mathematics 2J5, 2M3; Commerce 2A3, 2B3; Economics 2G3, 2H3; Engineering 2A5, 2P4, 2W4, 2E6.

YEAR III: 39 units
R/ Applied Mathematics 3V6; Commerce 3G3, 3K3; Engineering 2G4; Mechanical Engineering 2A4, 3O4, 3D3, 3M3, 3F3, Psychology 1A6 or Sociology 1A6.

YEAR IV: 36 units
R/ Commerce 3B3, 3D3, 3F3; Engineering 203, 3M3; Mechanical Engineering 3A3, 3C3, 3E4, 4C3, 4P2, 4R4; Sociology 1A6.
E/ Six units of electives selected from liberal studies or approved technical electives list.

YEAR V: 35 units
R/ Commerce 4B3, Mechanical Engineering 4G3, 4M4, 4Q3, 4S3, and nine additional units of Mechanical Engineering, Engineering 5A1.
E/ Nine units Commerce electives; one of Mechanical Engineering 4M4 may, with approval, be included in the Commerce electives, and the equivalent units replaced by technical elective units.)
Programmes for B. Eng. Degree
(Part-time)

Prerequisite requirements for courses listed for each programme are specified with the course description under "Work by Department"

CERAMIC, CIVIL, CHEMICAL, ELECTRICAL, ENGINEERING PHYSICS, MECHANICAL AND METALLURGICAL ENGINEERING

Admission
Completion of Engineering I with a weighted average of at least 60.0%. The following courses may be substituted for the corresponding required courses in Engineering I: Chemistry 1A6 or Physics 1A6.

YEAR II:
Courses common to all programmes.
R/ Applied Mathematics 2J5, 2M3; English 1A6 or 2E6; Engineering 2P4, 2Q4.

For Ceramic or Metallurgical Engineering: 37 units
R/ Engineering 203; Metallurgy 2C3; Engineering 2A5, 2W

For Chemical Engineering: 35 units
R/ Chemical Engineering 2D4, 2F4; Engineering 2A5

For Civil Engineering and Engineering Mechanics: 39 units
R/ Civil Engineering 2A2, 2B3, 2D3, Engineering 2A4, 2W

For Electrical Engineering: 37 units
R/ Electrical Engineering 2D3, 2H3, 2X3, 2B3; Engineering 2W

For Engineering Physics: 39 units
R/ Physics 2C5; technical electives 3 units. Eng 2A5, 2W

For Mechanical Engineering: 37 units
R/ Mechanical Engineering 2A4, 2B3; Engineering 2W

Engineering courses may be available in the day-time schedule only.

YEARS III and IV
As given in the appropriate sections for the full-time, day-time programmes. These courses are available only in the day-time schedule.
Programmes for the Honours B.A. Degree

Subject to possible timetable restrictions, and with the written approval of the appropriate Departments and Dean of Studies, a student may select any combination of two of the following subjects to make an Honours programme: Art History, Classical Civilization, Dramatic Arts, English, French, German, Greek, History, Italian, Latin, Music, Philosophy, Russian, Spanish. Combinations may also be possible with certain Social Science disci-
2. For students entering Honours Art Year II in September 1979 and after.

Admission:
University Standing in any Year I with an average of 70% in Art History 1A6 and Art 1B6 and 106.

Year I: 30 units (beginning in 1979-80)
Q/ Art 2A6, 2B6; six units chosen from Art History 2B3, 2C3, 2K3, 2L3, 2M3, 2N3, 2O3, 2P3.
R/ Art 2C3; three units chosen from Art History 2B3, 2C3, 2K3, 2L3, 2M3, 2N3, 2O3, 2P3.
E/ Six units elective excluding Art and Art History.

Year II: 30 units (beginning in 1980-81)
Q/ One of Art 3A6, 3B6, 3E6 or 4A6; six units chosen from Art History 2B3, 2C3, 2K3, 2L3, 2M3, 2N3, 2O3, 2P3.
R/ Art 3C3; three units of Art History.
E/ 12 units elective, at least six excluding Art and Art History.

Year IV: 30 units (beginning in 1981-82)
Q/ Art 4B12, or Art 4C6 and one of Art 3A6, 3B6, 3E6, or 4A6; six units of Art History.
R/ One of Art 3A6, 3B6, 3E6, and 4A6.
E/ Six units elective.

At least "D" is required in all Q and R group Art and Art History courses.

Combined Honours Programme

Students who wish to combine Art History with another subject in a combined Honours programme must complete Year I with an average of 70% in Art History 1A6 and six units of the other Honours subject. The Art History requirements for such a programme are as follows: 12 units of Art History in each of Years II, III, and IV, including 18 units chosen from Art History 2B3, 2C3, 2K3, 2L3, 2M3, 2N3, 2O3, 2P3, and at least one seminar course. At least "D" is required in all Q group Art History courses.

To the total of approximately 24 units of Q work in each Year of a Combined Honours programme, the student must add elective work to make up a minimum overall load of 30 units.

COMBINED HONOURS IN CANADIAN STUDIES

A combined Honours programme in Canadian Studies is under active consideration and it is hoped that this programme will commence in September 1979. The Canadian Studies component may be combined with subjects offered by the Faculties of Humanities and Social Sciences. If the programme is approved, a separate announcement will be made. Further information about the programme may be obtained from the Office of the Registrar or from the offices of the Faculties of Humanities and Social Sciences.

CLASSICAL CIVILIZATION

HONOURS CLASSICAL CIVILIZATION

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I, with an average of 70% in 12 units of Year I work including a mark of at least 70 in Classical Civilization 1A6. Students are recommended to include at least one of Greek 1A6, 1Z6, Latin 1A6, 1Z6 in their Year I programme.

Year II: 30 units
Q/ Classical Civilization 203; nine additional units of Classical Civilization or Ancient History; six units of Greek or Latin.
E/ 12 units elective, of which at least six units must exclude Greek, Latin, and Classical Civilization.

Year III: 30 units
Q/ Six units of Classical Civilization or Ancient History, six units of Greek; six units of Latin.
E/ 12 units elective, of which at least six units must exclude Greek, Latin and Classical Civilization.

Year IV: 30 units
Q/ Classical Civilization 4F3; three additional units of Classical Civilization; six units of Greek or Latin (whichever language taken in both Year II and Year III); three units of the other Classical language; and three to six units of Greek or Latin or Classical Civilization or Ancient History.
E/ Nine to 12 units elective.

Note: At least "D" is required in all Q group courses.

Combined Honours Programme

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Students who wish to combine Classical Civilization with another subject in a Combined Honours programme must complete Year I with a mark of at least 70 in Classical Civilization 1A6 and in six units of the other Honours subject. The Classical Civilization requirements for such a programme are as follows:

Twelve units of Classical Civilization in each of Years II (including Classical Civilization 203), III, and IV (including Classical Civilization 4F3). The student must choose no fewer than six units from each of the following groups:

(a) Archaeology and Art History: Classical Civilization 2B3, 2C3, 2L3, 2M3, 3F3, 3G3.
(b) Literature in Translation: Classical Civilization 2E3, 2H3, 2J3, 3C3, 3E3, 3J3, 3L3; English and Classics 4A3.
(c) Social, Political, and Religious Thought: Classical Civilization 2K3, 2P3, 3K3, 3K3, 3L3, 3M3, 3N3, 3O3.
(d) Language and Literature: Courses in Greek and Latin offered by the Department of Classics.
(e) Greek and Roman History: History 2L6, 3D6, 3L6, 4D6, 4I6.

With the approval of the Departmental Counsellor, courses offered by other departments in Ancient Philosophy and Religious Studies may be substituted for courses in Classical Civilization.

To the total of approximately 24 units of Q work in each year of a Combined Honours programme, the student must add elective work to make up a minimum overall load of 30 units.

Note: At least "D" is required in all Q group Classical Civilization courses.

HONOURS CLASSICS

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I with a mark of at least 70 in Greek 1A6 and in Latin 1A6. (Greek 1Z6 or Latin 1Z6 with a mark of at least 75 may be substituted for Greek 1A6 or Latin 1A6.) Students are recommended to include Classical Civilization 1A6 in their Year I programme.

At the end of each year, O-average will be based on the specified number of units of work in Greek, Latin, and Classical Civilization (or Ancient History) in which the student has been most successful.

Year II: 30 units
Q/ The 18 units of Greek, Latin, and Classical Civilization or Ancient History in which the student obtains the highest weighted average.
R/ Greek 2A3, 2B3, Latin 2F3 and nine additional units from Latin 1A6 (if not completed in Year I), 2C3, 2G3, 2H3, 2J3; Greek 1A6 (if not completed in Year I), otherwise six units of Classical Civilization or History 2L6.
E/ Six units elective, excluding Greek, Latin, and Classical Civilization.
HUMANITIES

YEAR III: 33 units
Q/ The 18 units of Greek, Latin, and Classical Civilization or Ancient History in which the student obtains the highest weighted average.
R/ Greek 3C3 (or 4E3)* and nine additional units of Year III (or Year IV)* Greek; Latin 4C3 (or 4E3)* and nine additional units of Year III (or Year IV)* Latin; six units of Classical Civilization or History 3D6 or 3L6.
E/ Three units elective, excluding Greek, Latin, and Classical Civilization.

YEAR IV: 30 units
Q/ The 18 units of Greek, Latin, and Classical Civilization or Ancient History in which the student obtains the highest weighted average.
R/ Greek 4E3 (or 3C3)* and nine additional units of Year IV (or Year III)* Greek; Latin 4G3 (or 3E3)* and nine additional units of Year IV (or Year III)* Latin; six units of Classical Civilization or History 3D6 or 3L6 or 4D6 or 4I6.
*Year III Greek courses alternate with Year IV Greek courses. Year III Greek courses are offered in 1978-79. Year IV Greek courses are offered in 1978-79. Year III Latin courses alternate with Year IV Latin courses. Year III Latin courses are offered in 1978-79. Year IV Latin courses are offered in 1979-80.

Note: At least "D" is required in all Q group courses.

Combined Honours Programmes

For the requirements for combining Greek see "Combined Honours Greek" in this section; for combining Latin see "Combined Honours Latin" in this section.

DRAMATIC ARTS

Combined Honours Programme

Note: No student may register in any Year of this programme without the approval of the Chairman of the Committee on Dramatic Arts. Students are therefore advised to consult the Chairman of the Committee on Dramatic Arts before completing registration forms in March.

Students who wish to combine Dramatic Arts with another subject in a Combined Honours programme must complete Year I with a weighted average of 70% in Dramatic Arts 1A6 and six units of the other Honours subject. For such a programme, 12 units of Dramatic Arts are required in each of Years II, III, and IV, including Dramatic Arts 2A6 (or 2A3); 2G3, and 3K6 (or 3E3). To the total of approximately 24 units of Q work in each year of a Combined Honours programme, the student must add elective work to make up a minimum overall load of 30 units.

At least "D" is required in all Dramatic Arts courses in the Q group.

Students are expected to have a working knowledge of a language other than English (Level 5 or 12E level). Students who do not meet this requirement should consult the Chairman of the Committee on Dramatic Arts before registering.

HONOURS ECONOMICS AND HISTORY

Admission:
University Standing in any Year I with an average of B in Economics 1A6 or 1B6 and in any Year I course in History, including a mark of at least 70% in Economics 1A6 or 1B6.

The mathematics requirements for this programme are described on page 50.

For the History component of this programme, see the description under Combined Honours Programme, Department of History, Faculty of Humanities and consult the History Departmental Counsellor.

YEAR II: 30 units
Q/ Economics 2L6 and 2M6 and their completion with at least 65% in each; six units of Year II History and six units of Year II or Year III History approved by the History Department.
R/ Economics 2B3*; Mathematics 1L3 and 1M3 or equivalent (if not completed in Year I). E/ Electives to complete a programme of 30 units.
*Students may also meet the statistics requirement by taking Economics 3O6 in Year III.

YEAR III: 30 units
Q/ Economics 3A3 and 3A3; six additional units of Economics, 12 units of History as specified by the History Department.
E/ Six units elective.

YEAR IV: 30 units
Q/ 12 units of Economics; 12 units of senior division History, including one Year IV course.
E/ Six units elective

HONOURS ENGLISH

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Note: At least "D" is required in all Q or R-group courses in Honours English.

Admission:
University Standing in any Year I, with an average of 70% in 12 units of Year I course-work in Humanities, including at least 70% in English 1A6 or 1B6.

At the end of each year, Q-average will be based on the specified number of units of work in English in which the student has been most successful.

YEAR II: 30 units
Q/ The 18 units of English in which the student obtains the highest weighted average.
R/ 18 units of English with a minimum of 12 from English 283/286, 2G6, 2H6, 2I6, 2V6.
E/ 12 units elective, of which at least six may not be English.

YEAR III: 30 units
Q/ The 18 units of English in which the student obtains the highest weighted average.
R/ 18 units of English with a minimum of 15 from English 3D3, 3D3, 3I3, 3K6, 3T3, 3V6.
E/ 12 units elective, of which at least six may not be English.

YEAR IV: 30 units
Q/ The 18 units of English in which the student obtains the highest weighted average.
R/ 18 units of English with a minimum of 15 from English 4B6, 4E6, 4L3, 4M3, 4N6.
E/ 12 units elective.

Note: Students wishing to graduate in Honours English must have attained at least "D" standing in six units of non-introductory work in a language other than English. The Department strongly advises students to fulfill this requirement before Year III.

Combined Honours Programme

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Students who wish to combine English with another subject in a Combined Honours programme must complete Year I with an average of 70% in 12 units of Year I course-work, including at least 70% in English 1A6 or 1B6.

Note: At least "D" is required in all Q or R-group courses in Combined Honours English.

At the end of each year, Q-average will be based on the 12 units of work in English in which the student has been most successful.
The English component of a Combined Honours programme will be as follows:

YEAR II:
Q/ The 12 units of English in which the student obtains the highest weighted average.  
R/ 12 units of English from 2B3/2B6, 2G6, 2H6, 2I6, 2V6.

YEAR III:
Q/ The 12 units of English in which the student obtains the highest weighted average.  
R/ 12 units of English with a minimum of nine from English 3D3, 3D03, 3Q, 3K6, 3T3, 3V6.

YEAR IV:
Q/ The 12 units of English in which the student obtains the highest weighted average.  
R/ 12 units of English with a minimum of nine from English 4B6, 4E6, 4L3, 4M3, 4N6.

To the total of approximately 24 units of Q work in each year of a Combined Honours programme, the student must add elective work to make up a minimum overall load of 30 units.

Students wishing to graduate in Honours English, combined with a subject other than a language, must have attained at least "D" standing in six units of a language other than English or of other courses approved for this purpose by the Department of English. Students should consult the Department for a list of approved courses. The Department strongly advises students to fulfill this requirement before Year III.

HONOURS FRENCH

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I with a weighted average of 70% in 12 units of French 1A6 or 1B6. Students will choose EITHER of the following two Honours programmes:

Programme A: French Literature

YEAR II: 31 units
Q/ French 2A4; at least one of French 2J3, 2JJ3; at least one of French 2W3, 2WW3; plus additional units to make a total of 19 units of French.
E/ 12 units elective, at least six excluding French.

YEAR III: 31 units
Q/ French 3C4; at least one of French 3K3, 3KK3; at least one of French 3Q3, 3QQ3; at least one three-unit seminar in French literature; plus additional units to make a total of 19 units of French.
E/ 12 units elective, at least six excluding French.

With the approval of the Department and the Associate Dean of Humanities (Studies), Year III of Honours French may be replaced by courses of study at a French-language university.

YEAR IV: 31 units
Q/ French 4A4; at least one of French 3K3, 3KK3, 3M3, 3MM3, 3Q3, 3QQ3, 3R3, 4J3, 4R3, 4S3; two three-unit seminars in French literature; plus additional units to make a total of 19 units of French.
E/ 12 units elective.

Programme B: French Language and Linguistics

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

YEAR II: 31 units
Q/ French 2A4; two 3-unit courses in French literature; one of French 3B3, 3D03, 3G3, 3L3; an introduction to the scientific study of language: Linguistics 1A6 or Anthropology 2M6.
E/ 12 units elective, at least six excluding French.

YEAR III: 31 units
Q/ French 3C4; two 3-unit courses in French literature; nine units from French 3A3, 3B3, 3C3, 3D3, 3G3, 3L3, 3N3, 3R3, 4BB3, 4D3, 4E3, 4K3.
E/ 12 units elective, at least six excluding French.

With the approval of the Department and of the Associate Dean of Humanities (Studies), Year III of Honours French may be replaced by courses of study at a French-language university.

YEAR IV: 31 units
Q/ French 4A4; one 3-unit course in French literature; six to nine units from French 3A3, 3B3, 3CC3, 3D03, 3G3, 3L3, 3M3, 3NN3, 3R3, 4BB3, 4D3, 4E3, 4K3; three to six units from the following courses in Linguistics: Anthropology 3M3, 4F3, 4K3 to a total of 19 units.
E/ 12 units elective.

Note: Related courses in Linguistics, notably English 2S3 and Russian 2F6, may be taken as electives.

Combined Honours Programme

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I with a weighted average of 70% in 12 units of the two Honours subjects, including at least 70% in French 1A6 or 1B6. The French component of a Combined Honours programme will be as follows:

YEAR II
Q/ French 2A4; at least one of French 2J3, 2JJ3; at least one of French 2W3, 2WW3; plus additional units to make a total of 13 units of French.

YEAR III
Q/ French 3C4; at least one of French 3K3, 3KK3; at least one of French 3Q3, 3QQ3; plus additional units to make a total of 13 units of French.

YEAR IV
Q/ French 4A4; one or two 3-unit seminars in French literature; plus additional units to make a total of 13 units of French.

In addition to the Q-courses in French and the Q-courses in the second subject, the student will add elective work to make a minimum total of 31 units each Year.

HONOURS GERMAN

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I, including German 1A6, with a weighted average of 70% in German 1A6 (or 126 with a grade of "A"), and six units acceptable to the Department.

YEAR II: 30 units
Q/ Either (a) German 2E3 and three of German 2A3, 2D3, 2F3, 2G3, or (b) German 1A6 and 226.
R/ Six units Humanities or six units approved by the Department.
E/ 12 units elective, at least six excluding German.

YEAR III: 30-31 units
Q/ Either (a) German 3C4 and 12 additional units of senior division German or (b) German 2A3, 2D3, 2E3, 2F3, 2G3.
R/ Three units Humanities or six units approved by the Department.
E/ 12 units elective, at least six excluding German.

With the approval of the Department and of the Associate Dean of Humanities (Studies), Year III of Honours German may be replaced by courses of study at a German university.

YEAR IV: 30 units
Q/ Either (a) German 4C4 and 16 additional units of senior division
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German or (b) German 3C4 and 20 additional units of senior division German or (c) German 4Z6 and 16 additional units of senior division German.

E/ Six to ten units elective to make a total of 30 units.

Students wishing to include the study of German and Austrian history in their programmes are advised to take History 3J6.

Combined Honours Programme

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Students who wish to combine German with another subject in a Combined Honours programme must complete Year I with a weighted average of 70% in German 1A6 (or 1Z6 with a grade of "A") and six units of the other Honours subject. The German requirements for such a programme are as follows:

Year II: Either
(a) German 2E3 and three of German 2A3, 2D3, 2F3, 2G3; or
(b) German 1A6 and 2Z6.

Year III: Either
(a) German 3C4 and eight additional units of German; or
(b) German 2E3 and three of German 2A3, 2D3, 2F3, 2G3.

Year IV: Either
(a) German 4C4 and 12 additional units of senior division German or
(b) German 3C4 and 12 additional units of German or
(c) German 4Z6 and eight additional units of senior division German.

To the total of approximately 24 units of Q work in each year of a Combined Honours programme, the student must add elective work to make up a minimum overall load of 30 units.

GREEK

Combined Honours Programme

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are, therefore, advised to consult the Departmental Counsellor before completing registration forms in March.

Students who wish to combine Greek with another subject in a Combined Honours programme must complete Year I with a mark of at least 70 in Greek 1A6 and in six units of the other Honours subject (Greek 1Z6 with a mark of at least 75 may be substituted for Greek 1A6).

The Greek requirements for such a programme are as follows:

12 units of Greek in each of Years II, III, and IV.

Year III Greek courses alternate with Year IV Greek courses. Year III Greek courses are offered in 1979-80. Year IV Greek courses are offered in 1978-79.

To the total of approximately 24 units of Q work in each year of a Combined Honours programme, the student must add elective work to make up a minimum overall load of 30 units.

Note: At least "D" is required in all Q group Greek courses.

HONOURS HISTORY

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I, with an average of 70% in any Year I course in History, and six additional units acceptable to the Department. Students should note that certain courses may require a reading knowledge of a language other than English.

YEAR II. 30 units
Q/ 12 units of Year II History; six units of either Year II or Year III History. A three-field requirement (see note below) must be satisfied by the end of Year II.

E/ 12 units elective, excluding History, approved by the Department.

YEAR III: 30 units
Q/ Six units of Year III History, six units of either Year III or Year II History, including History 2J6 if it has not been taken; six units of Year IV History.

E/ 12 units elective, six of which may be History, approved by the Department.

YEAR IV: 30 units
Q/ 12 units of Year IV History; six units of Year III History.

E/ 12 units elective, six of which may be History, approved by the Department.

At least "D" is required in all Q group courses.

Note: In selecting courses in this programme students must ensure that they take at least six units in each of three fields of History. For this purpose the Department has established the following five fields: European, Ancient, Canadian, British and United States.

Combined Honours Programme

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
Students who wish to combine History with another subject in a Combined Honours programme must complete Humanities I or Social Sciences I with a weighted average of 70% in any Year I course in History together with six units of the other Honours subject. Students should note that certain courses may require
a reading knowledge of a language other than English. The History requirements for a Combined Honours programme are as follows:

YEAR II
Q/ six units of Year II History; six units of Year II or Year III History.

YEAR III
Q/ six units of Year III or Year II History; six units of Year IV History. A three-field requirement (see note above) must be satisfied by the end of Year III.

YEAR IV
Q/ six units of Year III History; six units of Year IV History.

To the total of approximately 24 units of Q work in each year of a Combined Honours programme, the student must add elective work to make up a minimum overall load of 30 units.

At least "D" is required in all Q group History courses.

HONOURS ITALIAN

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I with a weighted average of 70% in Italian 1A6 or 1Z6, and six additional units acceptable to the Department.

YEAR II: 30 units
Q/ Italian 1A6 or 2D6; Italian 2E6.
R/ Six units of English if not previously completed; otherwise, six units of Humanities.
E/ 12 units elective, at least six excluding Italian.

YEAR III: 30-31 units
Q/ Italian 2D6, if not previously completed, or Italian 3D4; Italian 3I3, or 4P3; additional units of Italian to total 18 or 19 units.
E/ 12 units elective, at least six excluding Italian.

With the approval of the Department and of the Associate Dean of Humanities (Studies), Year III of Honours Italian may be replaced by courses of study at a European university.

YEAR IV: 30-31 units
Q/ Italian 3D4, if not previously completed, or Italian 4M3; Italian 3K3 or 4O3 if neither previously completed; additional units of Italian to total 18 to 19 units.
E/ 12 units elective.

Students must take either Italian 3K3 or 4O3 before the completion of Year IV of their programme.

Note: It is recommended that students include Italian 3O3 or 4Q3, 4G3, 4L4 and History 3A3 in their programme.

Combined Honours Programme

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Students who wish to combine Italian with another subject in a Combined Honours programme must complete Year I with a weighted average of 70% in Italian 1A6 or 1Z6 and six units of the other Honours subject. The Italian requirements for such a programme are as follows:

YEAR II
Q/ Italian 1A6 or 2D6; Italian 2E6.

YEAR III
Q/ Italian 2D6 or 3D4; Italian 3I3 or 4P3; additional units of Italian to total 12 units.

YEAR IV
Q/ Italian 3D4, if not previously completed, or 4M3; Italian 3K3 or 4O3 if neither previously completed; additional units of Italian to total 12 units.

Note: It is recommended that students include Italian 4L4 and History 3A3 in their programme.

To the total of approximately 24 units of Q work in each year of a Combined Honours programme the student must add elective work to make up a minimum overall load of 30 units.

LATIN

Combined Honours Programme

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are, therefore, advised to consult the Departmental Counsellor before completing registration forms in March.

Students who wish to combine Latin with another subject in a Combined Honours programme must complete Year I with a mark of at least 70 in Latin 1A6 and in six units of the other Honours subject. (Latin 1Z6 with a mark of at least 75 may be substituted for Latin 1A6.)

The Latin requirements for such a programme are as follows:

Year II/Latin 2F3; nine additional units from Latin 1A6 (if not completed in Year I), 2C3, 2G3, 2H3, 2J3.

Year III/Latin 3E3 (or 4C3)*; nine additional units of Year III (or Year IV)* Latin.

Year IV/Latin 4C3 (or 3E3)*; nine additional units of Year IV (or Year III)* Latin.

*Year III Latin courses alternate with Year IV Latin courses. Year III Latin courses are offered in 1978-79; Year IV Latin courses are offered in 1979-80.

To the total of approximately 24 units of Q work in each year of a Combined Honours programme, the student must add elective work to make up a minimum overall load of 30 units.

Note: At least "D" is required in all Q group Latin courses.

HONOURS MATHEMATICS AND PHILOSOPHY

Note: No student may register in any Year of this programme without first consulting the Departmental Counsellor.

Admission:
University Standing in any Year I with an average of at least 70% in Mathematics 1A6 or 1C6, 1B4* and six units acceptable to the Department of Philosophy.

*Students who have taken Applied Mathematics 1C6 instead of Mathematics 1B4 will be considered for admission to Honours Mathematics and Philosophy.

YEAR II: 32-35 units
Q/ Mathematics 2A4 or 2A5, 2B4, 2F4; 12 units of Philosophy including 2A6 or 2C6 and 2B3.
E/ Eight to 10 units elective.

YEAR III: 32 units
Q/ Mathematics 3A6, 3E4; 12 units of Philosophy.
R/ One of Mathematics 2C4, 3B4, 3L4, 3P4.
E/ Six units elective.

YEAR IV: 32-34 units
Q/ Two of Mathematics 4A6, 4E6, 4K4; 12 units of senior division Philosophy.
R/ One of Mathematics 3B4, 3L4, 3P4, 4B4.
E/ Six units elective.

HONOURS PHILOSOPHY

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I, with a weighted average of 70% in 12 units acceptable to the Department.
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YEAR II: 30 units
Q/ 15 units Philosophy, including Philosophy 2A6 and 2C6. Philosophy 2C6 may be taken in the third year of study.
R/ Philosophy 2B3.
E/ 12 units elective, only six of which may be in Philosophy.

YEAR III: 30 units
Q/ 18 units Philosophy, including Philosophy 3A6, 3G3, 3O3. Philosophy 3A6 and/or 3O3 may be taken in the fourth year of study.
E/ 12 units elective, only six of which may be in Philosophy.

YEAR IV: 30 units
Q/ 18 units senior division Philosophy, including Philosophy 4H3.
E/ 12 units elective.

Note: At least “D” is required in all Q and R group courses.

Combined Honours Programme
Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.
Students who wish to combine Philosophy with another subject in a Combined Honours programme must complete any Year I with an average of 70% in six units acceptable to the Department of Philosophy and six units of the other Honours subject. The Philosophy requirements for such a programme are as follows:

YEAR II
Q/ Philosophy 2A6 or 2C6 plus three more units of Philosophy.
R/ Philosophy 2B3.

YEAR III
Q/ 12 units senior division Philosophy, including Philosophy 2A6 or 2C6, if either not previously completed.

YEAR IV
Q/ 12 units of senior division Philosophy.
NOTE: At least “D’ is required in all Q and R group Philosophy Courses.
To the total of approximately 24 units of Q work in each year of a Combined Honours programme, the student must add elective work to make up a minimum overall load of 30 units.

HONOURS PHILOSOPHY AND RELIGIOUS STUDIES

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I with a weighted average of 70% in 12 units acceptable to the Departments.

YEAR II: 30-33 units
Q/ Philosophy 2A6 or 2C6 plus three more units of Philosophy; 12 units of Religious Studies as required in Honours Religious Studies.
R/ Philosophy 2B3. At least 12 units of Year II Religious Studies, as required in Honours Religious Studies.
E/ Six to nine units elective.

YEAR III: 30 units
Q/ 12 units of Philosophy including Philosophy 2A6 or 2C6, if either not previously completed; 12 units of Religious Studies as required in Honours Religious Studies.
R/ 12 units of Year III Religious Studies as required in Honours Religious Studies.
E/ Six units elective.

YEAR IV: 30 units
Q/ 12 units of senior division Philosophy; 12 units of Year IV Religious Studies as required in Honours Religious Studies.
E/ Six units elective.

HONOURS POLITICAL SCIENCE AND RUSSIAN

(See "Faculty of Social Sciences; Honours Political Science and Russian")

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Students who have not already taken either 2A6 or 2D4 may include one or the other, but not both, in their Year III elective group. With the approval of the Department and of the Associate Dean of Humanities (Studies). Year III of Honours Spanish may be replaced by a course of study at a university abroad.

YEAR IV: 31 units
Q/ Spanish 4A4 and 12 additional units of Year IV Spanish.
R/ Three units Humanities.
E/ 12 units elective.

Combined Honours Programme

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Students who wish to combine Spanish with another subject in a Combined Honours programme must complete Year I with a weighted average of 70% in Spanish 1Z6 or 1A6 and six units of the other Honours subject. The Spanish requirements for such a programme are as follows:

YEAR II
Q/ Spanish 1A6 or 2A6, and 2P3 and 2C3.

YEAR III
Q/ Spanish 3A4, and three of Spanish 3B3, 3B83, 3C3, 3CC3, 3E3, 3EE3.

YEAR IV
Q/ Spanish 4A4 and nine additional units of Year IV Spanish.
To the total of approximately 24 units of Q work in each year of a Combined Honours programme, the student must add elective work to make up a minimum overall load of 30 units.

Honours Programme for the Mus. Bac. Degree

HONOURS MUSIC

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in Music I including Music 1B4, 1C6, 1D2, 1E4, 1G2, with a weighted average of 70% in Music 1B4, 1C6, 1D2, 1E4.

YEAR II: 32 units
Q/ Music 2B4, 2C4, 2D2, 2H4.
R/ Music 2E4, 2G2.
E/ 12 units elective, at least six excluding Music.

YEAR III (History and Theory): 32 units
Q/ Music 3B4, 3C4, 3D4, 3P3.
R/ Music 3E4, 3H4, 3T3.
E/ Six units elective, excluding Music.

YEAR IV (History and Theory): 30 units
Q/ Music 4B4, 4C4, 4H4, 4I4.
R/ Music 4E4, one of 4A4, 4S4.
E/ Six units elective.

YEAR III (Education): 30-33 units
Q/ Music 3J4, 10-13 units from Music 3K3, 3L3, 3M4, 3N3, 3O3, 3T3.
R/ Music 3R4, 3E4, 3G2.
E/ Six units elective, excluding Music.

YEAR IV (Education): 30 units
Q/ 10 to 13 units from Music 4K3, 4L3, 4M4, 4N3, 4O3, 4P2.
R/ Music 4B4, 4E4, 4G2.
E/ Seven to 10 units elective.

At least "D" is required in all Q and R group courses.

Combined Honours Programme

Students who wish to combine Music with another subject in a Combined Honours programme are required to complete Music I with a weighted average of 70% in Music 1C6, 1D2, and six units of the other Honours subject. The Music requirements for such a programme are as follows:

Year II Music 2B4, 2C4, 2E4.
Year III Music 3B4, 3C4, 3E4.
Year IV Music 4B4, 4E4, four additional units of Music.

To the total of approximately 24 units of Q work in each Year of a Combined Honours programme, the student must add elective work to make up a minimum overall load of 30 units.

REQUIREMENTS FOR PART-TIME STUDENTS IN HONOURS MUSIC

Part-time students in Honours Music who are proceeding toward a first undergraduate degree will normally be required to complete a minimum of 18 units per year.
Part-time students in Honours Music who are proceeding toward a second undergraduate degree will normally be required to complete a minimum of 12 units per year.

Note: Completion of the Mus. Bac. degree requires considerable daytime attendance.

Pass Programmes for the Ordinary B.A. Degree

PASS ART AND ART HISTORY

The Department of Art and Art History offers two kinds of Pass programmes.

I Pass Art History

Note: No student may register in any Year of this programme without first consulting the Departmental Counsellor.

Admission:
University Standing in any Year I with a mark of 55 or higher in Art History 1A6.

YEAR II: 30 units
R/ 12 units chosen from Art History 2B3, 2C3, 2K3, 2L3, 2M3, 2N3, 203, 2P3; nine units of Art History; three units Humanities.
E/ 12 units elective, at least six excluding Art History.

YEAR III: 30 units
R/ Six units chosen from Art History 2B3, 2C3, 2K3, 2L3, 2M3, 2N3, 2O3, 2P3; nine units of Art History; three units Humanities.
E/ 12 units elective, at least six excluding Art History.

At least "D" is required in all R group Art History courses.

II Pass Art

1. For students in Years II and III.

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I with a mark of 55 or higher in Art History 1A6 and Art 1B6.

YEAR II (1978-79): 30 units
R/ Art 2A6 or 2B6, Art 2C3, six units chosen from Art History 2B3, 2C3, 2K3, 2L3, 2M3, 2N3, 2P3, three units of Humanities.
E/ 12 units elective, at least six excluding Art and Art History.

YEAR III (1978-79 and 1979-80): 30 units
R/ Art 2A6 or 2B6; six units from Art History 2B3, 2C3, 2K3, 2L3, 2M3, 2N3, 2O3, 2P3; three units of Art History; three units of Humanities.

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E/ 12 units elective, at least six excluding Art and Art History.

2. For students entering Pass Art Year II in September 1979 and after:

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I with a mark of 55 or higher in Art History 1A6 and Art 1B6 and 1D6.

YEAR II: 30 units (beginning 1979-80)
R/ Art 2A6 or 2B6; Art 2C3; six units from Art History 2B3, 2C3, 2K3, 2L3, 2M3, 2N3, 203; 2P3; three units Humanities.
E/ 12 units elective, at least six excluding Art and Art History.

YEAR III: 30 units (beginning 1980-81)
R/ Six units chosen from Art History 2B3, 2C3, 2K3, 2L3, 2M3, 2N3, 203, 2P3; three units of Art History; nine units Humanities, which may include courses in Art.
E/ 12 units elective; at least six excluding Art and Art History.

At least "D" is required in all R-group Art and Art History courses.

PASS CLASSICAL CIVILIZATION

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I with a mark of at least 55 in Classical Civilization 1A6. With the approval of the Departmental Counsellor, Greek 1A6 or 1B6 or Latin 1A6 or 1B6 or History 1L6 with a mark of at least 55 may be substituted for Classical Civilization 1A6.

YEAR II: 30 units
R/ 12 units from Classical Civilization 2B3, 2C3, 2D3, 2H3, 2J3, 2K3, six units Humanities.
E/ 12 units elective, of which at least six must exclude Classical Civilization.

YEAR III: 30 units
R/ 12 units of Classical Civilization; six units Humanities.
E/ 12 units elective, of which at least six must exclude Classical Civilization.

Students are encouraged to take at least six units of Greek or Latin.

Note: At least "D" is required in 12 units of Classical Civilization in the R group.

PASS DRAMATIC ARTS

Note: No student may register in any Year of this programme without the approval of the Chairman of the Committee on Dramatic Arts. Students are therefore advised to consult the Chairman of the Committee on Dramatic Arts before completing registration forms in March.

Admission:
University Standing in any Year I including Dramatic Arts 1A6 and six additional units of Humanities with a mark of at least 55 in Dramatic Arts 1A6.

YEAR II: 30 units
R/ 12 units of Dramatic Arts; six units Humanities.
E/ 12 units elective, not more than six of which may be Dramatic Arts.

YEAR III: 30 units
R/ 12 units of Dramatic Arts; six units Humanities.
E/ 12 units elective, not more than six of which may be Dramatic Arts.

Students must include the following courses in their programmes: Dramatic Arts 2A6 (or 2A3); 2G3; and 3E3 (or 3K6). At least "D" is required in all Dramatic Arts courses in the R group.

PASS ENGLISH

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University standing in any Year I with a mark of at least 55 in English 1A6 or 1B6.

YEAR II: 30 units
R/ English 2L6 and 2LL6; six units Humanities.
E/ 12 units elective, of which six may not be English.

YEAR III: 30 units
R/ English 3L6, 3LL6 and 3R6.
E/ 12 units elective, of which six may not be English.

Note: Students wishing to graduate in Pass English must have attained at least "D" standing in six units of a language other than English or of other courses approved for this purpose by the Department of English. Students should consult the Department for a list of approved courses. The Department strongly advises students to fulfill this requirement before Year III.

PASS FRENCH

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
Students who obtain less than 60% in French 1A6 or 1B6 must consult the Department before registration in Pass French.

YEAR II: 31 units
R/ French 2E4 and 2C3, at least one of French 2J3, 2K3; at least one of French 2W3, 2WW3, six units of Humanities. (Students who plan to take courses in French Canadian literature beyond French 2F3 or 2J3 should take at least one of those two courses before registering in French 3AA3, or 3BB3, or 4B3, or 4H3.)
E/ 12 units elective, at least six excluding French.

YEAR III: 31 units
R/ French 3C4, at least one of French 3JK3, 3KK3, 3G3, 3GG3, plus additional units to make a total of 16 units of French, three units Humanities.
E/ 12 units elective, at least six excluding French.

Note: At least "D" is required in all R-group French courses.

NOTE: A standing of not less than 60% in French 2E4 plus Honours standing in the Pass French R group will permit registration in Year III of any Honours programme in French.

PASS GERMAN

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I with a mark of at least 55 in German 1A6 or 1B6 (with permission of the Department).

Pass German students who achieve at least 70% in their Year II German courses may be admitted to Honours German in Year III.

YEAR II: 30 units
R/ Either (a) German 2E5 and three of German 2A3, 2D3, 2F3, 2G3, or (b) German 1A6 and 2G6; six units Humanities or six units approved by the Department.
E/ 12 units elective, at least six excluding German.

YEAR III: 30 units
R/ Either (a) German 3C4 and eight additional units of German, or (b) German 2E5 and three of German 2A3, 2D3, 2F3, 2G3; six units Humanities or six units approved by the Department.
E/ 12 units elective, at least six excluding German.

Students wishing to include the study of German and Austrian history in their programmes are advised to take History 3J6.

**PASS HISTORY**

**Note:** No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

**Admission:**
University Standing in any Year I including any course in Year I History.

Students who obtain less than 60% in Year I History must consult the Department before registration in Pass History. Pass History students who achieve second-class standing in their Year II History courses may be admitted to Honours History in Year III.

YEAR II: 30 units
R/ 12 units of Year II History; six units Humanities, excluding History.
E/ 12 units elective, six of which may be History beyond Year I.

YEAR III: 30 units
R/ 12 units of Year III History or Year IV History (with permission); six units Humanities, excluding History.
E/ 12 units elective, six of which may be History beyond Year I.

At least "D" is required in all R group courses.

**Note:** In selecting History courses in this programme, students must ensure that they take at least six units in each of three fields of history. For this purpose the Department has established the following five fields: European, Ancient, Canadian, British, and United States.

**PASS ITALIAN**

**Note:** No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

**Admission:**
University Standing in any Year I with a mark of at least 55 in Italian 1A6 or 1Z6.

YEAR II: 30 units
R/ Italian 1A6 or 2D6; Italian 2E6; six units of English, if not previously completed; otherwise, six units of Humanities.
E/ 12 units elective, at least six excluding Italian.

YEAR III: 30-31 units
R/ Italian 2D6, if not previously completed, or 3D4, Italian 3I3 or 4P3; Italian 3K3 or 4O3; additional units of Italian to total 12 to 13 units; six units Humanities.
E/ 12 units elective, at least six excluding Italian.

Note: it is recommended that students include History 3A3 in their programme.

**PASS LATIN**

**Note:** No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

**Admission:**
University Standing in any Year I with a mark of at least 55 in Latin 1A6 or at least 75 in Latin 1Z6.

YEAR II: 30 units
R/ Latin 2F3; nine additional units from Latin 1A6 (if not completed in Year I), 2C3, 2G3, 2H3, 2J3; six units of Classical Civilization or History 2L6.
E/ 12 units elective, of which at least six units must exclude Latin.

YEAR III: 30 units
R/ Latin 3A3, 3B3, 3D3, (or 4G3, 4H3, 4J3)*; Latin 2H3 or 2J3 (whichever not completed in Year II); six units of Classical Civilization.
E/ 12 units elective, of which at least six units must exclude Latin.

*Year III Latin courses alternate with Year IV courses. Year III Latin courses are offered in 1978-79; Year IV Latin courses are offered in 1979-80.

**Note:** At least "D" is required in all R group Latin courses.

**PASS MUSIC**

**Note:** No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

**Admission:**
University Standing in Music I, or any Year I with a mark of at least 55 in Music 1A6.

Students intending to register in Pass Music on the basis of Music 1A6 must first pass an audition, details of which will be found under "Admissions: Music I".

YEAR II: 30 units
R/ Music 2A6 and six to 12 additional units of Music, which must include Music 1C6, 1D2, and 2E4 if not taken in Year I.
E/ 12 to 18 units elective, of which no more than eight may include Music, to make a total of 30 units.

YEAR III: 30 units
R/ Music 2H4, 2E4 and four additional units of Music; six units Humanities.
E/ 12 units elective, excluding Music.

**REQUIREMENTS FOR PART-TIME STUDENTS IN PASS MUSIC**

Part-time students in Pass Music who are proceeding toward a first undergraduate degree will normally be required to complete a minimum of 18 units per year. Part-time students in Pass Music who are proceeding toward a second undergraduate degree will normally be required to complete a minimum of 12 units per year.

**PASS PHILOSOPHY**

**Note:** No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

**Admission:**
University Standing in any Year I, with a mark of at least 55 in a Year I course acceptable to the Department.

YEAR II: 30 units
R/ 12 units Philosophy, including Philosophy 2A6 and 2C6; six units Humanities or six units approved by the Department. Philosophy 2C6 may be taken in the third year of study.
E/ 12 units elective, at least six excluding Philosophy.

YEAR III: 30 units
R/ 12 units Philosophy; six units Philosophy or six units Humanities or six units approved by the Department.
E/ 12 units elective, only six may be in Philosophy.

A minimum of 30 units Philosophy must be completed in this programme. If taken in Year I, Philosophy 1B6 or 1D6 counts towards this total.

**PASS RUSSIAN**

**Note:** No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

**Admission:**
University Standing in any Year I with a mark of at least 55 in Russian 1Z6 or equivalent.
YEAR II: 30 units
R/ Russian 2A6, 2C6, 2E3; three units Humanities.
E/ 12 units elective, at least six exclusive of Russian.

YEAR III: 30 units
R/ Russian 3A3, 3C6; any one of Russian 3F3, 4A3, 4E3, 4F3, and three additional units of Russian; three units Humanities.
E/ 12 units elective, at least six exclusive of Russian.

Note: At least "D" is required in every R-group Russian course.

PASS SPANISH

Note: No student may register in any Year of this programme without the approval of the Departmental Counsellor. Students are therefore advised to consult the Departmental Counsellor before completing registration forms in March.

Admission:
University Standing in any Year I, with a mark of at least 55 in Spanish or 126 or 1A6.

YEAR II: 30 units
R/ Spanish 1A6 or 2A6, and 2B3, 2C3; six units Humanities.
E/ 12 units elective, at least six excluding Spanish.

YEAR III: 31 units
R/ Spanish 3A4 and three of Spanish 3B3, 3BB3, 3C3, 3CC3, 3E3, 3EE3; six units Humanities.
E/ 12 units elective, at least six excluding Spanish.

Faculty of Science

The Faculty of Science provides work through the following Departments:

*Applied Mathematics
*Biochemistry
*Biology
*Chemistry
*Geography
*Geology
*Mathematics
*Metallurgy and Materials Science
*Physics
*Psychology

All Departments offer four-year Honours programmes which prepare students for graduate studies, Type A teaching certificates, and industry. Three-year Pass programmes, which provide a science education, are less extensive and less demanding than the Honours programmes, and are offered by all Departments except Biochemistry and Metallurgy. Some Departments offer "Major" programmes as well (which are indicated in the list above by an asterisk). "Major" programmes require four years and offer in-depth studies suitable for students who will be seeking employment immediately upon graduation. Some of the Major programmes can also lead to Type A teaching certificates. Major programmes are distinguished from Honours programmes by being less specialized and somewhat less demanding.

For admission to and continuation in Honours and Major programmes, Q-group courses are to be taken in one academic session, except in the Department of Mathematics and in the Metallurgy and Materials Science Majors, and, very exceptionally for some part-time students, in the Departments of Applied Mathematics, Biology, Geology, Physics, and Psychology. Part-time students should plan their programmes in consultation with a Dean of Studies.

Students must achieve a grade of 'D' or better in all courses which are included in the Q-group of Honours and Major programmes, or in the subject of concentration of Pass programmes.

All first-year Science students take five courses or, with appropriate permission, six. Of the five, one is Mathematics; three others are chosen from additional Mathematics or Applied Mathematics, Biology, Chemistry, Geology, Physics, and Psychology; the fifth course may be in Science or in Humanities or in Social Sciences.

The percentage required for admission to a Year II Honours or Major programme must be obtained on the first attempt and, normally, based on work completed in one academic session.

Although there is considerable choice in the programme that a first-year Science student may select, the choice needs to be made carefully, with the requirements of specific Year II programmes clearly in mind. A suitable choice of first-year options will allow successful students to enter any one of several Year II programmes.

Up to the end of Year III, students may be permitted to transfer between Pass and Major, and Major and Honours, programmes, on the recommendation of the Department concerned and with the approval of a Dean of Studies.

Note: Attention is drawn to the specific deadline dates (page 3) for changing registration in first-term or full-year courses, for withdrawing from a first-term course, for changing registration in a second-term course, and for withdrawing from a second-term or full-year course. Beyond the September deadline date, first-term courses may not be replaced; beyond the January deadline date, second-term courses may not be replaced. First-term courses cancelled by the October deadline may not be replaced by second-term courses. Students who cancel a full-year course by the January deadline date may add a second-term course provided that their second-term work load is not thereby increased.

Programmes for the Honours B.Sc. Degree

HONOURS APPLIED CHEMISTRY

The number of students admitted to this programme is limited.

Admission:
University Standing in Natural Sciences I, including Chemistry 1A7 or 1C8, Mathematics 1A6 or 1C6, and Applied Mathematics 1C6, with a weighted average of at least 70% in Chemistry 1A7 or 1C8, and either Mathematics 1A6 or 1C6, or Physics 1A7 or 1B7 or 1C8. Physics 1A7 or 1B7 or 1C8 must be taken in Years I or II. Its election in Year I is strongly recommended.

Students who have taken Mathematics 1B4 instead of Applied Mathematics 1C6 will be considered.

Economics 1A6 or 1B6, if not taken in Year I, is recommended as an elective in Years II or III.

YEAR II: 33-36 units
Q/ The 16 to 18 units from R in which the student obtains the highest weighted average.
R/ Chemistry 2A4, 2S8, 2X1; Chemical Engineering 2D4, 2F4; Applied
**FACULTY OF SCIENCE**

Mathematics 1H3 or 2H3, Mathematics 2G3, 203.
E/ Three to six units elective, excluding Chemistry.

Attention is drawn to Chemistry 3X2, involving employment in the summer between Years II and III.

**YEAR III: 32 units**
Q/ Chemistry 3X2, the 18 to 21 units from R in which the student obtains the highest weighted average.
R/ Chemistry 3D6, 3E6, 3I3, 2U3. Chemical Engineering 3S6 or Chemistry 3A4 (if Chemical Engineering 3S6 not offered).
E/ Electives, at least six units of which may not be Chemistry, to make a total of 32 units.

Attention is drawn to Chemistry 4X2, involving employment in the summer between Years III and IV.

**YEAR IV: 32-35 units**
Q/ The 17 to 18 units from R in which the student obtains the highest weighted average.
R/ Chemistry 4X2, 4A3, 4S3, 4T4; either Chemistry 3C4 and 3Y3 or Chemical Engineering 4K4 and 4S3; either Chemistry 3A4 or Chemical Engineering 3S6 (whichever not taken in Year III).
E/ Electives* to make a total of 32 to 35 units.

*The following are among courses which are relevant: Engineering 204. Materials 4E3. Metallurgy 2C3, 3C3, 4C4. 4D3, 4N3. Chemical Engineering 3D4. 4K4, 4N4, 4F3. 4S2. Commerce 2A3, 2B3, 3B3. 3F3. Physics 286.

**HONOURS APPLIED MATHEMATICAL SCIENCES**

**Admission:**
University Standing in any Year I with a weighted average of at least 70% in Mathematics 1A6 or 1C6, Applied Mathematics 1C6 or 1C7 or Mathematics 1B4, and six additional units acceptable to the Department of Applied Mathematics.

This is a Year II programme from which students may enter the Honours Programmes in Applied Mathematics and Computer Science. Applied Mathematics and Theoretical Physics, Applied Statistics and Computation, and Computer Science and Mathematics.

For students intending to enter Honours Applied Mathematics and Theoretical Physics, Physics 1A7 is required in Year I and is strongly recommended for students intending to enter Applied Mathematics and Computer Science.

The election of Applied Mathematics 1H3 as an extra course in Natural Science Year I may be approved by the Dean of Science Studies.

The election of Economics 1A6 or 1B6 is recommended.

Students are to take the entire Q-group in one academic session, with the exception of certain part-time students who should consult the Chairman.

**YEAR II: 33-36 units**
Q/ Applied Mathematics 2L3, the 14 to 16 units from R in which the student obtains the highest weighted average.
R/ Applied Mathematics 2H3, unless 1H3 already completed; Mathematics 2A5. 2C4. 2D4. 2S4 or 2J8; one or two of Applied Mathematics 2K3, 3M3. Physics 2C5.
E/ Electives* to make a total of 33 to 36 units.

*Students intending to enter Year III Applied Mathematics and Computer Science choose Applied Mathematics 2K3; those intending to enter Applied Mathematics and Theoretical Physics choose Physics 2C5; those intending to enter Applied Statistics and Computation choose Applied Mathematics 3M3. If these courses are not taken in Year II they must be taken in Year III of the respective programmes.

**YEAR III and YEAR IV, have their programmes approved by the Chairman.**

**Admission:**
Completion of Year II Honours Applied Mathematical Sciences, or Year II Honours Mathematics including Applied Mathematics 1H3 or 2H3, 2L3. (If Physics 2C5 was not taken in Year II, it must be taken in Year III in place of Applied Mathematics 3B6, which must be elected in Year IV.)

**YEAR III: 33-35 units**
Q/ The 15 units in R in which the student obtains the highest weighted average.
R/ Applied Mathematics 2K3 (if not completed), 3A3, 3B6, 3M3 (if not completed), 3T3; eight to 12 units from the courses prescribed below.
E/ Electives*, at least six units of which may not be Applied Mathematics, Mathematics, or Physics, to make a total of 33 to 35 units.

**YEAR IV: 32-34 units**
Q/ Applied Mathematics 4G6; the 12 to 15 units in R in which the student obtains the highest weighted average.
R/ 12 to 20 units from the courses prescribed below, including Applied Mathematics 3D3 (if not completed).
E/ Electives to make a total of 32 to 34 units.

*Cognate courses that should be considered as electives are: Applied Mathematics 3H3, 3I3, 4C4, 4K3, 4S3, 4T3, 4U3, 4V3. Mathematics 3D6, 3U3, 4C4, 4M3, 4O3, 4X3. Physics 3B5.

* Prescribed courses are: Applied Mathematics 3C3, 3D3, 3E4, 3F4, 3G3, 4E3, 46E, 4J3, 4L3, 4M3, 4W3, 4X3, Mathematics 304. Physics 4D6.

**HONOURS APPLIED MATHEMATICS AND THEORETICAL PHYSICS**

**Admission:**
Completion of Year II Honours Applied Mathematical Sciences including Physics 2B6 and 2C5, or Honours Physics, or Honours Mathematics including Physics 2B6 and 2C5 according to note in Honours Mathematics Year II curriculum. (The student should have completed Applied Mathematics 1H3 or 2H3.)

**YEAR III: 32-35 units**
Q/ The four courses in which the student obtains the highest weighted average from among Applied Mathematics 3B6, 3F4, Mathematics 2A6 or 306, Physics 3K4, 3M6, 3N3.
R/ Applied Mathematics 3B6; Mathematics 3A6 or 3Q6; Physics 2H3 (if not completed), 3K4, 3M6; three to seven units from Physics 3N3, 3R4, 3S4; Applied Mathematics 3F4 or Mathematics 3Q4.
E/ Electives, at least six units of which may not be Applied Mathematics, Mathematics, or Physics, to make a total of 32 to 35 units.

**YEAR IV: 32-34 units**
Q/ Applied Mathematics 4C4, Physics 4C4, 4F3, one of Mathematics 4A6, or 3T3 and 403, 4T4, at least four units from R in which the student obtains the highest weighted average.
R/ Physics 4B4; seven-12 units of senior division Physics, Mathematics, and Applied Mathematics, including, if not completed, Applied Mathematics 3F4 or Mathematics 3Q4.
E/ Electives to make a total of 32 to 34 units.

**HONOURS APPLIED PHYSICS**

**Admission:**
Completion of Year II Honours Physics, or Honours, Applied Mathematical Sciences including Physics 2B6 and 2C5.

**YEAR III: 34-36 units**
Q/ The 18 or more units listed in R in which the student obtains the highest weighted average.
R/ Physics 2H3 (if not completed), 3B6, 3H4, 3M6; Applied Mathematics 3B6, additional units chosen from Physics 3K4, 3M3, 3R4, 3S4, 3T3; Engineering Physics 3D3, 3K4; Biology 4D4; Applied Mathematics 3F4 or Mathematics 3Q4, to make a total of 27 to 29 units.
E/ Six units, which may not be Physics or Engineering Physics.

**YEAR IV: 32-34 units**
Q/ The 18 units listed in R in which the student obtains the highest weighted average.
SCIENCE

R/ Physics 4A2, 4B4, 4D6, 4J4; Engineering Physics 4W3; six to eight units of senior division Physics or Engineering Physics.
E/ Electives to make a total of 32 to 34 units.

HONOURS APPLIED STATISTICS AND COMPUTATION

The Department of Applied Mathematics requires that Honours Applied Statistics and Computation students, entering Year III and Year IV, have their programmes approved by the Chairman.

Admission:
Completion of Year II Honours Applied Mathematical Sciences.

YEAR III: 32-34 units
Q/ Applied Mathematics 3A3* or 3G3; Mathematics 3D6; the nine units in R in which the student obtains the highest weighted average.
R/ Mathematics 3T3 and Applied Mathematics 3M3 (if not completed); eight to 10 units from the courses prescribed below.
E/ Electives, at least six units of which may not be Applied Mathematics or Mathematics, to make a total of 32 to 34 units.

*A student intending to take Year IV computing courses should elect Applied Mathematics 3A3 in Year III.

YEAR IV: 32-34 units
Q/ Applied Mathematics 4G6; the 12 units in R in which the student obtains the highest weighted average.
R/ Mathematics 4M3; 10 to 13 units from the courses prescribed below, including (if not completed) Applied Mathematics 3F4, or Mathematics 3Q4; Applied Mathematics 4S5, 4T3, 4U3.
E/ Electives to make a total of 32 to 34 units.

HONOURS BIOCHEMISTRY

This programme fulfills the academic requirements for professional membership in the Chemical Institute of Canada.

Admission:
University Standing in Natural Sciences I including Chemistry 1A7 or 1C8, with a weighted average of at least 70% in Chemistry 1A7 or 1C8 and Mathematics 1A6 or 1C6. Biology 1B6 or 1C6 must be taken in Years I or II; its election in Year I is recommended. The election of Applied Mathematics 1C6 in Year I and of Physics 1A7 or 1B7 or 1C8 in Year I or Year II is recommended.

YEAR II: 34-35 units
Q/ Mathematics 2N4, 2S8; Chemistry 2A4 or 2T4; Chemistry 3E4 or 3E6, 4A3, 4S6, 4V3, and Chemistry 3A4 or 3E6 or both 3C4 and 3Y3.
R/ Mathematics 305 or 3T4*;

Electives to make a total of 32 to 34 units.

YEAR III: 32-34 units
Q/ Chemistry 2N4, 2S8; Chemistry 205 or 2T4*
R/ 12 units of Mathematics or Natural Science*, including Biology 1B6 or 1C6 if not completed.
E/ Six units elective, excluding Biochemistry.

*Chemistry 2T4 requires that Mathematics 2G3 be elected. Chemistry 2U3 requires that Mathematics 2G3 and 2O3 be elected.

†Applied Mathematics 1H3 or 2H3, 2N3. Biology 3H6. Chemistry 2U3* and Physics 2A6 may be of interest.

Students considering Year III Honours Biochemistry and Chemistry are referred to that programme for the appropriate choice of electives.

YEAR III: 32-34 units
Q/ Biochemistry 3F3, 3G6, 3L4; Chemistry 3D6.
R/ Seven to nine units of Natural Science*; Junior division Biology courses are normally to be chosen.
E/ Six units elective, excluding Biochemistry.
†Biology 3F3, 4B4, 4B6, 4G4, 4I9, 4S6, 4V3, and Chemistry 3E4 or 3S6 may be of interest.

YEAR IV: 30-32 units
Q/ At least 12 units of senior division Biochemistry including Biochemistry 4D3 and one of Biochemistry 4G6, 4H4, 4L4, and additional units from R in which the student obtains the highest weighted average, to give a total of 19 to 21 units.
R/ Units to total 24 to 26 in combined Q and R from Biochemistry 4C4, 4E3, 4H3, 4P2, 4Q3, Biology 3P3, 4B4, 4B6, 4G4, 4I9, 4O4, 4S6, 4V3, Chemistry 3E4 or 3S6, 4A3, 4D3. Other senior division courses may be selected with permission of the department.
E/ Six units elective.

HONOURS BIOCHEMISTRY AND CHEMISTRY

Admission:
University Standing in Natural Sciences I, including Chemistry 1A7 or 1C8, Mathematics 1A6 or 1C6, Applied Mathematics 1C6, and either Biology 1B6 (or 1C6) or Physics 1A7 (or 1B7 or 1C8), with a weighted average of at least 70% in Chemistry 1A7 or 1C8 and Mathematics 1A6 or 1C6.

YEAR II: 34-36 units
Q/ Chemistry 2A4, 2B4, 2T4.
R/ Mathematics 2G3, 2O3; either Biology 1B6 (or 1C6) or Physics 1A7 (or 1B7 or 1C8), if both not completed in Year I.
E/ Electives, at least six units of which may not be Biochemistry or Chemistry, to make a total of 34 to 36 units.

Students considering Year III Honours Chemistry should elect Chemistry 2U3.

YEAR III: 33-35 units
Q/ The 16 to 19 units from R in which the student obtains the highest weighted average.
R/ Biochemistry 3F3, 3G6, 3L4 or 3L2; Chemistry 2U3, 3D6; Chemistry 3A4 or 3E6 or both 3C4 and 3Y3.
E/ Electives, at least six units of which may not be Biochemistry or Chemistry, to make a total of 33 to 35 units.

YEAR IV: 32-35 units
Q/ The 16 to 19 units from R in which the student obtains the highest weighted average.
R/ Biochemistry 4D3 and one of Biochemistry 4E3, 4P2 or 4Q3; Biochemistry 4U4 (Chemistry 4U4) or Biochemistry 4B6 or Chemistry 4G6; Chemistry 3A4 or 3E6 or both 3C4 and 3Y3; two to four units of senior division Biochemistry; three units of senior division Chemistry.
E/ Electives to make a total of 32 to 35 units.

HONOURS BIOLOGY

Admission:
University Standing in Natural Sciences I, including Chemistry 1A7 or 1C8, and one of Biology 1B6, 1C6, 1D6, 1E6, with a weighted average of at least 70% in one of Biology 1B6, 1C6, 1D6 or 1E6, and six additional units acceptable to the Department that at least 60% is attained in Biology 1B6 or 1C6 or 1D6 or 1E6. Physics 1B7 (or 1A7 or 1C8) must be taken in Year I or II; its election in Year I is strongly recommended.

Students are advised to note carefully the prerequisites for all courses listed in the following programme.

YEAR II: 30-32 units
Q/ 12 units of Biology (so chosen that Biology 1B6 and 1C6 and either Biology 1D6 or 1E6 are completed by the end of Year II), and five to eight units from such of the following as are taken: Applied Mathematics 1H3 or 2H3, Biology 2A3, 2H4, Chemistry 2O8, 2Q5, Physics 2A6, the five to eight units being those which yield the highest weighted average.
R/ Chemistry 2O8, 2Q5; or, alternatively, Applied Mathematics 1H3 or 2H3, Biology 2H4, and Chemistry 2O4 or 2O8. Physics 1B7 (or 1A7 or 1C8), unless completed.
E/ Electives to make a total of 30 to 32 units, not to include Biology or Biochemistry (unless Chemistry 2O4 is chosen in R, in which case at least six of the elective units may not include Biology or Biochemistry).

YEAR III: 30-32 units
Q/ The 17 units listed in R, other than Biology 1D3, 1E3, or 2A3, in which the student obtains the highest weighted average.
R/ 24 to 26 units of Biology, at least 19 of which must be from senior division; or one or more of Biochemistry 3G6, 3L2, Biology 2H4, Applied Mathematics 3M3 or 3S6, together with Biology courses to make a total of 24 to 26 units including at least 11 units of senior division Biology. (The election of one or more of Biochemistry 3G6, 3L2, Biology 2H4, Applied Mathematics 3M3 or 3S6 is strongly recommended.)
E/ Six units elective, excluding Biochemistry and Biology.

YEAR IV: 30-32 units
Q/ The 17 units from R in which the student obtains the highest weighted average.
R/ 24 to 26 units of senior division Biology or, subject to the approval of the Department, 16 to 20 units of senior division Biology, together with six to eight units of other senior division Natural Science.
E/ Six units elective.
In Years III and IV, students interested in interdisciplinary work may wish to elect, in consultation with the Chairman of the Department of Biology, courses offered by the Departments of Applied Mathematics, Biochemistry, Civil Engineering, Engineering Physics, Geography, Geology, Mathematics, Physics, and Psychology. A list of suggested courses is available in the Chairman’s office.

HONOURS BIOLOGY AND PSYCHOLOGY (LIFE SCIENCES)

Admission:
University standing in Natural Sciences I including Chemistry 1A7 or 1C8, Physics 1B7 or 1C8, Mathematics 1A6, 1C6, or 1F6, and a mark of at least 70% in each of Psychology 1A6 and Biology 1B6.

YEAR II: 32-35 units
Q: The 16-18 units of Biology and Psychology chosen from R in which the student obtains the highest weighted average.
R: Biology 1C6, either Psychology 2R6 or Biology 2H4 and Applied Mathematics 1H3, either Psychology 2T6 or 2D6, Chemistry 2O8, and Chemistry 2G5 or 2P4.
E: Electives, excluding Biology and Psychology, to make a total of 32 to 35 units.

YEAR III: 33-35 units
Q: The 18-20 units of Biology and Psychology chosen from R (excluding Biology 1E6) in which the student obtains the highest weighted average.
R: 12-14 units of Biology chosen from Biology 1E6, 3H6, 3L2, 3N4, 3P5, 3Y6, 4A2, 4E3, 4G4; 12-15 units of Psychology chosen from 2A3, 2D6, 2H2, 2J3, 2T6, 2U3, 2V3, 3B3, 3F6, 3K3, 3M6, 3N6, 3R3, 3S3, 3T3, 3U3, 3W6, 3X6, 3Y3, Biochemistry 3G6.
E: Electives, excluding Biology and Psychology, to make a total of 33 to 35 units.

YEAR IV: 33-36 units
Q: The 18-20 units of Biology and Psychology chosen from R in which the student obtains the highest weighted average.
R: 12-16 units of Psychology chosen from Psychology 4E7, 4D6, 4Q3, and the Psychology units listed under R for Year III; 12-14 units of Biology chosen from Biology 4C8, 4F4 (if eligible), 3F6, 3K6, 3M4, 3X3, 4R3, 4S6 and the senior division Biology units listed under R for Year III. Students may include only one of Psychology 4D6, Psychology 4Q3, Biology 4C8, or Biology 4F4.
E: Electives to make a total of 33 to 36 units, at least six of which may not be in Biology and Psychology.

General Requirements:
Students must complete a minimum of one laboratory course in Psychology and one in senior division Biology. A minimum of 18 units of Psychology and a minimum of 18 units of Biology must be included in the total Q group for Years III and IV combined.

HONOURS CHEMISTRY

This programme fulfills the academic requirements for professional membership in the Chemical Institute of Canada.

Admission:
University Standing in Natural Sciences I, including Chemistry 1A7 or 1C8, and Applied Mathematics 1C6*, with a weighted average of at least 70% in Chemistry 1A7 or 1C8, and either Mathematics 1A6 or 1C6 or Physics 1A7 or 1B7 or 1C8. Physics 1A7 or 1B7 or 1C8 must be taken in Years I or II; its election in Year I is strongly recommended.

* Students who have taken Mathematics 1B4 instead of Applied Mathematics 1C6 will be considered.

YEAR II: 32-35 units
Q: Three units of Year II Honours Chemistry, and Biology 1B6 or 1C6, are eligible for Year III Honours Biochemistry and Chemistry.

YEAR III: 32-35 units
Q: The 15 to 20 units from Chemistry 3A4, 3C4, 3D6, 3E6, 3Y3, in which the student obtains the highest weighted average.
R: The courses listed but not included in Q.
E: Nine to 12 units elective, six of which may not be Chemistry.

YEAR IV: 31-34 units
Q: Chemistry 4A3, 4E4, 4Q3, 4S3, six units of Year IV Chemistry
R: Six to nine units of Year IV Chemistry or senior division Natural Science or Engineering courses.
E: Six units elective.

Students who are planning graduate study in Physical Chemistry are advised to elect a course in Mathematics.

HONOURS CHEMISTRY AND GEOLOGY

This programme fulfills the academic requirements for professional membership in the Chemical Institute of Canada.

Admission:
University Standing in Natural Sciences I, including Mathematics 1A6 or 1C6, and Applied Mathematics 1C6*, with a weighted average of at least 70% in Geology 1A6 and Chemistry 1A7 or 1C8. The election of Physics 1A7 is recommended.

* Students who have taken Mathematics 1B4 instead of Applied Mathematics 1C6 will be considered.

YEAR II: 34 units
Q: The 15 to 20 units of which at least six must be in Geology) from Chemistry 2A4, 2S8, 2T4, Geography 2B6, 2C6, in which the student obtains the highest weighted average.
R: The courses listed but not included in Q; Mathematics 2G3.
E: Three units elective, excluding Chemistry and Geology.

YEAR III (1978-79 only): 32 units
Q: The 18 to 21 units (of which at least six must be in Chemistry) from Chemistry 2D6, 3C3, 3G6, Chemistry 2U3, 3E6, in which the student obtains the highest weighted average.
R: The courses listed but not included in Q; Geology 3E2.
E: Six units elective.

YEAR III (Beginning in 1979-80): 35 units
Q: The 15 to 19 units (of which at least six must be in Chemistry) from Geology 2D6, 3C6, 3G4. Chemistry 2U3, 3E6, in which the student obtains the highest weighted average.
R: The courses listed but not included in Q; Geology 3E2. Mathematics 2O3.
E: Six units elective.

YEAR IV: 31-34 units
Q: The 18 to 20 units from R in which the student obtains the highest weighted average.
R: Chemistry 3A4. 18 to 21 units of senior division Chemistry and Geology, including at least six units of each.
E: Electives to make a total of 31 to 34 units.

HONOURS CHEMISTRY AND PHYSICS

This programme fulfills the academic requirements for professional membership in the Chemical Institute of Canada.

Admission:
University Standing in Natural Sciences I, including Mathematics 1A6 or 1C6, Applied Mathematics 1C6*, Chemistry 1A7 or 1C8, and Physics 1A7*, with a weighted average of at least 70% in three of Mathematics 1A6 or 1C6, Applied Mathematics 1C6*, Chemistry 1A7 or 1C8, Physics 1A7*.

* Students who have taken Mathematics 1B4 or Physics 1B7 or 1C8 instead of the prescribed courses will be considered. Physics 1A7 is strongly recommended.

YEAR II: 32-33 units
Q: The 17 to 19 units from Chemistry 2S8, 2T4, Physics 2B6, 2C5, in which the student obtains the highest weighted average.
R: The course listed but not included in Q; Mathematics 2G3, 2O3.
E: Three or four units elective.

YEAR III: 32-35 units
Q: The 15 to 20 units from Chemistry 3A4, 3C4, 3D6, 3E6, 3Y3, in which the student obtains the highest weighted average.
R: The courses listed but not included in Q.
E: Nine to 12 units elective, six of which may not be Chemistry.

YEAR IV: 31-34 units
Q: Chemistry 4A3, 4E4, 4Q3, 4S3, six units of Year IV Chemistry
R: Six to nine units of Year IV Chemistry or senior division Natural Science or Engineering courses.
E: Six units elective.

Students who are planning graduate study in Physical Chemistry are advised to elect a course in Mathematics.
SCIENCE

YEAR III: 34 units
Q/ The 16 to 20 units from R in which the student obtains the highest weighted average.
R/ Chemistry 2A4, 3E6, Physics 3M6, six to nine units from Physics 3B6, 3N3, Chemistry 3Y3 or Physics 3K4, and Applied Mathematics 3B6.
E/ Electives to make a total of 34 units. Students who elect Year III courses in Year III and Year IV courses in Year IV will generally find that more options are offered by the timetable.

YEAR IV: 31-34 units
Q/ The 19 to 21 units from R in which the student obtains the highest weighted average.
R/ Chemistry 4E4 or Physics 4J4; Physics 4F3; Chemistry 3C4 if not taken in Year III; at least 14 units of senior division Chemistry or Physics, which must include Chemistry 3Y3 or Physics 3K4, if not taken in Year III.
E/ Six to nine units elective.

HONOURS COMPUTER SCIENCE AND MATHEMATICS

Admission:
University Standing in any Year I with a weighted average of at least 70% in Mathematics 1A6 or 1C6, either Applied Mathematics 1C6 or Mathematics 1B4, and six additional units acceptable to the Departments of Applied Mathematics and Mathematics. The election of Applied Mathematics 1H3 as an extra course in Year I may be approved by the Dean of Science Studies.

Year II Honours Applied Mathematical Sciences is equivalent to Year II of this programme.

YEAR II: 30-32 units
Q/ Mathematics 2A5, Applied Mathematics 2L3, and the three courses from Mathematics 2B4, 2C4, 2D4 and Applied Mathematics 2K3 in which the student obtains the highest weighted average.
R/ Applied Mathematics 2H3 (if 1H3 not completed); Mathematics 2B4, 2C4, one of Applied Mathematics 2K3, Mathematics 2D4.
E/ Electives, at least six units of which may not be Applied Mathematics or Mathematics, to make a total of 30 to 32 units. (Mathematics 2F4 is strongly recommended.)

Note: In Years III and IV combined, in addition to the specified courses, the student must include at least six units of senior division Mathematics and at least six units from the courses prescribed below:

YEAR III: 33-34 units
Q/ Mathematics 3A6; Applied Mathematics 3A3; the eight units from R in which the student obtains the highest weighted average.
R/ Applied Mathematics 2K3 (if 1H3 not completed); nine to 13 units chosen from senior division Mathematics* courses and the courses prescribed below.
E/ Electives, at least six units of which may not be Applied Mathematics or Mathematics, to make a total of 33 to 34 units.

YEAR IV: 32-34 units
Q/ Applied Mathematics 4G6; one of Mathematics 4A6, 4C4, 3T3 and 4O3, 4Q6, 4S4; the six units from R in which the student obtains the highest weighted average.
R/ 10 to 12 units chosen from senior division Mathematics* and the courses prescribed below including Applied Mathematics 3D3, if not completed.
E/ Electives to make a total of 32 to 34 units.

*Mathematics 3D6, 3E4, 3F6, 3L4, 3O4; (or Applied Mathematics 3F4), 3R3, 3S3, 3U3, 4G3, 4J3, 4M3, 4V4. 4X3 should be considered.

*Prescribed courses are: Applied Mathematics 3C3, 3D3, 3E4, 3F4, (or Mathematics 3O4), 3G3, 3T3, 4E3, 4E6, 4J3, 4L3, 4M3, 4X3.

HONOURS GEOGRAPHY

(For B.A. Programme in Honours Geography, see "Faculty of Social Sciences: Honours Geography").

Admission:
University Standing in Natural Sciences I, including Geography 1A6, with an average of at least 70% in Geography 1A6 and six units of Natural Science or Mathematics. The election of Geography 1A6 is recommended.

YEAR II: 30 units
Q/ Geography 2F3, 2L3, 2T3, 2W3; one of Geography 2C3, 2G3.
E/ 12 units elective, at least six of which may not be Geography.

YEAR III: 30 units
Q/ Geography 3F3 and 3M3; two of 3K3, 3L3, 3V3, and 3W3; six units selected from Year III Geography science courses or other science courses acceptable to the Department.
E/ 12 units elective, at least six of which may not be Geography.

*Geography science courses are designated with an asterisk in the offerings of the Department of Geography.

YEAR IV: 30 units
Q/ 18 units from Geography 4A3, 4B6, 4D3, 4F6, 4K3, 4L3, 4Q3, 4R3, 4V3, 4W3.
E/ 12 units elective.

HONOURS GEOGRAPHY AND GEOLOGY

(For B.A. Programme in Honours Geography and Geology, see "Faculty of Social Sciences: Honours Geography and Geology").

Admission:
University Standing in Natural Sciences I, including Geography 1A6, Geology 1A6, and Mathematics 1A6 or 1C6, with an average of at least 70% in Geography 1A6 and Geology 1A6. Chemistry 1A7 is strongly recommended.

YEAR II: 33 units
Q/ The 18 units from Geography 2L3, 2Q3, 2T3, Geology 2B6, 2C6, in which the student obtains the highest weighted average.
R/ The course listed but not included in Q; six additional units of Natural Science or Engineering approved by the Departments.
E/ Six units elective, excluding Geography and Geology.

Attention is drawn to Geography 3E3 and Geology 3E2 which are scheduled outside of regular term.

YEAR III (1978-79 only): 35 units
Q/ Geography 3M3; Geology 2D6, 3C3; six units of Geography science courses.
R/ Geography 3E3, Geology 3E2.
E/ 12 units elective, at least six of which may not be Geography or Geology.

YEAR III (Beginning in 1979-80): 35-37 units
Q/ Geography 3M3; Geology 2D5, 3C6; six units of Year III Geography science courses.
R/ Geography 3E3, Geology 3E2.
E/ 10-12 units elective, at least four of which may not be Geography or Geology.

YEAR IV: 31-33 units
Q/ Six units of Year IV Geography science courses; six units of Year IV Geology courses; six units of Year IV Geography science courses or senior division Geology courses.
E/ 13 to 15 units elective. Geology 3G4 is strongly recommended.

*Geography science courses are designated with an asterisk in the offerings of the Department of Geography.

HONOURS GEOLOGY

Admission:
University standing in Natural Sciences I, including Geology 1A6, Mathematics 1A6, or 1C6, and any two of a six-unit Year I course in Biology, Chemistry 1A7 or 1C8, Physics 1A7 or 1B7 or 1C8, with a weighted average of at least 70% in Geology 1A6 and one other of the courses listed previously.

YEAR II: 33-35 units
Q/ Geography 2B6, 2C6, 2D5.
R/ Geology 2A3, whichever of a six-unit Biology Year I course, Chemistry 1A7 or 1C8 and Physics 1A7, 1B7 or 1C8 not already completed. Science and/or Engineering courses approved by the Department such that the R group total is 10-12 units. (Applied Mathematics 1C6 and Chemistry 2F3 are recommended.)
E/ Six units elective, excluding Geology.

Attention is drawn to Geology 3E2, which is scheduled outside regular term.
YEAR III (1978-79 only): 33-35 units
Q/ Geology 3C3, 3D6, 3G6.  
R/ Geology 3E2; 10 to 12 units of Natural Science or Engineering.  
E/ Six units elective, excluding Geology.

YEAR III (Beginning in 1979-80): 32-35 units
Q/ Geology 3C6, 3D6, 3G4.  
R/ Geology 3E2; Chemistry 2F4, 2R2; two to six units Science and/or Engineering courses.  
E/ Six units elective, excluding Geology.

YEAR IV: 32 units
Q/ The 18 to 21 units of Science and/or Engineering, including at least 16 units of Year IV Geology in which the student obtains the highest weighted average.  
R/ Geology 4B5, 4M6.  
E/ Electives to make a total of 32 units.

HONOURS MATHEMATICS

(For Honours B.A. programme in Mathematics and Philosophy see “Faculty of Humanities: Honours Mathematics and Philosophy”, and for the Honours B.A. programme in Economics and Mathematics see “Faculty of Social Sciences: Honours Economics and Mathematics”.)

Admission:
University Standing in any Year I, including Mathematics 1A6 or 1C6, and 1B4**, with a weighted average of at least 70% in these two courses and six additional units acceptable to the Department of Mathematics. The election of Economics 1A6 or 1B6 or a Year I course in Philosophy is suggested.

*Students who have taken Applied Mathematics 1C6 instead of Mathematics 1B4 will be considered.

YEAR II: 31-33 units
Q/ Mathematics 2A5, 2B4, 2C4, 2D4, 2F4.  
E/ 10 to 12 units elective, six of which may not be Mathematics.

Students intending to enter Year III Honours Applied Mathematics and Theoretical Physics must replace Mathematics 2F4 with Physics 2G5 and must select Physics 2B6 as elective.

Recommended preparations for various career areas in mathematics are listed below. The recommended courses will prepare the student for graduate work in these fields

Mathematics
Recommended Year III courses: Mathematics 3B4, 3E4, 3F6, 3H4, 3L4 and 3P4.
Recommended Year IV courses: Mathematics 4A6, 4B4, 4E6, 4K4, 4N4 or 4T4, 4J4, 4R4.

Statistics
Recommended Year III courses: Mathematics 3D6, 3E4, 3F4, 3Q4 (or Applied Mathematics 3F4), 3R3, 3S3, 3T3, 3U3. Applied Mathematics 3M3
Recommended Year IV courses: Mathematics 4A6, 4C4, 4G3, 4J3, 4M3, 4Q3, 4R4, 4V4, 4X3. Applied Mathematics 4T3, 4U3.

Numerical Analysis
Recommended Year III courses: Mathematics 3D6, 3E4, 3F6, 3P4, 3Q4 (or Applied Mathematics 3F4), 3R3, 3S3, 3T3, 3U3. Recommended Year IV courses: Mathematics 3E4, 3F6, 3L4, 4J3, 4Q6, 4X3; Applied Mathematics 4T3, 4U3.

Operations Research
Recommended Year III courses: Mathematics 3D6, 3F6, 3L4, 3Q4 (or Applied Mathematics 3F4), 3U3, 3R3, 3S3. Applied Mathematics 1H5, 2L3, 3E4, 3M3; Economics 3O6.
Recommended Year IV courses: Mathematics 3E4, 3F6, 3L4, 4J3, 4O6, 4X3; Applied Mathematics 4T3, 4U3.

The Department of Mathematics requires that Honours Mathematics students entering Year III and IV have their mathematical pro­gramme approved by the Chairman or Associate Chairman of the Department.

YEAR III: 32-34 units
Q/ The 18 to 20 units of Mathematics in R in which the student obtains the highest weighted average.  
R/ Mathematics 3A6 and 18 additional units of senior division Mathematics.*

E/ Electives to make a total of 32 to 34 units, six of which may not be Mathematics.

*Mathematics 3E4 must be taken in Year III or Year IV.

YEAR IV: 32-34 units
Q/ The 18 to 20 units of Mathematics in R in which the student obtains the highest weighted average.  
R/ Mathematics 4A6, or 3T3, 4O3 (if not completed) and 16 additional units of senior division Mathematics.  
E/ Electives to make a total 32 to 34 units.

HONOURS METALLURGY AND MATERIALS SCIENCE

Admission:
University Standing in Natural Sciences I, including Mathematics 1A6 or 1C6, Applied Mathematics 1C6* and Chemistry 1A7 or 1C8, with a weighted average of at least 70% in Chemistry 1A7 or 1C8 and Applied Mathematics 1C6* or Physics 1A7*. Physics 1A7* must be taken in Year I or II, its election in Year I is strongly recommended.

*Students who have taken Mathematics 1B4 instead of Applied Mathematics 1C6, or Physics 1B7 or 1C8 instead of Physics 1A7, will be considered. The combination of Physics 1A7 and Applied Mathematics 1C6 is, however, strongly recommended.

YEAR II: 35-37 units
Q/ The 18 units from R in which the student obtains the highest weighted average.  
R/ Chemistry 2A4, 2T4; Mathematics 2G3, 2T4. Engineering 2O4 (unless Materials 1A6 completed); Materials 2F3. Metallurgy 2C3, Physics 1A7 or, if completed, Physics 2B6; Physics 2O4 or Engineering 2O4 (if Physics 1A7 is taken in Year II, no other Physics course may be selected.)

E/ Electives to make a total of 35 to 37 units.

In Years II and III, a total of at least six elective units may not be Applied Mathematics, Chemistry, Mathematics, Physics, or any course offered by the Department of Metallurgy and Materials Science.

Students who complete with the required standing Year II of Honours Chemistry and Physics or Honours Physics will be considered for admission to Year III of Honours Metallurgy and Materials Science.

YEAR III: 34 units
Q/ The 16-18 units from Applied Mathematics 3B6, Materials 3B2, 3D6, 3E6, 3G2; Physics 3M6 or Chemistry 2U3, in which the student obtains the highest weighted average.
R/ Physics 2B6, if not completed; the courses listed in, but not included in Q (Physics 3M6 or Chemistry 2U3 may be deferred to Year IV).
E/ Electives to make a total of 34 units.

Attention is drawn to Metallurgy 4A1, which requires an essay based on employment in the summer between Years III and IV.

YEAR IV: 30 units
Q/ The 17 units of senior division Applied Mathematics, Ceramics, Chemistry, Materials, Mathematics, Metallurgy, or Physics, from R and E in which the student obtains the highest weighted average.
R/ Materials 4E3, Metallurgy 4A1, 4K4, 4L4; Physics 3M6 or Chemistry 2U3, if not completed.
E/ Electives, at least six units of which may not be Applied Mathematics, Chemistry, Mathematics, Physics, or any course offered by the Department of Metallurgy and Materials Science, to make a total of 30 units.

HONOURS PHYSICS

Admission:
University Standing in Natural Sciences I*, including Physics 1A7* and Applied Mathematics 1C6* with a weighted average of at least 70% in Mathematics 1A6 or 1C6. Applied Mathematics 1C6* and Physics 1A7*. Chemistry 1A7 or 1C8 must be taken in Year I or II; its election in Year I is strongly recom­mended.

*Students who have taken Mathematics 1B4 or Physics 1B7 or 1C8 instead of the prescribed courses will be considered. Physics 1A7 and Applied Mathematics 1C6 are, however, strongly recommended.
**SCIENCE**

**YEAR II: 32-35 units**

O/ Physics 2B6, 2C5, 2H3.
R/ Mathematics 2A5, 2C4, Applied Mathematics 2H3.
E/ Six to nine units elective, at least six of which may not be Physics.

Students who have satisfactorily completed Year II Honours must be eligible to proceed to Year III Honours Applied Physics or Year III Honours Applied Mathematics and Theoretical Physics. They will be considered for admission to Year III Honours Applied Mathematics and Computer Science, provided that Applied Mathematics 2L3 has been elected in Year II, and to Year III Honours Metallurgy and Materials Science, preferably if Engineering 2O4 has been elected in Year II.

**YEAR III: 32-35 units**

O/ The 16 units of Physics listed in R (which may include Applied Mathematics 3B6) in which the student obtains the highest weighted average.
R/ Physics 2H4, 3K4, 3M6, 3N3; Applied Mathematics 3B6; three to six units of senior division Natural Science or Mathematics.
E/ Six units elective 

Physics 3B6 or 4D6 must be taken in Year III or IV. Students who elect Year III courses in Year III and Year IV courses in Year IV will generally find that more options are offered by the timetable.

**YEAR IV: 32-34 units**

O/ The six courses of senior division Physics from R and E in which the student obtains the highest weighted average.
R/ Physics 2A2, 2B4, 3F3, 4J4; two of Physics 3R4, 3S4, 4C4, 4D6, 4E3, 4K3; six units of senior division Science or Mathematics.
E/ Electives to make a total of 32 to 34 units.

**HONOURS PSYCHOLOGY**

(For B.A. Programme in Honours Psychology, see "Faculty of Social Sciences: Honours Psychology").

**Admission:**

University Standing in Natural Sciences I, with at least 70% in Psychology 1A6 and 70% in an additional 6 units of Mathematics or Natural Science.

At some time during the programme, the student must meet a laboratory requirement by completing at least two of Psychology 2L6, 2U3, 2V3, 3C8, 3E3, 3G3, 3S3, 3V3, 4D6, 4G3, or 4E7. (If in any of these courses laboratory work is optional, the laboratory option must be exercised to receive credit toward the laboratory requirement.) Further, it is strongly recommended that students complete Psychology 2D6 and 2T6 early in their programmes, and that one laboratory course be completed by the end of Year III. Courses presented to meet the laboratory requirement must be included in the Q group when determining honours standing.

Year II and Year III Psychology students will not be permitted to register in more than 18 units of Psychology in a given year, nor will they be permitted to register in courses of a year higher than the one in which they are registered.

Students registered in Honours programmes in Psychology must complete the entire Q group of each Year within one academic session, unless that student is registered in 18 or fewer units of university work. For such students the Q standing will be calculated on the basis of the first 15 units of Psychology completed in Year II (including Psychology 2R6), and the first 18 units of Psychology completed in each of Year III and Year IV.

A minimum grade of "D" must be obtained in Psychology courses presented to satisfy Q requirements.

**YEAR II: 33-35 units**

O/ Psychology 2R6 and nine additional units of Year II Psychology, or, if Psychology 2R3 is taken in place of Psychology 2R6, 12 additional units of Year II Psychology.
R/ 12 to 14 units of Biochemistry, Biology, Chemistry, Mathematics, or Physics.
E/ Six units elective, excluding Psychology.

**YEAR III: 32-34 units**

O/ 18 units of Year II and Year III Psychology.
R/ Six to eight units of senior division Biochemistry, Biology, Chemistry, Mathematics, or Physics.
E/ Electives, excluding Psychology, to make a total of 32 to 34 units.

**YEAR IV: 30-33 units**

O/ The 18-19 units of Psychology chosen from R and E in which the student obtains the highest weighted average.
R/ 18-19 units of Psychology.
E/ Electives to make a total of 30 to 33 units; electives may include Psychology.

**HONOURS STATISTICS**

**Admission:**

University Standing in any Year I with a weighted average of at least 70% in Mathematics 1A6 or 1C6, 1B4m and six additional units acceptable to the Department of Mathematics.

* "Students who have taken Applied Mathematics 1C6 instead of Mathematics 1B4 will be considered. The election of Economics 1A6 is recommended.

**YEAR II: 32-35 units**

O/ Mathematics 2A5, 2B4, 2D4, and the two courses from R in which the student obtains the highest weighted average.
R/ Applied Mathematics 2H3 (unless Applied Mathematics 1H3 completed) and two of Mathematics 2C4, 3R3, Applied Mathematics 2L3, 3M3.
E/ Electives, at least six units of which may not be Mathematics, to make a total of 32 to 35 units.

* The attention of students is drawn to Economics 2G3 and Economics 2L3.

**YEAR III: 32-34 units**

O/ Mathematics 3B6; the 12 units from R in which the student obtains the highest weighted average.
R/ Mathematics 3A6 or 3O6, at least nine units from the courses prescribed below.
E/ Electives, at least six units of which may not be Mathematics, to make a total of 32 to 34 units.

* Prescribed courses for Year III: Mathematics 3C4, 3F4, 3F6, 3R3, 3S3, 3T3, 3Q4 (or Applied Mathematics 3F4), 3U3, Applied Mathematics 2L3, 3A3 or 3G3, 3M3, 4G3, 4T3, 4U3, 4V3.

* The attention of students is drawn to Economics 306 and Commerce 3E3.

**YEAR IV: 32-34 units**

O/ Mathematics 4M3; the 15 units from R in which the student obtains the highest weighted average.
R/ Mathematics 3T3 (if not completed), at least 12 units from the courses prescribed below.
E/ Electives, at least six units of which may not be Mathematics, to make a total of 32 to 34 units.

* Prescribed courses for Year IV: Mathematics 3E4, 3P4, 3Q4 (or Applied Mathematics 3P4), 3R3, 3S3, 4C3, 4G3, 4T3, 4U3, 4V3, 4M3, 4K4, 4X3, Applied Mathematics 3A3 or 3G3, 3M3, 4G3, 4T3, 4V3.

* The attention of students is drawn to Economics 306, 466, Commerce 4V3, Mechanical Engineering 4C3 or Commerce 4E3.

Major Programmes for the Major B.Sc. Degree

**APPLIED MATHEMATICAL SCIENCES MAJOR**

**Admission:**

University Standing in any Year I with a weighted average of at least 60% in Mathematics 1A6 or 1C6, and Applied Mathematics 1C6 or 1C7 or Mathematics 1B4, and six additional units acceptable to the Department of Applied Mathematics.

This is a Year II programme from which students may enter the Major Programmes in Applied Mathematics and Computer Science, Applied Statistics and Computation, and Computer Science and Mathematics.

It is strongly recommended that students intending to enter Applied Mathematics and Computer Science Major take Applied
Mathematics 1C6 and Physics 1A7 in Year I. The election of Applied Mathematics 1H3 as an extra course in Year I may be approved by a Dean of Science Studies. The election of Economics 1A6 or 1B6 is recommended. Students are to take the entire Q-group in one academic session, with the exception of certain part-time students who should consult the Chairman.

YEAR II: 30-32 units
Q/ Applied Mathematics 2L3; the nine to 12 units in R in which the student obtains the highest weighted average.
R/ Applied Mathematics 2K3; 2H3, or if 1H3 completed, Applied Mathematics 3M3; Mathematics 2D4, 2G3, 2J6, 2Q3.
E/ Six units elective.*

*Electives must include at least three units other than Mathematics and Applied Mathematics. Students should consider Applied Mathematics 3M3 or Physics 2B6. Those intending to enter Applied Statistics and Computation should elect Applied Mathematics 3M3.

APPLIED MATHEMATICS AND COMPUTER SCIENCES MAJOR
The Department of Applied Mathematics requires that Applied Mathematics and Computer Science Major students, entering Year III and Year IV, have their programmes approved by the Chairman.

Admission:
Completion of Year II Applied Mathematical Sciences Major or Year II Mathematics Major including Applied Mathematics 2L3, 1H3 or 2H3. Mathematics 2D4.

YEAR III: 29-32 units
Q/ The 13 units in R in which the student obtains the highest weighted average.
R/ Applied Mathematics 2K3 if not completed, 3A3, 3M3, 3T3; Physics 2G3, six to nine units from the courses prescribed below.
E/ Electives*, at least six units of which may not be Applied Mathematics, Mathematics, or Physics, to make a total of 29 to 32 units.

YEAR IV: 30-32 units
Q/ The 15 units in R in which the student obtains the highest weighted average.
R/ Applied Mathematics 4G6; six to eight units from Applied Mathematics 3B6 or Mathematics 3T3, Applied Mathematics 3E4, 3F4 or Mathematics 3Q4; nine to 12 units from the courses prescribed below, including Applied Mathematics 3D3 (if not completed).
E/ Electives* to make a total of 30 to 32 units.

*Electives that should be considered as electives are Applied Mathematics 4C4, 4K3, 4S3, 4T3, 4U3, 4V3; Mathematics 3D6, 3J3, 4C4, 4M3, 4Q6, 4V3, 4X3.

Year IV: 30-32 units
Q/ The 15 units in R in which the student obtains the highest weighted average.
R/ Applied Mathematics 4G6; six to eight units from Applied Mathematics 3B6 or Mathematics 3T3, Applied Mathematics 3E4, 3F4 or Mathematics 3Q4; nine to 12 units from the courses prescribed below, including Applied Mathematics 3D3 (if not completed).
E/ Electives* to make a total of 30 to 32 units.

*Electives must include at least three units other than Mathematics and Applied Mathematics. Students should consider Applied Mathematics 3M3 or Physics 2B6. Those intending to enter Applied Statistics and Computation should elect Applied Mathematics 3M3.

APPLIED STATISTICS AND COMPUTATION MAJOR
The Department of Applied Mathematics requires that Applied Statistics and Computation Major students, entering Year III and Year IV, have their programmes approved by the Chairman.

Admission:
Completion of Year II Applied Mathematical Sciences Major.

YEAR III: 29-31 units
Q/ Applied Mathematics 3A3* or 3G3; Mathematics 3D6; the six to eight units in R in which the student obtains the highest weighted average.
R/ Mathematics 3T3 and Applied Mathematics 3M3 (if not completed); eight to 10 units from the courses prescribed below.
E/ Electives, at least six units of which may not be Applied Mathematics or Mathematics, to make a total of 29 to 31 units.

*Student intending to take Year IV computing courses should elect Applied Mathematics 3A3 in Year III.

YEAR IV: 29-31 units
Q/ Applied Mathematics 4G6; the nine units in R in which the student obtains the highest weighted average.
R/ 10 to 13 units from the courses prescribed below, including (if not completed) Applied Mathematics 3F4 (or Mathematics 3Q4), 4S3, 4T3, 4U3.

E/ Electives to make a total of 29 to 31 units.

Prescribed courses are: Applied Mathematics 3A3, 3E4, 3F4, 3G3, 4S3, 4T3, 4U3, 4V3; Mathematics 3Q4, 3U3, 4J3, 4M3, 4V4, 4X3.

BIOCHEMISTRY MAJOR

Admission:
University Standing in Natural Sciences I, including Chemistry 1A7 or 1C8, with a weighted average of at least 60% in Chemistry 1A7 or 1C8 and Mathematics 1A6 or 1C6. Biology 1B6 or 1C6 must be taken in Years I or II, its election in Year I is recommended.

YEAR I: 31 units
Q/ Chemistry 2Q6, 2S8.
R/ Biology 1C6 (or 1B6) if neither completed, six units of Natural Science.
E/ Electives, at least six units of which may not be Biochemistry, to make a total of 31 units.

YEAR III: 31-33 units
Q/ Biochemistry 3F3, 3G6, 3L4.
R/ Chemistry 3D6; six to eight units of Natural Science.
E/ Six units elective, excluding Biochemistry.

YEAR IV: 30-32 units
Q/ 16 units, including at least 10 units of Biochemistry from Biochemistry 4B6 or 4K4 or 4L4, 4C4, 4H3, 4D3, 4E3, 4P2, 4Q3: Biology 3P3, 4B4, 4B6, 4G4, 4J3, 4O4, 4S6, 4V3. Chemistry 3E4 or 3E6, 4A3, 4D3.
R/ Six units of Senior Division Natural Science.
E/ Electives to make a total of 30 to 32 units.

CHEMISTRY MAJOR

This programme is recommended for those considering a career in teaching. The programme fulfills the academic requirements for professional membership in the Chemical Institute of Canada.

Admission:
University Standing in Natural Science I, including Chemistry 1A7 or 1C8, Mathematics 1A6 or 1C6, and Applied Mathematics 1C6*, with a weighted average of at least 60% in Chemistry 1A7 or 1C8 and either Mathematics 1A6 or 1C6 or Physics 1A7 or 1B7 or 1C8. Physics 1A7 or 1B7 or 1C8 must be taken in Year I or II; its election in Year I is strongly recommended.

*Students who have taken Mathematics 1B4 instead of Applied Mathematics 1C6 will be considered.

YEAR II: 32-35 units
Q/ The 15 to 16 units from Chemistry 2A4, 2S8, 2T4, 2U3, 2X1 in which the student obtains the highest weighted average.
R/ The course listed, but not included in Q; Mathematics 2G3, 2Q3.
E/ Six to nine units elective, excluding Chemistry.

YEAR III: 31 units
Q/ The 13 to 16 units from Chemistry 3A4, 3D6, 3E6, 3Y3, in which the student obtains the highest weighted average.
R/ The course listed, but not included in Q; Mathematics 2G3, 2Q3.
E/ 12 units elective, six of which may not be Chemistry.

YEAR IV: 30-32 units
Q/ The 14 to 16 units from R in which the student obtains the highest weighted average.
R/ Chemistry 4E4 or 4T4, 3C4, if not previously taken; six units of Year IV Chemistry; six units of senior division Chemistry or other senior division Science or Engineering courses.
E/ Electives to make a total of 30 to 32 units.

YEAR IV (Beginning 1980-81): 30-32 units
Q/ The 14 to 16 units from R in which the student obtains the highest weighted average.
R/ Chemistry 4T4, 3C4, if not previously taken; six units of Year IV Chemistry; six units of senior division Chemistry or other senior division Science or Engineering courses.
E/ Electives to make a total of 30 to 32 units.

Students preparing for industrial employment should consider the following courses as electives in Years III and IV: Metallurgy 3C3, 4C4, 4D3; Chemical Engineering 2A5, 3D4, 4K4, 4P3, 4S2. Substitution of one or two of these for required courses will be considered.
COMPUTER SCIENCE AND MATHEMATICS MAJOR

Admission:
University Standing in any Year I with a weighted average of at least 60% in Mathematics 1A6 or 1C6; either Applied Mathematics 1C2 or 1C6 or Mathematics 1B4; and six additional units acceptable to the Departments of Applied Mathematics and Mathematics.

The election of Applied Mathematics 1H3 as an extra course in Year I may be approved by the Dean of Studies.

Year II of this programme is identical to Year II Applied Mathematical Sciences provided that Mathematics 2D4 is elected.

Year II: 30 units
Q/ Applied Mathematics 2L3; the nine units from R in which the student obtains the highest weighted average.
R/ Applied Mathematics 2H3 or, if 1H3 completed, 2K3. Mathematics 2G3, 2J6, 203.
E/ Electives, at least six units of which may not be Applied Mathematics or Mathematics, to make a total of 30 units.

Note: In Years III and IV combined, in addition to the specified courses, the student must include at least six units of senior division Mathematics courses* and at least six units from the courses prescribed below.

Year III: 30 units
Q/ Mathematics 306; Applied Mathematics 3A3; one additional course from R.
R/ Eight to ten units chosen from Applied Mathematics 2K3 (if not completed), senior division Mathematics courses, and the courses prescribed below.
E/ Electives, at least six units of which may not be Applied Mathematics or Mathematics, to make a total of 30 units.

Year IV: 30 units
Q/ Applied Mathematics 4G6; one of Mathematics 4C4, 3T3 and 4O3. 4Q6, 4S4; one other course from R.
R/ Six to eight units chosen from senior division Mathematics courses* and the courses prescribed below.†, including Applied Mathematics 3D3 if not completed.
E/ Electives to make a total of 30 units.

*Mathematics 3D6, 3E4. 3F6. 3L4. 3Q4. (or Applied Mathematics 3F4). 3R6. 3S3. 3U3. 4G2. 4J2. 4K3. 4V4. 4X3 should be considered.
†Prescribed courses are: Applied Mathematics 3C3. 3D3. 3E4. 3F4 (or Mathematics 3O4). 3G3. 3H3. 3I3. 3T3. 4E3. 4E6. 4J3. 4L3. 4M3. 4X3.

GEODESY MAJOR

Admission:
University standing in Natural Sciences I, including Chemistry 1A7 or 1C8, with a weighted average of at least 60% in Geology 1A6 and one of: a six-unit Year I Biology, Chemistry 1A7 or 1C8, Mathematics 1A6 or 1C6, Physics 1A7 or 1B7 or 1C8.

Year II: 30-32 units
Q/ Geology 2B6. 203. 206.
R/ Chemistry 2F3; a six-unit Year I Biology, or, if completed, six units of Natural Science and/or Engineering approved by the Department.
E/ Nine to 11 units elective, six of which may not be in Geology.

Attention is drawn to Geology 3E2, which is scheduled outside of regular term.

Year III (Beginning in 1979-80): 32-34 units
Q/ Geology 2D5. 3C6. 3G4. 3Q4.
R/ Geology 3E2; Chemistry 2P4. 2R2.
E/ Nine to 11 units elective, five of which may not be in Geology.

Year IV: 29 units
Q/ Geology 3D6. 10 units of Year IV Geology.
R/ Four to six units of Natural Science and/or Engineering approved by the Department.
E/ Electives to make a total of 29 units.

MATHEMATICS MAJOR

Admission:
University Standing in any Year I with a weighted average of at least 60% in Mathematics 1A6 or 1C6, 1B4*, and six additional units acceptable to the Department of Mathematics.

*Students who have taken Applied Mathematics 1C6 instead of Mathematics 1B4 will be considered.

Year II: 30 units
Q/ Mathematics 2D4. 2G3. 2J6. 203.
E/ 14 units elective, excluding Mathematics.

Year III: 30-32 units
Q/ The 12 units of Mathematics from R in which the student obtains the highest weighted average.
R/ Mathematics 306. 3T3, nine additional units of Mathematics.
E/ Electives, excluding Mathematics, to make a total of 30 to 32 units.

Year IV: 30-32 units
Q/ The 16 units of Mathematics from R in which the student obtains the highest weighted average.
R/ Mathematics 4O3 (if not completed); 17 to 19 additional units of senior division Mathematics.
E/ Electives, excluding Mathematics, to make a total of 30 to 32 units.

METALLURGY AND MATERIALS SCIENCE MAJOR

Admission:
University Standing in Natural Sciences I, including Mathematics 1A6 or 1C6, Applied Mathematics 1C6*, and Chemistry 1A7 or 1C8, with a weighted average of at least 60% in Chemistry 1A7 or 1C8 and either Applied Mathematics 1C6* or Physics 1A7*. Physics 1A7* must be taken in Years I or II; its election in Year I is strongly recommended.

*Students who have taken Mathematics 1B4 instead of Applied Mathematics 1C6, or Physics 1B7 or 1C8 instead of Physics 1A7, will be considered. Physics 1A7 is strongly recommended.

Year II: 29-32 units
Q/ The 15 units from R in which the student obtains the highest weighted average.
R/ Chemistry 2T4. Mathematics 2G3. 203; Engineering 204 (unless Materials 1A6 completed). Materials 2F3; Metallurgy 2C3; Physics 1A7 or, if completed, Physics 2B6; Physics 2G3 or 2C3, or Engineering 2W4. (If Physics 1A7 is taken in Year II, no other Physics course may be selected.)
E/ Electives to make a total of 29 to 32 units.

In Years II and III, a total of at least six elective units may not be Applied Mathematics, Chemistry. Mathematics, Physics, or any course offered by the Department of Metallurgy and Materials Science.

Year III: 32 units
Q/ The 15 units from R in which the student obtains the highest weighted average.
R/ Applied Mathematics 3B6 or 3V6; Chemistry 2A4, if not completed; Materials 3B2. 3D6. 3E6. 3G2; Physics 2B6, if not completed.
E/ Electives, to make a total of 32 units, such that in Years II and III combined, a total of at least six units of elective are not Applied Mathematics, Chemistry, Mathematics, Physics, or any course offered by the Department of Metallurgy and Materials Science.

Attention is drawn to Metallurgy 4A1, which requires an essay based on employment in the summer between Years III and IV.

Year IV: 30 units
Q/ The 15 units of senior division Applied Mathematics, Ceramics, Chemistry, Materials, Mathematics, Metallurgy, or Physics, from R and E in which the student obtains the highest weighted average.
R/ Materials 4E3; Metallurgy 4A1. 4L4.
E/ Electives, at least six units of which may not be Applied Mathematics, Chemistry, Mathematics, Physics, or any course offered by the Department of Metallurgy and Materials Science to make a total of 30 units.

1Applied Mathematics 3M3 or 3S6 may be of interest.
PHYSICS MAJOR (GENERAL OPTION)

Admission:
University Standing in Natural Sciences I, including Mathematics 1A6 or 1C6, Physics 1A7*, and Applied Mathematics 1C6*, with a weighted average of at least 60% in three subjects: Physics 1A7* and two of Mathematics 1A6, 1C6, Applied Mathematics 1C6*, Chemistry 1A7 or 1C8. Chemistry 1A7 or 1C8 must be taken in Years I or II; its election in Year I is strongly recommended.

*Students who have taken Mathematics 1B4 or Physics 1B7 or 1C8-weighted average of at least 60% in three subjects: Physics 1A7 and Applied Mathematics 1C6 are, however, strongly recommended.

YEAR II: 30-32 units
Q/ Physics 2B6 and 10 units of Physics, Chemistry, Mathematics, or Applied Mathematics, beyond Year I, from R and E.
R/ Physics 2G3 or 2C5, 2H3, Mathematics 2G3, 203.
E/ Electives, at least six units of which may not be Physics, to make a total of 30 to 32 units.

YEAR III: 29-32 units
Q/ The 15 units of Physics from R and E in which the student obtains the highest weighted average.
R/ Physics 3H4; either Applied Mathematics 3B6, Physics 3M6, and three to four units of senior division Physics, or Physics 3P3, 3T3 and nine to 10 units of senior division Physics.
E/ Electives, at least six units of which may not be Physics or Engineering Physics.

Students who elect Year III courses in Year III and Year IV courses in Year IV will generally find that more options are offered by the timetable.

YEAR IV: 30-32 units
Q/ The 15 units listed in R in which the student obtains the highest weighted average.
R/ Physics 4A2; 18 units of senior division Physics which must include Physics 3B6 or 4D6, if neither completed.
E/ Electives to make a total of 30 to 32 units.

PHYSICS MAJOR (HEALTH AND RADIATION PHYSICS OPTION)

Admission:
University Standing in Natural Sciences I, including Biology 1B6, Chemistry 1A7, Mathematics 1A6 or 1C6, Physics 1A7* and Applied Mathematics 1C6*, with a weighted average of at least 60% in three subjects: Physics 1A7* and two of Mathematics 1A6, 1C6, Applied Mathematics 1C6*, Chemistry 1A7, 1C8.

*Students who have taken Mathematics 1B4 or Physics 1B7 or 1C8 instead of the prescribed courses will be considered. Physics 1A7 and Applied Mathematics 1C6 are, however, strongly recommended.

YEAR II: 29-31 units
Q/ Physics 2B6, and 10 units of Physics, Chemistry, Mathematics, or Applied Mathematics, beyond Year I, from R and E.
R/ Physics 2G3 or 2C5, 2H3, Mathematics 2G3, 203, Applied Mathematics 2H3.
E/ Six to 10 units elective (Chemistry 2D4 or 208 is strongly recommended).

YEAR III: 30-32 units
Q/ Physics 3B6, 3H4, 3P3, 3T3.
R/ Biology 2A3, Chemistry 2F4.
E/ Electives to make a total of 30 to 32 units.

YEAR IV: 30-32 units
Q/ Physics 4D6, 4E3, 4Q4, 4R3.
R/ Biology 404, Engineering 4X3.
E/ Electives to make a total of 30 to 32 units.

PASS PROGRAMMES FOR THE ORDINARY B.SC. DEGREE

PASS BIOLOGY

Admission:
University Standing in Natural Sciences I, including Chemistry 1A7 or 1C8, with at least 55% in one of Biology 1B6, 1C6, 1D6, 1E6. Physics 1B7 (or 1A7 or 1C8) must be taken in Years I or II; its election in Year I is strongly recommended.

YEAR II: 30-32 units
R/ 12 units of Biology so chosen that Biology 1B6 and 1C6 and either Biology 1D6 or 1E6 are completed by the end of Year II; Chemistry 206 or Chemistry 2D4 and Biochemistry 2E4, or Chemistry 2D4 and Biology 2H4, Physics 1B7 (or 1A7 or 1C8), if not completed.
E/ Electives, at least six units of which may not be Biochemistry or Biology, to make a total of 30 to 32 units.

YEAR III: 30-32 units
R/ 18 units of Biology.
E/ Electives, at least six units of which may not be Biochemistry or Biology, to make a total of 30 to 32 units.

PASS CHEMISTRY

Admission:
University Standing in Natural Sciences I, including Mathematics 1A6 or 1C6, with at least 55% in Chemistry 1A7 or 1C8, Physics 1A7 or 1B7 or 1C8 must be taken in Years I or II; its election in Year I is strongly recommended.

YEAR II: 30 units
R/ Chemistry 2F4, 208, 2P4, 2R2.
E/ 12 units elective, excluding Chemistry.

YEAR III: 30-31 units
R/ Chemistry 3K6, Chemistry 313 and 304.
E/ Electives, at least six of which may not be Chemistry, to make a total of 30 or 31 units.

PASS COMPUTER SCIENCE

The Department of Applied Mathematics requires that Pass Computer Science students entering Year III, have their programmes approved by the Chairman.

Admission:
University Standing in any Year I with at least 55% in Mathematics 1A6 or 1C6.

The election of Applied Mathematics 1C6 and Economics 1A) or 1B6 is strongly recommended. The election of Applied Mathematics 1H3 as an extra course in Year I may be approved by a Dean of Science Studies.

YEAR II: 28-30 units
R/ Applied Mathematics 2H3 (if 1H3 not completed), 2K3, 2L3, six units of Applied Mathematics or Mathematics.
E/ Electives*, at least six units of which may not be Applied Mathematics, Mathematics, or Physics, to make a total of 28 to 30 units.

YEAR III: 28-30 units
R/ Applied Mathematics 3R6; six units from Applied Mathematics 3A3, 3D3, 3G3, 3H3, 3I3, 3T3, at least three units of Applied Mathematics, Mathematics, or Natural Science, beyond Year I.
E/ Electives*, at least six units of which may not be Applied Mathematics, Mathematics or Physics, to make a total of 28 to 30 units.

*It is recommended that students choose their electives so that in Years II and III combined, 18 units are in a single subject, e.g., Commerce.

†Only courses in Applied Mathematics and Mathematics count towards the area of concentration.
PASS GEOGRAPHY

(For B.A. Programme in Pass Geography, see “Faculty of Social Sciences: Pass Geography”.)

Admission:
University Standing in Natural Sciences I, with at least 55% in Geography 1A6.

YEAR II: 30 units
R/ Geography 2F3, 2K3, 2L3, 2T3, one of Geography 2C3, 2Q3, 2W3.
E/ 15 units elective, at least six of which may not be Geography.

YEAR III: 30 units
R/ Nine units from Geography 3F3, 3K3, 3L3, 3M3, 3N3, 3Q3, 3V3, 2W3, six units of Year III or IV Geography science courses or other science courses acceptable to the Department.
E/ 15 units elective, at least six of which may not be Geography.

*Geography science courses are designated with an asterisk in the offerings of the Department of Geography.

PASS GEOLGY

Admission:
University Standing in Natural Sciences I, including Geology 1A6, Chemistry 1A7 or 1C8, and Mathematics 1A6 or 1C6, with at least 55% in Geology 1A6.

YEAR II: 30 units
R/ Geology 2B6, 2C6, a six-unit Year I Biology course, if not already completed, or six units of Science and/or Engineering approved by the Department.
E/ 12 units elective, at least six of which may not be Geology.

YEAR III (Beginning in 1979-80): 31 units
R/ Geology 205, 3D6, 3E2
E/ 12 units elective, six of which may not be in Geology. Geology 3G4 is strongly recommended.

PASS MATHEMATICS

Admission:
University Standing in any Year I with a weighted average of at least 55% in Mathematics 1A6 or 1C6, and 1B4.

Students who have taken Applied Mathematics 1C6 instead of Mathematics 1B4 will be considered.

YEAR II: 30 units
R/ Mathematics 2G3, 2J6, 2T3
E/ 18 units elective, excluding Mathematics.

YEAR III: 30-32 units
R/ Mathematics 3O6, 3T3, six to eight additional units of Mathematics.
E/ 15 units elective, excluding Mathematics.

PASS PHYSICS

Admission:
University Standing in Natural Sciences I, including Mathematics 1A6 or 1C6, Applied Mathematics 1C6*, and Physics 1A7, with at least 55% in Physics 1A7. Chemistry 1A7 or 1C8 must be taken in Year I or Year II, its election in Year I is strongly recommended.

Students who have taken Mathematics 1B4 or Physics 1B7 or 1C8 instead of the prescribed courses will be considered. Physics 1A7 and Applied Mathematics 1C6 are, however, strongly recommended.

YEAR II: 29-31 units
R/ Physics 2B6, 2G3, Physics 2H3, or Chemistry 2P4 and 2R2, Mathematics 2G3, 2O3.
E/ Electives, at least six units of which may not be Physics, to make a total of 29 to 31 units.

YEAR III: 29-31 units
R/ Physics 2B6, 2G3, Physics 2H3, or Chemistry 2P4 and 2R2, Mathematics 2G3, 2O3.
E/ Electives, at least six units of which may not be Physics, to make a total of 29 to 31 units.

PASS PSYCHOLOGY

(For B.A. programme in Pass Psychology, see “Faculty of Social Sciences: Pass Psychology”.)

Admission:
University Standing in Natural Sciences I with at least 55% in Psychology 1A6.

At some time during the programme the student must meet a laboratory requirement by completing at least one of Psychology 2L6, 2U3, 2V3, 3C6, 3E3, 3Q3, 3S3, 3V3, 4D6, 4Q3, or 4E7. (If in any of these courses laboratory work is optional, the laboratory option must be exercised to receive credit toward the laboratory requirement.)

Year II and Year III Psychology students will not be permitted to register in more than 18 units of Psychology in a given year, nor will they be permitted to register in courses of a year higher than the one in which they are registered.

A minimum grade of F must be obtained in Psychology 2G3 or 2R3 or 2R6 and Psychology courses presented to satisfy area requirements.

YEAR II: 30-32 units
R/ At least 12 units of Year II Psychology including Psychology 2G3 or 2R3 or 2R6; six to eight units of Biochemistry, Biology, Chemistry, Mathematics, or Physics.
E/ Electives at least six units of which may not be Psychology, to make a total of 30 to 32 units.

YEAR III: 30-32 units
R/ 12 units of Year II and Year III Psychology; six to eight units of Biochemistry, Biology, Chemistry, Mathematics, or Physics, beyond Year I.
E/ Electives, at least six units of which may not be Psychology, to make a total of 30 to 32 units.

PASS SCIENCE

Admission:
University Standing in Natural Sciences I, including at least two courses from Year I Biology, Chemistry, and Physics, with a weighted average of at least 55% in two or more Mathematics or science courses. Chemistry 1A7 (or 1C8) and Physics 1B7 (or 1A7 or 1C8) must be taken in Years I or II; the election of both in Year I is strongly recommended.

YEAR II: 30 units
R/ 18 units of Natural Science courses (which may include Applied Mathematics or Mathematics or both) including Chemistry 1A7 (or 1C8), if not completed, or Physics 1B7 (or 1A7 or 1C8), if not completed.
E/ 12 units elective.

NOTE: In Years II and III combined, not more than 14 units of first-year work may be taken and not more than 18 units of R-group courses may be taken in any one Department

YEAR III: 30 units
R/ 18 units of Natural Science courses (which may include Applied Mathematics or Mathematics or both), at least six of which must be from the senior division.
E/ 12 units elective.
The Faculty of Social Sciences

The social sciences are concerned with the systematic study of the whole gamut of human relationships in societies which range from the primitive to the post-industrial. There is also a growing interest among social scientists in the interaction between men and their natural and artificial environments. Developments in theory and refinements of scientific method have, in recent years, given great impetus to social studies and research.

The Faculty of Social Sciences is essentially a convenient administrative structure that groups a number of disciplines in the following departments or schools:

- Anthropology
- Economics
- Political Science
- Physical Education
- Religious Studies
- Social Work
- Sociology

It is readily seen that not all disciplines that have a bearing on social science are represented by the departments within the Faculty; nor are all the constituent parts of the Faculty, strictly speaking, engaged in systematic social studies. Psychology, geography, and history, are, in some of their aspects, identifiable as social sciences. Physical education and social work, on the other hand, have a strong practical orientation, drawing largely, but not exclusively, on the social sciences for knowledge and insights that may be applied in professional practice.

The departments offer the regular three-year Pass programmes, as well as four-year Honours programmes. The Honours programmes provide a richer concentration in the particular field, and are normally a requirement for those who contemplate proceeding to graduate studies. In many cases, students may combine work in two departments and be graduated with a Combined Honours Degree in the two subjects.

The two schools—Social Work and Physical Education—attached to the Faculty offer programmes of study which lead to the combined BA/BSW degree in the one case, and the single BPE degree in the other.

Students are strongly advised to take advantage of the extensive counselling services provided by the Faculty. First-year students in particular should plan a programme of study that would allow them a number of options when they enter second year.

COURSES IN PHYSICAL EDUCATION AND SOCIAL WORK AVAILABLE FOR UNDERGRADUATE CREDIT

Several courses offered by the School of Physical Education and the School of Social Work can be taken by third— and fourth-year students as electives for undergraduate credit.

These courses are:

- Physical Education 3P3
- Physical Education 3Q3
- Physical Education 4G3
- Physical Education 4J3
- Social Work 3C3
- Social Work 3J3
- Social Work 4J3
- Social Work 4M3

Students in the Faculty of Social Sciences who are in the Social Work programme may take, as part of their B.A. programme, up to six units of Social Work courses which have been approved for B.A. credit. Students who are in the four year Bachelor of Physical Education programme may take as electives, up to six units of Physical Education courses which have been approved for arts credit.

Programmes for the Honours B.A. Degree

COMBINED HONOURS PROGRAMME

Subject to possible timetable restrictions, and with the written approval of the appropriate Departments and Deans of Studies, a student may combine work in any two departments, and be graduated with a combined honours degree in the two subjects. These programmes will normally include units of work beyond Year I in each Department (i.e. 6-12 Q units per year in each subject to a total during Years II, III, and IV, of approximately 36 units).

For special requirements in Honours programmes, and for taking extra units, either as extra work or as make-up work, see "Academic Regulations".

PART-TIME STUDIES

Subject to the limitations of course offerings, a student may pursue on a part-time basis any Honours programme in the Faculty of Social Sciences. Normally, a part-time student will arrange his programme of studies in consultation with the Undergraduate Advisor of the appropriate Department.

HONOURS ANTHROPOLOGY

Admission:

University Standing in any Year I with an average of at least 70% in Anthropology 1A3 and 1Z3, and six additional units acceptable to the Department. Anthropology 1B6 (Linguistics 1A6) may be substituted for either 1A3 or 1Z3.

During Years II, III, and IV, students must complete at least 36 units of Anthropology. In special cases, courses offered by other Departments may be approved for credit as an Anthropology course (and included in calculating the Q average). Students are required to take at least one half course above Year I in each of physical anthropology, archaeology, and linguistics.

(Appropriate physical anthropology courses include Anthropology 2D3, 2E3, 2J3).

YEAR II: 30 units

Q/ The 12 units chosen from R in which the student obtains the highest weighted average.

R/ Anthropology 2F3 and at least nine other units of Year II or Year III Anthropology; courses in other Departments may be substituted with Departmental approval.

E/ Electives to total 30 units. The Department recommends six units outside the Faculty of Social Sciences.

YEAR III: 30 units

Q/ The 12 units chosen from R in which the student obtains the highest weighted average.

R/ Anthropology 356 and at least six other units of Year II and Year III Anthropology; courses in other Departments may be substituted with Departmental approval.

E/ Electives to total 30 units. The Department recommends six units outside the Faculty of Social Sciences.

YEAR IV: 30 units-

Q/ The 12 units chosen from R in which the student obtains the highest weighted average.

R/ At least 12 units of Year IV Anthropology; courses in other Departments may be substituted with Departmental approval.

E/ Electives to total 30 units.

COMBINED HONOURS IN CANADIAN STUDIES

A combined Honours programme in Canadian Studies is under active consideration and it is hoped that this programme will commence in September 1979. The Canadian Studies component may be combined with subjects offered by the Faculties of Humanities and Social Sciences. If the programme is approved, a separate announcement will be made. Further information about the programme may be obtained from the Office of the Registrar or from the offices of the Faculties of Humanities and Social Sciences.
COMBINED HONOURS PROGRAMMES

With the approval of both departments concerned, a student may arrange to follow a Combined Honours programme in Economics and another discipline. Some of these programmes are described below. Students wishing to arrange other programmes should consult the Department.

Mathematics Requirements

The Honours Economics programme and all Combined Honours programmes in Economics and another subject (with the exception of Honours Economics and Mathematics) require the successful completion of one course from each of the following groups by the end of Year II:

1. Grade 13 calculus or Mathematics 1K3,
2. Mathematics 1L3 or 1B4 or Applied Mathematics 1C6 or 1C7,
3. Mathematics 1A6 or 1C6, 1M3.

Students should include these courses in their Year I programmes if at all possible.

If Mathematics 1L3 and 1M3 are chosen, they must be completed with an average grade of at least 55%.

HONOURS ECONOMICS:

Admission:

University standing in any Year I with an average of 70% in Economics 1A6 or 1B6 and in six units of Mathematics or another course acceptable to the Department of Economics, including a mark of at least 70% in Economics 1A6 or 1B6.

The mathematics requirements for this programme are described above. In the course of a 4-year programme, students must complete at least 54 units of Economics including Economics 306 or 2B3. Economics 306 is recommended. In addition, 48 units of work other than Economics are required.

YEAR II: 30 units

Q/ Economics 2L6 and 2M6 with a minimum of 65% in each.
R/ Economics 2B3 (unless Economics 306 is chosen in Year III); Mathematics 1L3 and 1M3 or equivalent (unless completed in Year I).
E/ Electives to complete a programme of 30 units, including at least six units offered by other departments.

YEAR III: 30 units

Q/ Economics 3A3 and 3AA3 and 12 additional units of Economics in which the student obtains the highest weighted average.
R/ At least 18 units of Economics including Economics 306 (unless Economics 2B3 has been completed in Year II).
E/ Electives to complete a programme of 30 units including at least six units offered by other departments.

YEAR IV: 30 units

Q/ The 18 units of Economics in which the student obtains the highest weighted average.
R/ At least 18 units of Economics including at least one of 4E3, 4F3, 4H3.
E/ Electives to complete a programme of 30 units.

HONOURS ECONOMICS AND GEOGRAPHY

Admission:

University Standing in any Year I with a mark of at least 70% in Economics 1A6 or 1B6 and in Geography 1B6.

The mathematics requirements for this programme are described above.

YEAR II: 30 units

Q/ Economics 2L6 and 2M6 and their completion with at least 65% in each. Geography 2A3, 2B3, 2F6.
R/ Geography 2L3 or Economics 2B3*; Mathematics 1L3 and 1M3 (if not completed in Year I).
E/ Electives to total 30 units.

YEAR III: 30 units

Q/ Economics 3A3 and 3AA3, six additional units of Economics; 12 units of Geography 3N3. Six units of Geography, including Geography 3N3.
R/ 12 units of Economics. 12 units of Year III or IV Geography excluding physical and regional geography.
E/ Six units elective.

YEAR IV: 30 units

Q/ 12 units of Economics. 12 units from Geography 4H3, 4J6, 4T3, 4U3, 4X6.
E/ Six units elective.

HONOURS ECONOMICS AND HISTORY

(See "Faculty of Humanities: Honours Economics and History").

HONOURS ECONOMICS AND MATHEMATICS

Admission:

University Standing in Business I, Natural Sciences I or Social Sciences I with an average of at least 70% in Economics 1A6 or 1B6, Mathematics 1A6 or 1C6, and 1B4°, including a mark of at least 70% in Economics 1A6 or 1B6.

° Students who have taken Applied Mathematics 1C6 instead of Mathematics 1B4 will be considered for admission to Honours Economics and Mathematics.

YEAR II: 30-32 units

Q/ Economics 2L6 and 2M6 and their completion with at least 65% in each. Mathematics 2A4 or 2A5, 2B4, 2D4, 2F4.
R/ Electives to total 30 to 32 units.

YEAR III: 30-32 units

Q/ Economics 3A3 and 3AA3, six additional units of Economics; Mathematics 2C4, 3A6 or 306; six units from Mathematics 3D6, 3E4, 3F6, 3I4, 3O4, 3T3, 3S3, 3U3, 3U3, 4G3.
E/ Electives to total 30 to 32 units.

YEAR IV: 30-32 units

Q/ 12 units of Economics, 10 units of Mathematics chosen from 3D6, 3E4, 3F6, 3I4, 3O4, 3R3, 3S3, 3T3 or 4A6 or 4O3, 3U3, 4C4, 4G3, 4J3, 4K4, 4M3, 4U4, 4X3.
E/ Electives to total 30 to 32 units.

HONOURS ECONOMICS AND POLITICAL SCIENCE

Admission:

University Standing in any Year I with an average of at least 70% in Economics 1A6 or 1B6 and six additional units acceptable to the Department of Political Science, including a mark of at least 70% in Economics 1A6 or 1B6. A first-year course in Political Science is recommended.

The mathematics requirements for the programme are described above.

YEAR II: 30 units

Q/ Economics 2L6 and 2M6, and their completion with at least 65% in each; 12 units of Year II Political Science. Political Science 2F6 is recommended.
R/ Economics 2B3*; Mathematics 1L3 and 1M3 or equivalent (if not completed in Year I).
E/ Electives to total 30 units.

° Students may also meet the statistics requirement by taking Economics 306 in Year III.

YEAR III: 30 units

Q/ Economics 3A3 and 3AA3, six additional units of Economics; 12 units of senior division Political Science.
E/ Six units elective.
YEAR IV: 30 units
Q/ 12 units of Economics, 12 units of senior division Political Science.
E/ Six units elective.

HONOURS GEOGRAPHY

(For B.Sc. programme in Honours Geography, see “Faculty of Science: Honours Geography”.

Admission:
University Standing in any Year I with a mark of at least 70% in Geography 1A6 or 1B6, and an average of at least 70% in that and six additional units acceptable to the Department. Students are advised to consult the Handbook for Undergraduate Geographers, which may be obtained from the departmental office.

YEAR II: 30 units
Q/ The 12 units of second year geography from R in which the student obtains the highest weighted average.
R/ Geography 2L3, nine units chosen from 2A3, 2B3, 2D3, 2F3, 2K3, 2R3, 2T3, at least six additional units of Geography or approved courses offered by other Departments. Geography 1A6 or 1B6 may be included.
E/ At least 12 units electives, six of which must not be in Geography.

YEAR III: 30-32 units
Q/ The 18 Geography units from R in which the student obtains the highest weighted average.
R/ Nine units chosen from 3C3, 3D3, 3H3, 3K3, 3L3, 3M3, 3N3, 3O3, 3T3, 3U3, 3V3, 3W3, 3Z3; at least nine additional units of Year III or IV geography, or approved courses offered by other Departments.
E/ At least 12 units elective, six of which must not be in Geography.

YEAR IV: 30 units
Q/ The 12 units of Year IV Geography in which the student obtains the highest weighted average.
R/ At least 18 units of Years III and IV Geography or approved courses offered by other Departments.
E/ At least 12 units elective, six of which must not be in Geography.

HONOURS GEOGRAPHY AND GEOLOGY

(For B.Sc. programme in Honours Geography and Geology, see “Faculty of Science: Honours Geography and Geology”.

Admission:
University standing in any Year I with an average of at least 70% in Geography 1A6 and Geology 1A6 or 1B6.

YEAR II: 32 units
Q/ The 15 units of Geography and Geology (excluding Geography 3E3) chosen from R in which the student obtains the highest weighted average.
R/ Geography 2L3, 2O3, 2T3, 3E3, Geology 2B6, 2C6, Mathematics 1A6, 1B6, 1E6 or 1K3 and 1L3 or 1M3, if not taken in Year I.
E/ Electives to total 32 units.

YEAR III: 29-32 units
Q/ The 15 units from R (excluding Geology 3E2), in which the student obtains the highest weighted average.
R/ Geography 3M3, 3W3; Geology 3E2, 3H6; at least six additional units of Year III Geography or Geology.
E/ Nine to 12 units elective, at least six units may not be Geography or Geology.

YEAR IV: 30 units
Q/ Six units of Year IV Geography; six units of Year IV Geology; six units of Year IV Geography or senior division Geology courses.
E/ 12 units elective.

HONOURS POLITICAL SCIENCE

Admission:
University Standing in any Year I with an average of 70% in Political Science 1A6 plus six units acceptable to the Department of Political Science. Any student who has not completed Political Science 1A6 in Year I will normally be required to do so in Year II.

R group courses are those which are eligible for R group credit.

The R group includes all courses in Political Science. Years III and IV students cannot include Year II Political Science courses in the R group.

During Years II, III, and IV, students in Honours Political Science must complete not fewer than 48 units and not more than 60 units of Political Science, 12-18 units of which must be in Year II.

Subject to the approval of the Department, students in Honours Political Science are permitted to select, above the minimum 48 units of Political Science, up to 12 units in other Departments for inclusion in the R group.

Students in Year II may take Year III courses, provided they meet all prerequisites.

Students in Year III or Year IV may take Year II, III, or IV courses, provided they meet all prerequisites.

YEAR II: 30 units
Q/ The 12 units chosen from R in which the student obtains the highest weighted average.
R/ A total of 18 units. At least 12 units of Year II Political Science and no more than six units of approved courses in other Departments.
E/ 12 units elective.

YEAR III: 30 units
Q/ The 18 units of Year III and Year IV courses chosen from R in which the student obtains the highest weighted average.
R/ A total of 24 units. At least 18 units of Year III Political Science.
E/ Six units elective.

YEAR IV: 30 units
Q/ The 18 units of Year III and Year IV courses chosen from R in which the student obtains the highest weighted average.
R/ A total of 24 units. At least 12 units of Year IV Political Science, plus 12 units of either Year III or Year IV Political Science or six units of approved courses in other Departments. Political Science 4Z6 is required.
E/ Six units elective.

COMBINED HONOURS PROGRAMME

During Years II, III, and IV, students in the Combined Honours Programme must complete not fewer than 36 units of Political Science, at least 24 units of which must be in Year III or Year IV course but will not be required to take Political Science 4Z6.

HONOURS POLITICAL SCIENCE AND RELIGIOUS STUDIES

Admission:
University Standing in Business I, Humanities I, or Social Sciences I, with an average of 70% in 12 units acceptable to the Departments.

YEAR II: 30 units
Q/ 12 units of Year II Political Science; 12 units of Religious Studies as required in Honours Religious Studies. Political Science 2F6 is recommended.
R/ At least 12 units of Year II Religious Studies as required in Honours Religious Studies.
E/ Six units elective.

YEAR III: 30 units
Q/ 12 units of senior division Political Science; 12 units of Religious Studies as required in Honours Religious Studies.
R/ 12 units of Year III Religious Studies as required in Honours Religious Studies.
E/ Six units elective.

YEAR IV: 30 units
Q/ Political Science 4E6; six units senior division Political Science; 12 units of Year IV Religious Studies as required in Honours Religious Studies.
E/ Six units elective.

HONOURS POLITICAL SCIENCE AND RUSSIAN

Admission:
University Standing in Humanities I or Social Sciences I, with an average of 70% in Russian 126 (or equivalent) and in six units acceptable to the Department of Political Science. A Year I course in Political Science is recommended.
YEAR II: 30 units
Q/ Political Science 2K6 or 3M6; six units of Year II Political Science; Russian 2A5, 2C6, 2E3.
E/ Three units elective.

YEAR III: 30 units
Q/ Political Science 2K6 or 3M6; six units of senior division Political Science; Russian 3A3, 3C6 and three additional units of Russian.
E/ Six units elective.

YEAR IV: 30 units
Q/ Political Science 4J6; six units of senior division Political Science; Russian 4C6; any two of Russian 3F3, 4E3, 4F3, if not taken previously, and three additional units of Russian.
E/ Three units elective.

Note: At least "D" is required in every Q-group Russian course.

HONOURS PSYCHOLOGY
(For B.Sc. programme in Honours Psychology, see "Faculty of Science: Honours Psychology").

Admission:
University Standing in any Year I with at least 70% in Psychology 1A6 and 70% in six additional units. At sometime during the programme, the student must meet a laboratory requirement by completing at least two of Psychology 2L6, 2U3, 2V3, 3C6, 3E3, 3Q3, 3S3, 3V3, 4D6, 4Q3 or 4E7. (If in any of these courses laboratory work is optional, the laboratory option must be exercised to receive credit toward the laboratory requirement.)

Further, it is strongly recommended that students complete Psychology 2D6 and 2T6 early in their programmes. Courses presented to meet the laboratory requirement must be included in the Q-group when determining honours standing.

Students enrolling in the Honours Psychology B.A. programme in the 1979-80 academic year and thereafter must complete one of Mathematics 1M3, 1A5, 1C5, or 1F6 with a grade of at least 50% preferably in Year I of their university work. Students who qualify for honours but who did not complete the mathematics requirement in Year I may proceed in Honours Psychology, provided that they complete the mathematics requirement in Year II. In this instance, Psychology 2R6 will be deferred to the Year III Q group and another six units of Psychology will be taken to complete the Q group for Year II.

Year II and Year III Psychology students will not be permitted to substitute psychology courses for electives nor will they be permitted to register in courses a year higher than the one in which they are registered.

Students registered in Honours programmes in Psychology must complete the entire Q group for each Year within one academic session, unless they are registered in 18 or fewer units of university work. For such students the Q standing will be calculated on the basis of the first 15 units of Psychology completed in Year II (including Psychology 2R6 or 2R3), and the first 18 units of Psychology completed in each of Years III and IV.

A minimum grade of "D" must be obtained in Psychology courses presented to satisfy Q requirements.

YEAR II: 30 units
Q/ The 15-18 units of Psychology chosen from R and E in which the student obtains the highest weighted average. Psychology 2R6 or 2R3 must be included if taken.
R/ 15-18 units of Year II Psychology, including Psychology 2R6 or 2R3 (except as noted under "Admission" above).
E/ Electives to total 30 units, at least 12 of which must be outside of Psychology.

YEAR III: 30 units
Q/ The 18 units of Psychology designated in R.
R/ 18 units of Year II and Year III Psychology.
E/ Electives, excluding Psychology, to total 30 units.

YEAR IV: 30-31 units
Q/ The 18-19 units of Psychology chosen from R and E in which the student obtains the highest weighted average.
R/ 18-19 units of Psychology.
E/ Electives to total 30-31 units. Electives may include Psychology.

HONOURS RELIGIOUS STUDIES

Admission:
University Standing in any Year I with an average of 70% in 12 units acceptable to the Department, preferably to include at least one of the following: Anthropology 1A3 and 123, Philosophy 1B6, 1C6 or 1D6, Sociology 1A6 or 1B6, or one of the first-year Religious Studies courses.

R group courses are those which are eligible for Q credit. In consultation with the Departmental Undergraduate Advisor, students may include in their R group courses which are offered by other Departments. A list of such courses as are recommended by the Department is available in the Religious Studies Handbook in the Department Office. E group courses are those which are not eligible for Q credit. During Years II, III, and IV, students must complete at least 36 units of Religious Studies (including courses approved as substitutes for courses in Religious Studies) and at least 24 units outside of Religious Studies.

In consultation with the Departmental Undergraduate Advisor, this Honours programme may be modified so that a student may pursue concentrated work in a second subject.

All Honours students are required to arrange their programmes in close consultation with and upon approval of the Departmental Undergraduate Advisor.

In selecting their courses students will bear in mind the twofold purpose of the Honours Religious Studies Programme: to comprehend the depth and variety of religious traditions and to know at least one religious tradition in detail. Ideally, students are encouraged to study from each of three Groups of courses and to follow a sequence of courses from Years II through IV in at least one Group.

The three Groups are:
Group A: Asian Religions
Group B: Early Mediterranean Religions
Group C: Modern Western Religion

YEAR II: 30 units
Q/ The 12 units of Religious Studies chosen from R in which the student obtains the highest weighted average.
R/ At least 12 units of the following Year II Religious Studies taken in at least two of the Groups, one of which is recommended to be Group A.

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<tr>
<th>Group A</th>
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<th>Group C</th>
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<tbody>
<tr>
<td>2B6</td>
<td>2DD3/2EE3</td>
<td>2J6</td>
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<tr>
<td>2O6</td>
<td>2E6</td>
<td>2L6</td>
</tr>
</tbody>
</table>

E/ Electives to total 30 units.

YEAR III: 30 units
Q/ The 12 units of Religious Studies chosen from R in which the student obtains the highest weighted average.
R/ At least 12 units of Year III Religious Studies (or approved courses of other departments), including six units from the following list in the Group in which the student is concentrating:

<table>
<thead>
<tr>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
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</thead>
<tbody>
<tr>
<td>3A3</td>
<td>3P6</td>
<td>3M3</td>
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<tr>
<td>3S3</td>
<td>3O3</td>
<td>3K3</td>
</tr>
<tr>
<td>3V6</td>
<td>3T3</td>
<td>3GG3</td>
</tr>
</tbody>
</table>

E/ Electives to total 30 units.

YEAR IV: 30 units
Q/ The 12 units of Religious Studies from R in which the student obtains the highest weighted average.
R/ At least 12 units of Year IV Religious Studies consisting of 4FF3, 4GG3, and six units of Advanced Study courses from the Group in which the student is concentrating.
E/ Electives to total 30 units.
HONOURS SOCIOLOGY

Admission:

University Standing in any Year I with an average of 70% in 12 units acceptable to the Department, including a mark of at least 70% in Sociology 1A6.

During Years II, III, and IV students must complete at least 42 units of Sociology. As part of their programme, Honours students must successfully complete 12 units of course work from among the following courses in Theory, Methodology and Statistics: including six units from Sociology 2S6, 3A3 or 3P3, and six units from Sociology 2Y3, 2Z3, 3H8 or 303. A student may take a maximum of six units of Year IV independent research in Sociology 4M3, 4N3. Normally, Honours students will arrange their programmes in consultation with the departmental advisor. Senior division courses are Year III and IV courses.

YEAR II: 30 units
Q/ The 12 units chosen from R in which the student obtains the highest weighted average.
R/ At least 12 units of Year II or Year III sociology.
E/ Electives to total 30 units. The Department strongly recommends six units outside the Faculty of Social Sciences.

YEAR III: 30 units
Q/ The 12 units of Sociology chosen from R in which the student obtains the highest weighted average.
R/ At least 12 units of Year II or Year III sociology.
E/ Electives to total 30 units. The Department strongly recommends six units outside the Faculty of Social Sciences.

YEAR IV: 30 units
Q/ The 12 units of Sociology chosen from R in which the student obtains the highest weighted average.
R/ 18 units of senior division sociology to include not less than 12 units of Year IV sociology.
E/ Electives to total 30 units. The Department strongly recommends six units outside the Faculty of Social Sciences.

PASS ECONOMICS

Admission:

University Standing in any Year I including a mark of at least 55% in Economics 1A6 or 1B6.

General Provisions:

In the course of a three year programme students must complete at least 30 units of Economics including Economics 2B3 or 3O6. In addition, 42 units outside of Economics are required. Students must complete Mathematics 1K3 and 1L3 with an average of at least 55% before the end of Year II and preferably by the end of Year I. Mathematics 1A6 and one of Mathematics 1B4 or Applied Mathematics 1C6 or 1C7 may be substituted for Mathematics 1K3 and 1L3. Level 5 (Grade 13) calculus may be substituted for Mathematics 1K3, but this case 55% is required in Mathematics 1L3.

To continue in the Pass Economics programme a student must obtain a grade of at least 55% in each of Economics 2L6 and 2M6.

YEAR II: 30 units
R/ Economics 2L6 and 2M6; Economics 2B3*; Mathematics 1K3 and 1L3 if not completed in Year I.
E/ Electives to complete a programme of 30 units; including at least six in other departments.

YEAR III: 30 units
R/ At least 12 units of Economics.
E/ Electives to complete a programme of 30 units.

PASS GEOGRAPHY

(For B.Sc. programme in Pass Geography, see "Faculty of Science: Pass Geography").

Admission:

University Standing in any Year I including Geography 1A6 or 1B6.

During Years II and III, students must complete at least 18 units of work outside of Geography.

YEAR II: 30 units
R/ At least 12 units of Year II Geography.
E/ Electives to total 30 units.

YEAR III: 30-32 units
R/ At least 12 units of Year III Geography.
E/ Electives to total 30 to 32 units.

PASS POLITICAL SCIENCE

Admission:

University Standing in any Year I. Year I course in Political Science is recommended.

The Pass degree is based upon the best 24 units of R group courses.

During Years II and III, students in Pass Political Science must complete at least 24 units of Political Science, 12 of which must be in Year III or Year IV courses, and at least 12 units outside of Political Science.

Subject to the approval of the Department, students may include in their R group courses in other Departments.

Students in Year II may take Year III courses, provided they meet all prerequisites. Students in Year III may take Years II, III or IV courses, provided they meet all prerequisites.

YEAR II: 30 units
R/ At least 12 units of Year II Political Science.
E/ Electives to total 30 units.

YEAR III: 30 units
PASS PSYCHOLOGY

(For B.Sc. programme in Pass Psychology, see "Faculty of Science: Pass Psychology")

Admission:
University Standing in any Year I with at least 55% in Psychology 1A6.

Year II and Year III Psychology students will not be permitted to register in more than 18 units of Psychology courses in a given year, nor will they be permitted to register in courses a year higher than the one in which they are registered.

A minimum grade of ‘D’ must be obtained in Psychology 2G3 or 2R3 or 2R6 and Psychology courses presented to satisfy area requirements.

YEAR II: 30 units
R/ At least 12 units of Year II Psychology, including Psychology 2G3, 2R6, or 2R3.
E/ Electives to total 30 units.

YEAR III: 30 units
R/ At least 12 units of Year II and Year III Psychology.
E/ Electives to total 30 units.

PASS RELIGIOUS STUDIES

Admission:
University Standing in any Year I. Completion of six units in Religious Studies with a grade of 55% is recommended.

In consultation with the Department, students may include in their R group courses which are offered by other Departments.

During Years II and III, students must complete at least 24 units of Religious Studies (including courses approved as substitutes for courses in Religious Studies) and at least 18 units of work outside of Religious Studies.

All Pass students are required to arrange their programmes in close consultation with and upon approval of the Departmental Undergraduate Advisor. In selecting their courses students will bear in mind the twofold purpose of the Pass Religious Studies Programme: to comprehend the depth and variety of religious traditions and to know at least one religious tradition in detail. Ideally, students are encouraged to study from each of three Groups of courses and to follow a sequence of courses from Years II through III in at least one Group. The three Groups are:

Group A: Asian Religions
Group B: Early Mediterranean Religions
Group C: Modern Western Religion

YEAR II: 30 units
R/ At least 12 units of the following Year II Religious Studies, taken in at least two of the Groups, one of which is recommended to be Group A.

<table>
<thead>
<tr>
<th>Group A</th>
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<th>Group C</th>
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<tbody>
<tr>
<td>286</td>
<td>20D3/2EE3</td>
<td>2J6</td>
</tr>
<tr>
<td>206</td>
<td>2E6</td>
<td>2L6</td>
</tr>
</tbody>
</table>
E/ Electives to total 30 units.

YEAR III: 30 units
R/ At least 12 units of Year III Religious Studies (or approved courses of other Departments), including six units from the following list in the Group in which the student is concentrating:

<table>
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<tr>
<th>Group A</th>
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<th>Group C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3A3, 3P6, 3JS</td>
<td>3M3, 3O3, 3T3</td>
<td>3D6, 3K6</td>
</tr>
<tr>
<td>3I6, 3Q6, 3V6</td>
<td>3X3, 3YY6</td>
<td>3QQ3, 3RR3</td>
</tr>
</tbody>
</table>
E/ Electives to total 30 units.

PASS SOCIOLOGY

Admission:
University Standing in any Year I including Sociology 1A6. A grade of 55% or above in six units of Sociology is required.

During Years II and III, students must complete at least 24 units of Sociology.
Pass students must complete at least three units from among the following courses in Theory, Methodology and Statistics: Sociology 256, 2Y3, 2Z3, 3H6.

YEAR II: 30 units
R/ At least 12 units of Year II or Year III Sociology.
E/ Electives to total 30 units. The Department strongly recommends six units outside of the Faculty of Social Sciences.

YEAR III: 30 units
R/ At least 12 units of Year II or Year III Sociology.
E/ Electives to total 30 units. The Department strongly recommends six units outside of the Faculty of Social Sciences.

Programme for the B.P.E. Degree

PHYSICAL EDUCATION

Throughout the four years, in the "R" courses in the B.P.E. programme (delineated by year below), a student must achieve a minimum of 50% in each course taken and a weighted average of at least 60% each year.

In Year I, a student is required to withdraw unless he/she completes I/O activities satisfactorily on the first attempt (during the first year of attendance in B.P.E.). Students who do not obtain the required 50% in each course or the weighted average of 60% in the "R" group may be permitted, subject to the approval of the Department, to repeat required B.P.E. courses, or to repeat or replace B.P.E. elective courses, up to six units per year. Students may not proceed to the next year until the weighted average is achieved.

The minimum requirement for graduation in the programme leading to the degree Bachelor of Physical Education is a weighted average of 60% in at least 36 units of Physical Education taken in Years II, III, and IV. A student taking the Physical Education programme may be awarded First Class, Second Class, or Pass, standing on the basis of the weighted average of the Physical Education courses taken in Years III and IV.

YEAR I: 30 units
R/ Physical Education 1A6, 1C3, 1E3; Physical Education 1U0.
E/ 18 units excluding Physical Education.

YEAR II: 30 units
R/ Physical Education 2C6, 2D3, 2E3, 2F3; Physical Education 2U0.
E/ 15 units excluding Physical Education.

YEAR III: 30 units
R/ Physical Education 3A6, 3E3; six units of Physical Education from Year III or Year IV levels; Physical Education 3U0.
E/ 15 units excluding Physical Education.

YEAR IV: 30 units
R/ 12 to 18 units of Physical Education at Year III or Year IV levels; Physical Education 4U0.
E/ 12 to 18 units excluding Physical Education.
Four-Year Combined Pass Arts and Social Work Programme for the Ordinary B.A. Degree and the B.S.W. Degree

Year I students who intend to work for the combined B.A. and B.S.W. degrees should consult the School of Social Work prior to registration.

Graduation from the Pass programme for the ordinary B.A. degree requires a weighted average of at least 60% in at least 24 units of the subject of concentration in Years II and III.

During Years II, III, and IV, students qualifying for the B.A. and B.S.W. degrees must take at least 48 units of Social Work for credit toward the B.S.W. degree, and 60 units of credit toward the B.A. degree. They must also fulfill Departmental requirements in the area of concentration. The B.S.W. degree will be granted only if the student has maintained an overall average in all Social Work courses of 60%, and attained 60% in each of the four required courses.

Admission:
Admission to the School of Social Work is contingent upon completion of any Year I programme, or in the case of part-time students (normally), completion of a minimum of 30 units of work. In choosing courses in Year I, care must be taken to include those courses that will be appropriate for the subject of concentration selected for the B.A. programme in Year II. (Note: Students have found courses in Psychology, Sociology, Economics, and Political Science to be excellent preparation for Social Work studies.)

Enrolment in Year II of the combined Pass Arts and Social Work programme is limited. Application for admission should be made to the School of Social Work prior to March 1.

Students in Years III and IV are expected to assume the cost of travelling to and from their field practice agencies.

YEAR II: 36 units
R/ Courses in the subject of concentration as prescribed in the corresponding Pass programme, Social Work 2B6 and 2C6.
E/ Electives, all of which must be outside Social Work area, to total 24 units.

YEAR III: 36 units
R/ Courses in the subject of concentration as prescribed in the corresponding Pass programme, Social Work 3D9, and an additional three units of Year III or Year IV Social Work for credit towards the B.S.W. degree.
E/ Electives for credit towards the B.A. degree, to total at least 24 units

YEAR IV: 36 units
R/ Social Work 4D12. 12 units of Year III and Year IV Social Work for credit towards the B.S.W. degree.
E/ Electives for credit towards the B.A. degree, to total at least 12 units.

Programme for the B.S.W. as a Second Degree.
Individually already holding a B.A. degree may be admitted to the School of Social Work. Applicants who intend to work for the B.S.W. as a second degree should first apply for admission to the School of Social Work. Application should be made to the School prior to March 1 for the Fall Term. (Application forms are available after January 1.) Enrolment is limited.

Students are required to take courses to total 60 units. The required courses: Social Work 2B6, Social Work 2C6, Social Work 3D9 and Social Work 4D12 must be taken in sequence. Of the 27 additional units of electives, 15 must be in Social Work. The B.S.W. degree will be granted only if the student has maintained an overall average of 60%, and attained 60% in each of the four required courses.
Part-time Degree Studies

The University offers a broad range of educational opportunities for students who wish to take degree studies on a part-time basis. In addition to the daytime offerings of the summer and winter session, courses are scheduled in both summer and winter evenings. Most of these are open to full and part-time students alike. The academic programmes for both groups of students are identical, the only difference being that part-time students will progress more slowly through their programmes. All programmes require a degree of specialization in one or two related subjects.

Each student taking degree courses is required to register in one of the five undergraduate Faculties (Business, Engineering, Humanities, Science and Social Sciences). By so doing, you establish a relationship with the academic counsellors of your Faculty and with the departments concerned with your major intellectual interests. If your interests change, it is possible to transfer to another department or Faculty. The organization of subjects of interest by Faculty is presented in the table below.

ORGANIZATION OF SUBJECTS OF INTEREST BY FACULTIES

Faculty of Business

Commerce

Faculty of Engineering

Ceramics Engineering
Chemical Engineering
Civil Engineering
Electrical Engineering
Engineering Physics
Mechanical Engineering
Metallurgical Engineering
Engineering and Management*

*jointly with Business Faculty

Faculty of Humanities

Art
Art History
Chinese
Classical Civilization
Dramatic Arts
English
French
German
Greek
History
Italian
Latin
Music
Philosophy
Russian
Spanish
Ukrainian

Faculty of Science

Applied Mathematics
Biochemistry
Biology
Chemistry
Computer Science
Geography
Geology
Mathematics
Metallurgy & Materials Science
Physics
Psychology
Statistics

Social Sciences

Anthropology
Economics
Geography
Political Science

Physical Education
Psychology
Religious Studies
Social Work
Sociology

Applicants who satisfy the normal admission requirements of the University (see page 8 of this Calendar) can register for either full or part-time studies. Those who do not satisfy these requirements may be admissible as "Special Students" and given the opportunity to show that they can deal successfully with university work by taking Year I courses. Initially "Special students" may not take more than 7 units of work per session. Details of regulations are found on page 10 of the Calendar.

The University welcomes to its courses students who wish to obtain university credit but who do not wish to follow a degree programme. Such persons who satisfy normal admission requirements may be admitted to any courses for which they have the prerequisites. Those without these qualifications are admissible as Special students and normally will begin by taking Year I courses. For purposes of identification within the University framework, students not proceeding to a degree are called "Occasional Students" if they do not hold a university degree, or "Continuing Students" if they already have completed a degree programme. Occasional Students may transfer to a degree programme but may not be able to use all the credits they have earned toward the requirements of that programme.

Although both daytime and evening courses are in principle open to part-time students, part-time students often have other responsibilities which restrict them to the courses offered in the evenings or in the summer. We have, therefore, listed the evening and summer courses which the University intends to offer on the main campus during the next two-year period. Additions to this list may be made from time to time as departmental resources permit. The schedule for 1978 and 1979-80 can be regarded as "firm": that for 1979 and 1979-80 may have to be modified because of staffing. This schedule has been carefully planned to make available the required courses for most of the Pass Programmes and some of the Honours Programmes of the University over a five or six year period. For those who can arrange to take day courses, the options are greatly enlarged.

The University offers a limited number of first year courses in the January to June evening session, primarily to meet the needs of students who want to begin university studies at the New Year. We also offer a number of courses at Outside Centres such as Brantford, Burlington, Grimsby, Hagersville, Oakville, and Downtown Hamilton. Announcements concerning these two groups of offerings will be made from time to time.

You are urged to contact the academic counsellor in the Faculty of your choice. The offices of the Academic Counsellors of the Faculties of Humanities (extensions 4326, 4328) and Social Science (extensions 4604, 4719) invite you to make an appointment by telephone. You are urged to familiarize yourself with the structure of academic programmes, the description of courses and the academic regulations described in this Calendar. General information on brochures, courses, application procedures and admission regulations is provided by the Registrar's Office (525-9140 local 4786). In addition, the University works closely with the Education Information Centres in Hagersville (2 Main St. West; phone 1-768-1010), in Downtown Hamilton (16 James St. South; phone 522-3361), and in Brantford (16 Market Street; phone 1-519 753-3171). The staffs of all these Centres stand ready to assist you.

The table below presents the dates upon which first and second term courses begin and final examinations are completed for the University sessions for 1978, 1979 and the first part of 1980. The full Sessional Dates and procedures for application and registration can be found on pages 3 to 10.
SESSIONAL DATES FOR 1978-1980

<table>
<thead>
<tr>
<th>Session</th>
<th>Code</th>
<th>First-term courses begin</th>
<th>Second-term courses begin</th>
<th>Final Examinations End</th>
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<td>1978 Summer evenings</td>
<td>78SE</td>
<td>May 8</td>
<td>June 26</td>
<td>Aug. 17</td>
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<tr>
<td>1978 Summer days</td>
<td>78SD</td>
<td>July 3</td>
<td>July 24</td>
<td>Aug. 17</td>
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<td>1978-9 Winter days</td>
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<tr>
<td>1978-9 Winter evenings</td>
<td>78-79 WE</td>
<td>Sept 11</td>
<td>Jan. 3</td>
<td>April 28</td>
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<tr>
<td>1979 Jan. to June</td>
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<td></td>
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<tr>
<td>1979 Summer evenings</td>
<td>79SE</td>
<td>May 7</td>
<td>June 25</td>
<td>Aug. 16</td>
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<td>1979 Summer days</td>
<td>79SD</td>
<td>July 2</td>
<td>July 23</td>
<td>Aug. 16</td>
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<tr>
<td>1979-80 Winter days</td>
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<td>1979-80 Winter evenings</td>
<td>79-80 WE</td>
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<td>Jan. 7</td>
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COURSE OFFERINGS 1978–80

Course offerings are arranged alphabetically, by department. The sessions in which the courses will be given are indicated, according to the code shown in the table of Sessional Dates. First and second term offerings are differentiated by the code numbers 1 and 2. The code number 3 indicates a course that runs through both terms; an x indicates that the term in which the course will be given has not yet been determined.

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<thead>
<tr>
<th>COURSE NAME</th>
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<td>Introduction to Cultural and Sociological Anthropology</td>
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<td>World Prehistory – Paleolithic</td>
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<td>2B3</td>
<td>Peoples of North America</td>
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<td>2D3</td>
<td>Genetics and Evolution</td>
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<td>2E3</td>
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<td>Social Anthropology</td>
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<td>Folklore Studies</td>
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<td>History of Anthropology</td>
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<td>World Prehistory-Neolithic Culture</td>
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<td>2Q3</td>
<td>Linguistics and the Study of Culture</td>
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<tr>
<td>2R3</td>
<td>Religion Magic and Witchcraft</td>
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<td>Human Biology &amp; Social Controversy</td>
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<td>Ethnology: The Canadian North</td>
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<td>Contemporary Northern Peoples</td>
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<td>Archaeological Methods</td>
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<td>3L3</td>
<td>Primitive Systems of Thought</td>
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<td>3O6</td>
<td>Human Osteology</td>
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<td>3Q3</td>
<td>Anthropology and Education</td>
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<td>3S6</td>
<td>The History of Anthropological Theory</td>
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<td>3X3</td>
<td>Peoples of India</td>
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<td>4B3</td>
<td>Problems in Social and Cultural Anthropology</td>
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<tr>
<td>4C3</td>
<td>Communication and Culture</td>
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<td>4R3</td>
<td>Contemporary Anthropological Theory</td>
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<td>4L3</td>
<td>Culture and the Individual</td>
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<td>4X3</td>
<td>Voluntary Associations</td>
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APPLIED MATHEMATICS (including Computer Science and Statistics)

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<td>1C7</td>
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## COURSE OFFERINGS

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<td>Introduction to Computing</td>
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<td>2N3</td>
<td>Intermediate Computing</td>
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<tr>
<td>2J5</td>
<td>Engineering Mathematics II</td>
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<td>3F4</td>
<td>Numerical Analysis</td>
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<td>Statistical Analysis</td>
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### ART HISTORY

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<tr>
<td>1A6</td>
<td>Introduction to the Study of Visual Art</td>
</tr>
<tr>
<td>2B3</td>
<td>Greek Art (same as Classical Civilization 2B3)</td>
</tr>
<tr>
<td>2C3</td>
<td>Roman Art (same as Classical Civilization 2C3)</td>
</tr>
<tr>
<td>2K3</td>
<td>Early Mediaeval Art and Architecture</td>
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<tr>
<td>2L3</td>
<td>The Gothic Image</td>
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<tr>
<td>2O3</td>
<td>Modern Art and Architecture 1780-1880</td>
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<tr>
<td>2P3</td>
<td>Twentieth Century Art</td>
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<td>3B3</td>
<td>Topics in Canadian Art</td>
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<td>3C3</td>
<td>Topics in American Art</td>
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<tr>
<td>3H3</td>
<td>Approaches to Art History</td>
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<tr>
<td>4B3</td>
<td>Art of Byzantium</td>
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<td>4E3</td>
<td>English Painting (1780-1930)</td>
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<tr>
<td>4F3</td>
<td>Topics in Northern European Art of the 17th Century</td>
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<tr>
<td>4G3</td>
<td>Aspects of 18th and 19th-Century Art</td>
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The Department will also provide two 3-unit courses from offerings of Year III and IV in Winter 1979-80.

### ART

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<td>Introduction to Studio Practice II</td>
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<td>Drawing</td>
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<td>Painting II</td>
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<td>Sculpture II</td>
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<tr>
<td>1B6</td>
<td>Cell Biology and Physiology</td>
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<tr>
<td>1C6</td>
<td>Genetics and Evolution</td>
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<td>1G6</td>
<td>Introduction to Biology</td>
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### CHEMISTRY

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<td>General Chemistry</td>
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<td>Inorganic Chemistry</td>
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<td>Organic Chemistry</td>
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### CHINESE

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<td>Beginners' Chinese</td>
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### CLASSICAL CIVILIZATION

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<tr>
<td>1A6</td>
<td>An Introduction to the Civilization of Greece and Rome</td>
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<tr>
<td>2B3</td>
<td>Greek Art (same as Art History 2B3)</td>
</tr>
<tr>
<td>2C3</td>
<td>Roman Art (same as Art History 2C3)</td>
</tr>
<tr>
<td>2E3</td>
<td>Greek and Roman Drama</td>
</tr>
<tr>
<td>2H3</td>
<td>Greek Literature in Translation</td>
</tr>
<tr>
<td>2K3</td>
<td>Social Life and Thought of the Greeks and Romans</td>
</tr>
<tr>
<td>2L3</td>
<td>The Greek City: An Archaeological Study</td>
</tr>
<tr>
<td>3C3</td>
<td>Greek and Roman Epic</td>
</tr>
<tr>
<td>3E3</td>
<td>The Greek Historians and their Theories of History</td>
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<td>Archaic Greek Art (same as Art History 3F3)</td>
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<td>3K3</td>
<td>Education and Rhetoric in the Graeco-Roman World</td>
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<td>303</td>
<td>Political Life and Thought of the Greeks and Romans</td>
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**COMMERCE**

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<td>Financial Accounting I</td>
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<td>Computer Augmented Statistical Analysis</td>
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<td>Introduction to Marketing</td>
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* April 26—July 19/78
** April 23—July 20/79

**COMPUTER SCIENCE**

See Applied Mathematics

**DRAMATIC ARTS**

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<tr>
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<td>The Development of English Drama [same as English 2B6]</td>
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<td>Greek and Roman Drama [same as Classical Civilization 2E3]</td>
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<td>Topics in Theatre History</td>
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<td>Topics in Theatre History: Independent Study</td>
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<td>Perspectives in Dance—A Cultural Survey</td>
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<td>Perspectives in Dance—Dance in Contemporary Society</td>
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**ECONOMICS**

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* This course to be scheduled in either Summer Day or Summer Evening.

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**STATISTICS**

See Applied Mathematics

**UKRAINIAN**

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Courses by Departments

Anthropology

Professors
D. Damas
M. Freeman
E. V. Glanville
R. Landes/emeritus
E. Rogers/part-time
R. Slobodin

Associate Professors
M. Cooper
D. R. Counts
C. R. Hallpike
W. C. Noble
R. Preston/Chairman
C. Stortroen
E. J. E. Szathmary

Assistant Professors
J. Colarasso
W. Denham
P. Ramsden
W. Rodman
P. Stephenson

Associate Member
R. Matthews/Sociology

CURRICULUM 1978-80

Not all courses are offered in every year. Students should consult the Department's brochure, which will be available prior to registration for a list and description of the courses offered in the current year, and the names of the instructors. A 50% minimum is required in all prerequisite courses, unless otherwise specified. There are no co-requisite requirements for part-time students. The University reserves the right to limit enrolment in any course. The Department offers two Year I Anthropology courses: 1A3, 123, which taken together are designed to provide an introduction to the study of anthropology.

1A3/ Introduction to Cultural and Social Anthropology. A general introduction to the study of human culture and society in all of its aspects. Examples and illustrations will be drawn largely from non-Western societies.
3 hrs. (lects. and discussion); one term.
Prerequisite: Open, except to students who have completed Anthropology 1A6, 1B3, 1C3, 1D3, 1E3, or 1H3.

1B6/ The Study of Language. A far-reaching survey intended to acquaint the student with the numerous disciplines that deal with language and many of the crucial concepts and techniques developed within them.
3 hrs. (lects. and discussion); both terms.
Prerequisite: Open.
Same as Linguistics 1A6.

123/ Human Origins and Cultural Beginnings. Emphasis will be on the evolution of man as seen in the fossil record and on the growth and development of human societies in prehistoric times.
3 hrs. (lects. and discussion); one term.
Prerequisite: Open, except to students who have completed Anthropology 1A6, 1B3, or 1G3.

2A3/ World Prehistory—Paleolithic. A study of human cultures and societies during the Pleistocene, from approximately 2 million to 8000 years ago.
3 hrs. (lects. and discussion); first term.
Prerequisite: Six units of Year I Anthropology or permission of the instructor. Not open to students who have completed Anthropology 2A6.

2B3/ Peoples of North America. A comparative study of selected cultures of this continent, dealing with traditional and modern situations.
3 hrs. (lects. and discussion); second term.
Prerequisite: Anthropology 1A3. Not open to students who have completed Anthropology 3C6.

2C3/ Communal Societies. Comparative study of communal societies emphasizing conditions giving rise to them and practices and beliefs which sustain them.
3 hrs. (lects. and discussion); first term.
Prerequisite: Six units of Year I Anthropology.

2D3/ Genetics and Evolution. Introduction to basic genetics and the operation of microevolutionary processes on human populations.
3 hrs. (lects. and discussion); second term.
Prerequisite: Anthropology 2E3 or permission of the instructor.

3 hrs. (lects. and discussion); first term.
Prerequisite: Six units of Year I Anthropology or permission of the instructor. (This course is a prerequisite for advanced courses in physical anthropology.)

2F3/ Social Anthropology. An introduction to the anthropological concepts and theory underlying the comparative study of the social institutions of non-literate peoples.
3 hrs. (lects. and discussion); first term.
Prerequisite: Registration in Pass or Honours Anthropology or permission of the instructor.
This course is required of all students registered in Pass or Honours Anthropology in Year II.

2G3/ Folklore Studies. The systematic study of oral traditions, folktales, folksongs, jokes, riddles, etc. as well as customs transmitted by oral traditions.
3 hrs. (lects. and discussion); first term.
Prerequisite: Six units of Year I Anthropology or permission of the instructor.

3 hrs. (lects. and discussion); first term.
Prerequisite: Anthropology 2F3 or permission of the instructor.

2I3/ History of Anthropology. Some of the major developments and personalities in the history of anthropology as a discipline, with emphasis upon the English-speaking world.
3 hrs. (lects. and discussion); second term.
Prerequisite: Six units of Year I Anthropology or permission of the instructor.

2J3/ Human Growth and Adaptation. Variation in body form and composition examined in the context of growth, evolutionary development, and environmental adaptation.
3 hrs. (lects. and discussion); second term.
Prerequisite: Anthropology 2F3 or permission of the instructor.
Offered in 1978-79 and alternate years.

3 hrs. (lects. and discussion); second term.
Prerequisite: Anthropology 2F3 or permission of the instructor.
Offered in 1979-80 and alternate years.

2L3/ Comparative Political Organization. An introduction to the comparative study of political process, with emphasis on the societies of non-literate peoples.
3 hrs. (lects. and discussion); second term.
Prerequisite: Anthropology 2F3 or permission of the instructor.

2M6/ General Linguistics. An introduction to the concepts and techniques used in the scientific analysis of language. Phonetics, phonology, morphology, historical reconstruction, syntax and semantics will be covered. Many diverse languages will be examined.
3 hrs. (lects.); both terms.
Prerequisite: Linguistics 1A6 or permission of the instructor.

2N3/ World Prehistory—Neolithic Cultures. A survey of the development of settled, food-producing human cultures from earliest villages to urban life.
3 hrs. (lects. and discussion); second term.
Prerequisite: Six units of Year I Anthropology or permission of the instructor.

2P3/ Peoples of the Pacific. An introduction to the ways of life and thought in Pacific island societies. The course will emphasize the material culture, networks of social relations, and systems of belief of the peoples of Melanesia, Polynesia, and Micronesia.
ANTHROPOLOGY

3 hrs. (lects. and discussion); first term. Prerequisite: Open.

2G3/ Linguistics and the Study of Culture. A survey of the major areas in which linguistics and linguistic methods are used to explore anthropological problems: e.g., evolution, world view, socio-linguistics, etc. 3 hrs. (lects. and discussion); second term. Prerequisite: Open except to students who have completed Anthropology 3M3.

2R3/ Religion, Magic, and Witchcraft. A survey of beliefs and practices related to supernatural in non-Western societies. Emphasis will be placed on the relationship between ideology and social structure. 3 hrs. (lects. and discussion); second term. Prerequisite: At least three units of Year I Anthropology or permission of the instructor.

2S3/ Human Biology and Social Controversy. Biological models of Man and relation to them by society. Selected controversies, current and historical, will be considered: biological vs. cultural determinism; dualism vs. monism; biological vs. cultural evolution, human variation and racism. 3 hrs. (lects. and discussion); second term. Prerequisite: Open. Offered in 1979-80.

2W3/ Special Topics in Anthropology. Reading and discussion of selected topics in Anthropology. First or second term. Prerequisite: Written permission of the supervising professor. This course may be repeated in Year II, if on a different topic, to a total of six units. Not open to those who completed 2G6 in 1974-75.

2X3/ Warfare and Aggression. The aim of the course is to assess the extent to which violence is both controlled by and an expression of society and culture. 3 hrs. (lects. and discussion); first term. Prerequisite: At least three units of Year I Anthropology or permission of the instructor.

3A3/ Ethnology: The Canadian North. A comparative ethnological analysis of selected societies in the Canadian North. 3 hrs. (lects. and discussion); first term. Prerequisite: At least three units of Year I Anthropology or permission of the instructor.

3B3/ Ethnology: Europe. A comparative ethnological survey of selected societies in Europe. 3 hrs. (lects. and discussion); second term. Prerequisite: At least three units of Year I Anthropology or permission of the instructor.

3C3/ Ethnology: North America. A comparative ethnological survey of selected societies in North America. 3 hrs. (lects. and discussion); second term. Prerequisite: Anthropology 2F3 or permission of the instructor.

3D3/ Ethnology: Pacific Islands. Analysis of selected issues in Pacific anthropology. 3 hrs. (lects. and discussion); first term. Prerequisite: Anthropology 2F3 or permission of the instructor.

3E3/ Ethnology: Australia. A survey of ethnographic and theoretical problems in the study of Australian aboriginal societies. 3 hrs. (lects. and discussion); first term. Prerequisite: Anthropology 2F3 or permission of the instructor. Offered in 1979-80 and alternate years.

3F3/ Contemporary Northern Peoples. An examination of native-white interaction in northern Canada from the perspective of the native. 3 hrs. (lects. and discussion); second term. Prerequisite: One course beyond Year I or permission of the instructor.

3G3/ Comparative Mythology. An examination of some of the major anthropological attempts to explain the existence and meaning of myth. 3 hrs. (lects. and discussion); second term. Prerequisite: Anthropology 2G3, or permission of the instructor. 3 hrs. (lects.); first term. Prerequisite: Anthropology 2M6 or permission of the instructor.

3H3/ Ethnology: Southeast Asia. A comparative ethnological survey of selected societies in Southeast Asia. 3 hrs. (lects. and discussion); first term. Prerequisite: At least three units of Year I Anthropology or permission of instructor.

3I3/ Phonetics and Phonology. An advanced course covering phonetics, phonology, and morphology. The student will be taught to analyse many diverse languages. 3 hrs. (lects.) first term. Prerequisite: Anthropology 2M6 or permission of the instructor. Not open to students who have completed Anthropology 4F3. Offered in 1979-80 and alternate years.

3J3/ Syntax and Semantics. An advanced course covering transformational syntax and several theories of semantics. Problems of semantic and cultural analysis will be treated. Data will be drawn from diverse languages. 3 hrs. (lects.); first term. Prerequisite: Anthropology 2M6 or permission of the instructor. Not open to students who have completed Anthropology 4K3. Offered in 1978-79 and alternate years.


3K3/ Archaeological Methods. Technique and methodology in the investigation of archaeological material. 3 hrs. (lects. and discussion); first term. Prerequisite: Anthropology 2A3 or Anthropology 2A6 or permission of the instructor. Enrollment in this course may be limited.

3L3/ Primitive Systems of Thought. Selected studies in religion, magic, and systems of knowledge, in the cultures of non-literate peoples, and their expression in myth and ritual. 3 hrs. (lects. and discussion); first term. Prerequisite: Anthropology 2F3 or permission of the instructor.

3N6/ Human Evolution. A general consideration of evolutionary trends within the Order Primates. Special emphasis is given to the evolution of the hominids. 3 hrs. (lects. and discussion); both terms. Prerequisite: Anthropology 2D3 or Anthropology 2E3 or permission of instructor. Offered in 1979-80 and alternate years.

3O6/ Human Osteology. Identification and analysis of the bones of the human skeleton, with a consideration of disease processes that have affected earlier populations. 3 hrs. (lects. and discussion); both terms. Prerequisite: Anthropology 2D3 or Anthropology 2E3 or permission of the instructor. Offered in 1978-79 and alternate years.

3Q3/ Anthropology and Education. A comparison of the formal and informal ways in which people learn within their cultural context, and a survey of the uses of anthropology in schools. 3 hrs. (lects. and discussion); first term. Prerequisite: Anthropology 1A3 or permission of the instructor.

3S6/ The History of Anthropological Theory. The development of anthropology as a discipline, with emphasis upon the emergence and refinement of concepts concerning culture, social structure, and sociocultural change. 3 hrs. (lects. and discussion); both terms. Prerequisite: Anthropology 2F3 or permission of the instructor. This course is required of all students registered in Honours Anthropology.

3U3/ North American Prehistory. A study of the development of North American cultures from the original peopling of the New World until the arrival of Europeans. 3 hrs. (lects. and discussion); second term. Prerequisite: Anthropology 2A6 or Anthropology 2A3 and 2N3 or permission of the instructor.

3W3/ Special Topics in Anthropology. Reading and discussion of selected problems in anthropology. First or second term. Prerequisite: Written permission of the supervising professor. This course may be repeated in Year III, if on a different topic, to a total of six units.

3X3/ People of India. Discussion of the ethnology, archaeology and physical anthropology of selected societies in India. 3 hrs. (lects. and discussion); first term. Prerequisite: At least six units of Anthropology. Offered in 1979-80 and alternate years.

3Y3/ Medical Anthropology. Health and illness in non-Western societies and an examination of social practices and beliefs which influence them. 3 hrs. (lects. and discussion); first term. Prerequisite: Anthropology 2F3 or permission of the instructor. Offered in 1979-80 and alternate years.

4A3/ Linguistic Field Methods. An advanced course presenting the techniques for eliciting and organizing enough data to form a grammatical sketch of a selected language informant and recording techniques. 3 hrs. (seminar); first term. Prerequisite: Anthropology 313 or Anthropology 3J3 or permission of the instructor.

4B3/ Problems in Social and Cultural Anthropology. 3 hrs. (seminar); first term. Prerequisite: Registration in Year IV Honours Anthropology or permission of the instructor. This course may be taken twice in a term with different instructors.

4C3/ Communication and Culture. Discussion centers on the roles which communication systems such as ritual, myth, sign lan-
guage, and music play in the maintenance and evolution of culture.
3 hrs. (seminar); first term. 
Prerequisite: Registration in Year IV Honours Anthropology or permission of the instructor. 
Offered in 1979-80 and alternate years.

4E3/ Advanced Regional Archaeology I. A study of the field data, methods, and theoretical problems in the prehistory of selected areas.
3 hrs. seminar; first term. 
Prerequisite: Anthropology 3K6 or 3K3 and 3U3 or permission of the instructor.

4G3/ Independent Research. Independent study of a research problem through published materials and/or field work. Students will be required to write up the results of their inquiry in scholarly form. 
Prerequisite: Registration in Year IV Honours Anthropology and written permission of the supervising professor. This course may be repeated, if on a different topic, to a total of six units.

3 hrs. (seminar); first term. 
Prerequisite: Registration in Year IV Honours Anthropology. Not open to students who have completed Anthropology 3P6. This course is required of all students registered in Honours Anthropology.

4J6/ Research Design. Intensive examination of conceptual and practical problems in social science research design, research methods, and data analysis. Introduction to computer applications. 
2 hrs. (seminar) and 2 hrs (lab); both terms. 
Prerequisite: Registration in Year IV Honours in any Social Sciences Programme and permission of the instructor.

4L3/ Culture and the Individual. Deals with the relationship between individual persons and their lives in the context of various concepts of culture. A case history approach is used employing autobiographical material from both “natives” and Anthropologists. 
3 hrs. (seminar); second term. 
Prerequisite: Registration in Year IV Anthropology or permission of the instructor.

4M3/ Advanced Regional Archaeology II. A study of the field data methods and theoretical problems in the prehistory of selected areas. 
3 hrs. (seminar); second term. 
Prerequisite: Anthropology 3K6 or 3K3 and 3U3 or permission of the instructor.

4O3/ Human Genetics. Consideration of some of the major areas in human genetics, including cytogenetics, bio-chemical, behavioural, and population genetics. 
3 hrs. (lects. and discussion); second term. 
Prerequisite: Anthropology 2D3 or Biology 1C6, or permission of the instructor. 
Offered in 1979-80 and alternate years.

4P3/ Primate Behavior. Ecology, demography, social organization, and development of social behavior among Old and New World monkeys and apes. 
3 hrs. (lects. and discussion); first term. 
Prerequisite: One of Anthropology 2E3, 2F3, 2K3 or permission of the instructor.

4Q3/ Comparative Economic Organization. A consideration of contrasting types of economic organization, with particular reference to societies with a non-industrial base. 
3 hrs. (lects. and discussion); second term. 
Prerequisite: Anthropology 2F3 or permission of the instructor. 
Offered in 1979-80 and alternate years.

4X3/ Voluntary Associations. Discussion will focus on cross-cultural regularities and discontinuities in the internal dynamics and social effects of selected types of voluntary associations. 
3 hrs. seminar; first term. 
Prerequisite: Registration in Year IV Honours Anthropology or permission of instructor.

4Y3/ Social and Cultural Change. Considers various perspectives on the processes of change. Topics will include the meaning of development, innovation and technological change, urbanization, and protest movements. 
3 hrs. (lects. and discussion); second term. 
Prerequisite: Anthropology 3P6, 356 or permission of the instructor.

Note: Students may be interested in the following courses, offered by other departments, which have linguistic content: English 3C3; French 3B3, 3G3, 3L4, 4K3; Linguistics 1A6; Russian 2P6.

Applied Mathematics

Professors
C. W. Dunnett/Chairman 
G. Field 
L. Keech 
D. W. L. Sprung/Professor of Physics 
M. A. Stephens 
M. L. Tiku 
A. B. Volkov/Professor of Physics

Associate Professors
P. C. Chakravarti 
W. H. Fleming 
E. O. Gadamer 
D. J. Kenworthy 
K. A. Redish 
N. Sontseff 
D. Wood

Assistant Professors
I. A. Ahmad 
E. C. Ihrig 
M. E. Ismail 
A. M. Jopko/part-time 
Y. S. Kwong 
P. D. M. Macdonald 
J. S. Masterson/part-time 
P. Yip

Associate Member
G. D. Anderson (Clinical Epidemiology and Biostatistics)

Lecturer
H. Mueller/part-time

CURRICULUM 1978-80

For prerequisite purposes, a grade of “D” or better is required.

1C6/ Applied Analysis. Mathematics used in science with emphasis on the solution of problems. Topics include application of the calculus and introductions to algebra, vectors, statistics and numerical methods.
3 lects.; both terms. 
Prerequisite: Registration in, or completion of, Mathematics 1A6 or 1C6.

1C7/ Engineering Mathematics I. Mathematics used in engineering with emphasis on the solution of problems. Topics include application of the calculus and introductions to algebra, vectors, statistics and numerical methods, partial differentiation, multiple integrals.
3 lects., first term; 4 lects., second term. 
Prerequisite: Registration in Engineering I.

1H3/ Introduction to Computing. Organization and characteristics of stored-programme computers; basic programming and data representation; programme testing; algorithms; computer solution of problems.
3 hrs., first term. 
Prerequisite: Level 5 (Grade 13) Mathematics (2 credits) or equivalent, or Mathematics 1K3 and 1L3. Not open to students who are registered in, or have completed, Applied Mathematics 2H3 or 2M3.

2H3/ Introduction to Computing. Organization and characteristics of stored-programme computers; basic programming and data representation: programme testing; algorithms; computer solution of several numerical problems.
2 lects., 1 tut. (2); first term. 
Prerequisite: Completion of Mathematics 1A6 or 1C6 and either Mathematics 1B4 or Applied Mathematics 1C5 or 1C6. Not open to students who are registered in, or have completed, Applied Mathematics 1H3 or 2M3.

3 lects., first term; 2 lects., second term. 
Prerequisite: Mathematics 1A6 and Applied Mathematics 1C7.

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2K3/ Introduction to Computer Design. The basic arithmetic and logical operations and general system organization of modern computers are described in terms of basic computer elements, logical design, boolean algebra, logic elements, etc. 3 lects.; second term. Prerequisite: Mathematics 1A6 or 1C6. Applied Mathematics 1H3 or 2H3 or 2M3, or permission of the instructor. Not open to students who are registered in, or have completed, Electrical Engineering 2N3.

2L3/ Algorithms and Programming. A second course for students specializing in computing. Skills in problem solving are developed by studying a set of examples suitable for a digital computer and for many of which formal or mathematical models are not immediately obvious. 3 lects.; second term. Prerequisite: Applied Mathematics 1H3 or 2H3 or 2M3, and registration in a programme in which Applied Mathematics 2L3 is required, or permission of the instructor. 2 hrs., first term. 3 hr., second term. Prerequisite: Applied Mathematics 2L3 or 2H3 or 2M3. Offered in the first term to Civil Engineering students and in the second term to other students. 3 hrs.; second term.

2M3/ Introduction to Computing for Engineers. Organization and characteristics of stored-programme computers; basic programming and data representation; programme testing; algorithms; computer solution of several numerical problems. 2 lects.; 1 lab. (2); one term. Prerequisite: Registration in a programme in Engineering. Not open to students who have completed Applied Mathematics 1H3 or 2H3. Offered in the first term to Civil Engineering students and in the second term to other students.

2N3/ Intermediate Computing. A second course for students who do not intend to specialize in computing. Structured programming, program organization and design; error detection and avoiding techniques; program debugging; queues, lists, trees, utility programs. 3 lects.; second term. Prerequisite: Applied Mathematics 1H3 or 2H3 or 2M3. Not open to students in Honours or Major programmes in Applied Mathematical Sciences, Applied Mathematics and Computer Science, Applied Statistics and Computation, Computer Science and Mathematics, or Pass Computer Science. 3 hrs.; first term. 2 hrs., second term.

3A3/ Data Structures and Programming Languages. Description of and operations on structured data: strings, lists, treaps. Applications from text ending, symbolic differentiation graphics, programming languages. The Pascal-6000 programming language. 3 lects.; first term. Prerequisite: Applied Mathematics 2L3 or permission of the instructor.

3B6/ Mathematical Physics I. Partial differential equations, orthogonal systems and eigenvalue problems for differential equations, special functions, vector analysis, linear algebra, wave motion, functions of a complex variable. 3 lects.; both terms. Prerequisite: Mathematics 2A4 or 2A5 and 2C4, or 2G3 and 2Q3, or Applied Mathematics 2J5 or equivalent, and Physics 2C5 or 2G3. Not open to students who are registered in, or have completed, any of Applied Mathematics 3A4, 3V6, 3W5.

3C3/ Operating Systems. The purpose of operating systems and their historical development from batch processing to interactive systems. Synchronization of concurrent processes; resource sharing, job scheduling, resource protection. 3 lects.; second term. Prerequisite: Applied Mathematics 3D3 or permission of the instructor.

3D3/ Computer Design. The logical design of computing systems; organization of the central processing unit; peripheral facilities; features for multiprogramming and multiprocessing; primitive software systems; IBM 370 and CDC 6400 architecture. 3 lects.; first term. Prerequisite: Applied Mathematics 2K3 or permission of the instructor.

3E4/ Mathematical Techniques in Operational Research. An introduction to linear programming and the simplex algorithm, integer programming, transportation problems, non-linear programming, simulation, and queuing theory. 2 lects.; both terms. Prerequisite: Applied Mathematics 1H3 or 2H3 or 2M3. Applied Mathematics 3S6 or Mathematics 2D4. Offered in 1978-79, and in alternate years.

3F4/ Numerical Analysis. Computer-oriented methods and programming suitable for solution of algebraic and transcendental equations, interpolation and approximation, numerical differentiation and quadrature, solution of ordinary differential equations, linear algebra. 2 lects.; both terms. Prerequisite: Mathematics 2A4 or 2A5 and 2C4, or 2G3 and 2Q3, registration in, or completion of, a course in computer programming, or permission of the instructor. Not open to students registered in, or who have completed, Mathematics 3Q4. Offered in 1979-80. alternating with Mathematics 3Q4.

3G3/ Scientific Data Processing. Machine and software organization; programming techniques; utility programs; file processing; graphical output. 3 lects.; second term. Prerequisite: Applied Mathematics 2L3, or permission of the instructor.

3H3/ Business Data Processing. I. Data representation; COBOL; structured programming application to report generation, data editing, and file maintenance with sequential files; sorting and merging techniques; case studies. 3 lects.; first term. Prerequisite: Applied Mathematics 1H3 or 2H3 or 2M3 or Commerce 3H3, or permission of the instructor.

3I3/ Business Data Processing II. Direct access devices; file organization concepts and techniques; random processing with COBOL; introduction to systems analysis and design; case studies. 3 lects.; second term. Prerequisite: Applied Mathematics 3H3, or permission of the instructor. Not open to students who have completed Applied Mathematics 3H6.

3M3/ Statistical Methods. The first term of Applied Mathematics 3S6. 3 hrs.; first term. Prerequisite: Mathematics 1A6 or 1C6 or 1F6 or a grade of at least B in Mathematics 1K3 and 1L3. Not open to students who are registered in, or have completed, any of Applied Mathematics 3S6. Offered in alternate years. 3 hrs.; second term.

3N6/ Project. The design and implementation of a large programme, or suite of programmes, and its documentation. Students work in small teams. Prerequisite: Registration in Year III Pass Computer Science or permission of the instructor. 3 hrs.; second term.

3S6/ Statistical Analysis. Introduction to statistical methods and applications. First term: Data analysis and statistical methods. Second term: Probability and properties of statistical distributions basic to the techniques discussed in the first term. 3 hrs.; first term. 2 lects.; first term. 1 lab. (1); second term. Prerequisite: Mathematics 1A6 or 1C6 or 1F6 or a grade of B or better in Mathematics 1K3 and 1L3. Not open to students who are registered in, or have completed, Mathematics 1F6 or 2D4 or Applied Mathematics 3M3.

3T3/ Assembly Languages. Storage of numeric and alphanumeric data, instruction sets, index registers, indirect addressing and dynamic compilation of software, processor architecture. 3 lects.; second term. Prerequisite: Applied Mathematics 2L3 or 2N3, or permission of the instructor.

3U4/ Engineering Mathematics III. Topics in mathematics of interest for civil engineering, including probability and statistics, partial differential equations, numerical analysis, and matrix algebra. 4 hrs.; first term. Prerequisite: Applied Mathematics 2J5, 2M3.

3V6/ Engineering Statistics III. Topics in mathematics of interest for mechanical, metallurgical and ceramic engineering, including probability and statistics, partial differential equations, numerical analysis. 2 hrs.; first term; 4 hrs.; second term. Prerequisite: Applied Mathematics 2J5, 2M3, or their equivalent.

3W5/ Engineering Mathematics III. Topics in mathematics of interest for electrical engineering, including complex variable theory, linear algebra and other material. 5 hrs.; first term. Prerequisite: Applied Mathematics 2J5, 2M3.

3X3/ Engineering Mathematics IV. Further topics of interest for electrical engineering, emphasizing probability theory. 3 hrs.; second term. Prerequisite: Applied Mathematics 2J5, 2M3.

4C4/ Mathematical Physics II. Some mathematical techniques and their applications to physics and engineering. Typical topics and applications are: integral equations, integral transforms, tensor analysis, calculus of variations, hydrodynamics, elasticity, general relativity, field theory. 2 lects.; both terms. Prerequisite: Applied Mathematics 2B6 and registration in an Honours or Engineering programme.


4E3/ Compilers: The first term of Applied Mathematics 4E6. 3 lects.; first term. Prerequisite: Applied Mathematics 3A3 or permission of the instructor.
4G6/ Project. The design and implementation of a large programme or suite of programmes, and its documentation. Students work in small teams. Prerequisite: Registration in a programme in which Applied Mathematics 4G6 is specified, or permission of the Chairman. Not open to students who are registered in Applied Mathematics 3R6.


4K3/ Methods and Applications of Integral Transforms. Theory and application of Fourier, Laplace, Hankel, and other integral transforms, with emphasis on application; introduction to discrete transforms, z-transforms. Walsh functions and their applications to science and engineering. 3 lects.; second term. Prerequisite: Applied Mathematics 3H6 or 3J3, or permission of the instructor.

4L3/ File Design and Data Bases. A course dealing with data structures useful in computer storage and file design. Topics include machine-level implementation structures, storage management, sorting and searching, input/output devices, access methods, indexed sequential accessing, fields, keys, inverted files, descriptors. 2 lects., 1 tut.; one term. Prerequisite: Applied Mathematics 3H6 or 3J3, or permission of the instructor.

4M3/ Models of Programming Languages. Run-time representations of programming languages, specifically Algol, Pascal, and PL/I, emphasizing re-entrant representation of procedures and information structures. 3 lects.; second term. Prerequisite: Applied Mathematics 3A3 or permission of the instructor.

4S3/ Survey Sampling. Survey design; simple random sampling; stratified sampling; proportional allocation; ratio estimation; cluster sampling; systematic sampling and sample size determination. A project associated with current research is required. 3 lects.; second term. Prerequisite: Applied Mathematics 3S6, or Mathematics 2D4 and Applied Mathematics 3M3, or permission of the instructor.

4T3/ Design of Experiments. Analysis of variance and covariance; linear models, randomised block designs, Latin squares, factorial experiments. Emphasis on applications. 3 lects.; first term. Prerequisite: Applied Mathematics 3S6, or Mathematics 3D6, or Applied Mathematics 3M3 and Mathematics 2D4.

4U3/ Nonparametric and Sequential Methods in Statistics. Rank tests and non-parametric methods; rank correlation; comparisons with parametric methods. The sequential probability ratio test; sequential estimation. 3 lects.; second term. Prerequisite: Applied Mathematics 3S6, or Mathematics 2D4. Offered in 1978-80 and in alternate years.

4V3/ Technometrics. Linear and non-linear models; response surface analysis; evolutionary operation; tests based on residuals; probability-plotting methods; statistical methods in instrument calibration. 3 lects.; second term. Prerequisite: Applied Mathematics 4T3.

4W3/ Computer Simulation Languages and the Simulation of Computers. Three languages for the simulation of discrete stochastic systems will be compared: GPSS, Simscript or Simula, and the Gasp II package. Simulation of various operations in computer systems. 3 lects.; one term. Prerequisite: Applied Mathematics 2L3 and 3M3 or Mathematics 2D4.

4X3/ The Mathematical Analysis of Algorithms. How fast does this algorithm run? Is this the fastest algorithm? This course will deal with these and related questions as an introduction to the analysis of algorithms. 3 lects.; one term. Prerequisite: Applied Mathematics 3A3, Mathematics 2F4 or 2J6. Offered in 1978-80, alternating with Applied Mathematics 4J3.

ART AND ART HISTORY

Art and Art History

Professors
G. B. Wallace/Chairman
P. H. Walton

Assistant Professors
D. Carr
H. G. Galloway
H. B. J. Maginnis
B. D. Mangrum
G. T. Scott

Lecturers
L. J. Toews
W. Tresidder
D. Taylor/Art Gallery Curator

Associate Members
Katherine M. D. Dunbabin
A. G. McKay

ART HISTORY

CURRICULUM 1978-80

At least "D" is required in all courses listed under "prerequisite", unless otherwise indicated.

1A6/ Introduction to the Study of Visual Art. An examination of methods employed in the interpretation, criticism, and history of art; with emphasis on major monuments of art and architecture in the western tradition. 3 lects.; both terms. Prerequisite: Open.

2B3/ Greek Art. The architecture, sculpture, and painting of the Greek and Hellenistic worlds. 3 lects.; one term. Prerequisite: Open to students in Year II or above. Same as Classical Civilization 2B3.

2C3/ Roman Art. The architecture, sculpture, and painting, of the Roman world. 3 lects.; one term. Prerequisite: Open to students in Year II or above. Same as Classical Civilization 2C3.

2K3/ Early Medieval Art and Architecture in Western Europe. A study of art and architecture in Europe from 600-1200. 3 lects.; one term. Prerequisite: Open, except to students with standing in Art History 2D6.

2L3/ The Gothic Image. A study of European art and architecture in the later Middle Ages. 3 lects.; one term. Prerequisite: Open, except to students with standing in Art History 2D6.

2M3/ The Art and Architecture of the European Renaissance 1400-1580. 3 lects.; one term. Prerequisite: Open, except to students with standing in Art History 2E6.

2N3/ Seventeenth and Eighteenth Century European Art and Architecture. An examination of the major trends in European art and architecture from 1580-1780. 3 lects.; one term. Prerequisite: Open, except to students with standing in Art History 2E6.

2O3/ Modern Art and Architecture 1780-1880. A study of the origin and development of modern styles from Neo-Classicism through Impressionism. 3 lects.; one term. Prerequisite: Open, except to students with standing in Art History 2F6.

2P3/ Modern Art and Architecture 1880 to the Present. Topics examined will include Post-Impressionism, Fauvism, Cubism, Surrealism and related developments. 3 lects.; one term. Prerequisite: Open, except to students with standing in Art History 2F6.
ART AND ART HISTORY

2J3/ An Introduction to the History of Print Making. A study of woodcut, engraving, lithography, and other methods of print making, from the 15th century to the present. 3 lects.; one term. Prerequisite: Open.

3A3/ The Imagery and Symbolism of Christian Art. A study of the representation of selected subjects in Christian art. 3 lects.; one term. Prerequisite: Open to students in Year II or above.

3B3/ Canadian Art and Architecture. A survey of the visual arts in Canada from the earliest explorations and settlements to the present. 3 lects.; one term. Prerequisite: Registration in Year III or IV of a programme in Art or Art History or six units of Art History.

3C3/ Topics in American Art and Architecture. An examination of painting, sculpture and architecture in the United States. 3 lects.; one term. Prerequisite: Registration in Year III or IV of a programme in Art or Art History.

3D3/ Northern European Painting, 1380-1600. The development of painting in the Lowlands, France, and Germany, and the influences of regional schools. 3 lects.; one term. Prerequisite: Art History 2E6 or Art History 2M3 and 2N3. Alternates with Art History 4C3.

3E3/ Italian Baroque Art and Architecture. A discussion of the formation and character of the Baroque style in Italy in the 17th century. The works of principal artists will be examined, and special attention will be given to the cultural structure of Rome. 3 lects.; one term. Prerequisite: Art History 2E6 or Art History 2M3 and 2N3. Alternates with Art History 4D3.

3F3/ Archatic Greek Art. The painting, sculpture, and architecture, of pre-classical Greece. 3 lects.; one term. Prerequisite: Art History 2B3. Same as Classical Civilization 3F3. Alternates with Art History 3G3.

3G3/ Late Antiquity and Early Christian Art. The art and architecture of the later Roman Empire, and the birth of Christian Art (A.D. 200-500). 3 lects.; one term. Prerequisite: Art History 2C3 or 2D6 or Art History 2K3 and 2L3. Same as Classical Civilization 3G3. Alternates with Art History 3F3.

3H3/ Approaches to Art History. A study of the various approaches which art historians of the last one hundred years have taken in investigating the art of the past. Seminar (2 hrs.); one term. Prerequisite: Registration in Years III or IV of a programme in Art or Art History and permission of the Department (limited enrolment). Alternates with Art History 3L3.

3J3/ The Carolingian Renaissance. The architecture, painting, and sculpture, of the Carolingian Renaissance is examined against the background of the political, theological, and literary achievements of the period. Seminar (2 hrs.); one term. Prerequisite: Art History 2D6 or Art History 2K3 and 2L3 and registration in Years III or IV of a programme in Art or Art History and permission of the Department (limited enrolment). Alternates with Art History 3K3.

3K3/ Studies in Late Mediaeval Art. An investigation of aspects of the art of the late Middle Ages. Seminar (2 hrs.); one term. Prerequisite: Art History 2D6 or Art History 2K3 and 2L3 and registration in Years III or IV of a programme in Art or Art History and permission of the Department (limited enrolment). Alternates with Art History 3J3.

3L3/ Venetian Renaissance Painting. An examination of the works of the major painters of the Renaissance in Venice, including such artists as Giovanni Bellini, Giorgione, and Titian. Seminar (2 hrs.); one term. Prerequisite: Art History 2E6 or Art History 2M3 and 2N3 and registration in Years III or IV of a programme in Art or Art History and permission of the Department (limited enrolment). Alternates with Art History 3K3.

3M3/ Modern Architecture. An examination of the new problems facing the architect in the 19th century, and the Modern Movement in Europe and America in the 20th century. 3 lects.; one term. Prerequisite: Registration in Years III or IV of a programme in Art or Art History or six units of Art History. Offered in alternate years.

3N3/ Romanesque Painting and Sculpture. A study of the style and iconography of eleventh and twelfth century painting and sculpture in Western Europe, with emphasis on developments in France. 3 lects.; one term. Prerequisite: Registration in Years III or IV of a programme in Art or Art History or permission of the instructor. Alternates with Art History 3J3.

3O3/ Myth and Allegory in Italian Renaissance Art. An examination of interpretations by Italian Renaissance artists of selected classical myths and the use of the allegorical mode of artistic expression. 3 lects.; one term. Prerequisite: Open to students in Year II or above. Offered in alternate years.

4B3/ Art of Byzantium. The art and architecture of the Greek East from the founding of Constantinople to 1453. 3 lects.; one term. Prerequisite: Art History 2D6 or 2K3 and 2L3. Alternates with Art History 4A3.

4C3/ The Art of the High Renaissance in Rome. A study of a the art and architecture of Raphael, Michelangelo and their contemporaries in Rome in the early 16th century. 3 lects.; one term. Prerequisite: Art History 2E6 or 2M3 and 2N3. Alternates with Art History 3D3.

4D3/ European Architecture. A course dealing with European Architecture during the 17th and 18th centuries. 3 lects.; one term. Prerequisite: Art History 2E6 or 2M3 and 2N3. Alternates with Art History 3E3.

4E3/ English Painting 1730 to the Present. The development of English painting from Hogarth to Francis Bacon with some consideration of related trends in the graphic arts. 3 lects.; one term. Prerequisite: Registration in Years III or IV of a programme in Art or Art History or six units of Art History. Alternates with Art History 3C3.

4F3/ Topics in Northern European Art of the 17th Century. An examination of selected subjects in the history of Northern European Art in the 17th century. Seminar (2 hrs.); one term. Prerequisite: Art History 2E6 or Art History 2M3 and 2N3 and registration in Years III or IV of a programme in Art or Art History and permission of the Department (limited enrolment). Alternates with Art History 4H3.

4G3/ Topics in 18th and 19th Century Art. Discussion of selected European painters, sculptors and architects. Seminar (2 hrs.); one term. Prerequisite: Art History 2E6 (or 2M3 and 2N3) or Art History 2F6 (or 203 and 2P3) and registration in Years III or IV of a programme in Art and Art History and permission of the Department (limited enrolment). Alternates with Art History 4F3.

4H3/ Naturalism in Baroque Painting. A stylistic and iconological study of works by major Baroque artists in the context of the literary and philosophical culture of the period. Seminar (2 hrs.); one term. Prerequisite: Art History 2E6 or Art History 2M3 and 2N3 and registration in Years III or IV of a programme in Art or Art History and permission of the Department (limited enrolment). Alternates with Art History 4J3.

4I3/ Expressionism. Examination of one of the major tendencies in 20th-century art in Europe and North America. Seminar (2 hrs.); one term. Prerequisite: Art History 2F6 or Art History 2O3 and 2P3 and registration in Years III or IV of a programme in Art or Art History and permission of the Department (limited enrolment). Alternates with Art History 4G3.

4K3/ Supervised Reading. Readings in a field of special interest to the student, under the guidance of a Faculty member. Prerequisite: Registration in Years III or IV of a programme in Art and Art History and permission of the Department. and a grade of 70% or more in a previous course in the chosen field. Note: Students wishing to combine Art History 4K3 with Art History 406 must have a grade of 80% or more in a previous course in the chosen field or fields.

4O6/ Thesis. Supervised study of a problem in the history of art of special interest to the student, through library research and the examination of photographs and original objects. Prerequisite: Registration in Year IV of Honours Art History and a grade of 70% or more in a previous course in the chosen field, and permission of the Department. Note: Students wishing to combine Art History 4K3 with Art History 406 must have a grade of 80% or more in a previous course in the chosen field or fields.
ART CURRICULUM 1978-80

At least "D" is required in all courses listed under "prerequisites", unless otherwise indicated.

1B6/ Introduction to Studio Practice I. An introduction to the methods and materials used in drawing and print making.
   2 studio practice (3); both terms.
   Prerequisite: Intention of entering a programme in Art and submission of an acceptable portfolio. Not open to students with previous standing in Art 1A6.

1D6/ Introduction to Studio Practice II. An introduction to the methods and materials used in painting and sculpture.
   2 studio practice (3); both terms.
   Prerequisite: Intention of entering a programme in Art and submission of an acceptable portfolio. Not open to students with previous standing in Art 1A6.

Note: Students intending to take Art 1B6 and Art 1D6 must submit to the Chairman of the Department of Art and Art History in the spring a portfolio to show their interests and ability. We believe that drawings made without supervision or assistance are especially helpful in making this assessment and the portfolio could contain drawings from nature in several media; for example, a self portrait, a still life, or a landscape. It is recommended that applicants come to the Department for an interview, if possible. Late applications will be considered if space is available in the class.

2A6/ Painting I. A sequential investigation of the elements of painting based upon the painter’s traditional points of reference.
   2 studio practice (3); both terms.
   Prerequisite: Registration in a programme in Art.

2B6/ Sculpture. A study of basic three-dimensional principles leading to a comprehension of sculptural form. Emphasis on the human model.
   2 studio practice (3); both terms.
   Prerequisite: Registration in a programme in Art.

2C3/ Figure Drawing and Superficial Anatomy.
   1 studio practice (3); both terms.
   Prerequisite: Registration in a programme in Art.

3A6/ Painting II. An advanced course based upon figure composition, life painting, and still life, in which the student is progressively encouraged to work on his own themes.
   2 studio practice (3); both terms.
   Prerequisite: Art 2A6.

3B6/ Sculpture II. An advanced course concentrating on techniques of carving and casting.
   2 studio practice (3); both terms.
   Prerequisite: Art 2B6.

3C3/ Advanced Drawing
   1 studio practice (3); both terms.
   Prerequisite: Registration in a programme in Art.

3E6/ Print Making I. Studio class in the intaglio and relief methods of print making.
   2 studio practice (3); both terms.
   Prerequisite: Registration in a programme in Art.

4A8/ Print Making II. Studio course in the techniques of lithography and silk screen printing.
   2 studio practice (3); both terms.
   Prerequisite: Registration in a programme in Art.

4B12/ Studio Project. A summation of investigations into aspects of technique begun in any of Art 3A6, 3B6, 3E6, or 4A8; to be done under supervision of a staff member.
   Prerequisite: Registration in Year IV Honours Art and an average grade of 80% or more in the previous course in the chosen field.

4C6/ Minor Studio Project. An investigation of techniques begun in any of Art 3A6, 3B6, 3E6, 4A6, 4C3, or 3C3, supervised by a staff member.
   Prerequisite: Registration in Honours Art and a grade of 70% or more in the previous course in the chosen field. Not available to students taking, or who have taken, Fine Arts 4P12 or Art 4B12.

Note: Students wishing to combine Art 4C6 with Art 4D3 must have a mark of at least 80% in a previous course in the chosen field or fields. Students wishing to combine Art 4D3 with Art 4C6 must have a mark of at least 80% in a previous course in the chosen field or fields or be given special permission by the Chairman of the Department.

ASIAN STUDIES

4D3/ Media Research. Investigation of studio techniques; under the guidance of a staff member.
   Prerequisite: Registration in Honours Art and a grade of 70% or more in the previous course in the chosen field.

Note: Students wishing to combine Art 4D3 with Art 4B12 must have a mark of at least 80% in a previous course in the chosen field or fields. Students wishing to combine Art 4D3 with Art 4C6 must have a mark of at least 80% in a previous course in the chosen field or fields or be given special permission by the Chairman of the Department.

Asian Studies

While there is no B.A. Programme in Asian Studies, students interested in concentrating in this area may choose from among the following courses offered by various Departments. Those desiring further information on specific courses should consult the departmental listings in the Calendar.

Students wishing to pursue Asian Studies may obtain further information from the Associate Deans (Studies), Faculties of Social Sciences and Humanities.

CURRICULUM 1978-1980

1. Courses Dealing Strictly with Asian Material

ANTHROPOLOGY

3H3/ Ethnology: Southeast Asia

3X3/ People of India. (Offered in 1979-80 and in alternate years)

HISTORY

206/ China: Traditional and Modern
2U6/ The History of Modern Asia (Offered in 1978-79 and in alternate years)
3G6/ The History of South Asia (Offered in 1979-80 and in alternate years)
3Q6/ China: From the Opium War to the Present
4G6/ The Revolutionary Movement in Modern China

POLITICAL SCIENCE

2M6/ Introduction to Far Eastern Political Traditions (Offered in 1978-79 and in alternate years)
3C3/ Comparative Politics: South Asian Systems
3D3/ Comparative Politics: Southeast Asian Systems
3Q6/ Politics in Japan

RELIGIOUS STUDIES

2A3/ Pathways of Indian Mysticism (Offered in 1979-80)
2B6/ Introduction to Asian Philosophy (Offered in 1978-79)
2D6/ Religious Traditions of Asia
2P3/ Buddhist Art in Asia (Offered in 1978-79)
3A3/ Religion in Contemporary India (Offered in 1978-79)
3C3/ Jainism: Religion and Art (Offered in 1979-80)
3I6/ The Hindu Temple (Offered in 1979-80)
3P6/ Indian Philosophy
BIOCHEMISTRY

3Q6/ The Buddhist Tradition (Offered in 1979-80)
3S3/ Hindu Mythology and Cult (Offered in 1978-79)
3V3/ Indian Art and Religion (Offered in 1978-79)
3VV6/ Topics in East Asian Thought and Religion (Offered in 1978-79)
3WW3/ Yoga: Theory and Practice (Offered in 1978-79)
3XX3/ Studies in Hindu Sacred Literature: The Visionary Poets of the
Rg Veda (Offered in 1979-80)
4AA6/ Advanced Study in Hindu Religious History
4BB6/ Advanced Study in Buddhist and East Asian Religious History
4E6/ Advanced Study in Indian Philosophy

2. Courses with a Significant Amount of Asian Content

ECONOMICS

3J6/ Economic Development

POLITICAL SCIENCE

2CC3/ Culture and Politics of Southern Asia and North Africa
4Q6/ Developing Political Systems

RELIGIOUS STUDIES

1B6/ World Religions
1CE/ Texts, Traditions, and Thought
1FB/ Religion and Current Problems (Offered in 1979-80)
2BB3/ Images of the Divine Feminine (Offered in 1978-80)
2CC3/ Specialists in the Sacred (Offered 1978-80)
3L6/ The Nature of Human Nature (Offered in 1978-79)

3. Language Courses (Chinese 1Z6 and 2Z6 are offered by the
Russian Department; Chinese 4A6 and Sanskrit 4A6, by the
Department of Religious Studies.)

Chinese 1Z6/ Elementary Modern Chinese (Offered in 1979-80)
Chinese 2Z6/ Intermediate Modern Chinese (Offered in 1978-79)
Sanskrit 4A6/ Introduction to Sanskrit

Biochemistry

Profs.
L. A. Branda
W. W. Chan
Barbara M. Ferrier part-time
K. B. Freeman/Chairman
H. P. Ghosh
R. H. Hall
B. L. Hillcoat
D. R. McCalla
T. Neilson

Associate Prof.
R. M. EEpand

Associate Members
S. Goldstein (Medicine)
R. J. Haslam (Pathology)

CURRICULUM 1978-80

For prerequisite purposes, a grade of "D" or better is required.

2E4/ Introductory Biochemistry. A predominantly descriptive treat-
ment of the basic areas of biochemistry, including physiological
chemistry. This course is designed for students who do not
intend to take further biochemistry.
4 lects.; second term.
Prerequisite: Completion of or registration in one of Chemistry
2D4, 208, 2S8.

3F3/ Biological Chemistry. The chemistry of natural products neces-
sary for understanding biochemistry, including such topics as carbo-
hydrates, nucleotides, peptides, and steroids.
3 lects.; first term.
Prerequisite: Chemistry 2S8 or permission of the instructor.

3G6/ Comprehensive Biochemistry. Major concepts of biochemistry,
and modern methods used in biochemical investigations; nature of
cellular processes; structure and function of macromole-
cules; metabolism and its regulation.
3 lects.; both terms.
Prerequisite: One of Chemistry 2S8 (with concurrent registration
in Biochemistry 3F3) or Chemistry 2O8 or 3D6; and one of
Chemistry 2P4, 2Q5, 2T4.

3L4/ Laboratory. Illustration of fundamental principles as presented
in Biochemistry 3G6.
2 labs. (3); both terms.
Prerequisite: Registration in Biochemistry 3G6.

3L2/ Laboratory. Illustration of fundamental principles as presented
in Biochemistry 3G6.
1 lab. (3); both terms.
Prerequisite: Registration in Biochemistry 3G6.

4B6/ Senior Thesis. A thesis based on a project under the direction
of a member of the Faculty. Enrollment may be limited.
Prerequisite: Registration in Year IV Biochemistry or Biochemis-
try and Chemistry and permission of the Chairman.

4C4/ Biochemistry in Contemporary Society. Areas of sociological
importance are explored from a biochemist's viewpoint. Typical
topics are nutrition, agriculture, the food and pharmaceutical
industries, pollution, and infection.
2 lects.; both terms.
Prerequisite: Biochemistry 3G6, or permission of the Depart-
ment.

4D3/ Patterns in Biochemical Research. Approaches and problems
involved in isolation and structural determination of cellular
components, interaction and assembly of components, and ex-
trapolation to in vivo conditions.
3 lects.; first term.
Prerequisite: Biochemistry 3G6.

4E3/ Advanced Biochemistry. Biochemical approaches for studying
the possible molecular components and regulatory mechanisms
involved in complex biological phenomena, such as cell trans-
formation, carcinogenesis, and differentiation.
3 lects.; second term.
Prerequisite: Biochemistry 3G6.

4H3/ Clinical Chemistry. An outline of clinical chemistry; its rele-
vance to health care; and its contribution to basic biological
science. The anatomy, physiology, and chemical tests relevant
to the major organ systems. This course is identical with Chem-
istry 4H3.
3 lects.; second term.
Prerequisite: Registration in Year IV of an Honours or Major programme in Biochemistry or Chemistry.

4K4/ Advanced Biochemistry Laboratory. A major project or a series of experiments together with a minor project. This laboratory complements Biochemistry 4C4, the projects and experiments are oriented towards environmental problems. 2 labs. (3); both terms.
Prerequisite: Registration in Biochemistry 4C4. Registration in this course may be limited.

4L4/ Advanced Biochemistry Laboratory. The fundamental principles of experimental biochemistry using modern instrumental methods. In one term, a project may be selected by the student. 2 labs. (3); both terms.
Prerequisite: Biochemistry 3L2 or 3L4.

4P2/ Physical Biochemistry and Membrane Structure. Experimental and theoretical approaches to the determination of molecular conformation, intermolecular interactions, with special emphasis on the structure of biological membranes. 2 lects.; first term.
Prerequisite: Biochemistry 3G6. Not open to students registered in Biology 404.

4Q3/ Molecular Pharmacology. Interactions of drugs with living systems during absorption, distribution, elimination, metabolism, and action in terms of the chemical and biochemical structure of drugs and their receptors. 3 lects.; second term.
Prerequisite: Biochemistry 3G6.

4U4/ Advanced Experimentation. A course emphasizing fundamental principles in biochemistry and chemistry using a broad range of modern instrumental methods. This course is identical with Biochemistry 4U4. 1 lab. (4); both terms.
Prerequisite: Biochemistry 3L4.

For Graduate Courses see Calendar of School of Graduate Studies.

Bioengineering

Courses in Bioengineering are coordinated by the Bioengineering Committee of the Faculty of Engineering, which is an interdisciplinary committee. Students interested in this area of study should consult the chairman of their department or the appropriate member of the Bioengineering Committee. Members in 1977-78 were as follows:

J. L. Brash (Chemical Engineering)
I. A. Feuerstein (Chemical Engineering)
W. James (Civil Engineering & Mech Engineering)
M. Milner (Electrical Engineering/Medicine)
Y. E. Missirlis (Engineering Physics)
R. A. Morton (Biology)
W. R. Newcombe (Mechanical Engineering)
L. D. Pengelly (Medicine)
W. V. Prestwich (Physics)
G. F. Round (Mechanical Engineering)
S. K. Sarna (Electrical Engineering/Surgery)
L. W. Shemilt (Dean of Engineering & Professor Chemical Engineering)
G. D. Sweeney (Medicine)

CURRICULUM 1978-80

Elective courses in Bioengineering are available through a number of departments in the Faculty of Engineering. In keeping with the basic definition of Bioengineering “the application of Engineering Principles and Knowledge to Medicine and Biology” the following elective courses offer an opportunity to relate engineering studies to the needs of medicine and biology.

Biology 1B3: Cell Biology and Physiology
Psychology 1A6: General Psychology
Sociology 1A6: An Introduction to Sociology
Chemistry 2D4: Introductory Organic Chemistry
Chemistry 2D4: Introductory Organic Chemistry
Chemistry 208: Organic Chemistry
Biochemistry 2E4: Introductory Biochemistry
Psychology 2R6: Statistical Principles in Experimental Design
Engineering Physics 3X4: Engineering Applications in Physiological Systems
Chemical Engineering 4T3: Transport Processes in Biomedical Engineering
Electrical Engineering 4U4: Biomedical Electronics Instrumentation
Engineering 4X3: Introduction to Biomedical Engineering
Engineering Physics 4Y3: Introduction to Biomedical Physics

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Biology

Professors
S. T. Bayley
D. Davidson
D. M. Davies
K. A. Kershaw
S. Mak
J. J. Miller
E. L. McCandless
A. Oaks
I. Takahashi
S. F. H. Threlfell/Chairman

Associate Professors
A. D. Dingle
G. P. Harris
D. E. N. Jensen
J. N. A. Lott
J. E. M. Westermann
R. A. Morton
L. Prevce
G. J. Sorger

Assistant Professors
T. T. Chen
F. L. Graham
R. S. Singh
C. M. Wood

L. Laking/part-time

CURRICULUM 1978-80

The University reserves the right to limit registration in any course. Where priorities have to be established, first consideration will be given to Honours and Pass Biology students.

For prerequisite purposes, a grade of "D" or better is required.

1B3/ Cell Biology. The first term of Biology 1B6, including cell fine structure; cell division; differentiation and an introduction to the macromolecular organization of cells and cell physiology.
2 lects., 1 lab. (3); first term.
Prerequisite: Registration in Engineering above Year I.

1B6/ Cell Biology and Physiology. Cellular fine structure as related to function; cell growth and division; cell populations; how cells obtain and use energy; how the information in macromolecules is used.
2 lects., 1 lab. (3); both terms.
Prerequisite: Registration in, or completion of, Natural Sciences I, or registration in Pass or Honours Psychology.

1C6/ Genetics and Evolution. An introduction to the principles of genetics, with special reference to the mechanism of evolution.
2 lects., 1 tut. or 1 lab. (3); both terms.
Prerequisite: Registration in, or completion of, Natural Sciences I. Normally not open to students who are registered in, or have completed, Science 2K3.

1D6/ The Plant Kingdom and Ecology. First term: an introduction to the major plant groups. Second term: the fundamental concepts of ecology, the ecosystem, food-chains, energy flow, population dynamics, and basic environmental factors.
3 lects. or 2 lects., 1 lab. (3) or 1 tut.; both terms.
Prerequisite: Registration in, or completion of, Natural Sciences I, or at least a grade of C in Biology 1G6. Not open to students who have completed Biology 1D3 or 1E6 or 1F3.

1D3/ The Plant Kingdom. An introduction to the major plant groups: identical with the first term of Biology 1D6.
2 lects., 1 lab. (3); first term.
Prerequisite: Completion of Natural Sciences I, or at least a grade of C in Biology 1G6. Not open to students who have completed Biology 1D6.

3 lects. or 2 lects., 1 lab (3) or 1 tut.; both terms.
Prerequisite: Registration in, or completion of, Natural Sciences I, or registration in Pass or Honours Psychology. Not open to students who are registered in, or have completed, Biology 1D6 or 1E6.

1E5/ The Animal Kingdom. An introduction to the major animal groups: identical with the second term of Biology 1E6.
2 lects., 1 lab. (3); second term.
Prerequisite: Completion of Natural Sciences I, or registration in Pass or Honours Psychology. Not open to students who have completed Biology 1E6.

1F3/ Ecology. The fundamental concepts of ecology, the ecosystem, food-chains, energy flow, population dynamics, and basic environmental factors.
2 lects., 1 lab (3); second term.
Prerequisite: Open, except to students who are registered in Natural Sciences I, or who are registered in, or who have completed, Biology 1D6 or 1E6.

1G6/ Introduction to Biology. Basic concepts in cell biology, animal physiology, and genetics. The course covers cell structure, organelle function, metabolism, growth, division, endocrinology, muscle function, circulation, excretion, and immunology.
3 lects. or 2 lects. and 1 lab (3); both terms.
Prerequisite: At least a 60% average in two Grade 13 science or mathematics courses, or at least a grade of C in Physical Education 2C6. Not open to students registered in the Faculty of Science.

2A3/ Radiation Biology. The effects of radiation upon biological material at the physical, molecular, cellular, tissue, and organismal level. Applications of radiation in medicine and industry.
3 lects., first term.
Prerequisite: Biology 1B6 and Physics 1A7 or 1B7 or 1C8.

2H4/ Biological Application of Mathematical and Computing Techniques. The first term illustrates techniques using examples from different areas of biology; the second term is a project involving computer analysis of experimental data.
1 lect., 1 tut. (3), both terms.
Prerequisite: Mathematics 1A6 or 1C6 or 1F6, and completion of, or registration in, Applied Mathematics 1H3 or 2H3.

3A4/ Structure and Function of Plants. Morphology, anatomy, and ultrastructure of higher plants in relation to physiological activities.
3 lects., 1 lab. (3); second term.
Prerequisite: Biology 1E6, 1C6 and registration in, or completion of, Biology 3N4.

3C3/ Biochemical Microbiology. Basic energy-yielding mechanisms, synthesis of cellular components, and microbial life under extreme conditions.
2 lects., 1 tut. or 1 lab. (3); second term.
Prerequisite: Biology 3E3. Not open to students who have completed, or are registered in, Biochemistry 3G6.

3D3/ Animal Parasitology. Parasites of animals, dealing with life histories, host-parasite relationships, and arthropod vectors.
1 lect., 1 tut. or lab. (3) every other week; both terms (1978-79 only).
2 lects., 1 lab. (3); first term (beginning in 1979-80).
Prerequisite: Biology 1E3 or 1E6.

2 lects., 1 lab. (3); first term.
Prerequisite: Chemistry 201 or 2D4.

3F6/ Comparative Anatomy and Evolution of Vertebrates. An introduction to the development of structure and function in vertebrates.
2 lects., 1 lab. (3); both terms.
Prerequisite: Biology 1E6 or permission of the instructor.

3H6/ Cell Biology. Cell organization; the development and functions of organelles; cell growth and cell proliferation; cell to cell interactions; the behaviour of cells in culture; responses to inhibitors.
3 lects., first term; 2 lects., second term; 1 lab. (3) every other week; both terms.
Prerequisite: Biology 1B6 or permission of the instructor.

3K6/ Animal Histology. The structure, function, and organization of cells, tissues, organs and organ systems.
2 lects., 1 lab. (3); both terms.
Prerequisite: Biology 1E5 or permission of the instructor.

3L2/ Laboratory. Projects involving techniques used in the general area of cell biology, including fixation and staining of cells, auto-radiography, immunofluorescence.
1 lab. (3), alternating with a discussion period; both terms.
Prerequisite: Registration in Year III or Year IV of a Biology programme.
3M4/ Form, Function, and Life History of Interebrates. Development of specialization in form, function, and life cycle during evolution and during the growth of individuals of certain groups.
2 lec.; 1 lab.; 3 terms; both terms.
Prerequisite: Biology 1E6 or 1E3.

3N4/ Developmental Biology. A comparative and analytical study of developmental phenomena. Particular emphasis will be given to processes of growth, cell differentiation, and morphogenesis during embryonic development.
2 lec.; 1 lab.; 1st term; 2 lec.; 1st term; 1 lab.; (3) every other week; both terms.
Prerequisite: Biology 1B6.

2 lec.; 1 tut.; 1st term.
Prerequisite: Biology 1B6, and registration in, or completion of, Biochemistry 3G6.

3T2/ Mechanisms of Genetic Variation. An analysis of mechanisms of change in genetic material; genetics of recombination.
2 lec.; 2nd term.
Prerequisite: Biology 1C6.
Offered in 1978-80 and in alternate years.

3U2/ Chromosome Evolution. Evolution of genetic complements; chromosomal polymorphism in man and other animals; changes in populations.
2 lec.; 2nd term.
Prerequisite: Biology 1C6.

3W3/ Ecology of Northern Plant Associations. The vegetation of northern Canada and its relationships with climate, geomorphology, and glacial history. Anatomical, morphological, and physiological adaptations to northern environments. The potential impact of man on these systems.
2 lec.; 1 seminar; 2nd term.
Prerequisite: Biology 1D6 or 1E6 or 1F3.
Offered in 1978-80 and in alternate years.

2 lec.; 1 lab.; (3); 1st term.
Prerequisite: Biology 1D6 or 1E6 or 1F3, and registration in, or completion of, Biochemistry 3G4.

3Y6/ Comparative Physiology. Water relations, nutrition, circulatory mechanisms, and integrative mechanisms in plant and animal systems.
2 lec.; 1 lab.; (3); 2nd term.
Prerequisite: Biology 1B6 or registration in at least Year III of a non-science programme and a grade of at least B in Biology 1G6.

2 lec.; 1st term.
Prerequisite: Biology 1C6.
Offered in 1978-79 and in alternate years.

4B6/ Plant Physiology. Principles of physiology and metabolism in plants.
2 lec.; 1 tut.; 1 lab.; (3); both terms.
Prerequisite: Registration in, or completion of, Biochemistry 3G6, or permission of the instructor.

4B4/ Plant Physiology. The same as Biology 4B6, but without the laboratory or tutorial.
2 lec.; both terms.
Prerequisite: Registration in, or completion of, Biochemistry 3G6, or permission of the instructor.

4C8/ Senior Thesis. A thesis based upon a research project carried out under the direction of a member of the Faculty.
Prerequisite: Approval by the Chairman in the preceding spring term. Normally open only to students who obtain first-class honours in Year III. Not open to students who are registered in, or have completed, Biology 4F4.

4E3/ Population Genetics. Experimental and theoretical aspects of the genetic basis of evolutionary changes in populations.
2 lec.; 1st term.
Prerequisite: Biology 1C6 and Mathematics 1F6 (or 1A6 or 1C6).

4F4/ Selected Topics in Biology. Students may enlarge their background in a field of specialization through an experimental or library project under the direction of a member of the Faculty.
Prerequisite: Approval by the Chairman in the preceding spring term. Not open to students who are registered in, or who have completed, Biology 4C8.

4G4/ Molecular Genetics. Concepts of genetic mechanisms, with particular regard to microbial genetics and the physical basis of inheritance.
4 lec.; 1st term.
Prerequisite: Biology 1C6 and registration in, or completion of, Biochemistry 3G6.

4H2/ Plant Development. An experimental analysis of development in plants: cytological, genetical, and biochemical studies.
2 lec.; 2nd term.
Prerequisite: Biology 3H6.

4I3/ Immunology. An introduction to humoral and cellular immunity. The molecular and cellular basis of immunity, and an introduction to immunological techniques.
2 lec.; 1 tut.; (2); 1st term.
Prerequisite: Completion of, or registration in, Biochemistry 3G6.

4J3/ Field Course. A two-week study of ecological problems in a low-arctic environment, held at Churchill, Manitoba, preceding registration week. A report must be submitted before the end of the first term.
Prerequisite: Biology 1D3 or 1D6.
Offered in 1978-79 and in alternate years.

1 lec.; 1 lab.; (3); 1st term.
Prerequisite: Biology 4J3.
Offered in 1979-80 and in alternate years.

4L2/ Advanced Laboratory. Projects involving radioisotope labelling, ultracentrifugation, electron microscopy. 1 lab.; (3); alternating with a discussion period; both terms.
Prerequisite: Registration in Year III or Year IV of a Biology programme.

4M4/ Molecular Biophysics. The physical structure of important biological macromolecules, and methods for their study such as X-ray diffraction, sedimentation, microscopy, and spectroscopy.
2 lec.; both terms.
Prerequisite: Registration in Year IV Honours Biology (with registration in, or completion of, Biochemistry 3G6) or in Year IV Biochemistry, or in Year III or Year IV Honours Physics or Physics Major, or permission of the instructor.
Offered in 1978-79 and in alternate years.

4N3/ Entomology. Functional morphology and development of insects, with some attention to adaptations for habitats and habitats.
2 lec.; 1 lab.; (3); 2nd term.
Prerequisite: Registration in, or completion of, Biology 3M4.
Offered in 1979-80 and in alternate years.

4R6/ Vertebrate Physiology. Comparative studies of functional activities of vertebrate animals.
2 lec.; 1 lab.; (3); both terms.
Prerequisite: Biology 1B6; registration in, or completion of, Biochemistry 3G6. Biology 3P3 is recommended.

4U3/ Freshwater Invertebrates. The development and ecology of freshwater forms, with emphasis on arthropods of the region.
2 lec.; 1 lab.; (3); 2nd term.
Prerequisite: Registration in, or completion of, Biology 3M4.
Offered in 1978-79 and in alternate years.

4V3/ Virology. The viruses of animals, bacteria, and plants, with emphasis on the molecular biology of virus replication and the diversity of virus-cell interactions.
2 lec.; 1 tut.; (2); 2nd term.
Prerequisite: Completion of, or registration in, Biochemistry 3G6.

4W3/ Mycology. Structure and identification of fungi: physiology of their growth and reproduction; their environmental role.
2 lec.; 1 lab.; (3); 2nd term.
Prerequisite: Registration in, or completion of, Biology 3E3.

4X4/ Plant Taxonomy. Classification and nomenclature of the Angiosperms, with special reference to local flora. Laboratory periods include field studies with experience in identification.
2 lec.; 2 labs.; (2); first term.
Prerequisite: Biology 1D3 or 1D6.
Offered in 1979-80, alternating with Biology 4Z3.

4Y3/ Ecology of Inland Waters. Physical, chemical, and biological characteristics of fresh waters, including aspects of pollution.
2 lec.; 1 lab.; (3); 1st term.
Prerequisite: Biology 1D6 or 1E6 or six other units of Biology including Biology 1F3, and registration in Year III or IV of a B Sc. programme.

Canadian Studies

A combined B.A. Honours programme in Canadian Studies to be offered by the Faculties of Humanities and Social Sciences is under active consideration, and it is hoped that the programme may be introduced in September 1979. A number of Canadian Studies courses will be developed and existing courses which are relevant to those interested in Canadian Studies will be identified. Further information may be obtained from the Office of the Registrar or from the offices of the Faculties of Humanities and Social Sciences.

Chemical Engineering

Professors

R. B. Anderson
M. H. I. Baird
J. L. Brash
C. M. Crowe
A. E. Hamielec/Chairman
T. W. Hoffman
K. L. Murphy/part-time
L. W. Shemilt
D. R. Woods

Associate Professors

A. Benedek
I. Feuerstein
J. F. MacGregor
J. Vlachopoulos
J. D. Wright/part-time

CURRICULUM 1978-80

A minimum grade of ‘D’ is normally required for prerequisites specified for Chemical Engineering courses unless otherwise stated below. Special cases may be considered by the Department upon request. Enrolment in these courses by students in programmes other than Chemical Engineering, Chemical Engineering & Management or Honours Applied Chemistry may be limited.

2C3/ Information Management. How to obtain, interpret, store, retrieve, manipulate and communicate information. T.V. taping to improve verbal communication, computer programming, searching the literature, organization, treatment of data, and polishing. 1 lects., 2 tut. (3); first term; 1 tut. (3), second term. Prerequisite: Registration in Year II Chemical Engineering or Chemical Engineering & Management or permission of the Department.

2D4/ Chemical Engineering Principles I. Steady-state mass balances in chemical processes and the first law of thermodynamics. The behaviour of gases and liquids, and their physical equilibria. Recycle in steady state operation. 3 lects., 1 tut. (3); first term. Prerequisite: Registration in Year II Chemical Engineering, Chemical Engineering & Management or Applied Chemistry, or permission of the Department.

2F4/ Chemical Engineering Principles II. Combined mass and energy balances in the steady and unsteady state. The second law of thermodynamics and physical and chemical equilibria. 3 lects., 1 tut. (3); second term. Prerequisite: Chemical Engineering 2D4 or permission of the Department.

3A4/ Fluid Flow and Heat Transfer. The application of fluid mechanics to flow through packed beds, filtration, fluidization, etc. Heat transfer in chemical engineering systems. Steady and unsteady state conduction, natural and forced convection, radiant heat transfer, condensation of vapours and boiling. 4 lects.; second term. Prerequisite: Engineering 304, or Chemical Engineering 304; Chemical Engineering 2F4 or permission of the Department. Co-requisite: Chemical Engineering 3B3.

3B3/ Laboratory and Design. Problems, experiments, and projects, in statistics, fluid mechanics, heat transfer, and thermodynamics. 1 lab. (3); 1 calculation lab. (3); second term. Co-requisite: Chemical Engineering 3A4.

3D4/ Chemical Engineering Thermodynamics. Review of the total energy balance and mechanical energy balance. Theoretical and practical cycles, including throttling and refrigeration. Chemical reaction and phase equilibria of multicomponent systems, and deviations from ideality in the gas and liquid phase. 2 lects.; both terms. Prerequisite: Chemical Engineering 2F4 or permission of the Department.

3E3/ Process Model Formulation and Solution. Formulation of models for various chemical processing units in the steady and unsteady states. Techniques for numerical solution of model equations, including algebraic and ordinary differential equations, both linear and non-linear. 3 lects.; first term.
Prerequisite: Chemical Engineering 2F4, or permission of the Department.

304/ Fluid Mechanics. The laws of statics and dynamics in both compressible and incompressible fluids. Equations of conservation and motion, turbulence and boundary layer theory, applied to submerged and conduit flow. Similitude, unsteady flow, measuring devices, and fluid machinery. 3 lects., 1 tut. or lab. (3); first term. Prerequisite: Applied Mathematics 2J7 or 2J5.

356/ Transport Phenomena and Unit Operations. Heat, mass, and momentum transfer, and their application to the analysis and design of equipment in the chemical industry. Specifically intended for the industrial chemist. 3 lects.; both terms. Prerequisite: Chemical Engineering 2D4 and 2F4, or permission of the Department. Not open to students registered in Chemical Engineering or Chemical Engineering and Management.

4A5/ Transport Phenomena—Theory and Applications. Simultaneous heat and mass transfer, with and without chemical reaction, in binary and multicomponent systems for steady and unsteady state. Boundary layer theory for various geometries. Applications: basic design techniques for distillation, solvent extraction, gas absorption, humidification, and drying. 3 lects.; first term; 2 lects., second term. Prerequisite: Chemical Engineering 3A4 or permission of the Department.

4K4/ Reaction Kinetics and Reactor Design. Chemical kinetics, mechanisms of reactions, and derivation of rate equations from experimental data. Performance of ideal chemical reactors (batch/plug-flow and back-mix) with various reaction mechanisms. Non-ideal reactors: residence-time distributions, segregated flow, and maximum mixedness. Thermal stability and optimization of reactors. 2 lects.; both terms. Prerequisite: Chemical Engineering 2D4, 2F4 or permission of the Department.

4N4/ Cost Estimation and Process Development. The design and operation of chemical plants, and the creation and development of new processes using case studies. Design methodology, decision-making, reliability theory, project planning, cost estimation, time value of money, functional analysis, and a survey of optimization techniques. 2 lects.; both terms. Prerequisite: Registration in, or completion of, R-group courses in Year IV Chemical Engineering.


4R4/ Chemical Engineering Laboratory. Calculation classes and laboratory projects in transport phenomena, reaction kinetics and reactor design. 2 labs. (3); both terms. Prerequisite: Registration in, or completion of, R-group courses in Year IV Chemical Engineering or permission of the Department.

4S3/ Heterogeneous Catalysis. A survey of heterogeneous catalysis, including the preparation of catalysts and tools for investigating them, physical "absorption and chemisorption," the kinetics and mechanism of catalytic reactions, and commercial processes. 3 lects.; first term. Co-requisite: Chemical Engineering 4K4 or permission of the Department.

4T3/ Transport Processes in Biomedical Engineering. The use of analytical, experimental, and design principles, and chemical engineering skills for solving problems in biological flow systems, e.g., haemodynamics, extracorporeal oxygenator, artificial kidney, and artery disease. 3 lects.; first term. Prerequisite: Chemical Engineering 304 or Engineering 304, or permission of the Department.

4V3/ Air Pollution Control. The source and chemistry of air pollutants; measurement survey techniques and legal constraints; dispersion in the atmosphere; stack height calculations; pollution from vehicles. Design of processes for removal of pollutants. 2 lects., 1 tut.(2); first term. Prerequisite: Permission of the Department. To be offered in 1979-80 and in alternate years.

4W4/ Chemical Plant Design and Simulation. Projects, often in cooperation with industry, usually involve steady-state computer simulation of an existing process or design of a new process. Process equipment may be tested to develop simulation models. 1 project lab. (3), first term; 3 project labs. (3), second term. Prerequisite: Registration in, or completion of, R-group courses in Year IV Chemical Engineering, or permission of the Department.

4Y4/ Undergraduate Research Project. Research projects with students working on their own under the direction of a Faculty member. 1 lab. (3), first term; 3 labs (3), second term. Prerequisite: Registration in, or completion of, R-group courses in Year IV Chemical Engineering and first-class standing and permission of the Department.

Engineering 4U3/ Water and Wastewater Treatment Design. Offered jointly by the Departments of Chemical Engineering, Civil Engineering and Engineering Mechanics. See Engineering (General) for course description.

* The hours assigned can be freely scheduled to suit those involved in a particular project and may include computation classes, laboratory work, discussions, or individual study.

See also the Calendar of the School of Graduate Studies.

Chemistry

Professors
R. F. W. Bader
R. A. Bell
T. Birchall
A. N. Bourns
A. Corsini
D. R. Eaton
K. Fritze
R. J. Gillespie
R. P. Graham
G. W. King
C. J. Lock
D. B. MacLean/Chairman
J. J. McCullough
J. A. Morrison
D. P. Santry
I. D. Spencer
H. G. Thode
R. H. Toominson
J. Warkentin

Associate Professors
R. F. Childs
P. T. Dawson
J. E. Greedan
O. E. Hileman, Jr.
D. A. Humphreys
J. D. Laposa
M. J. McGlinchey
N. H. Westluk
A. J. Yarwood

Assistant Professors
G. A. MacAlpine
B. E. McCurry

W. H. C. Walker (Pathology)
CHEMISTRY

Teaching Fellows
A. D. Bain
S. H. Mehdi
C. N. Murphy
T. N. Ting

Senior Demonstrators
Nancy Fabian
J. Ozog

CURRICULUM 1978-80
For prerequisite purposes, a grade of "D" or better is required.

Course is not necessarily offered every session; consult the Chairman of the Department or a Dean of Science Studies.

1A7/ General Chemistry. An introduction to the principles of chemistry. The laboratory is designed to illustrate the lecture material, and co-ordinates with it.
3 lects., 1 tut. alternating 1 lab. (3); both terms.
Prerequisite: Registration in Natural Sciences I or Engineering I, or permission of the Chairman of the Department.

1A6/ General Chemistry. An introduction to the principles of chemistry. This course parallels Chemistry 1A7, but it involves less laboratory work and gives students a greater opportunity for individual study.
4 hrs. (2 lects., 2 tuts. or lab.); both terms.
Prerequisite: Level 5 (Grade 13) Chemistry or permission of instructor.
Open only to students in a part-time programme.

1B7/ General Chemistry. An introduction to the principles of chemistry. A course designed for students who are registered in Faculties other than Science or Engineering.
2 lects., 1 tut., 1 lab. (3); both terms.
Prerequisite: Level 5 (Grade 13) Chemistry, or Level 4 Chemistry with an overall Grade 13 average of at least 75%, or permission of the instructor. Not open to students in Natural Sciences I.

1C8/ General Chemistry. An introduction to the principles of chemistry. A course designed for students who do not have Level 5 (Grade 13) Chemistry consisting of Chemistry 1A7 with an additional tutorial.
3 lects., 1 tut., 1 lab. (3) every other week; both terms.
Prerequisite: Level 4 (Grade 12) Chemistry and registration in Natural Sciences I or Engineering I, or permission of the Chairman of the Department. Not open to students who have Level 5 (Grade 13) Chemistry.

2A4/ Analytical Chemistry I. An introduction to the basic principles of analytical chemistry, with particular emphasis on solution equilibria. Applications to classical methods of analysis.
2 lects., 2 labs. (3); second term.
Prerequisite: Chemistry 2T4, or registration in a programme in which Chemistry 2A4 is required.

2D4/ Introductory Organic Chemistry.
3 lects., 1 lab. (3); first term.
Prerequisite: Chemistry 1A7 or 1B7 or 1C8.

2F3/ Inorganic Chemistry. Chemistry 2F4 without the associated laboratory work.
3 lects.; first term.
Prerequisite: Chemistry 1A7 or 1C8. Not open to students in a programme in Chemistry.

2F4/ Inorganic Chemistry. A course designed for those who are not registered in Honours Applied Chemistry, Honours Chemistry, or Chemistry Major, Atomic, molecular, and crystal structure; valency and chemical bonding; comparative chemistry of the non-transition metals.
3 lects., 1 lab. (3); first term.
Prerequisite: Chemistry 1A7 or 1C8.

2M4/ Analytical Chemistry. An introduction to classical and modern analytical techniques with an emphasis on applications in Engineering.
1 lect., 1 lab. (3); both terms.
Prerequisite: Chemical Engineering 2D4, 2F4, either of which may be taken concurrently. Not open to students registered in Biochemistry or who have completed Chemistry 2X1 or 3K6.

2N4/ Analytical Chemistry. An introduction to classical and modern analytical techniques with emphasis on applications in Life Sciences.
1 lect., 1 lab. (3); both terms.
Prerequisite: Chemistry 2P4 or 2O5 or 2T4, any of which may be taken concurrently. Not open to students registered in Engineering or who have completed Chemistry 2X1 or 3K6.

Lect. and lab.
Text: Morrison and Boyd, Organic Chemistry (3rd ed.)
Prerequisite: Chemistry 1A6. Open only to students in a part-time programme.

Text: Morrison and Boyd, Organic Chemistry (3rd ed.).
3 lects., 1 lab. (3); both terms.
Prerequisite: Chemistry 1A7 or 1C8. Not open to students registered in Chemistry 258.

2P4/ Physical Chemistry. The states of matter; elementary principles of thermodynamics; chemical and physical equilibria; electrochemistry; rates of chemical reactions.
2 lects., both terms.
Prerequisite: Chemistry 1A7 or 1C8, and Mathematics 1A6 or 1C6.

2Q5/ Physical Chemistry. Basis of physical phenomena related to biological systems, including equilibria, transport, and kinetics.
2 lects., 1 lab. (3) or problem session (3) every other week; both terms.
Prerequisite: Chemistry 1A7 or 1C8, and Mathematics 1A6 or 1C6, which may be taken concurrently.

2S8/ Structure and Reactions of the Main Group Elements. Structure, stereochemistry, and reactions of organic and inorganic covalent compounds; structures of ionic solids; methods of structure determination.
3 lects., 1 lab. (3); both terms.
Prerequisite: Registration in a programme in which Chemistry 258 is required.

2T4/ Thermodynamics. An introduction to the basic principles of thermodynamics, with applications to physical and chemical equilibria in ideal and real systems.
3 lects. 1 lab. (3); first term.
Prerequisite: Chemistry 1A7 or 1C8; Mathematics 2G3, which may be taken concurrently.

2U3/ Quantum Chemistry. An introduction to the principles of quantum mechanics and their application in chemistry.
3 lects.; second term.
Prerequisite: Chemistry 1A7 or 1C8; Mathematics 2G3, 2O3, which may be taken concurrently.

2X1/ Qualitative Inorganic Analysis. A laboratory course on the identification of cations and anions in inorganic mixtures.
1 lab. (3); first term.
Prerequisite: Co-registration in Chemistry 2A4.

3A4/ Analytical Chemistry II. An introduction to separation techniques and modern instrumental methods of analysis.
3 lects., 1 lab. (3); first term.
Prerequisite: Chemistry 2A4.

3C4/ Chemical Kinetics. The rates of chemical reactions in gaseous, condensed, and interfacial systems, and the molecular processes by which reactions occur.
3 lects., 1 lab. (3); second term.
Prerequisite: Chemistry 3Y3.

2 lects., 1 lab. (3); both terms.
Prerequisite: Registration in a programme in which Chemistry 3D6 is required.

3E4/ Inorganic Chemistry. The properties, structures, and reactions of inorganic compounds, with emphasis on transition element chemistry.
2 lects.; both terms.
Prerequisite: Chemistry 2S8 and registration in Honours Biochemistry or Biochemistry Major.

3E6/ Inorganic Chemistry. The properties, structures, and reactions of inorganic compounds, with emphasis on transition element chemistry.
2 lects., 1 lab. (3); both terms.
Prerequisite: Registration in a programme in which Chemistry 3E6 is required.

3 lects.; second term.
Prerequisite: Chemistry 2S8; or 2O8 and 2F4.

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CHEMISTRY

3K3/ Analytical Chemistry. An introduction to modern analytical techniques.
1 lect., 2 labs. (3); second term.
Prerequisite: Chemistry 2F4 or 2Q5 or 2T4, any of which may be taken concurrently, and Chemistry 2A4 or 2M4 or 2N4. Not open to students who are registered in, or have completed, Chemistry 3A4 or 3K6.

3K6/ Analytical Chemistry. An introduction to classical and modern analytical techniques.
1 lect., 2 labs. (3); both terms.
Prerequisite: Chemistry 2F4 or 2Q5 or 2T4, any of which may be taken concurrently. Not open to students who are registered in, or have completed, Chemistry 2A4 or 3A4 or 3K3 or 2M4 or 2N4.

3Q4/ Inorganic Chemistry. A sequel to Chemistry 2F3 or 2F4. Transition metal complexes; application of physical techniques in inorganic problems.
3 lects., 1 lab. (3); second term.
Prerequisite: Chemistry 2F3 or 2F4 or registration in Honours Metallurgy and Materials Science or Metallurgy and Materials Science Major or Metallurgical Engineering.

3Q3/ Inorganic Chemistry. Chemistry 3Q4 without the associated laboratory. Not open to students in a programme in Chemistry.
3 lects.; second term.
Prerequisite: Chemistry 2F3 or 2F4.

3X2/ Applied Chemistry Summer Experience. A minimum of 12 weeks of practical experience in an industrial plant or a research laboratory, normally during the summer vacation preceding Year III, arranged through the Department in consultation with the Chairman. An essay embodying a report on this work and an evaluation of the experience is to be submitted not later than the last day of courses of the first term.
Prerequisite: Registration in Honours Applied Chemistry. Credit in this course is restricted to this programme.

3Y3/ Statistical Thermodynamics. An introduction to the principles of statistical thermodynamics and their applications in chemistry.
3 lects.; first term.
Prerequisite: Chemistry 2T4 and either Chemistry 2U3 or Physics 3M6. Physics 3M6 may be taken concurrently. Not open to students who are registered in, or have completed, Physics 3K3.

Chemical Engineering 3S6/ Transport Phenomena and Unit Operations.
The fundamentals of heat-, mass- and momentum-transfer, and their application to analysis and design of equipment in the chemical industry.
3 lects.; both terms.
Prerequisite: Chemical Engineering 2D4, 2F4 or permission of the instructor.

*4A3/ Advanced Organic Chemistry. A discussion of some modern advances in organic chemistry including such topics as aromaticity, molecular rearrangements, and organic photochemistry.
3 lects.; first term.
Prerequisite: Chemistry 3D6.

*4B3/ Chemical Applications of Spectroscopy. The applications of elementary group theory and spectroscopy to the solution of chemical problems, quantum states and spectra; theory of microwave, infrared, Raman, electronic, and magnetic resonance spectra; gas and tunable lasers.
3 lects.; first term.
Prerequisite: Registration in Year IV of an Honours or Major programme in Chemistry.

*4C3/ Solid State Chemistry. The structure and properties of solids, particularly crystalline solids; principles of structure, including non-stoichiometric and defect structures; associated chemical and physical properties. The growth and preparation of single crystals. Properties peculiar to solids, anisotropy, cooperative effects.
3 lects.; second term.
Prerequisite: Chemistry 2T4 or 2P4 or 2Q5, and registration in Year IV of an Honours or Major programme in Chemistry.

*4D3/ The Chemistry of Natural Products. The structural elucidation and synthesis of selected naturally occurring organic compounds.
3 lects.; second term.
Prerequisite: Chemistry 3D6.

*4E4/ Advanced Experimentation. A laboratory course emphasizing fundamental principles in chemistry using modern instrumental methods.
2 labs. (4); first term.
Prerequisite: Registration in Year IV of an Honours or Major programme in Chemistry.

*4F3/ The Physical Chemistry of Surfaces. The principles and applications of surface chemistry, including all interface types, capil-
Civil Engineering and Engineering Mechanics

Professors
A. C. Heidebrecht
W. James/part-time
M. Levinson
K. L. Murphy
G. A. Oravas
H. Robinson
A. A. Smith
W. K. Tso/Chairman
N. E. Wilson

Associate Professors
R. G. Drysdale
J. J. Emery
R. M. Korol
Y. P. Vaid

Assistant Professors
B. L. Allen
F. L. Hall

Lecturer
J. McLeod/part-time
B. T. Shin

Teaching Fellow
S. Bharathra

CURRICULUM 1978-80

A minimum grade of "D" is required for prerequisites specified for Civil Engineering courses. Special circumstances should be submitted to the Department for consideration.

2A2/ Surveying and Measurement. Introduction to measurement and computational techniques of surveying, the theory of measurement and errors, adjustment of observations. 1 lect., 1 lab. (5); first term. Prerequisite: Registration in Civil Engineering.

2B3/ Introduction to Civil Engineering. Topics will include: Design methodology, construction methods, earthwork quantities, and geo-technical aspects. Concrete mix design. A professional liaison programme with visits to engineering firms is also included, as is oral and written communication. 2 lects., first term; 1 lab. (3) every other week; both terms. Prerequisite: Registration in Civil Engineering.

2C4/ Structural Mechanics. Determine systems, stress resultants and deflection; virtual work, Castigliano's theorems, shear flow, combined bending, unsymmetrical bending, equivalent stresses; column buckling, beam columns, impact loading, structural proportioning. 3 lects., 1 lab. (3); second term. Prerequisite: Engineering 2P4.

2D3/ Geology for Engineers. Composition of the earth; minerals and rocks; weathering; erosion, transportation and deposition; engineering properties of rock; geologic structure; ground water; earth movements; subsurface exploration; map usage and aerial photo interpretation; site selection for engineering works; field trips. 2 lects., 1 lab. (3); second term. Prerequisite: Registration in Civil Engineering. Not open to students with credit in Geology 1A6 or 1B6.

3A3/ Geotechnical Engineering I. Composition and characteristics of soils; soil classification systems; site investigation; soil compaction; hydraulic characteristics of soils; flow nets and ground water; total and effective stresses; stresses and displacements, consolidation theory and settlement analysis. 2 lects., each week; 1 lab. (3) or (1) tut. (2), alternate weeks; first term. Prerequisite: Civil Engineering 2D3 or Geology 1A6 or 1B6.

3B3/ Geotechnical Engineering II. Shear strength characteristics and failure criteria for soils: direct shear, triaxial, plane strain, and field tests; earth pressure theory; lateral earth pressure on retaining walls, bearing capacity; introduction to shallow and deep foundations; introduction to slope stability and embankment design. 2 lects., each week; 1 lab. (3) or 1 tut. (2), alternate weeks; second term. Prerequisite: Civil Engineering 3A3.

3C4/ Structural Analysis. Indeterminate systems using methods of slope-deflection and moment distribution. Virtual work for trusses. Loading conditions and influence lines. An introduction to steel design. 3 lects., 1 lab (3); first term. Prerequisite: Civil Engineering 2C4.

3D4/ Reinforced Concrete Design. Introduction to concrete technology; design by working stress and by ultimate strength methods to insure adequate capacities for bending moment, shear and diagonal tension, axial force, bond and anchorage; consideration of practical design requirements; interpretation of building code, with regard to behaviour of structures. 3 lects., 1 lab (3); second term. Prerequisite: Civil Engineering 3D4.

3K3/ Introduction to Transportation Planning. Methods of predicting and planning for future transportation demand; basic concepts of traffic operations and control; design of transportation facilities; transportation systems evaluation. 2 lects., 1 tut. (2); first term. Prerequisite: Applied Mathematics 2J5 or permission of the Department.

3M4/ Hydraulics and Hydrology. Demand for water; water collection and distribution; flow in pipes and open channels. Hydraulic machines. Flow measurement. Hydrology; precipitation and runoff; recurrence intervals; unit hydrograph. 2 lects., 1 tut. 1 lab. (3); second term. Prerequisite: Civil Engineering 3C4.

3O4/ Civil Engineering Fluid Mechanics. Hydrostatics; kinematics of fluids; continuity equations. Hydrodynamics; conservation of energy and momentum; Bernoulli equation; turbulence and boundary layers; similarity and dynamic machinery; measuring devices; unsteady flow. Application to open channels and pipe flows. 3 lects., 1 tut. or 1 lab. (3); first term. Prerequisite: Applied Mathematics 2J5.

4A4/ Water Resources Engineering. Analysis of storms, snowmelt runoff, infiltration, hydrology of low-flows, storage-draft-frequency analysis, catchment models for floods, flood routing, spillway design, non-uniform flow, freeboard design, and hydro-economics. Use of interactive computer simulations of, and field trips to, the local water resources system. 3 lects., 1 lab. (2); first term. Prerequisite: Civil Engineering 3M4, or permission of the Department.

4B3/ Engineering Systems. Mathematical models and systems; project comparison; optimization; linear, non-linear and dynamic programming; simulation and computer-aided design. 2 lects., 1 lab. (3); second term. Prerequisite: Knowledge of Fortran programming, and permission of the Department.

4C3/ Environmental Protection. Environmental impact statement and procedures, economic-ecological tradeoff methods, cost-benefit analysis. Energy hydrological and great elemental cycles on the broad scale. Engineering aspects involving water control, solid waste treatment and disposal, recycling and resource management, building systems. Student groups will undertake specific research projects with Faculty guidance. 2 lects., 1 tut. (2); first term. Prerequisite: Engineering 2W4 or permission of the Department.

4D4/ Geometric Highway Design. Location and design of various types and classes of streets and highways. Theory and practice in design of intersections, interchanges, arterial highways, and freeways, in urban and rural areas, with consideration of alignment, cross sections, safety, traffic demand, right-of-way utilization, and environmental impact. 3 lects., 1 lab. (2); second term. Prerequisite: Civil Engineering 3K3, or permission of the Department.

4F3/ Traffic Engineering. Selected elements of operation and control of streets and highways. Analysis of traffic stream and vehicular characteristics affecting traffic flow. Intersection signalization and timing plans including strategies for area traffic control. Highway/freeway control and surveillance. Measurement and analysis of traffic data. 3 lects; first term. Prerequisite: Civil Engineering 3K3, or permission of the Department.

4G4/ Pavement Materials and Design. Components of highway pavement; ground water and drainage for highway facilities; soil compaction and stabilization; flexible culvert design; aggregates, bituminous materials, concrete mixes, flexible pavement design, concrete pavement design. 3 lects., 1 lab. (3); first term.
Prerequisite: Civil Engineering 3A3 and 3B3 or permission of the Department.

4H3/ Land Use and Transportation. An analysis of models of urban land use and urban growth, with particular reference to the interrelations between transportation systems and land use change.
3 lects.; first term.
Prerequisite: Civil Engineering 3K3 or permission of the Department. Same course as Geography 4H3.

4I3/ Design of Water Resources Systems. Investigation, planning, and design, of elements in a hypothetical development of a real river system, using primary government hydrographic and hydrotec data and maps. Such elements would include flood control, water supply, hydro-power, navigation, drainage, irrigation, recreation and municipal and biological aspects of watershed management. Role of conservation authorities and public bodies. The laboratory involves several site visits and design sessions using a library of computer programs.
2 lects., 1 lab. (2); second term.
Prerequisite: Civil Engineering 3M4 or permission of the Department.

2 lects., 1 tut. (2); second term.
Prerequisite: Registration in a Civil Engineering programme, or permission of the Department.

4K3/ Modern Methods of Structural Analysis. The development and application of matrix methods of structural analysis, covering primarily the displacement method, but also including the basic aspects of the force method. Introduction to the finite element method, dynamic properties, and stability considerations in structures.
2 lects., 1 tut. (2); first term.
Prerequisite: Civil Engineering 3G4.

2 lects., 1 tut. (2); first term.
Prerequisite: Civil Engineering 3M4 and 304 or permission of the Department.

4N4/ Design of Steel Structures. Elastic and plastic analysis and design of steel members and structures. Relationship of design specifications to the basic behaviour of structures. Use of design specifications as an aid to the solution of practical design problems. Concept of direct state design and plastic collapse.
2 lects., 1 lab. (3); second term.
Prerequisite: Civil Engineering 3G4.

4P3/ Mechanics of Materials. A course in stress analysis (as opposed to structural analysis). Elements of the theory of elasticity, advanced topics from among areas of energy principles, beam theory, and torsion, an introduction to theory of plates and shells.
3 lects.; second term.
Prerequisite: Civil Engineering 3G4.

4R4/ Structural Synthesis. Discussion of structural design process, gravity and lateral loading requirements, structural performance criteria, choice of structural systems. Approximate analysis of different structural systems, such as frames and shear walls, suitable for preliminary design. Analysis of actual buildings based on working drawings of the structures. Use of package computer programme for alternate design comparison.
3 lects., 1 lab. (3); first term.
Prerequisite: Civil Engineering 3G4, 3J4.

4S3/ Foundation Engineering. Principles of foundation design: bearing capacity, settlement, and location, footings, retaining structures; pile foundations; slope stability; embankment design and construction; groundwater control; grouting; geotechnical techniques and case histories.
2 lects., 1 tut. (2); second term.
Prerequisite: Civil Engineering 3B3.

3 lects., 1 lab. and/or tut. (2); second term.
Prerequisite: Civil Engineering 3J4.

4V3/ Water and Wastewater Treatment Design. Offered jointly by the Departments of Chemical Engineering, and Civil Engineering and Engineering Mechanics. The process capabilities, hardware and design equations of the physical, chemical, and biological processes, used to improve water. Emphasis on processes such as bio-oxidation, clarification,
2C3/ Roman Art. The architecture, sculpture, and painting of the Roman world. 
3 lects.; one term. 
Prerequisite: Open to students in Year II and above. 
Same as Art History 2C3.

2D3/ Greek and Roman Mythology. A study of the Greek and Roman myths, and the intellectual and spiritual climate in which they were fostered and developed, from the Mycenaeans Age to early Christian times. 
3 lects.; one term. 
Prerequisite: Open to students in Year II and above.

2E3/ Greek and Roman Drama. Reading of selected Greek and Roman tragedies and comedies. Lectures about the development of the drama, presentation of plays, the authors and their works, and the influence of classical drama on later drama. 
3 lects.; one term. 
Prerequisite: Open to students in Year II and above. 
Alternates with Classical Civilization 2F3. 
Same as Dramatic Arts 2E3.

2H3/ Greek Literature in Translation. A study of selected works representative of various genres: e.g. epic, drama, lyric, romance; and selections from the historians and philosophers. 
3 lects.; one term. 
Prerequisite: Open to students in Year II and above. 
Alternates with Classical Civilization 2J3.

2J3/ Roman Literature in Translation. A study of selected works representative of various genres: e.g. epic, drama, lyric, novel, and biography. 
3 lects.; one term. 
Prerequisite: Open to students in Year II and above. 
Alternates with Classical Civilization 2H3.

2K3/ Social Life and Thought of the Greeks and Romans. A description and analysis of selected aspects of the social life of Greece and Rome. The topics surveyed include work and leisure, slavery, marriage and family life, the role of women, religion, law, social structure, and social mobility. 
3 lects.; one term. 
Prerequisite: Open to students in Year II and above, except students who have completed Classical Civilization 3M3, 3N3, or 3O3.

2L3/ The Greek City: An Archæological Study. A study of the physical growth and development of the cities which became the focal point of society and culture in the Greek world. The chief topics will be the rise and fall of the principal centres of Cretan and Mycenaean culture, the emergence of the mature Greek cities, culminating in Athens in the 5th century, and subsequent urban development and city planning in the time of Alexander the Great and his successors. 
3 lects.; one term. 
Prerequisite: Open to students in Year II and above. 
Alternates with Classical Civilization 2M3.

2M3/ The Roman City: An Archæological Study. A study of the transformation of the city of Rome from an obscure village to a vast metropolis, the nature of city planning and urban life, and the patterns of urban development in Rome and her Empire. The study is based upon the evidence of monuments and architectural remains in Rome, Pompeii, and other surviving cities of the Empire in Europe, Africa, and Asia. 
3 lects.; one term. 
Prerequisite: Open to students in Year II and above. 
Alternates with Classical Civilization 2L3.

2P3/ Greek and Roman Background to Early Christianity. A description and analysis of selected Greek and Roman social and political institutions which helped to form the background to the life of early Christians and the New Testament writers. The topics surveyed include: the spread of the Greek language and culture; Roman provincial government and the Roman army, travel by land and sea, the life of major cities, education, and literature. 
3 lects.; one term. 
Prerequisite: Open to students in Year II and above. 
Alternates with Classical Civilization 2E3. 
Same as Religious Studies 2G3.

2Q3/ Greek and Roman Religion. A study of the role of religion in Greek and Roman public and private life. 
3 lects.; one term. 
Prerequisite: Open to students in Year II and above. 
Offered every third year, alternating with Classical Civilization 3E3 and 3K3. 
Same as Religious Studies 2H3.

3G3/ Greek and Roman Epic. A survey of epic poetry, including the origins, Homer and Greek epic, Vergil and Roman epic. 
3 lects.; one term. 
Prerequisite: Classical Civilization 1A6 or 2D3, or permission of the Department. 
Offered every third year, alternating with Classical Civilization 3J3 and 3L3.

3 lects.; one term. 
Prerequisite: Six units of Classical Civilization or History 1L6 or 2L6, or permission of the Department. 
Offered every third year, alternating with Classical Civilization 2G3 and 3K3.

3F3/ Archæic Greek Art. The painting, sculpture, and architecture of pre-Classical Greece (1000-480 B.C.). 
3 lects.; one term. 
Prerequisite: Classical Civilization 2B3 or Art History 2B3, or permission of the Department. 
Alternates with Classical Civilization 3G3. 
Same as Art History 3F3.

3G3/ Late Antiqua and Early Christian Art. The art and architecture of the later Roman Empire, and the birth of Christian art (A.D. 200-600). 
3 lects.; one term. 
Prerequisite: Classical Civilization 2C3 or Art History 2C3 or 2D6, or permission of the Department. 
Alternates with Classical Civilization 3F3. 
Same as Art History 3G3.

3J3/ Roman Satire. A study of Roman satire and its Greek precursors, the literary, social, political, and philosophical milieu in which satire originated and developed. Selected readings from Horace, Persius, Juvenal, Petronius, and others. 
3 lects.; one term. 
Prerequisite: Six units of Classical Civilization, or permission of the Department. 
Offered every third year, alternating with Classical Civilization 2G3 and 3E3.

3K3/ Education and Rhetoric in the Graeco-Roman World. A study of the theoretical and practical aspects of the education in eloquence which was standard in schools from antiquity until the 18th century. The influence of this education upon contemporary European literature and modern theories of literary criticism will be examined. 
3 lects.; one term. 
Prerequisite: Six units of Classical Civilization, or permission of the Department. 
Offered every third year, alternating with Classical Civilization 2G3 and 3E3.

3L3/ Greek and Roman Biography. The origins and development of biography, its relation to encomia and other literary genres, the problem of fact and interpretation. Readings in Plutarch and Suetonius. 
3 lects.; one term. 
Prerequisite: Six units of Classical Civilization or History 1L6 or 2L6, or permission of the Department. 
Offered every third year, alternating with Classical Civilization 3C3 and 3L3.

3M3/ Social Life and Thought in Periclean Athens. A description and analysis of selected aspects of the social life of Athens in the second half of the 5th century B.C., based upon contemporary literature, documents, and artifacts. Lectures will deal in greater depth with topics introduced in Classical Civilization 2K3, as well as others peculiar to Periclean Athens: work and leisure, education, religion, marriage and family-life, the roles of women, war and peace, social structure, and social mobility. 
3 lects.; one term. 
Prerequisite: Classical Civilization 2K3 and six additional units of Classical Civilization or History 1L6 or 2L6, or permission of the Department. 
Offered every third year, alternating with Classical Civilization 3N3 and 3O3.

3N3/ Social Life and Thought in Augustan Rome. A description and analysis of selected aspects of the social life of Rome at the end of the 1st century B.C. and the beginning of the 1st century A.D., based upon contemporary literature, documents, and artifacts. Lectures will deal in greater depth with topics introduced in Classical Civilization 2K3, as well as others peculiar to Augustan Rome: work and leisure, education, religion, marriage and family-life, the roles of women, war and peace, social structure, and social mobility. 
3 lects.; one term. 
Prerequisite: Classical Civilization 2K3 and six additional units of Classical Civilization or History 1L6 or 2L6, or permission of the Department. 
Offered every third year, alternating with Classical Civilization 3M3 and 3O3.
3C3/ Political Life and Thought of the Greeks and Romans. A description and analysis of selected aspects of the political life of Greece and Rome. The topics surveyed include forms of government (aristocracy, tyranny, democracy), electoral systems, parties and policies, political dissent, and the theory and practice of political change.

Prerequisite: Classical Civilization 2K3 and six additional units of Classical Civilization or History 1L6 or 2L6, or permission of the Department.

Offered every third year, alternating with Classical Civilization 3M3 and 3N3.

4F3/ Supervised Study. In consultation with members of the Department of Classics students will choose programme areas for study with a view to synthesizing the work of previous years.

Tuts., one term.

Prerequisite: Registration in Year IV of Honours Classical Civilization or an Honours programme including Classical Civilization.

ENGLISH AND CLASSICS

4A3/ The Classics and English Literature. A course devoted to an exploration of the influences of classical literature upon English writers from mediaeval to modern times, and conducted jointly by the Departments of Classics and English.

1 lect., first term; 1 seminar (2 hrs.), second term.

Prerequisite: Registration in Years III or IV of a programme including English, Classics, Classical Civilization, Latin, or Greek, or permission of the Departments.

The following courses in the field of Classical Civilization are offered by the Department of History:

History 1L6/ Ancient History
History 2L6/ Greece and Rome
History 3D6/ Roman History 264 B.C.-A.D. 117
History 3L6/ The World of Ancient Greece
History 4D6/ Special Topics in Greek History
History 416/ Special Topics in Roman History

The following courses in the field of Classical Civilization are offered by the Department of Philosophy:

Philosophy 2A6/ Ancient Greek Philosophy
Philosophy 3E3/ Plato
Philosophy 3J3/ Aristotle

The following courses in the field of Classical Civilization are offered by the Department of Religious Studies:

Religious Studies 2E6/ The Beginnings of Christianity
Religious Studies 3H13/ The Triumph of Christianity
Religious Studies 303/ The Fourth Gospel
Religious Studies 306/ Western Religious Thought—Development of the Christian Traditions between 100 and 800
Religious Studies 3X3/ The Letters of Paul

GREEK

BEGINNERS' LANGUAGE COURSE

126/ Beginners’ Intensive Greek. A rapid introduction to the grammar of Ancient Greek. Passages of simple Greek are read in the second term.

5 hrs. (lects. and tuts.); both terms.

Prerequisite: Open.

INTERMEDIATE AND ADVANCED LANGUAGE AND LITERATURE COURSES

1A6/ Introduction to Greek Studies. Selected readings from the Apology of Plato and the Persian Wars of Herodotus.

3 lects.; 1 tut; both terms.

Prerequisite: Grade 13 Greek, Greek 1Z6, or permission of the Department.

2A3/ Plato Selected readings from the Republic of Plato.

3 lects.; one term.

Prerequisite: Greek 1A6, or Greek 1Z6 with a mark of at least 75.

2B3/ Homer. Selected readings from the Odyssey.

3 lects.; one term.

Prerequisite: Greek 1A6, or Greek 1Z6 with a mark of at least 75.

3A6/ Greek Tragedy. Selected readings from the tragedies of Aeschylus, Sophocles, and Euripides.

3 lects.; both terms.

Prerequisite: Greek 2A3 and 2B3, or permission of the Department.

Alternates with Greek 4D6.

3C3/ Thucydides, and Language Study. Selected readings from the Peloponnesian War; advanced language study.

3 lects.; 1 tut.; one term.

Prerequisite: Registration in Years III or IV of Honours Classics or an Honours programme including Greek, or permission of the Department.

Alternates with Greek 4F3.

3D3/ Plato and Aristotle. Selected readings from works on literary criticism.

3 lects.; one term.

Prerequisite: Greek 2A3 and 2B3, or permission of the Department.

Alternates with Greek 3A6.

4E3/ Demosthenes, and Language Study. Selected readings from the speeches; advanced language study.

3 lects.; 1 tut.; one term.

Prerequisite: Registration in Years III or IV of Honours Classics or an Honours programme including Greek, or permission of the Department.

Alternates with Greek 3C3.

4F3/ Greek Comedy. Selected readings from the comedies of Aristophanes and Menander.

3 lects.; one term.

Prerequisite: Greek 2A3 and 2B3, or permission of the Department.

Alternates with Greek 3F3.

NEW TESTAMENT AND KOINE GREEK


4 lects. both terms.

Prerequisite: Open

Same as New Testament 186 (See Divinity College Calendar).


3 lects.; both terms.

Prerequisite: Greek 1D6

Same as New Testament 386. (See Divinity College Calendar).

LATIN

BEGINNERS' LANGUAGE COURSE

126/ Beginners’ Intensive Latin. A rapid introduction to Latin, normally intended for students with no Latin or students who have not completed Grade 13 Latin. The study of grammar is followed by the reading of simple prose passages and selections from the speeches of Cicero.

5 hours (lects. and tuts.); both terms.

Prerequisite: Open

NOTE: This course, with a mark of at least 75, is accepted as a prerequisite for admission to any Honours programme which includes Latin and Pass Latin.

INTERMEDIATE AND ADVANCED LANGUAGE AND LITERATURE COURSES

1A6/ Introduction to Latin Studies. Selected readings from the poems of Catullus and the Odes of Horace.
For Graduate Courses see Calendar of School of Graduate Studies.
2D3/ Computer-Aided Quantitative Analysis. Introduction to deter-
ministic and probabilistic techniques in management science with a
strong emphasis on computer-aided solution of practical
problems. Descriptive statistics and computer programming in
BASIC on the HP 2000 time shared system. Introductory proba-
bility, random variables, discrete and continuous probability dis-
tributions.
3 lects.; one term.
Prerequisite: At least "C" in each of the Business 1 Mathemat-
ics requirements and registration in Commerce.

2E3/ Computer-Augmented Statistical Analysis. Based on the analy-
tical and programming skills developed in 2D3, this course has
as its goal the application of statistical analysis to managerial
decision making. The concepts of statistical analysis are ap-
plied to a variety of topics, including decision making, estima-
tion by sampling, hypothesis testing, analysis of variance, sim-
ple linear and multiple regression and forecasting.
3 lects.; one term.
Prerequisite: At least "C" in Commerce 2D3 or equivalent course(s)
in the Eng./Mgt. programme.

3A3/ Financial Accounting II. A first course in intermediate financial
accounting dealing with the theory and practice of financial
statement preparation and reporting, asset valuation and the
basics of intercorporate investments.
3 lects.; one term.
Prerequisite: At least "C" in Commerce 2B3.

3B3/ Introduction to Marketing. Introduction to marketing as a field
of study, market structure, marketing institutions, marketing
concepts and strategies. Stress is placed upon the analytical,
managerial, and conceptual aspects of the subject.
3 lects.; one term.
Prerequisite: At least "C" in Economics 1A6 or 1B6.

3D3/ Introduction to Managerial Finance. An introduction to the na-
ture and administration of the finance function. The emphasis is
on the development of basic concepts pertaining to the invest-
ment problem in asset management, and the financing problem
in short and long-range sources of funds, capital structure, and
dividend policy. Analytical and theoretical constructs are dis-
cussed in, and applied to, actual case situations.
3 lects.; one term.
Prerequisite: At least "C" in Commerce 3K3.

3E3/ Production. This course provides an introduction to production
management with emphasis on the production function in the
industrial context. Concepts and techniques of quantitative
analysis are used extensively. Topics include: characteristics of
the production process, product design, process selection,
plant layout, planning and scheduling of manufacturing, inven-
tory control, and quality control.
3 lects.; one term.
Prerequisite: At least "C" in Commerce 2E3 or equivalent course(s)
in the Eng./Mgt. programme.

3F3/ Industrial Relations. This course focuses on the structure and
process whereby labour, management and the public interact to
produce terms and conditions of employment. A major objective
is to provide students with analytical tools for evaluating indus-
trial relations problems and issues. Among the topics covered
will be the development, structure and objectives of organized
labour, management philosophy and policy in industrial rela-
tions and governmental policy in the labour market.
3 lects.; one term.
Prerequisite: At least "C" in Economics 2G3 and Economics 2H3.

3G3/ Cost and Managerial Accounting II. A consideration of more
complex topics in inventory valuation and management plan-
ning and control including cost allocations, performance evalu-
analysis, analysis and investigation of variances, cost behaviour
determination, and income measurement for management.
3 lects.; one term.
Prerequisite: At least "C" in Commerce 2B3.

3H3/ Management Information Technology. The fundamental tech-
nology of information-processing devices especially the elec-
tronic digital computer. The course will have two major objec-
tives: First, to provide a general orientation to the computer and
its use in Business (data processing concepts, equipment, sys-
tems analysis, applications); second, to provide a working
knowledge of a programming language through its use in busi-
ness applications.
3 lects.; one term.
Prerequisite: At least "C" in Commerce 2E3 or equivalent course(s)
in the Eng./Mgt. programme.

3K3/ Financial Instruments and Institutions. Students are exposed to
the range of financial instruments traded in Canadian capital
markets and the functions and macroeconomic effects of the
financial institutions involved. Topics include: monetary theory
and policy, financial instruments, banking and credit arrange-
ments, the brokerage function and the impact of financial insti-
tutions on corporate financial management.
3 lects.; one term.

Prerequisite: At least "C" in Economics 2H3 and Commerce 2B3.

3L3/ Financial Accounting III. A second course completing the cov-
erage of intermediate financial accounting which deals with par-
ticular problems of liability valuation, accounting for income
taxes, corporate equities and general financial statement analy-
sis.
3 lects.; one term.
Prerequisite: At least "C" in Commerce 3A3.

NORMALLY SECTION SIZE IN 4TH YEAR COMMERCE COURSES WILL
BE RESTRICTED TO A MAXIMUM OF 30 STUDENTS: STUDENTS WILL
BE ADMITTED ON A FIRST-COME BASIS.

4A3/ Auditing. An examination of the attest function in accounting
including ethical, legal, and statutory influences in the develop-
ment of auditing standards. The nature of control structures
and of audit evidence is examined. The nature, scope, and
application of auditing procedures are examined through a
selective analysis of asset, liability, revenue, and expense items.
2 lects.; one term.
Prerequisite: At least "C" in Commerce 3L3, and registration in
either Year IV Commerce or the Eng./Mgt. programme.

4B3/ Business Policy. This course builds upon, and integrates, the
students' knowledge of the functional areas of business. Var-
ious management practices in specific corporate situations are
compared, and several theories of management strategy formu-
lation at different stages of corporate development are exami-
ned.
2 lects.; one term.
Prerequisite: Registration in either Year IV Commerce or the
Eng./Mgt. programme.

4C3/ Securities Analysis. The emphasis is upon the analysis of mar-
ketable securities, especially equities. Topics include: the me-
chanics of the secondary markets, the investment characteris-
tics of securities, investment strategies to improve rates of re-
turn, and the techniques of securities analysis and valuation.
In addition, the course introduces portfolio considerations and the
"efficient markets" literature.
2 lects.; one term.
Prerequisite: At least "C" in Commerce 3D3, and registration in
either Year IV Commerce or the Eng./Mgt. programme.

4D3/ Accounting Information Systems. Consideration of the princi-
ples underlying the role of accounting as an information system
for planning and controlling business operations. Topics in-
clude accounting information and its uses, techniques of de-
signing information systems, problems of internal control, and
design, installation, and control, of computer-based information
systems.
2 lects.; one term.
Prerequisite: At least "C" in Commerce 2B3 and 3H3 and regis-
tration in either Year IV Commerce or the Eng./Mgt. pro-
m. programme.

4E3/ Analysis of Production Problems. Analysis of industrial opera-
tions with emphasis upon the methods useful to production
management in making economic decisions. Presentation of
normal methods of analyzing the role of control in production
planning and control.
2 lects.; one term.
Prerequisite: At least "C" in Commerce 3E3 and registration in
either Year IV Commerce or the Eng./Mgt. programme.

4F3/ Taxation. The principles of Canadian federal income taxation
are examined in considerable detail through a reading of both
the statute law and the common law. Emphasis is placed upon
the application of the law to the situations of individuals and
businesses. Topics include: Administration, liability for income
tax, computation of income, computation of taxable income,
and computation of tax.
2 lects.; one term.
Prerequisite: At least "C" in Commerce 3A3 and 3D3, and regis-
tration in either Year IV Commerce or the Eng./Mgt. pro-
m. programme.

4H3/ Advanced Canadian Income Taxation. This course continues
the study of Canadian federal income taxation with an in-depth
coverage of selected provisions of the Income Tax Act pertain-
ing to business activities, particularly the activities of corpora-
tions.
2 lects.; one term.
Prerequisite: At least "C" in Commerce 4F3 and registration in
either Year IV Commerce or the Eng./Mgt. programme.

4I3/ Organizational Psychology. The course introduces students to
a number of behavioural science concepts concerning human
behaviour in organizations. Major topics include individual dif-
fences, motivation, learning, communication and problem
solving in small groups. Attention is also given to the structure
and design of organizations and to the managerial function.
COMMERCE

4U3/ Behavioural Issues in Management. An advanced course focusing on the structure and design of organizations; organizational communications; group processes; employee performance and satisfaction; leadership and decision-making; and management of change and conflict. Selected case histories are analyzed and discussed. The emphasis of the course is on applying behavioural concepts in a managerial context.

2 lects.; one term.
Prerequisite: Registration in Year IV Commerce or the Eng./Mgt. programme.

4V3/ Quantitative Analysis for Business. An introduction to the techniques of management science and their application to business problems. Topics include linear programming, integer programming, decision analysis and computer simulation.

2 lects.; one term.
Prerequisite: At least “C” in Commerce 4S3, and registration in either Year IV Commerce or the Eng./Mgt. programme.

4W3/ Financial Accounting IV. An advanced accounting course considering specific problems of accounting for the corporate entity, such as, business combinations, intercorporate investments, consolidated financial statements, accounting for foreign operations and foreign currency transactions, segment reporting.

3 lects.; one term.
Prerequisite: At least “C” in Commerce 3L3 and registration in either Year IV Commerce or the Eng./Mgt. programme.

4X3/ Seminar in Accounting Theory. A review of accounting theory as a background for applying underlying concepts to current accounting problems. Emphasis is on current literature, with a major term paper required.

2 lects.; one term.
Prerequisite: At least “C” in Commerce 3L3, and registration in either Year IV Commerce or the Eng./Mgt. programme.

4Y3/ International Business. A survey of theories, concepts, and corporate strategies relevant to the actual conditions and problems of international investment, trade, finance, and other related areas. Topics include balance of payments, foreign exchange, political risk, joint venture, global strategy, international personnel, and international development.

2 lects.; one term.
Prerequisite: At least “C” in Commerce 3B3 and registration in either Year IV Commerce or the Eng./Mgt. programme.

4Z3/ Collective Bargaining. A survey of the nature, determinants, and impact of collective bargaining in Canada. Both the procedural and substantive aspects of collective bargaining will be studied.

2 lects.; one term.
Prerequisite: At least “C” in Commerce 3F3, and registration in either Year IV Commerce or the Eng./Mgt. programme.

4A3/ Personnel. An introduction to the principal issues in the administration of personnel. Administrative and research aspects of the selection, placement, remuneration, training, and promoting of people in organizations are examined.

2 lects.; one term.
Prerequisite: At least “C” in Commerce 3F3 or Economics 3D3, and registration in either Year IV Commerce or the Eng./Mgt. programme.

4B3/ Personnel Selection. This course considers the strategies and problems in personnel decisions in the context of the Canadian environment. Topics include job analysis and manpower plan-

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Comparative Literature

CURRICULUM 1978-80

3B3/ Introduction to Comparative Literary Studies. General and comparative literary theory; selected methodological approaches in literary criticism; application of theory and methods to representative texts chosen from various literatures in translation. 2 lects., 1 tut., one term. Prerequisite: Registration in Year III or IV of any programme in language or literature, or permission of the co-ordinator.

Comparative Literature

Dramatic Arts

Courses and programmes in Dramatic Arts and Film at McMaster University are supervised and co-ordinated by an interdisciplinary Committee on Dramatic Arts. Students who plan to register in a programme in Dramatic Arts must consult the Chairman of the Committee before selecting courses.

Committee of Instruction
B. Blakey (French)
A. Brennan (English)
J. D. Browning (Spanish)
C. Denton (Film)
D. J. M. Duncan (English)
Nathalie D. Emmett (Acting)
A. D. Hammond (English)
R. M. Hill (Dance)
Christine Knight (Acting)
B. A. W. Jackson (English)
A. G. McKay (Classics)
Elaine F. Nardocchio (French)
G. Petrie (Film)
B. S. Pocknell (French)/Chairman
D. M. Shepherd (Classics)
R. L. Van Dusen (German)
R. W. Vince (English)/Chairman

CURRICULUM 1978-80

At least “D” is required in all courses listed under “prerequisite”, unless otherwise indicated.

1A6/ The History of Theatrical Art. An historical survey of theatre from Aeschylus to Ostrovsky, focusing on the range in form and style in Western drama, and including a consideration of performance. 2 lects., 1 tut., both terms. Prerequisite: Open to students in Years I and II only.

2A5/ An Introduction to the Actor’s Craft. Workshops in body movement, dance, mime and mask; voice and speech; explorations in acting methods. 2 studio practice (2½ hrs.); both terms. Prerequisite: Registration in a programme in Dramatic Arts or permission of the instructor after audition.

2A3/ An Introduction to the Actor’s Craft. Similar to Dramatic Arts 2A6, but requiring one-half the number of hours of instruction. Prerequisite: Registration in a programme in Dramatic Arts or permission of the instructor after audition. Offered in Summer Session Only.

2B6/ The Development of English Drama. English drama from the mediaeval period to the close of the 18th century (excluding Shakespeare). 3 lects., both terms. Prerequisite: Registration in an Honours programme in English, or permission of the Department. Same as English 2B6.

2B3/ The Development of English Drama I. The first half of Dramatic Arts 2B6. English drama from the mediaeval period to about 1610, excluding Shakespeare, with emphasis on Marlowe and Jonson. 3 lects., one term. Prerequisite: Registration in an Honours programme in English, or permission of the Department. Same as English 2B3.

2E3/ Greek and Roman Drama. Reading of selected Greek and Roman tragedies and comedies. Lectures about the development of the drama, presentation of plays, the authors and their works, and the influence of classical drama upon later drama. 3 lects., one term. Prerequisite: Open to students in Years II, III, and IV. Offered in alternate years. Same as Classical Civilization 2E3.

2F3/ Opera. An analysis of selected operatic works in their historical context, with a view to determining the nature and limitations of opera as a theatrical form. 1 lect.; first term; 2 lects., second term. Prerequisite: Dramatic Arts 1A6 or permission of the instructor. A knowledge of the rudiments of music is desirable, but not essential. Same as Music 2F3.

2G3/ Introduction to Theatre History. A survey of theatre history from the Greeks through the 19th century, with special attention to sources and basic reference material. 1 seminar (2 hrs.); one term. Prerequisite: Dramatic Arts 1A6 or permission of the instructor.

2X6/ The Art of the Film. The film as a medium for artistic expression, as seen in the work of major European and American directors. 1 lect., 1 tut., plus one weekly evening film screening; both terms. Prerequisite: Permission of the department (limited enrolment).

3A6/ Styles of Acting. The study and practice of styles of acting in classic and period theatre and dance, from the Greeks through the 18th century. 2 studio practice (2½ hrs.); both terms. Prerequisite: Dramatic Arts 2A6 or 2A3, or permission of the instructor.

3A3/ Styles of Acting. Similar to Dramatic Arts 3A6, but requiring one-half the number of hours of instruction. Prerequisite: Dramatic Arts 2A6 or 2A3, or permission of the instructor. Offered in Summer Session only.


3C3/ Modern European Drama in English Translation. A study of representative plays by modern European dramatists from Ibsen to the present. 1 seminar (2 hrs.) plus playreadings; one term. Prerequisite: Dramatic Arts 1A6 or permission of the instructor.

3E3/ Shakespeare: Selected Plays. Study of a representative selection of plays. 3 lects.; one term. Prerequisite: Dramatic Arts 1A6 or English 1A6 or 166. Not available to students who have standing in Dramatic Arts/English 3K4 or 3K6. Same as English 3E3.

3K6/ Shakespeare. An extensive critical reading and discussion of selected plays. 3 lects., both terms. Prerequisite: Registration in an Honours programme in English, or permission of the Department. Not available to students with standing in English 3K4. Same as English 3K6.

3P3/ Modern Drama in English. A representative selection of plays by modern British, Irish, and North American dramatists will be examined in order to study the relationship between drama and society in our age, as well as conventions and experiments in the contemporary theatre. 3 lects.; one term. Prerequisite: Dramatic Arts 1A6 or English 1A6 or 166. Same as English 3P3.

3R6/ Studies in the American Film. A survey of some of the predominant features of the American cinema, approached from a thematic, rather than a chronological perspective. 1 lect., 1 tut., plus one weekly evening film screening; both terms. Prerequisite: Permission of the department (limited enrolment).
3Y3/ French Cinema. A survey of French film from 1896 to the present day, with particular emphasis upon such major figures as Renoir, Clair, Brasson, Truffaut, and Resnais.
1 lec., 1 tut., plus one weekly evening film screening; one term.
Prerequisite: Permission of the department (limited enrolment). Same as French 3Y3.

4A6/ Principles of Stage Directing. An examination of, and experimentation in, various theories of staging and interpretation; the study of visual concepts of theatre; rudiments of technical stagecraft.
2 studio practice (2 1/2 hrs.); both terms.
Prerequisite: Dramatic Arts 3A6 or 3A3 or permission of the Instructor.

4B3/ Topics in Theatre History: Independent Study (I). Students who wish to undertake independent study in one of the following areas must consult the Chairman of the Committee on Dramatic Arts prior to registration: Medieval Theatre, Elizabethan Theatre, Spanish Golden Age Theatre, Renaissance and Baroque scene design; Modern European Theatre.
One term.
Prerequisite: Dramatic Arts 2G3 or permission of the Chairman of the Committee of Instruction.

4BB3/ Topics in Theatre History: Independent Study (II). Students who wish to undertake independent study in one of the following areas, which must be different from that selected for 4B3, must consult the Chairman of the Committee on Dramatic Arts prior to registration: Medieval Theatre, Elizabethan Theatre, Spanish Golden Age Theatre, Renaissance and Baroque scene design; Modern European Theatre.
One term.
Prerequisite: Dramatic Arts 4G3.

1 lec., 1 tut., (2 hrs.); one term.
Prerequisite: Registration in Year III or IV of a programme in Dramatic Arts or permission of the instructor.

4D3/ Special Studies in Dramatic Literature. 1978-79. Comedy. An examination of comedy and comic theory from a variety of periods and cultures in an attempt to define the genre.
1 lec., 1 seminar (2 hrs.); one term.
1979-80. Topic to be announced.
Prerequisite: Registration in Year III or IV of a programme in Dramatic Arts or permission of the Instructor.
Note: 4D3 may be repeated, if on a different topic, to a total of six units.

4G3/ Perspectives in Dance – A Cultural Survey. A survey of dance in selected cultures, studying its role in ritual, in art and in theatre.
3 hrs. (lec., seminars); one term.
Prerequisite: With permission of the Instructor, this may be taken as an elective for B.A. credit by undergraduates not in Physical Education.
Same as Physical Education 4G3. Alternates with Dramatic Arts 4J3.

4J3/ Perspectives in Dance – Dance in Contemporary Society. A study of dance forms in the 20th century. Students will view films, dance performances and participate in dance work shops.
3 hrs. (lec., seminars); one term.
Prerequisite: With permission of the Instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.
Same as Physical Education 4G3. Alternates with Dramatic Arts 4J3.

ECONOMICS

Students are advised to consult the Department for more detailed information on current offerings.

A 50% minimum is required in all prerequisite courses, unless a higher grade is specified.

1A6/ Introductory Economics. An introduction to the method and theory of economics, and their application to the analysis of contemporary economic problems.
3 hrs.; both terms.
Prerequisite: Open, except to students enrolled in Economics 1B6.

1B6/ Introductory Economics. Economic concepts and methods introduced and used through analysis of two issues such as inflation or pollution. (As preparation for further work in economics, equivalent to Economics 1A6).
3 hrs., 2 lec., 1 tut.; both terms.
Prerequisite: Open except to students enrolled in Economics 1A6.
Enrolment is limited. Not offered 1978-79.

2B3/ Introduction to Analysis of Economic Data. Descriptive analysis of economic data with attention to Canadian sources. Topics include index numbers, descriptive simple and multiple regression.
3 hrs., one term.
Prerequisite: At least 55% in Economics 1A6 or 1B6; an average of at least 55% in Mathematics 1K3 and 1L3.

2G3/ Intermediate Price Theory. Elements of consumer behaviour; production and cost, price and output determination under various market structures; employment of inputs.
3 hrs.; one term.
Prerequisite: Economics 1A6 or 1B6, and an average of at least 55% in Mathematics 1K3 and 1L3, or permission of the Department. Not open to students receiving credit for 2L5.

2H0/ Intermediate Income and Employment Theory. Elements of national accounting; basic models of income determination.
3AA/ Advanced Economic Theory
2K/ Economic History of Canada. The changing structure of the Canadian economy; early significance of primary product exports; emerging domestic markets and industrialization; government's role in developing the national economy.
3 hrs.; both terms.
Prerequisite: Economics 1A6 or 1B6. Students may choose this course as part of their Year III or IV programmes.

2L/ Intermediate Microeconomics. Consumer behaviour; production and cost; price and output determination under various market structures; factor pricing and distribution of factor payments; general equilibrium; welfare economics.
3 hrs.; both terms.
Prerequisite: Economics 1A6 or 1B6, and an average of at least 55% (or concurrent registration with permission of the instructor) in Mathematics 1K3 and 1L3; or permission of the Department. A student receiving credit for Economics 2L3 may receive only 3 additional units of credit for Economics 2L6.

2M/ Intermediate Macroeconomics. National income accounting and related problems; income determination with money and labour markets; monetary and fiscal policy and economic fluctuations, emphasizing Canadian economic problems.
3 hrs.; both terms.
Prerequisite: Economics 1A6 or 1B6, and an average of at least 55% (or concurrent registration with permission of the instructor) in Mathematics 1K3 and 1L3; or permission of the Department. A student receiving credit for Economics 2M3 may receive only 3 additional units of credit for Economics 2M6.

3A/ Advanced Economic Theory I. Static optimization and comparative statics in the context of the theory of the firm and consumer.
3 hrs.; one term.
Prerequisite: Mathematics 1M3 and an average grade of at least 70% in Economics 2L6 and 2M6; or permission from the Department. Not open to students claiming credit for Economics 3A6.

3A3/ Advanced Economic Theory II. Comparative static and dynamic analysis of macroeconomic models.
3 hrs.; one term.
Prerequisite: Economics 3A3 or permission of the Department. Not open to students claiming credit for Economics 4D6.

3B/ Public Finance. The economics of the public sector. Topics covered include: the role of government; taxation of income, expenditure and wealth; intergovernmental fiscal relations; government budgeting.
3 hrs.; one term.
Prerequisite: Economics 2G3 or 2L6. Not open to students receiving credit for Economics 3C6.

3C/ Public Finance. Theory and practice of public finance with special reference to Canada. Topics include: government expenditure criteria; fiscal policy; taxation of income, wealth and expenditure; intergovernmental fiscal relations.
3 hrs.; both terms.
Prerequisite: Economics 2G3 or 2L6. Economics 2H3 or 2M6. A student who has credit for Economics 3B3 may receive only three additional units of credit for Economics 3C6.

3D/ Labour Economics. Introduction to the economics of the labour market, demand for labour in the firm and industry; supply of labour by the individual; investment in human capital.
3 hrs.; one term.
Prerequisite: Economics 2G3 or 2L6; Economics 2H3 or 2M6.

3E/ Topics in Labour Economics. Topics will vary from year to year. The following are given as examples: economic goals and effects of unions; labour mobility; labour force participation; wage differentials; discrimination; unemployment.
3 hrs.; one term.
Prerequisite: Economics 3D3, and Economics 2B3 or 306; or permission of the instructor. Not offered 1979-80.

3G/ Radical Critiques of Economic Theory. An examination of critiques of orthodox economics and a consideration of the validity and relevance of proposed radical alternatives.
3 hrs.; one term.
Prerequisite: Economics 2G3 or 2L6. Not offered 1979-80.

3H/ International Economics. International finance, emphasizing balance of payments and economic problems of an open economy with special reference to Canada; the international financial system and proposals for its reform.
3 hrs. (lects. and seminars), one term.
Prerequisite: Economics 2H3 or 2M6. Not open to students receiving credit for Economics 4B6.

3I/ Economic History of the United States. The development of the U.S. economy from colonial times to the present; the role of exports; growth and structural change; the emergence of the national market; the rise of manufacturing and the corporation; technological change.
3 lects., one term.
Prerequisite: Economics 1A6 or 1B6.

3J/ Economic Development. Analysis of economic backwardness within countries as viewed mainly, but not exclusively, from an economic perspective; contemporary theory and policy concerning promotion of economic and social development.
3 hrs.; both terms.
Prerequisite: Economics 2G3 or 2L6, and Economics 2H3 or 2M6.

3 hrs.; both terms.
Prerequisite: Economics 2G3 or 2L6, and Economics 2H3 or 2M6; or permission of the instructor.

3L/ Marxist Economics. An examination of the foundations of marxist economic thought; marxism as a theory of the capitalist system; the place of marxian doctrine in contemporary economic analysis.
3 lects.; one term.
Prerequisite: Economics 2G3 or 2L6. Not offered 1979-80.

3M/ Economic History of Britain from 1750. The development of the British economy; the Industrial Revolution; population; trade unions; business organization; transportation; finance; trade; migration; capital movements; the role of government.
3 hrs. (lects. and seminars), both terms.
Prerequisite: Economics 1A6 or 1B6.

3N/ Industrial Organization and Public Policy. The structure, conduct and performance of industrial markets, with emphasis upon the problems and methods of maintaining effective competition. Seminars on selected topics.
3 hrs. (lects. and seminars); both terms.
Prerequisite: Economics 2G3 or 2L6. A student who has credit for Economics 3S3 may receive only three additional units of credit for Economics 3N6.

3O/ Economic Statistics. Statistical analysis as a basic research technique in economics; emphasizing estimation and statistical inferences, including linear regression models. Applications are drawn from micro and macroeconomics.
3 lects.; both terms.
Prerequisite: An average of at least 65% in Mathematics 1K3, 1L3 and 1M3 (or completion of Mathematics 1A6 and 1B4) and an average of at least 65% in Economics 2G3 or 2L6 and 2H3 or 2M6; or permission of the instructor.

3P/ Comparative Economic Systems. The organization and performance of selected contemporary economics. Topics include aspects of socialist economics and problems of economic planning in capitalist and socialist systems.
3 hrs. (lects. and seminars); both terms.
Prerequisite: Economics 2G3 or 2L6, and Economics 2H3 or 2M6; or permission of the instructor.

3Q/ Contemporary Economic Issues. A study of selected issues and institutions in the Canadian and world economies. (Students should consult the Department concerning topics to be examined.)
3 hrs.; one term.
Prerequisite: Economics 1A6 or 1B6. Students registered in any programme in Economics may take this course only as an elective.
Not offered 1978-79.

3S/ Industrial Organization. A study of the structure, conduct, and performance of industrial markets, with emphasis upon the problems and methods of maintaining effective competition.
3 lects.; one term.
Prerequisite: Economics 2G3 or 2L6. Not open to students receiving credit for Economics 3N6.

3T/ Transport Economics. With emphasis on the Canadian transport sector, economic theory applied to such questions as demand for each mode of transport, cost analysis, pricing, and government regulation.
3 hrs.; one term.
Prerequisite: Economics 2G3 or 2L6, or permission of the instructor.

3U/ The Economics of Poverty and Income Maintenance. An examination of poverty in a modern economic system, the nature and determination of income redistribution; policies designed to redistribute income. Special attention is given to the labour market.
3 hrs. (lects. and seminars), one term.
Prerequisite: Economics 1A6 or 1B6.

3V/ Public Choice and Benefit-Cost Analysis. The economics of decision-making; the logic of group decision and the
political process; welfare economics, theory and application of benefit-cost analysis.
3 hrs. (lects. and seminars); one term.
Prerequisite: Economics 2G3 or 2L6; or permission of the instructor.

3W3/ Natural Resources. An examination of the economics of natural resources.
3 hrs. (lects. and seminars); one term.
Prerequisite: Economics 2G3 or 2L6, or permission of the instructor.
Not offered 1978-79.

3X3/ Selected Topics I. Topics will vary from year to year depending on student interests and faculty availability. Students should consult the Department on topics to be offered.
3 hrs.; one term.
Prerequisite: Permission of the Department.

3Y3/ Selected Topics II. As for Economics 3X3.
3 hrs.; one term.
Prerequisite: Permission of the Department.

3Z3/ Topics in Quantitative Economic History. Application of economic theory and quantitative techniques to problems in Canadian Economic Development or other areas of Economic History.
3 hrs.; one term.
Prerequisite: Economics 2G3 or 2L6, Economics 2H3 or 2M6; Economics 2S3 or 3O6, or permission of the instructor. A previous course in Economic History is recommended. Not offered 1978-79.

4B6/ International Economics. Monetary aspects of the international economy; the relationship between resource use, productivity and growth, and techniques of monetary and commercial policy. 3 hrs., (lects. and seminars); both terms.
Prerequisite: Economics 2G3 or 2L6, Economics 2H3 or 2M6. A student who has credit for Economics 3H3 may receive only three additional units of credit for Economics 4B6.
Not offered 1978-80.

4C6/ History of Economic Theory. The development of economic thought from earliest times, with emphasis on the major schools from Adam Smith to Alfred Marshall; selected modern trends and controversies.
3 hrs. (lects. and seminars); both terms.
Prerequisite: Economics 2G3 or 2L6, Economics 2H3 or 2M6.

4E3/ Topics in Microeconomics. Applications of advanced microeconomic theory.
3 hrs.; one term.
Prerequisite: Economics 3A3. Not open to students claiming credit for 3A5.
Not offered 1978-79.

4F3/ Topics in Macroeconomics. Applications of advanced macroeconomic theory.
3 hrs.; one term.
Prerequisite: Economics 3AA3 and Economics 2B3 or 3O6. Not open to students claiming credit for 4D6.

Prerequisite: Economics 3O6, or permission of the instructor.

4H3/ Linear Economic Models. Application and interpretation in economics of linear programming, game theory, and inter-industry analysis.
3 lects.; one term.
Prerequisite: Mathematics 1L3 and 1M3 with an average of at least 60% (or Mathematics 1A6 and 1B4), and Economics 2G3 or 2L6, and 2H3 or 2M6; or permission of the instructor.
Offered in 1978-80 and in alternate years.

4M6/ Directed Research I. A reading and/or research programme supervised by a Department member. A major paper is required. Students should consult the Department concerning admission.
Prerequisite: Permission of the Department.

Prerequisite: Permission of the Department.

For Graduate Courses see Calendar of School of Graduate Studies.

Eighteenth-Century Studies

There is no B.A. Programme in eighteenth-century studies, but students wishing to make a special study of the field may group electives from the following list of relevant courses offered by various departments. For full descriptions of contents and requirements, see the appropriate departmental listings.

Art History 4D3/ European Architecture
English 2LL6/ English Literature of the 17th and 18th Centuries
English 2TR3/ Topics in Restoration and 18th Century Literature
English 4B6/ English Literature, 1660-1800
German 3A4/ Eighteenth-Century Drama
History 2N6/ British History, 1400 to the present
History 2M6/ European Society from Absolutism to Democracy
History 3M6/ Revolution and Reaction, 1789-1848
History 3S3/ Topics in Eighteenth-Century British History
History 4A6/ Special Topics in British History (1668-1830)
History 4F6/ Special Topics in the Age of the Enlightenment.
History 4T6/ Europe in the Era of the French Revolution and Napoleon I

Philosophy 3A6/ History of Modern Philosophy
Philosophy 4R3/ Hume
Philosophy 4T3/ Kant
French 2P3/ Eighteenth-Century French Literature in Translation
French 3K3/ Eighteenth-Century French Literature I
French 3K3/ Eighteenth-Century French Literature II
French 3M3/ The Early Eighteenth-Century French Novel
French 3M3/ The Late Eighteenth-Century French Novel
French 4V3/ Voltaire
Italian 3N3/ Eighteenth-Century Italian Literature

Electrical Engineering

Professors
J. W. Bandler
C. K. Campbell
E. Della Torre/Chairman
C. D. diCanzo
A. S. Gladwin
S. S. Haykin
R. Kitai
N. K. Sinha

Associate Professors
R. T. H. Alden
S. H. Chisholm
M. Milner
S. K. Sarno

Assistant Professors
J. B. Anderson
C. R. Carter
T. H. Fawzi
D. P. Taylor

CURRICULUM 1978-80

A minimum grade of "D" is normally required as prerequisite for Electrical Engineering courses unless otherwise specified. Enrolment in an Electrical Engineering course may be limited to those students for whom the course is a required course.

For Graduate Courses see Calendar of School of Graduate Studies.
2B3/ Electrical Science. Quantitative problems in electrostatics, electric field strength and potential; DC circuits. Electromagnetic fields; mechanical forces; induced emf; inductance. Magnetic circuits. Conducting, insulating and magnetic materials.
3 lectures; first term.
Prerequisite: Applied Mathematics 1C7 and Physics 1A7.

3 lectures; second term.

2 lectures; ½ lab.; ½ tut.; first term.
Prerequisite: Registration in Year 2 Engineering.

2X3/ Electrical Science and Circuits Laboratory. Tutorial and laboratory experiments connected with material covered in Electrical Engineering 2B3 and Electrical Engineering 2D3.
1 lab.; ½ t.; both terms.

3 lectures; ½ lab.; ½ t.; first term.

2 lectures; ½ lab. ½ t.; both terms.

3 lectures; ½ lab.; ½ t.; first term.
Prerequisite: Electrical Engineering 2B3 or Engineering 2A5.

3G4/ Electronics II. Diode circuits; piecewise linear circuits; digital logic circuits; discrete-component multivibrators; ramp generators; linear operational amplifier circuits; introduction to analog computing, non-linear operational amplifier circuits; oscillators. Noise analysis.
3 lectures; ½ lab. ½ t.; second term.
Prerequisite: Electrical Engineering 3F4.

2 lectures; ½ lab.; ½ t.; second term.
Prerequisite: Electrical Engineering 2H3 and registration in Electrical Engineering or Electrical Engineering and Management programmes or permission of the Department.

3 lectures. 1 lab.; second term.
Co-requisite: Electrical Engineering 3B4. 3C5.

3N3/ Energy Conversion I. Fundamentals of electromechanical energy conversion. DC motors and generators, transformers, polyphase, electric and magnetic circuits, synchronous, and induction machines.
2 lectures. ½ lab.; ½ t.; first term.
Prerequisite: Electrical Engineering 2D3.

3S3/ Energy Conversion II. Analysis and design of energy conversion systems for industrial applications, electric power generation, rotary industrial drives, transportation systems using linear electric machines, controllable DC drives.
2 lectures. ½ lab.; ½ t.; second term.
Prerequisite: Electrical Engineering 3N3 or Engineering 3M3 with permission of the Department.

2 lectures. ½ lab.; ½ t.; first term.
Prerequisite: Electrical Engineering 3B4 or 3E5, and Applied Mathematics 3P3 or 3X3 or permission of the Department.

3 lectures; 1 lab.; (3) first term.
Prerequisite: Engineering 3C5.

3 lectures; ½ lab. ½ t.; first term.

2 lectures. ½ lab.; ½ t.; second term.
Prerequisite: Electrical Engineering 4H3.

4F3/ Power Electronics. Characteristics of semiconductor devices—rectifier, transistor, SCR, GTO-SCR, TRIAC; heat flow calculations; circuits with power switches; AC voltage controllers; controlled rectifiers; converters and inverters.
2 lectures; 1 lab.; t.; term.
Prerequisite: Electrical Engineering 3E4.

2 lectures; 1 tut.; (2) second term.
Prerequisite: Electrical Engineering 4A4 and Applied Mathematics 3X3.

4H3/ Digital Systems III. Small computer organization and architecture (PDP-8A, Intel 8080, Motorola 6800); instruction classification and execution, interfacing, skip and interrupt modes, direct memory access, computer peripherals.
2 lectures; ½ lab.; ½ t.; first term.
Prerequisite: Electrical Engineering 3H3 with B standing or permission of the Department.

4I4/ Thesis Project. An experimental investigation or design project to be carried out by the student, to test initiative, grasp of the subject, and capacity for independent work.
2 labs. (3); both term.
Prerequisite: Registration in a programme in Electrical Engineering and first class standing or permission of the Department.

3 lectures. 1 lab.; first term.
Prerequisite: Electrical Engineering 3K4.

2 lectures; ½ lab.; ½ t.; second term.
Prerequisite: Electrical Engineering 3B4.

2 lectures; 1 tut.; second term.
Prerequisite: Electrical Engineering 3B4.

4N3/ Power Systems. An introduction to modern power system analysis and control; energy flow concepts; component representation, load flow techniques, generation scheduling, megawatt-frequency and megavolt-voltage control; stability.
2 lectures; ½ lab.; ½ t.; second term.
Prerequisite: Electrical Engineering 3S3.

4U4/ Biomedical Electronic Instrumentation. Generation and nature of bio-electric potentials; bio-electrodes impedances and transducers, signal, ultrasonics, lasers, telemetry, electrical safety, electronic pacemakers, cardiovascular, pulmonary, gastrointestinal and neuro-muscular instrumentation.
3 lectures; ½ lab.; second term.
Prerequisite: Electrical Engineering 3F4 or Engineering 3N3 or equivalent.

See also the Calendar of the School of Graduate Studies.

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Engineering (General)

CURRICULUM 1978-80

A minimum grade of "D" is required for Engineering General Courses unless otherwise stated below. Enrolment in these courses by students in programmes other than Engineering or Engineering and Management may be limited.

1A0/ Careers in Engineering. A non-credit course providing guidance and career information on engineering activities.
1 lect.; both terms.
Prerequisite: Registration in Engineering I.

1C4/ Engineering Design. Graphical communication and problem solving techniques. Introduction to engineering design. Projects on conceptual design in the different engineering disciplines.
1 lect.; 1 lab.; both terms.
Prerequisite: Registration in Engineering I.

2 lect.; both terms.
Prerequisite: Physics 1A7 and registration in Applied Mathematics 2J5.

2A5/ Electrical Science. An introduction to electricity and magnetism covering electrostatics, electric current, magnetism and electromagnetism, with applications in circuits and linear systems theory.
2 lects. each week, 1 lab. (3) every second week; both terms.
Prerequisite: Physics 1A7 and registration in Applied Mathematics 2J5.

2O3/ Structure and Properties of Materials. The relationships between the structure of solids and their properties are developed by study of specific mechanical, electrical, magnetic, and chemical, properties, along with the various levels of structural complexity exhibited by solid materials. Student independent study is aided by audio-visual materials. Student independent study is aided by audio-visual materials and regular tutorial assistance.
Self-paced study; first term.
Prerequisite: Completion of at least 12 units of Year 1 Chemistry, Mathematics, or Physics. Not open to students who are registered in, or have completed, Materials 1A6.

2O4/ Structure and Properties of Materials. Engineering 2O3, plus a laboratory involving design experiments which illustrate the properties of crystals, glasses, magnetic materials, electrical conductors, and steels.
Self-paced study, 1 lab. (3); first term.
Prerequisite: Completion of at least 12 units of Year 1 Chemistry, Mathematics, or Physics. Not open to students who are registered in, or have completed, Materials 1A6.

3 lects.; plus one unit to comprise tutorials or lectures, devoted to applications, at the discretion of the instructor; first term.
Prerequisite: Applied Mathematics 1C7, Mathematics 1A6, and Physics 1A7.

3 lects.; plus one unit to comprise tutorials or lectures, devoted to applications, at the discretion of the instructor; second term.
Prerequisite: Engineering 2P4.

2 lects.; both terms.
Prerequisite: Applied Mathematics 1C7, Mathematics 1A6, and Physics 1A7.

2W4/ Thermodynamics. An introduction to the principles of thermodynamics, and their application to engineering.
3 lects., 1 tut.; second term.
Prerequisite: Chemistry 1A7; Applied Mathematics 2J5, which may be taken concurrently.

2 lects. and ½ tut. (1) ½ lab. (3); first term.
Prerequisite: Engineering 2A4 or 2A5.

2 lects., 1 tut. (2) or 1 lab. (3); second term.
Prerequisite: Engineering 2A4 or 2A5.

3 lects.; second term.
Prerequisite: Applied Mathematics 2JS or equivalent, Engineer­ ing 2PA or 2P4, Mathematics 2G3 and 203 or Physics 2C5.

3Q3/ Electronic Properties of Solids. The dielectric, electric, and magnetic behaviour of insulators, semiconductors, metals, and junctions, with emphasis upon a quantitative explanation of their behaviour, how to control it, and how to use it effectively.
3 lects.; second term.
Prerequisite: Engineering 2A4 or 2A5, or Physics 2A6 or 2B6 or 2K5.

4J3/ Metal Forming. Offered jointly by the Departments of Mechanical Engineering and Metallurgy and Materials Science. Engineering plasticity applied to rolling, forging, deep drawing, extrusion, wire drawing. The effect of solidification and mechanical working on the structure and properties of engineering alloys is exemplified by reviews of foundry practice, power metallurgy, thermomechanical processing, and non-destructive testing.
3 lects.; second term.
Prerequisite: Engineering 203 or 204 and 3E3 or 3P3.

4U3/ Water and Wastewater Treatment Design. Offered jointly by the Departments of Chemical Engineering and Civil Engineering and Engineering Mechanics. The process capabilities, hardware, and design equations, of the physical, chemical, and biological, processes used to improve water. Emphasis on processes such as bio-oxidation, clarification, coagulation, sludge dewaterings, and disinfection. The design by the class of a complete water quality control plant.
2 lects., 1 tut. (2); second term.
Prerequisite: Chemical Engineering 304 or Civil Engineering 304 or Engineering 304, or Mechanical Engineering 304.

4X3/ Introduction to Biomedical Engineering. Engineering and physi­ cal science approach to human physiological systems: Cardio­ vascular system, with specific organ circulations, respiratory system, overall integration and control.
3 lects.; first term.
Prerequisite: Completion of a Year II Honours or Major programme in Science or a Year II Engineering programme, or permission of instructor.

5A1/ Engineering and Management Report. Report on a topic related to career development required of each student in the Engi­ neering and Management programme; guidelines and evalua­ tion procedures provided by Programme Co-ordinator; grades of "Complete" given for satisfactory reports.
Prerequisite: Registration in Year V of the Engineering and Management Programme or permission of the Programme Co-ordinator.
Engineering Physics

Professors
S. Banerjee
E. A. Ballik
J. A. Davies/part-time
B. K. Garside/Chairman
T. J. Kennett
D. A. Menley/part-time
J. Schewchun

Associate Professors
H. D. Barber/part-time
A. A. Harms
J. P. Marton/part-time
L. D. Pelly
J. E. Robinson
D. A. Thompson
O. A. Trojan/part-time

Assistant Professors
H. E. Howard-Lock/part-time
Y. F. Missirlis
J. Reid/part-time

Special Lecturer
J. W. Harvey/Health Physics

CURRICULUM 1978-80

A minimum grade of "D" is normally required for prerequisites specified for Engineering Physics courses unless otherwise stated below. Special cases may be considered by the Department upon request.

2A7/ Electromagnetic Science. An introduction to electricity and magnetism, covering electrostatics, electric currents, magnetism, and electromagnetic waves, with applications in circuits and linear systems. Theory Engineering 2A5, plus additional lectures.
3 lects. each week; 1 lab (3) every second week; first and second terms.
Prerequisite: Physics 1A7, and registration in Applied Mathematics 2J5.

3D3/ Principles of Nuclear Engineering. An introduction to the analytical techniques and the underlying physical principles of modern nuclear engineering.
3 lects.; first term.
Prerequisite: Applied Mathematics 2J5 and Engineering 2A5 or equivalent.

3E5/ Fundamentals of Opto-Electronics. Coherence, interference and diffraction phenomena, holography; reflection and refraction, optical constants of materials, elements of lasers, metals, semiconductors and insulators; charge carriers in semiconductors and their distributions; conductivity and mobility; recombination processes and diffusion and optical absorption; solar cells, light-emitting diodes, photodiode detectors and p-n junction lasers.
2 lects.; 1 tut/lab every other week.
Prerequisite: Engineering 2A4 or 2A5 or Engineering Physics 2A7, or equivalent.

3X4/ Engineering Applications in Physiological Systems. Engineering science principles, coupled with elements of anatomy, biology, and physiology, applied to the study of physiological systems. Description and analysis of the technology involved in measuring instruments and prosthetic devices used for medical purposes.
2 lects.; both terms.
Prerequisite: Applied Mathematics 2J5 or Mathematics 2G6 or Mathematics 2G3 and 203.

4A4/ Thesis or Design Project. Supervised design or research problem to be arranged in consultation with faculty adviser. Thesis or design projects offered by any department in the Faculty of Engineering will be accepted.
2 labs. (3); both terms.
Prerequisite: Permission of the Department.

2 lects.; 1 tut.; second term.
Prerequisite: Completion of Year III Engineering Physics or completion of Year III Engineering or Physics with at least a B average, together with Physics 3B5/3B6 or equivalent.

4C2/ Special Topics in Engineering Physics. Selected topics in engineering physics. Visiting lecturers from industry, research laboratories, and institutions.
1 lect.; both terms.
Prerequisite: Completion of any Year III Engineering programme.

4D4/ Nuclear Reactor Systems Analysis. Elements of release and utilization of energy from nuclear processes; self-sustaining re-actions and dynamic characteristics; radiation shielding and nuclear fuel analysis; systems description and component analysis; alternative nuclear reactor concepts; the McMaster University Nuclear Reactor will be used as a demonstration facility.
2 lects.; both terms.
Prerequisite: Completion of any Year III Engineering or Year III of an Honours or Major programme in Physics.

4D6/ Nuclear Reactor Systems and Experimental Analysis. Engineering Physics 4D4, plus a laboratory/tutorial. The McMaster Nuclear Reactor will be used as a teaching facility for experiments in radiation detection, radiation shielding, reactor instrumentation, control and transient response.
3 lects.; first term; 2 lects., 1 tut., 1 lab. (3); second term.
Prerequisite: Completion of any Year III Engineering or Year III of an Honours or Major programme in Physics.

Not available to students registered in or having completed Engineering Physics 4U4.

3 lects.; first term; 2 lects., 1 lab (3), second term.
Prerequisite: At least B average in Year III Engineering.

3 lects.; first term; 2 lects., 1 lab (3), second term.
Prerequisite: At least B average in Year III Engineering.

4G3/ Optical Instrumentation. Detectors (photographic, photoelectric, etc.). Optical power measurements and spectroscopic methods.
2 lects.; 1 tut.; second term.
Prerequisite: Physics 3N3 or Engineering Physics 3E5.

4H6/ Special Studies in Engineering Physics. A special programme of studies to be arranged by mutual consent of the professor, departmental chairman, and the student. A student elects to work with a professor in his area of specialization carrying out literature surveys, experiments, theoretical investigations, etc. A written report is required.
2 lects.; 1 tut.; second term.
Prerequisite: Permission of the Department.

4K3/ Optical Communications Systems. Simple concepts of the theory of information and information transmission, the mathematics of the passage of signals through transmission media, some simple optical concepts and systems, including integrated optical methods. Modulation and demodulation, modulation systems using analogue and digital coding. Signal to noise considerations for several detection systems. Random signal considerations. Optical communication system design.
2 lects.; 1 tut.; second term.
Prerequisite: Completion of Year III Engineering Physics or Year III of an Engineering or Honours or Major programme in Physics with at least a B average.

4S4/ Introduction to Lasers and Electro-Optics. Multiple beam interference, masers and lasers, optical resonators, complex degree of coherence, statistical optics, light detectors, non-linear optics.
2 lects.; both terms.
Prerequisite: Physics 3N3 or Engineering Physics 3E5.

4U4/ Modern and Applied Physics Laboratory. Selected senior, basic, and applied, experiments in the atomic, nuclear, quantum optics, and solid state, areas. This laboratory will make use of advanced solid-state electronics facilities, lasers, and optical facilities, nuclear detection instrumentation, and the McMaster Nuclear Reactor.
2 labs. (3); both terms.
Prerequisite: Completion of the R-group courses of Year III Engineering Physics.

4W3/ Acquisition and Analysis of Experimental Information. A system approach to experimental measurement, in which topics such as simulation, modelling, estimation, signal-processing and en-
hancement, data reduction techniques, and modern sensing methods, are examined.

1 lect., 1 tut; both terms.

Prerequisite: Applied Mathematics 3B6 or permission of the Department.

4Y3/ Physiology and Biophysics. A physiology course for engineering and physical science students. Muscle and nerve physiology, along with examination of systems such as auditory, visual, renal, and digestive, will be covered. Provides the background and connection between physiology and biophysics with macro-system bioengineering.

3 lects.; second term.

Prerequisite: Completion of a Year III Honours or Major programme in Science or a Year III Engineering programme, or permission of instructor.

Physics 3B6/ Electronics. An introduction to electronics, including: network theory and filters, semiconductor devices (diodes, bipolar and unipolar transistors), analysis and design of amplifier circuits, design considerations for D.C. power supplies, use of integrated circuit building blocks involving linear circuits (operational amplifiers) and digital circuits.

2 lects.; both terms; 6 three-hour laboratory periods each term.

Prerequisite: Engineering Physics 2A7 or Physics 2B5.

Physics 4D6/ Digital Logic and Computer Systems. The design and use of digital logic systems. The applications of digital systems to data acquisition and control techniques. A project-oriented laboratory will involve both hardware and software.

2 lects.; 1 lab. (3); both terms.

Prerequisite: Physics 2B6 or 2K5.

See also the Calendar of the School of Graduate Studies.
COURSE INTENDED PRIMARILY FOR STUDENTS REGISTERED IN EITHER AN HONOURS OR PASS ENGLISH PROGRAMME

2V6/ The English Language. An introduction to the study of English grammar, with particular reference to syntactic patterns. The following areas will be considered: English phonology, historical linguistics, morphology, transformational-generative grammar, vocabulary and word formation. 3 lects.; both terms. Prerequisite: Registration in an Honours or Pass English programme or permission of the Department. Same as Dramatic Arts 2V5.

2B6/ The Development of English Drama. English drama from the mediaeval period to about 1610, excluding Shakespeare, with emphasis on Marlowe and Jonson. 3 lects.; one term. Prerequisite: Registration in an Honours programme in English, or permission of the Department. Same as Dramatic Arts 2B3.

2G6/ Canadian Literature. Major aspects of the development of Canadian literature from the late 18th century to the mid-20th century. French-Canadian work in translation will be used for comparative purposes. 3 lects.; both terms. Prerequisite: Registration in an Honours programme in English, or permission of the Department. Same as Dramatic Arts 2G5.

2H6/ American Literature. A survey of significant American writers from the 17th century to the present, which emphasizes the interrelationship between the literature and its philosophical and historical background. 3 lects.; both terms. Prerequisite: Registration in an Honours programme in English, or permission of the Department.

2L6/ Modern British Literature. A study of representative literature by British writers of the 20th century. Through criticism of poems, plays and fiction, an attempt is made to relate modern British literature to its social, intellectual and cultural context. 3 lects.; one term. Prerequisite: Registration in an Honours programme in English, or permission of the Department.

3D6/ The Earliest English Literature. An introduction to Old English alliterative poetry through close reading of representative modes, such as heroic, lyric, elegiac and gnomic, supplemented by related prose texts. 3 lects.; one term. Prerequisite: Registration in an Honours programme in English, or permission of the Department.

3D3/ Beowulf. An exploration of the Old English epic Beowulf, supplemented by related poetic and prose texts. 3 lects.; one term. Prerequisite: English 3D3 or permission of the instructor.

33/ Studies in 16th-Century Literature. A study of the prose and poetry of the first phase of the English Renaissance, with some emphasis on the work of More and Sidney, and subsidiary reading of continental writers influential in England, such as Petrarch, Pico, Erasmus, Castiglione, Machiavelli and Montaigne. 3 lects.; one term. Prerequisite: Registration in an Honours programme in English, or permission of the Department.

3K6/ Shakespeare. An extensive critical reading and discussion of selected plays. 3 lects.; both terms. Prerequisite: Registration in an Honours programme in English, or permission of the Department. Same as Dramatic Arts 3K5.

3T3/ Spenser. The main work of the course will be close study of The Faerie Queene, but The Shepherds Calendar, Epithalamion and Prothalamion will also be read. 3 lects.; one term. Prerequisite: Registration in an Honours programme in English, or permission of the Department.

3V5/ Studies in 17th-Century Literature. A detailed examination of poets and prose-writers of the period, with emphasis on the poetry of Donne, the "metaphysical school", Jonson and Milton. 3 lects.; both terms. Prerequisite: Registration in an Honours programme in English, or permission of the Department.

4B6/ English Literature, 1660-1800. A study of English literature during the period 1660-1800, with special attention to works by Dryden, Swift, Pope and Johnson. 3 lects.; both terms. Prerequisite: Registration in an Honours programme in English, or permission of the Department.

4E6/ Chaucer and His Contemporaries. A critical, mainly literary, course in the poetry of late 14th-century England. It will study the writings of Chaucer in some depth, before taking up examples of mediaeval romance, alchemy and drama. 3 lects.; both terms. Prerequisite: Registration in an Honours programme in English, or permission of the Department.

4L3/ Romantic Poetry. A study of selected poems and, where appropriate, of the literary theory of the major Romantic poets. Special attention will be given to Blake, Wordsworth, Coleridge, Byron, Shelley, Keats. 3 lects.; one term. Prerequisite: Registration in an Honours programme in English, or permission of the Department.

4M3/ Victorian Poetry. A study of selected poems and, where appropriate, of the literary theory of the major Victorian poets. Special attention will be given to Tennyson, Browning, Arnold, Hopkins. 3 lects.; one term. Prerequisite: Registration in an Honours programme in English, or permission of the Department.

4N6/ The British Novel. This course, in assessing and analysing approximately 12 novels, will trace the history of English fiction to the 20th century. The course focuses on the varieties of narrative forms, while also exploring the intellectual, cultural and psychological contexts of fiction. 3 lects.; both terms. Prerequisite: Registration in an Honours programme in English, or permission of the Department.

4X3/ Independent Study. In consultation with members of the English Department, students will prepare an essay designed to bring together aspects of their work over the previous years. Prerequisite: Registration in Year IV of an Honours programme in English, and permission of the English 4X3 Committee.

COURSES INTENDED PRIMARILY FOR STUDENTS REGISTERED IN PASS ENGLISH

2L6/ English Literature: Chaucer to Shakespeare. A critical reading of representative poetry, prose and drama from the end of the Middle Ages to the Age of Shakespeare. 2 lects., 2 tuts.; one term. Prerequisite: Registration in a Pass English programme or permission of the Department.

2LL6/ English Literature of the 17th and 18th Centuries. A critical reading of representative poetry, prose and drama of the period. 2 lects., 2 tuts.; one term. Prerequisite: Registration in a Pass English programme or permission of the Department.

3L6/ 19th-Century British Literature. A critical reading of representative fiction, drama and poetry of the period. 1 lect., 3 tuts.; one term. Prerequisite: Registration in a Pass English programme or permission of the Department.

3L6/ 20th-Century British Literature. A critical reading of representative fiction, drama and poetry of the period. 1 lect., 3 tuts.; one term. Prerequisite: Registration in a Pass English programme or permission of the Department.

3R6/ American and Canadian Literature. A study of selected representative American and Canadian works. An attempt will be made to identify both shared and distinctive features of the two literatures through an examination of their historical development. 1 lect., 2 tuts.; both terms. Prerequisite: Registration in a Pass English programme or permission of the Department.

COURSES OPEN AS ELECTIVES TO QUALIFIED STUDENTS REGISTERED IN ANY UNIVERSITY PROGRAMME (Note restrictions specified in individual cases.)

2C3/ Contemporary Canadian Fiction. A study of the themes and structure of the contemporary Canadian novel, usually with emphasis upon the relationship of Canada's cultural patterns and its literature. 3 lects.; one term.
Prerequisite: English 1A6 or 1B6 or permission of the instructor. Not available to students registered in Pass English.

2F3/ Studies in American Literature. A study of some of the most important writers who developed American literature as a distinctive mode of writing in English.

3 lects.; one term.

Prerequisite: English 1A6 or 1B6 or permission of the instructor. Not available to students with standing in English 2H6 or to students registered in Pass English.

2M3/ Practical Criticism. This course gives the student the opportunity to write a piece of criticism once a week. This work is evaluated by members of the course and the instructor.

2 lects.; first term; 1 lect.; second term.

Prerequisite: Permission of the Department. (limited enrolment).

2O3/ Topics in Renaissance Literature. 1978-79: Christopher Marlowe. A study of Marlowe's drama, from both a literary and a theatrical point of view, and of selected poetry.

3 lects.; one term.

Prerequisite: English 1A6 or 1B6.

English 2O3 may be repeated, if on a different topic, to a total of six units.


3 lects.; one term.

Prerequisite: English 1A6 or 1B6 or permission of the instructor. English 2R3 may be repeated, if on a different topic, to a total of six units.

2S3/ English as Communication: Introductory Linguistics. An introductory study of the English language in the light of its function as a system of communication. The course covers a variety of linguistic areas, such as phonetics, semantics, etymology and grammar.

3 lects.; one term.

Prerequisite: Open, except to students with standing in English 2V6 or 3C3.

2T3/ The Development of the English Language. A study of the history and development of the English language with critical consideration of stylistic qualities.

3 lects.; one term.

Prerequisite: Open.

2X3/ Topics in the English Literary Tradition. 1978-79: Medieval Literature in Translation. A study of selected mediaeval themes and genres from texts read mainly in translation. While the course will be devoted primarily to English writers, including Chaucer, other vernacular literatures and related media, such as art and music, will be considered.

3 lects.; one term.

Prerequisite: Open, except to students with standing in English 2N3 or 4E6.

1979-80: The Bible as Literature. A literary-critical study of the Bible as a continuous narrative from the Creation to the Last Judgment, and as a major influence on other literature, especially English.

3 lects.; one term.

Prerequisite: Open, except to students with standing in English 2P3.

English 2X3 may be repeated, if on a different topic, to a total of six units.


3 lects.; one term.

Prerequisite: English 1A6 or 1B6 or Dramatic Arts 1A6. Not open to students with standing in English/Dramatic Arts 3K6. Same as Dramatic Arts 3E3.

3EE3/ Aspects of Mutuality in 20th-Century Literature. An interdisciplinary course offered by the Departments of English, Psychiatry, and Religious Studies. It explores the nature of male and female relationships by utilizing literary, psychosocial and religious approaches to 20th-century literature, and deals with representative British and American works and genres.

1 lect., 2 labs.; one term.

Prerequisite: Open.

Same as Religious Studies 3FF3.

3FF3/ Techniques of Creative Writing. This course will require the composition of verse and prose. Experiments with a variety of forms will be attempted in order to increase the student's mastery of the forms and prose techniques.

2 lects., first term; 1 lect., second term.

Prerequisite: At least "B" in six units of English, and permission of the Department. (limited enrolment).

3G3J/ Topics in 19th-Century Literature. 1978-79: The Brontës. An introduction to the lives and literary achievement of the three Brontë sisters. The course will involve a critical reading of the seven novels of Anne, Emily and Charlotte Brontë.

3 lects.; one term.

Prerequisite: English 1A6 or 1B6 or permission of the instructor. 1979-80: Fantasy, Romance and Mystery. An introduction to non-realistic fiction in the 19th century. Works by authors such as Mary Shelley, Lewis Carroll, George MacDonald and William Morris will be considered.

3 lects.; one term.

Prerequisite: English 1A6 or 1B6 or permission of the instructor. English 3G3J may be repeated, if on a different topic, to a total of six units.


3 lects.; one term.

Prerequisite: English 1A6 or 1B6 or permission of the instructor. 1979-80: Poetry of the First World War. A study of poetry by such major figures as Brooke, Sassoon, Owen, Rosenberg and David Jones, with some consideration of minor poets and prose memoirs.

3 lects.; one term.

Prerequisite: English 1A6 or 1B6 or permission of the instructor. English 3HH3 may be repeated, if on a different topic, to a total of six units.


3 lects.; one term.

Prerequisite: English 1A6 or 1B6 or permission of the instructor. 1979-80: Evelyn Waugh. An examination of his major fiction in the context of the English satirical tradition.

3 lects.; one term.

Prerequisite: English 1A6 or 1B6 or permission of the instructor. English 3I3 may be repeated, if on a different topic, to a total of six units.

3J3J/ Topics in Fiction II. 1978-79 and 1979-80: Fantasy and Science Fiction. An investigation of some aspects of "speculative" literature from H. G. Wells to the present day. The course may include some films.

3 lects.; one term.

Prerequisite: Open, except to students with standing in English 2V3.

English 3J3J may be repeated, if on a different topic, to a total of six units.

3KK3/ Topics in Critical Approaches. 1978-79: Creativity. A study of the motivations of some representative writers and of the psychological processes in literary creativity. Psychoanalytic and psychiatric contributions to understanding this subject will be considered.

3 lects.; one term.

Prerequisite: Permission of the instructor. Not available to students with standing in English 3U3.

1979-80: Psychoanalytic Approaches to Literary Texts. The basic assumptions and methods of psychoanalytic criticism will be studied with reference to selected texts in drama, fiction and poetry from Shakespeare to the present.

3 lects.; one term.

Prerequisite: Registration in Year II, III or IV of any programme. Not available to students with standing in English 2U3.

English 3KK3 may be repeated, if on a different topic, to a total of six units.

3P3/ Modern Drama in English. A representative selection of plays by modern British, Irish and North American dramatists will be examined in order to study the relationship between drama and society in our age, as well as conventions and experiments in the contemporary theatre.

3 lects.; one term.

Prerequisite: English 1A6 or 1B6 or Dramatic Arts 1A6. Same as Dramatic Arts 3P3.


3 lects.; one term.

Prerequisite: English 1A6 or 1B6 or permission of the instructor. English 3PP3 may be repeated, if on a different topic, to a total of six units.

ENGLISH AND CLASSICS

4A3/ The Classics and English Literature. A course devoted to an exploration of the influences of classical literature upon English writers from mediaeval to modern times, and conducted jointly by the Departments of Classics and English.
1 lect., first term; 1 sem. (2 hrs.), second term.
Prerequisite: Registration in Years III or IV of a programme in English, Classics, Classical Civilization, Latin or Greek; or permission of the Department.

GEOGRAPHY

3XX3/ Topics in 20th-Century Literature II, 1978-79: The Bloomsbury Group. The literary focus of the course will be upon the novels of E. M. Forster and Virginia Woolf; but such other aspects of Bloomsbury as philosophy, art, politics and economics will also be considered.
3 lects.; one term.
Prerequisite: English 1A6 or 1B6 or permission of the instructor.

3Z3/ Contemporary Canadian Poetry. The development of Canadian poetry from the 1940's to the present. Parallel developments in French Canadian poetry (studied in translation) will also be considered.
3 lects.; one term.
Prerequisite: English 1A6 or 1B6 or permission of the instructor.

4C3/ The History and Theory of Criticism. A survey of literary criticism from Plato to the present, with emphasis upon the variety and interplay of mimetic and formal theories of literary art.
1 sem. (2 hrs.); one term.
Prerequisite: Registration in Year III or IV of a programme in language or literature, or permission of the instructor.

Note: Students may be interested in the following courses with linguistic content offered by other Departments: Anthropology 2M6, 3M3, 4F3; French 3B3, 3G3, 3L4, 4K3; Linguistics 1A6; Russian 2F6.

FILM

(See Dramatic Arts 2X6, 3R6, 3Y3.) Film courses are not accepted for "Q" or "R"-group credit for students in Pass or Honours English programmes.

Geography

Professors
A. F. Burghardt
B. T. Bunting
J. A. Davies
D. C. Ford/Chairman
R. L. Gentile
F. G. Hannell
L. J. King
S. B. McCann
L. G. Reeds
W. R. Rouse/Associate Chairman
H. A. Wood

Associate Professors
P. J. Howarth
G. Papageorgiou
M. J. Webber

Assistant Professors
M. J. Dear
F. L. Hall
P. R. Jones
K. L. Liaw
D. A. Norris
S. M. Taylor
G. I. Thrall
M. K. Woo

CURRICULUM 1978-1980

For prerequisite purposes, a grade of "D" or better is required.

*Indicates a Science course.

1A5/ Introduction to Physical Geography. The principles of geomorphology, particularly erosion processes and landscape evolution; the physical basis of climatology and man's role in modifying climate.
2 lects., 1 lab. (2); both terms.
Prerequisite: Open.

1B6/ Introduction to Urban Geography. Introduction to the theory and methods of urban geography, emphasizing historical, economic, and behavioural explanations of the structure of, and relations between, urban areas.
2 lects., 1 tut.; both terms.
Prerequisite: Open.

2A3/ Location Theory. Theories of location of economic activities, including agriculture, industry, and settlement.
2 lects., 1 lab. (2); first term.
Prerequisite: Geography 1B6, or Economics 1A6 or 1B6, or permission of the instructor.
GEOGRAPHY

2B3/ Urban Geography. A detailed study of the concepts and methods of geographical analysis applied to problems at the inter- and intra-urban levels.
3 lects.; second term.
Prerequisite: Geography 1B6, or permission of the instructor.

2 lects., 1 lab. (2); second term.
Prerequisite: Geography 1A6 or 1B6, or permission of the instructor.

2D3/ The Geography of Settlement. An examination of the geographical development of settlement, with particular reference to Old World origins and the beginnings of European settlement in North America.
2 lects., 1 lab. (2); first term.
Prerequisite: Open.

2E3/ Canada. The physical and economic geography of Canada, emphasizing problems of regional development. This course is given in the second term as Geography 2H3.
3 lects.; first term.
Prerequisite: Open.

2F3/ Climatology I. The role of solar radiant energy in the heat balance within the earth's atmosphere and at the earth's surface.
2 lects., 1 lab. (2); first term.
Prerequisite: Geography 1A6, or permission of the instructor. A course in calculus is recommended.

2H3/ Canada. The same as Geography 2E3.
3 lects.; second term.
Prerequisite: Open.

2K3/ Introductory Soil Studies. The composition, morphology, and description of soils; the classification and environmental relationships of soil groups; the interpretation of soil maps and survey data.
3 lects.; second term.
Prerequisite: Geography 1A6 or permission of the instructor.

2L3/ Introduction to Quantitative Analysis. The collection, description, and simple analysis of geographic data.
2 lects., 1 lab. (2); second term.
Prerequisite: Registration in Pass or Honours Geography, or permission of the instructor.

2M3/ Latin America. An introductory survey of current development trends, problems, and potentials, at both national and subnational levels.
3 lects.; second term.
Prerequisite: Open.

2P3/ The United States of America. The physical and economic geography of the United States.
3 lects.; second term.
Prerequisite: Open.

2Q3/ Field Mapping. Introduction to survey and field location methods.
4 hrs. (lects. and field work); first term.
Prerequisite: Registration in Honours Geography programme or in a programme in which Geography 203 is required or a specified option.
Enrolment is limited.

2R3/ Behavioural Geography. An application of theories of individual behaviour and concept of problems of urban geography.
2 lects., 1 lab. (2); first term.
Prerequisite: Geography 1A6, or permission of the instructor.

2T3/ Fluvial Geomorphology. An analysis of landforms created by running water in humid and arid environments.
2 lects., 1 lab. (2); first term.
Prerequisite: Geography 1A6 or permission of the instructor.

2W3/ Hydrology in Canada. A discussion of fresh water resources, including both surface and groundwater, and river sedimentation.
3 lects.; second term.
Prerequisite: Geography 1A6.

3B3/ Europe. The physical, economic, social, and political geography of Europe, past and present.
3 lects.; first term.
Prerequisite: Open.

3C3/ Introduction to Historical Geography. An examination of the main themes and approaches of historical geography. Examples are drawn from the Geography of North America between 1600 and 1800.
3 lects.; first term.
Prerequisite: Geography 1B6.

3D3/ Historical Geography of Canada. Major themes in the historical geography of Canada, with particular reference to settlement changes in the 19th century.
3 lects.; second term.
Prerequisite: Geography 2D3 or 3C3, or permission of the instructor.

*SE3/ Field Camp. Studies of geographical methods in the field, held in the week prior to registration in Year III, followed by seminars during term. A variety of topics is offered each year, the program being posted in March.
Prerequisite: Registration in a programme in Geography; appropriate second year courses may be required. Students must notify the Department by June 1.
Enrolment is limited.

*3F3/ Climatology II. Climatological approaches to evaluating radiation and energy exchanges at the earth's surface and in the atmosphere.
2 lects., 1 lab. (2); second term.
Prerequisite: Geography 2F3.

3H3/ Agricultural Geography. An introduction to the methodology of agricultural geography illustrated by case studies from Ontario; applied aspects, rural planning, and conservation of land resources.
3 lects.; second term.
Prerequisite: Geography 1A6 or 1B6, or permission of the instructor.

3K3 Geography of the Soils of Canada. Field and laboratory studies of soil formation in Canada, especially of podzols, luvisols, and gley soils. The application of soils studies to land use planning.
2 lects., 1 lab. (2); first term.
Prerequisite: Geography 2K3 or permission of the instructor.

3L3/ Multivariate Analysis in Geography. An introduction to the application of multivariate statistical techniques to problems in physical and urban geography.
4 hrs. (lects. and lab.); first term.
Prerequisite: Geography 2L3, a course in linear algebra is recommended.

2 lects., 1 lab. (2); second term.
Prerequisite: Geography 2T3. Not open to students who have completed Geography 2J3 or 3M6.

3N3/ Spatial Interaction. Patterns and processes in trade, migration, and communication, and related explanatory factors.
3 lects.; first term.
Prerequisite: Geography 2A3 or permission of the instructor.

3O3/ Explanation in Geography. The application of the scientific model of explanation in geographic research with emphasis on the principles of research design.
2 lects., 1 sem. (2); second term.
Prerequisite: Registration in Year III or IV of a programme in Geography.

3T3/ Geography of Planning. A systematic approach to the study of the planning process, with emphasis on analysis of the social, economic, and political bases of planning.
2 lects., 1 lab. (2); first term.
Prerequisite: One of Geography 2A3, 2B3, 2R3, or permission of the instructor.

2 lects., 1 lab. (2); second term.
Prerequisite: Geography 3N3 or permission of the instructor.

*3V3/ Remote Sensing I. The physical principles of remote sensing, with emphasis on photographic systems. Visual interpretation procedures and their application in geographical studies.
2 lects., 1 lab. (2); second term.
Prerequisite: Geography 1A6 or Geography 1B6, or permission of the instructor.

2 lects., 1 lab. (2); first term.
Prerequisite: Geography 1A6 and 2L3, or permission of the instructor.

3Y3/ Geomorphology of Canada. A regional study, illustrating the role of past and present geomorphic processes in the landscape evolution of Canada.
3 lects.; first term.
Prerequisite: Open. Not acceptable for G-group credit in an Honours programme in Geography.

3Z3/ Political Geography. An introduction to the concepts and methods of political geography, with particular emphasis on the state and its administrative subdivisions.
3 lects.; second term.
Prerequisite: Registration in an Honours programme, or permission of the instructor.

*4A3/ Karst Geomorphology. A discussion of selected problems in karst research; including carbonate rock solution, limestone cavern genesis and speleothem chronology.
3 lects.; second term.
Prerequisite: Geography 3M3, or permission of the instructor.

*4B6/ Research Paper in Physical Geography. Prior to May 1, the student will select a study in physical geography supervised by a member of Faculty, and will submit a written report by April 1.
4C6/ Research Paper. Prior to May 1, the student will select a study in geography supervised by a member of Faculty, and will submit a written report by April 1.
Prerequisite: Registration in an Honours B.A. programme in Geography and permission of the Chairman.

*4D3/ Coastal Geomorphology. The dynamics and morphologies of the shore zone.
3 lects.; first term.
Prerequisite: Geography 3M3, or permission of the instructor.

*4E3/ Field Course in Northern Climatology. Methods of measurement and analysis in climatology in the northern environment. Emphasis on the radiation and energy balance and its interaction with the soil moisture and thermal regimes. Held at Churchill, Manitoba, in the two weeks preceding fall registration. A report is to be submitted before the end of first term.
Prerequisite: Geography 2F3 or two years in a Science programme including Geography 1A6 or its equivalent.

*4F6/ Applied Microclimatology. The application of climatic principles to restricted areas, including cities, slopes of varying aspects, shelter-belts, soils, and methods of frost protection.
3 lects.; both terms.
Prerequisite: Geography 2G3 or registration in a programme in Science.

4H3/ Land Use and Transportation. An analysis of models of urban land use and urban growth, with particular reference to the interrelations between transportation systems and land use changes.
3 lects.; first term.
Prerequisite: Geography 2B3 or 3N3, or permission of the instructor. A course in linear algebra is recommended.

4J6/ Urban Behavioural Geography. A consideration of theoretical, methodological, and empirical studies of urban cognition and urban spatial behaviour. Student research projects are a part of the course.
2 lects., 1 lab. (2); both terms.
Prerequisite: Geography 2G3 (and 303, beginning in 1979-80), or permission of the instructor.

4K3/ Pedology and Soil Micromorphology. Studies of soil genesis and soil micromorphology, to include field survey and sampling procedures, and the study of soils in thin section.
3 lects.; second term.
Prerequisite: Geography 3K3 or permission of the instructor.

4L3/ Linear Models in Geography. Use of linear optimization techniques and advanced multivariate statistical models in geographical theory and empirical research.
3 lects.; first term.
Prerequisite: Geography 3L3 or permission of the instructor.

4M6/ Development Geography of Latin America. Spatial manifestations of selected problems of socio-economic development are examined within the Latin American context. Lectures are supplemented by class exercises and student seminars.
3 lects.; both terms.
Prerequisite: Geography 2N3 or permission of the instructor.

*4Q3/ Climates in High Latitudes. Aspects of the heat and water balance climatology of terrestrial ecosystems in northern areas, with emphasis on the Canadian sub-arctic and tundra.
3 lects.; second term.
Prerequisite: Geography 3F3, or permission of the instructor.

3 lects.; first term.
Prerequisite: Geography 3F3.

4T3/ Regional Planning. Discussion of methods and criteria for analyzing and influencing the distribution of income, employment, and population among regions of a country.
2 lects., 1 lab. (2); second term.
Prerequisite: Geography 2R3 or permission of the instructor. A course in linear algebra is recommended.

4U3/ Selected Problems in Urban Planning. An examination of planning as a public decision process, with emphasis on land use conflicts and their resolution in the Hamilton region. 2 seminars (2); second term.
Prerequisite: Geography 3T3.

*4V3/ Remote Sensing II. A study of airborne and spaceborne remote sensing systems. The extraction, manipulation and analysis of data acquired by remote sensors, and their application in geographical studies.
2 lects., 1 lab. (2); first term.
Prerequisite: Geography 3V3.

*4W3/ Hydrological Modelling. Analyses and extension of hydrologic data, with a survey of deterministic and stochastic models in hydrology.
2 lects., 1 lab. (2); second term.
Prerequisite: Geography 3W3 and 3L3, or permission of the instructor.

4X6/ Urban Models and Policy Analysis. A survey of modern literature of urban spatial structure. Topics include equilibrium, optimum, welfare criteria, externality, public goods. Student research projects are required.
3 lects.; both terms.
Prerequisite: Geography 283 and a course in calculus, or permission of the instructor.

4Z6/ Advanced Cultural Geography. The role of culture and politics in the geographical development of Canadian communities in the recent past. Student research projects are part of the course.
2 seminars (2); both terms.
Prerequisite: Registration in Year IV of an Honours programme.

For Graduate Courses see Calendar of School of Graduate Studies.

Geology

Professors
B. J. Burley
C. M. Clifford/Chairman
J. H. Crockett
J. R. Kramer
G. V. Middleton
F. P. Schwarcz
D. M. Shaw
R. G. Walker

Professor and Curator
G. E. G. Westermann

Associate Professors
R. H. McNutt
H. D. Grundy
M. J. Risk

Special Lecturer
A. E. Beck/part-time

CURRICULUM 1978-80

For prerequisite purposes, a grade of 'D' or better is required.

1A6/ General Geology. The physical and chemical processes which are operative within and upon the earth. Laboratory work includes the study of minerals, rocks, and geological maps.
2 lects., 1 lab. (3); both terms.
Prerequisite: Registration in, or completion of, Natural Sciences 1A7.

1B6/ General Geology. An introduction to physical and historical geology. Laboratory work includes the study of minerals, rocks, fossils, and geological maps.
2 lects., 1 lab. (3); both terms.
Prerequisite: Registration in, or completion of, Natural Sciences 1B7.

3 lects.; both terms.
Prerequisite: Registration in a Geology programme; completion of Physics 1C8, or registration in, or completion of, Physics 1A7 or 1B7.
2B2/ Morphological Crystallography. The first part of Geology 2B6. 2 lects., 1 lab (2), first term. Prerequisite: Open, except to students registered in a Geology programme.

2B4/ Optical Crystallography and Introductory Petrography. Elementary optical theory with applications to the common rock-forming minerals. Descriptive study of igneous, sedimentary and metamorphic rocks. The latter part of Geology 2B6. 2 lects., 1 lab (2); in parts of both terms. Prerequisite: Open only to students registered in Ceramic Engineering or permission of instructor.

2B6/ Optical Crystallography and Introductory Petrography. Elementary optical theory with applications to the common rock-forming minerals. Descriptive study of igneous, sedimentary, and metamorphic rocks. 2 lects., 1 lab (2); both terms. Prerequisite: Geology 1A6 or 1B6.

2C6/ Earth History. The principles of continental evolution, as illustrated by North America and the classical geological areas. Field and laboratory demonstrations in earth history and geological maps. 2 lects., 1 lab (2), both terms. Prerequisite: Geology 1A6 or 1B6 or permission of the instructor.

2D5/ Structural Geology 1. A study of inherent and imposed structures in rocks; their modes of formations, inter-relationships, and geological environments. 2 lects., 1 lab (3) every other week; both terms. Prerequisite: Geology 1A6 or 1B6.

2D6/ Structural Geology 1. Same as Geology 2D5 but with a laboratory every week. Prerequisite: Geology 1A6 or 1B6. Offered in 1978-79 only.

2H1/ Computing Laboratory. Application of computing techniques to problems in geology. 1 lab (2), second term. Prerequisite: Concurrent registration in Applied Mathematics 1H3 or 2H3, and in a programme in Geology.

3A3/ Applied Geophysics A. Principles and uses of electrical, magnetic, electromagnetic and radioactivity-based techniques in exploration geophysics. Borehole logging methods. 3 hours of lects.; first term. Prerequisite: First-year courses in calculus and physics, and any two science courses beyond Year I, or permission of the instructor. Alternates with Geology 3B3. Offered in 1979-80 and in alternate years.

3B3/ Applied Geophysics B. Gravitational and seismic principles and methods and their use in exploration geophysics. 3 hours of lects.; first term. Prerequisite: First-year courses in calculus and physics, and any two science courses beyond Year I, or permission of the instructor. Alternates with Geology 3A3. Offered in 1978-79 and in alternate years.

3C3/ Petrography. A sequel to Geology 2B6. An introductory course in the petrology of igneous, sedimentary, and metamorphic rocks. Laboratory studies on rock suites. 2 lects., 1 lab (3); second term. Prerequisite: Geology 2B6. Offered only in 1978-79.

3C6/ Petrography. A sequel to Geology 2B6. An introductory course in the petrology of igneous, sedimentary, and metamorphic rocks. Laboratory studies on rock suites. 2 lects., 1 lab (2); both terms. Prerequisite: Geology 2B6. Not open to students who have completed Geology 3C3. Offered in 1979-80 and subsequent years.

3D6/ Palaeontology I. An introductory course in the principles of palaeontology, and in the organization and evolution of life in the past, with emphasis on invertebrate fossils. 2 lects., 1 lab (3); both terms. Prerequisite: Geology 1A6 or 1B6 and Biology 1B6 or 1E6 (or equivalent), or permission of the instructor.

3E2/ Field Camp. A field camp; of about two weeks’ duration, held immediately after the April-May Examinations. This is normally taken immediately following Year II by students in Honours Geology and in Honours Chemistry and Geology, and immediately following Year III by students in Honours Geography and Geology and in Geology Major.

3G6/ Crystallography and Mineralogy. Topics in elementary symmetry theory, an introduction to crystal chemistry and mineralogy; laboratory studies in symmetry and the physical and chemical properties of minerals. 2 lects., 1 lab (2); both terms. Prerequisite: Geology 2B6. Offered in 1978-79 only.

3G8/ Crystallography. The first term of Geology 3G6. 2 lects., 1 lab (2), first term. Prerequisite: Open, except to students registered in Geology Major, Honours Geology, or Honours Chemistry and Geology. Offered in 1978-79 only.

3G4/ Crystallography and Mineralogy. Topics in elementary symmetry theory, an introduction to crystal chemistry and mineralogy; laboratory studies in symmetry and the physical and chemical properties of minerals. 3 lects., 1 lab (3); first term. Prerequisite: Geology 2B6. Not open to students who have completed Geology 3G3 or 3G6. Offered in 1979-80 and subsequent years.

3H4/ Introduction to Petrology and Geochemistry. An introduction to the geochemistry and petrology of igneous, sedimentary, and metamorphic rocks. 2 lects., 1 lab (3); both terms. Prerequisite: Geology 2B6 and 2C6. Not open to students who are registered in or have completed Geology 3C3.

4B6/ Igneous and Metamorphic Petrology. Advanced theory and practice on igneous and metamorphic rocks. Laboratory studies on metamorphic rock suites. 3 lects., first term; 2 lects., 1 lab (3), second term. Prerequisite: Geology 3C3 or 3C6, Chemistry 2P4.

4D3/ Palaeontology II. The first term of Geology 4D6, devoted mainly to marine biology and ecology. 2 lects., 1 seminar; first term. Prerequisite: Geology 3D6 or registration in Year IV Honours Biology or permission of the instructor.

4D6/ Palaeontology II. An introduction to palaeoecology. Surveys of selected living and fossil marine communities, marine habitats, functional interpretation of fossil skeletons, and quantitative techniques. 2 lects., 1 seminar; both terms. Prerequisite: Geology 3D6 or registration in Year IV Honours Biology, or permission of the instructor.

4E6/ Metallic Mineral Deposits. Geochemistry and mineralogy of ore deposits; theories of ore genesis, mineralogy. 2 lects., 1 lab (2); both terms. Prerequisite: Registration in Year IV of a Geology programme or permission of the instructor.

4K6/ Geology Thesis. Prerequisite: Open to students in Year IV of a Geology programme, subject to the approval of the Department.

4M6/ Sedimentology. A first course in the principles of chemical and physical sedimentology. 3 lects.; both terms. Prerequisite: Chemistry 1A7, 1B7, or 1CB. Open only to Year IV Geology students; or permission of instructor.

4N4/ Structural Geology II. Emphasis is placed on advanced principles of rock deformation as inferred from theory and experiment. These principles are applied to the study of actual geological structures on all scales. 2 lects.; both terms. Prerequisite: Geology 2D5 and 3C6. Offered in 1978-79 and in alternate years.

4P2/ Precambrian Geology. General features of Precambrian rocks throughout the world. Structural, lithological, and chronological, divisions of the Canadian Shield. Evolution of the early crust of the earth. Special problems in Precambrian geology. 2 lects.; first term. Prerequisite: Registration in Year III or Year IV of a Geology programme. Offered in 1978-79 and in alternate years.

4Q4/ Geochemistry. Review of thermodynamics and crystal chemistry; consideration of sedimentary, igneous, metamorphic, and economic geochemical cycles; special topics including origin of crust, oceans. 2 lects.; both terms. Prerequisite: Registration in Year IV of an Honours or Major programme in Geology or Chemistry.

4S6/ Introductory Oceanography. Biological, physical, and chemical properties of sea water; geological and geophysical properties of ocean basins, mineral resources. The laboratory will include a research cruise on the Great Lakes.
German

Professor
K. Denner/Chairman

Associate Professors
C. G. Chapple
J. B. Lawson
G. Teuscher
R. L. Van Dusen
F. T. Widmaier

Assistant Professor
H. H. Schulte

CURRICULUM 1978-80

At least "D" is required in courses listed under "prerequisite", unless otherwise indicated.

BEGINNERS' LANGUAGE COURSE

126/ Beginners' Intensive German. This course attempts to give the student the ability to express himself reasonably well in German. In addition, he will acquire the basics of German grammar and considerable reading skill. Small tutorial groups will ensure maximum participation by each student. Laboratory practice, slides and films, will be an integral part of the instruction.
5 hrs., including lab. practice; both terms.
Prerequisite: Open, except to graduates of Level 4 (Grade 12) or Level 5 (Grade 13); German A grade of at least "B" will permit students to proceed to German 226; however, a grade of "A" is necessary for students intending to enter the Intensive Honours Programme by taking German 1A6 and 226.

INTERMEDIATE AND ADVANCED LANGUAGE AND LITERATURE COURSES

A number of the following language courses are designed for non-native speakers; therefore, the Department may recommend alternative courses for native speakers of German.

1A6/ Introduction to German Studies. An approach based upon a balanced division between the written and spoken language, and between the historical and text-oriented aspects of literary study. The two tutorials include one concentrating on the close reading and discussion of texts, and one involving grammatical study and practice in the spoken language. The lectures present an outline of the development of German literature as it appears against the background of German history, art, and music. Laboratory practice in pronunciation, listening comprehension, oral expression, lectures and tutorials in German, written reports in German and English. A required course for those intending to enter Pass or Honours programmes in German.
5 hours (2 lects., 2 tuts., lab. practice); both terms.
Prerequisite: Level 5 (Grade 13) German, or German 126 (with a grade of "A") or permission of the Department.

2A3/ Modern German Literature I. Discussion of selected readings from major writers; emphasis on 20th-century prose. The lectures will be supplemented by films, recordings and other related material dealing with a particular author, work or period.
2 lects., 1 tut., one term.
Prerequisite: German 1A6 or permission of the Department.

203/ The German Novelle. Analysis and discussion of short prose works, principally from the 19th century.
2 lects., 1 tut., one term.
Prerequisite: German 1A6 or permission of the Department.

2E3/ German Grammar. A systematic review, including oral practice.
3 hrs., including lab. practice; one term.
Prerequisite: German 1A6 or permission of the Department.

2F3/ German Drama of the 20th Century from Hauptmann to Dörrn­matt. The plays will be studied both as individual works and in the context of their historical and intellectual background.
3 lects.; one term.
Prerequisite: German 1A6 or permission of the Department.

2G3/ German Language Practice. A course designed for non-native speakers to develop language skills, with principal emphasis on vocabulary building. German 2E3 is recommended but not required as a corequisite.
3 hrs., lab. practice; one term.
Prerequisite: German 1A6 and permission of the Department.

2K3/ Introductory Grammar for Reading German

2L3/ German for Arts and Science Students

226/ Intermediate Intensive German. The approach of German 126, which makes extensive use of language lab, films and slides, will be continued. At the same time the student will be introduced to selected works of modern German authors. Films and texts will be the basis for class discussions in German.
4 hrs. lab. practice; both terms.
Prerequisite: Level 4 (Grade 12) German or German 126 (with at least a "B"), or permission of the Department.

3A4/ Eighteenth-Century Drama. The major dramas of Lessing and Schiller will be dealt with, primarily in the context of 18th-century thought.
2 lects.; both terms.
Prerequisite: 18 units of German or permission of the Department.

3B4/ The Age of Goethe.
1 lect. (2), both terms.
Prerequisite: 18 units of German or permission of the Department.

3C4/ Advanced Oral and Written Language Practice. A variety of themes will be selected for discussion in class; these will be further treated in essays outside of class. The main emphasis is placed upon the practical use of German as a means of oral and written communication.
2 hrs., including lab. practice; both terms.
Prerequisite: 18 units of German or permission of the Department.

3E4/ Introduction to Literary Criticism. This course familiarizes the student with the nature, function and materials of literary criticism and interpretation. After a main library resources are identified and examined, examples of the major schools of German literary criticism are analyzed to aid the student in developing a critical method.
2 lects.; both terms.
Prerequisite: German 1A6 and permission of the Department. Not available to students with standing in German 3E3.

3H4/ History of the German Language; Introduction to Middle High German
3 lects.; both terms.
Prerequisite: 18 units of German or permission of the Department.

4A4/ German Lyric Poetry. This course examines lyric poetry as it reflects the changing styles and the main trends of literary experience in Germany from the 17th to the 20th century.
2 lects.; both terms.
Prerequisite: 18 units of German or permission of the Department.

4B4/ Nineteenth Century Drama. A study of selected dramas by Kleist, Buchner, Grillparzer, and Hebbel.
2 lects.; both terms.
Prerequisite: 18 units of German or permission of the Department.

4C4/ Advanced Grammar and Stylistics. Intensive practice in oral expression; composition; translation. The weekly translation exercises introduce the student to the art and techniques of translating, and provide the basis for a wide range of grammatical, stylistic and lexicographical commentaries.
2 hrs., lab. practice; both terms.
Prerequisite: German 3C4.
HISTORY

4F4 / Modern German Literature II. Close reading of selected novels, dramas, poetry and prose by Mann, Rilke, Benn, Celan, Brecht, et al. Where appropriate the course will treat the relationship of literary works to the other arts, including painting, film, and opera.
Seminar (2 hrs.); both terms.
Prerequisite: 18 units of German or permission of the Department.

Seminar (2 hrs.); both terms.
Prerequisite: 18 units of German or permission of the Department.

4H4 / Medieval German Literature; Readings in Middle High German and Old High German.
2 lects.; both terms.
Prerequisite: German 3H4.

4J4 / The German Novel. A study of the development of the novel form from the late 19th century to the present, based on novels by Fontane, Thomas Mann, Schnitzler, Kafka, Boll et al.
1 lect. (2); both terms.
Prerequisite: 18 units of German or permission of the Department.

4K4 / Gothic. An introduction to the Gothic language through close reading of selected texts.
2 lects.; both terms.
Prerequisite: German 3H4.

4Z6 / Special Topics in Language Studies. A comparative analysis of the most important grammatical structures of English and German and the study of the sound systems of these languages form the background for discussions of methods and techniques of teaching German to speakers of English. The theoretical part of the course is combined with practical application by teaching small tutorial groups of German 1Z6.
1 lect., practice teaching (4); both terms.
Prerequisite: Registration in Year IV of any Honours programme in German and permission of the Department. (limited enrolment).

Students interested in German and Austrian history are advised to take History 3J6.

For Graduate Courses see Calendar of School of Graduate Studies.

GREEK
(See "Classics: Greek").

HEBREW
(See Religious Studies: Hebrew").

History

Professors
A. R. Allen
E. Cappadocia
A. Cassels
C. M. Johnston
D. J. Russo
J. H. Trueman

Associate Professors
E. M. Beame
J. P. Campbell/Chairman
J. W. Daly
P. S. Fritz
D. P. Gagan
D. J. Geagan
C. J. Jago
R. H. Johnston
H. A. Levenstein
R. A. Rempel
H. E. Turner
E. M. Wightman
T. E. Willey

Assistant Professors
G. J. Grinnell
B. Kaczynski
J. C. Weaver

Lecturers
D. P. Barrett
N. G. Cassels/part-time

Associate Member
P. J. George

CURRICULUM 1978-80

At least "D" is required in all courses listed under "prerequisite", unless otherwise indicated.

The Department of History offers four Year 1 courses, each of which is designed to introduce the student to the study of history at the university level through the examination of an important aspect of the development of western civilization. Students will be admitted to Pass or Honours programmes in History from any one of the four courses. Students may take only one of these courses. Since enrolment in each course will be limited, students will be asked at the time of registration to indicate their preferences. Students in Pass History may take a maximum of 12 units in any one field of Ancient, Asian, Canadian, British, and United States history, and 18 units of European history, including Year 1, but exclusive of electives. Students in any Honours programme in History may take a maximum of 24 units in any one field of Ancient, Asian, Canadian, British, and United States history, and 30 units of European history, including Year 1, but exclusive of electives.

In selecting courses students in Pass and Honours History and in a Combined Honours programme including History must ensure that they take at least six units in each of three fields of history. For this purpose the Department has established the following five fields: European, Ancient, Canadian, British and United States.

Students interested in Ancient History are advised to examine the offerings of the Department of Classics on Classical Civilization.

YEAR 1 COURSES

1A6 / Mediaeval Europe. A study of the principal features and the development of mediaeval Europe.
3 hrs. (lects. and discussion groups); both terms.
Prerequisite: Open. Students may take only one Year 1 History.
Not open to students with standing in History 216.
Enrolment is limited.

1B6 / Modern European History: The Emergence of the Liberal State.
A study of the problem of freedom versus authority in European
society and politics in the period 1500 to 1914. 3 hrs. (lect. and discussion groups); both terms. Prerequisite: Students may take only one Year I History. Not open to students with standing in History 2M6. Enrollment is limited.

1C6/ The Modern World: The End of European Primacy. A study of the background and development, from the Revolutionary Era to the present of the principal political, intellectual, and economic factors that have shaped the 20th-century world. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Open. Students may take only one Year 1 History. Enrollment is limited.

1L6/ Ancient History. A survey of the major civilizations of ancient times, including the Ancient Near East, Egypt, Greece, and Rome. Special attention will be given to their cultural and intellectual contributions to Western Civilization. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Students may take only one Year 1 History. Not open to students with standing in History 2D6 or 2L6. Enrollment is limited.

YEAR II COURSES

2A6/ Early Modern Europe 1400-1715. A study of the transition from late medieval to early modern civilization, with emphasis upon the breakup of feudal society and the consequent changes in the character of Europe. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Open to students in Year II or above, except those with standing in History 1B6. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Open to students in Year II or above. Not open to students with standing in History 2B6 or 3C6. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Open to students in Year II or above.

2K6/ The History of Canada. A study of the major social and political forces that have contributed to the development of modern Canada. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Open to students in Year II or above, except those with standing in History 1K6.

2L6/ Continental Europe in the Middle Ages. A survey of European history from A.D. 400-1400. Particular attention will be given to the trends at political and social organization which led to the "birth of Europe". 3 lects.: both terms. Prerequisite: Open to students in Year II or above. Not open to students with standing in History 1A6.

2M6/ The History of Science. An introductory study of the evolution of scientific ideas and their relationship to the social and intellectual history of Europe. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Open to students in Year II or above.

2N6/ Greek and Rome. A study of the history of Greece and Rome from the Bronze Age to the 4th century A.D. Attention will be drawn to the political and social developments, as well as to the uses of archaeology in reconstructing historical events. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Open to students in Year II or above.

2R6/ Greece and Rome. A study of the history of Greece and Rome from the Bronze Age to the 4th century A.D. Attention will be drawn to the political and social developments, as well as to the uses of archaeology in reconstructing historical events. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Open to students in Year II or above, except those with standing in History 1L6.

2S6/ British History 1400 to the Present. Emphasis will be placed on the main political, religious, economic and social developments. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Registration in Pass History, any Honours programme in History, or permission of the Chairman of the Department.

2T6/ China: Traditional and Modern. Selected aspects of Chinese history in both the cultural and political fields. The People's Republic will be included. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Open to students in Year II or above.

2U6/ The History of Modern Asia. A survey of the history of East and South Asia with emphasis on the interaction between Asian and European civilization. 3 lects.: both terms. Prerequisite: Open to students in Year II or above, except those with standing in History 3U6. Alternates with History 3G6.

YEAR III COURSES

3A3/ Topics in Modern Italian History, 1815 to the Present. The Risorgimento, the Roman question, Fascism and contemporary issues of Catholicism and Communism. 3 lects.: one term. Prerequisite: Open to students in Year II or above.

3C3/ The Indian in Eastern Canada. A history of the Indian in Ontario, Quebec, and the Maritimes, from the earliest days of Indian-white contact to the twentieth century. 3 hrs. (lects. and discussion groups); one term. Prerequisite: History 2J6, or permission of the Chairman of the Department.

3D6/ Roman History, 264 B.C. to A.D. 117. A study of Rome and the Roman Empire during its greatest days, with special emphasis upon politics and the expansion of Rome's power. (Knowledge of Greek or Latin not required.) 3 hrs. (lects. and discussion groups); both terms. Prerequisite: History 1L6 or 2D6 or 2L6 or Classical Civilization 1A6 or registration in any programme in Classics or permission of the Chairman of the Department. Alternates with History 4F6.

3E6/ Selected Topics in the Recent History of the United States. An intensive examination of American society, politics, and foreign policy since World War I. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: History 1K6 or 2F6 or permission of the Chairman of the Department. This course is not open to students in Honours History.

3G6/ History of South Asia. The history of South Asia with a focus on the traditions of the Indian sub-continent, the British Raj and the emergence of independent India and Pakistan. 3 lects.: both terms. Prerequisite: Open to students in Year II or above. Alternates with History 2U6.

3H6/ The History of Modern Russia. A survey of the history of Russia with major emphasis on the 19th and 20th centuries. 3 lects.: both terms. Prerequisite: Registration in Pass History, any Honours programme in History, or permission of the Chairman of the Department.

3I6/ Latin America. A survey of Latin American history from the pre-Columbian civilizations to the present. 3 lects.: both terms. Prerequisite: Open.

3J6/ Germany and Austria from the Habsburgs to Hitler. An analysis of major political, social, and cultural developments in the German states and Austria from the Reformations to 1955. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: Registration in Pass History, any Honours programme in History or Pass or Honours German, or permission of the Chairman of the Department.

3K3/ The Liberal Tradition in the Nineteenth Century. The Utilitarian and the Natural Right schools of Liberalism. Classical Liberalism and Nationalism. The traditionalist and Marxist critique. The Catholic Church and Liberalism. 3 lects.: one term. Prerequisite: Open to students in Year II or above who have taken any of History 1B6, 1C6, 2M6 or permission of the Chairman of the Department.

3L6/ The World of Ancient Greece. Greek history from the Bronze age to the coming of the Romans, including the problems of Mycenaean and Minoan cultures, 5th-century Athens, and Alexander the Great and his successors. (Knowledge of Greek or Latin not required.) 3 hrs. (lects. and discussion groups); both terms. Prerequisite: History 1L6 or 2D6 or 2L6 or Classical Civilization 1A6 or registration in any programme in Classics or permission of the Chairman of the Department. Alternates with History 4D6.

3M6/ Revolution and Reaction 1789-1848. A study of the liberal, radical, and conservative tradition in France and in Europe. The relationship of liberalism and nationalism. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: At least one previous course in European history or permission of the Chairman of the Department.

3N6/ The English Reformation and Revolution, 1530-1700. A study of the relation between these crises, the forces which operated in them, and their historical interpretation. 3 hrs. (lects. and discussion groups); both terms. Prerequisite: History 2N6, and registration in Pass History, any Honours Programme in History, or permission of the Chairman of the Department.

3O6/ The City in North Atlantic Development. Internal developments and the external economic relations of cities, particularly in North America from the colonial era to the present. Supporting
references are made to European cities.

3 3lects.; both terms.

Prerequisite: Open to students in Years II or above.


An examination of the European seaborne empires from the late fifteenth to the seventeenth centuries and of the accompanying changes in the character of the European economy.

3 hrs. (lects. and discussion groups); one term.

Prerequisite: Open to students in Year II or above who have taken any of History 156, 186, 216, 3N6, or permission of the Chairman of the Department. Not open to students with standing in History 3B6.

3Q6/ China: From the Opium War to the Present.

The history of China in the nineteenth and twentieth centuries. The emphasis will be on internal developments, from the disintegration of the imperial system through the rise of the Communist Party to the building of the People’s Republic of today.

3 hrs. (lects. and discussion groups); both terms.

Prerequisite: Open to students in Year II or above.

3R3/ Religion and Politics in the Age of the Reformation.

An examination of both the Protestant and Catholic movements of the sixteenth century with particular attention to their political and social implications.

3 3lects.; one term.

Prerequisite: Any of History 1B6, 2A6, 3N6, or Religion 3N6, or permission of the Chairman of the Department.

3S3/ Topics in Eighteenth-Century British History.


3 hrs. (lects. and discussion groups); one term.

Prerequisite: History 2N6 and registration in Pass History, any Honours programme in History, or permission of the Chairman of the Department.

3T3/ Topics in Twentieth-Century British History.

1978-79—The Impact of World War I on British Society.

1979-80—The Impact of World War II on British Society.

3 hrs. (lects. and discussion groups); one term.

Prerequisite: History 2N6 and registration in Pass History, any Honours programme in History, or permission of the Chairman of the Department.


A survey of the development of society in Ontario stressing the interplay of social, economic and demographic factors in the transition from an agrarian to an urban industrial society.

3 hrs. (lects., seminars, and discussion groups); both terms.

Prerequisite: History 2E6 or 2J6 or permission of the Chairman of the Department.

3W3/ Introduction to Canadian Intellectual History.

A study of such topics as the early 18th-century conservative mind and its critics, the response to Darwin, social criticism, varieties of nationalism and the intellectual in Canadian history.

3 3lects.; one term.

Prerequisite: History 2E6 or 2J6 or permission of the Chairman of the Department.

3Z6/ Studies in Canadian History: French Canada.

An examination of the history of French Canada, particularly Quebec, from the 16th to the 20th century. A reading knowledge of French is desirable.

3 hrs. (lects. and discussion groups); both terms.

Prerequisite: History 2E6 or 2J6 or permission of the Chairman of the Department.

YEAR IV COURSES

Enrolment in any fourth-year history course will be limited to twelve students. Preference will be given in order to students in the following categories: Fourth-year Honours History; Fourth-year Combined Honours History; Continuing students taking a full course load; Third-year Honours History; Third-year Combined Honours History; Third-Year Pass History; others.

4A6/ Special Topics in British History (1688-1830).

Seminar; both terms.

Prerequisite: History 2N6 and registration in any Honours programme in History or permission of the Chairman of the Department.

4B6/ Special Topics in the History of Pre-confederation Ontario.

A course designed to acquaint the student with the mechanics of research and the effective use of archival materials. The subject matter will be drawn principally from the history of Ontario.

Seminar; both terms.

Prerequisite: Registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

4C6/ Special Topics in British Imperial History. The major emphasis of this course will be on the Victorian Empire.

Seminar; both terms.

Prerequisite: Registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

Alternates with History 4C6.

4D6/ Special Topics in Greek History. Detailed investigation into the historical problems in interpreting various aspects of Ancient Greek civilization and culture.

Seminar; both terms.

Prerequisite: History 2L6 or 3L6, and registration in any Honours programme in History or a programme requiring History 4D6, or permission of the Chairman of the Department (limited enrolment).

Alternates with History 3L6.

4E6/ Special Topics in the History of Victorian Britain. An examination of such themes as the two-party system, the Irish question, working-class life, religious and literary movements, evolving industrialism, imperialism and social reform.

Seminar; both terms.

Prerequisite: History 2N6 and registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

4F6/ Special Topics in the Age of the Enlightenment. A detailed study of the intellectual revolution of the 17th and 18th centuries.

Seminar; both terms.

Prerequisite: Six units of European history, registration in any Honours programme in History, a programme requiring History 4FE, or permission of the Chairman of the Department (limited enrolment).

Not open to students who have completed History 3P6.

4G6/ The Revolutionary Movement in Modern China. A history of twentieth-century China with the focus on the political movements that have been the agents of change.

Seminar; both terms.

Prerequisite: A course on China or on Marxism and registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

4H6/ The European Historical Tradition. Topics in the development of European historiography from the Enlightenment to the twentieth century. The seminar will concentrate on the emergence of history as a scientific discipline in Europe and on the intellectual forces which affected the writing of history in England and on the Continent.

Seminar; both terms.

Prerequisite: Registration in any Honours programme in History, or permission of the Chairman of the Department (limited enrolment).

4I6/ Special Topics in Roman History. The central theme will be the process and results of Roman expansion within Italy and beyond.

Seminar; both terms.

Prerequisite: History 2L6 or 3D6, and registration in any Honours programme in History or a programme requiring History 4I6 or permission of the Chairman of the Department (limited enrolment).

Alternates with History 3D6.


Seminar; both terms.

Prerequisite: History 1K6 or 2H6 and registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

4K6/ Conservatism in the Modern World. A study of the development of conservatism from its eighteenth-century origins to its contemporary problems. Emphasis is on intellectual history, with some attention to politics and society.

Seminar; both terms.

Prerequisite: One of History 1B6, 2M6 or 3M6 and registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

4L6/ Special Topics in the History of the United States Before 1865.

Seminar; both terms.

Prerequisite: History 1K6 or 2H6 and registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

Not open to students who have completed History 3K6.

4M6/ Special Topics in the History of the Renaissance and the Reformation.

Seminar; both terms.
Prerequisite: History 2J6 or 3C6 or permission of the Chairman of the Department (limited enrolment).

4O6 / Russian and Revolution. The impact of modernization upon the Soviet state and society. Seminar; both terms. 
Prerequisite: History 3H6 and registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

4P6 / Contemporary Europe. Topics in the history of Europe during the 20th century. Seminar; both terms. 
Prerequisite: A course in 19th or 20th century European history, registration in any Honours programme in History, or permission of the Chairman of the Department (limited enrolment).

4Q6 / Special Topics in the History of Medieval Europe and Byzantium. Topics will include the consequences of the Barbarian invasions, diplomatic communications between West and East, relations between the Roman and Orthodox Churches, the impact of the Crusades, and the significance of the fall of Constantinople. Seminar; both terms. 
Prerequisite: History 1A6 or 216 and registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

Prerequisite: Registration in any Honours programme in History, or permission of the Chairman of the Department (limited enrolment).

Prerequisite: History 1A6 or 216 and registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

4T6 / Europe in the Era of the French Revolution and Napoleon I. Seminar; both terms. 
Prerequisite: History 3M6 and registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

4U6 / Independent Research. A reading and/or research programme under the supervision of at least two members of the Department. A major paper is required, as well as a formal oral examination. 
Prerequisite: Open to students in any 4th-year Honours programme in History who have an upper second-class standing in History and the permission of the Chairman of the Department. Qualified students interested in doing field work in Ancient Archaeology as part of this course should see Dr. E. Wightman or the Chairman of the Department.

4V6 / The Reform Tradition in Canada. The history of reform in Canada, 1880-1939, under the influence of new thought, the new industrial-urban order, immigration, war, and depression. Seminar; both terms. 
Prerequisite: History 2J6 and registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment). 
Students may take only two of History 4B6, 4N6, 4V6, 4W6, and 4Z6.

4W6 / The Canadian City. An examination of the Canadian city, including the study of traditional local histories, as well as urban social history. The course will examine change in urban society, questions of health, housing, economic activity, planning, and politics. Seminar; both terms. 
Prerequisite: History 2J6 and registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment). 
Students may take only two of History 4B6, 4N6, 4V6, 4W6, and 4Z6.

4X6 / Special Topics in the History of Modern Science. A study of the scientific revolution and of its impact on western culture in the nineteenth and twentieth centuries. Seminar; both terms. 
Prerequisite: Registration in the senior division of any Honours Programme or permission of the Chairman of the Department (limited enrolment).

4Y6 / Society and Culture in 17th-Century Europe. An intensive study of the social and economic structure of Europe, 1600-1715, and of the cultural changes associated with this period. Seminar; both terms. 
Prerequisite: Six units of European history. Registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment).

4Z6 / Canadian Social History: Introduction to Methods and Analysis. A study of the methods, techniques, and concept of quantitative history, as they apply to an analysis of Canadian Society. The historical content of the course will focus on 19th-century rural Canadian society, emphasizing the relationship between family structure, function, culture, and landholdings. The methodological aspects of the course will focus on the techniques of family reconstruction from demographic records and simple electronic data-processing procedures. Seminar; both terms. 
Prerequisite: Registration in any Honours programme in History or permission of the Chairman of the Department (limited enrolment). 
Students may take only two of History 4B6, 4N6, 4V6, 4W6, and 4Z6.

For Graduate Courses see Calendar of School of Graduate Studies.
Linguistics

CURRICULUM 1978-80

Linguistics is the study of language as a system of human communication. As a discipline it combines the methods of traditional scholarship and philosophy with those of observational and experimental science in order to investigate the nature, structure, and development of languages everywhere in the world and of language as a uniquely human faculty.

Courses in linguistics are supervised and co-ordinated by a Committee of Instruction in Linguistics. Advice on the selection of courses may be obtained from the chairman of the committee J. Colarusso (Anthropology) or its secretary G. Thomas (Russian).

There is no B.A. programme in linguistics but students may enrol in courses with linguistic content offered by the various departments.

1. The following introductory course in linguistics is available:

   Linguistics 1A6/ The Study of Language. A far-reaching survey intended to acquaint the student with the numerous disciplines that deal with language and many of the crucial concepts and techniques developed within them. The course will enable the student to pursue higher studies in either linguistics or other language-related disciplines.

   2 lec., 1 tut.; both terms.
   Prerequisite: Open. Same as Anthropology 1B6.

2. Courses which have Linguistics 1A6 as prerequisite:

   Anthropology 2M6/ General Linguistics
   Russian 2F6/ Introduction to Slavic Linguistics

3. Other courses in Linguistics:

   Anthropology 3G3/ Phonetics and Phonology
   Anthropology 3J3/ Syntax and Semantics
   English 253/ English as Communication
   French 3B3/ Semantics
   French 3G3/ General and Comparative Phonetics
   French 3L3/ French Syntax
   French 4K3/ Advanced Semantics
   Italian 4L4/ Introduction to Italian Philology
   Russian 3F3/ Russian Language and Soviet Society

For full course descriptions and prerequisites of the above courses see the listings under each department. Other courses related to linguistics include Philosophy 4D3, Sociology 3X6 and courses in the history of specific languages.

Mathematics

Professors
B. Banaschewski
E. A. Behrens
C. E. Billigheimer
G. Bruns
T. Hussein
H. L. Jackson
N. D. Lane
R. G. Lintz
W. J. McCallion
S. G. Mohanty
B. Mueller
C. R. Riehm/Chairman
A. Rosa
M. A. Stephens

Associate Professors
M. Behara
C. Bennett
T. H. Choe
I. Z. Chorneyko
J. Csima
T. M. K. Davison
H. P. Heinig
Z. V. Kovarik
E. Mead
J. Stewart

Assistant Professors
I. A. Ahmad
I. Hambleton

Associate Member
M. E. H. Ismail (Applied Mathematics)

CURRICULUM 1978-80

For prerequisite purposes, a grade of "E" or better is required.

*Course is not necessarily offered every session; consult the Chairman of the Department or a Dean of Science Studies.

1A6/ Calculus I. This is a course in differential and integral calculus with emphasis on the fundamental processes and applications. 3 lec., 1 tut.; both terms. Prerequisite: Level 5 (Grade 13) Calculus.

1B4/ Linear Algebra I. Vectors, matrices, determinants, vector valued functions and space curves, complex numbers. 2 lec., 1 tut.; both terms. Prerequisite: Registration in, or completion of, Mathematics 1A6 or 1C6.

1C6/ Calculus. A course in differential and integral calculus from an advanced viewpoint for students with a strong calculus background. Emphasis is placed on fundamental processes and applications in mathematics and the physical sciences. 3 lec., 1 tut.; both terms. Prerequisite: Level 5 (Grade 13) Mathematics (at least two credits, including differential calculus, with an average of at least 60%), and such other criteria as the Department may consider appropriate.

1F6/ Calculus and Statistics. The rudiments of differential and integral calculus. An introduction to probability and statistics including the binomial, Poisson, and normal distributions, linear regression, and simple hypothesis testing. 3 lec., 1 tut.; both terms. Prerequisite: Registration in Natural Science I, not open to students who are registered in, or have completed, Applied Mathematics 1C6 or Mathematics 1B4.

1K3/ Introductory Calculus for Business and the Social Sciences. An introduction to differential and integral calculus. 3 lec., 1 tut.; first term. Prerequisite: Level 4 (Grade 12) Mathematics. Not open to students who are registered in, or have completed, any of Mathematics 1A6, 1C6, 1D6, 1E6, 1F6. Normally not open to students who have completed Level 5 (Grade 13) Calculus.

1L3/ Linear Algebra and Probability for Business and the Social
100/ Remedial Mathematics. The number system, notion of variable and function, basic operations involving variables, simplification of algebraic expressions, solutions of quadratic equations, introduction to trigonometric functions, and logarithms.


Text: Hoffman and Kunze, Linear Algebra

2 lects.; both terms.

Prerequisite: Mathematics 1 A6 or 1 C6, or Applied Mathematics 1 C6. Not open to students who are registered in, or have completed, Mathematics 2 G3.


2 lects.; both terms.

Prerequisite: Registration in, or completion of, Mathematics 2 A4 or 2 A5. Not open to students who are registered in, or have completed, Mathematics 2 J6.

2D4/ Probability Theory I. Elementary theory of probability; random variables; discrete and continuous distributions including binomial, Poisson, hypergeometric, uniform, normal $x^2$, moment-generating functions, limiting distributions, central limit theorems; applications.

2 lects.; both terms.

Prerequisite: One of Mathematics 1 A6, 1 C6, 1 M3 and one of Mathematics 1 B4, 1 L3, Applied Mathematics 1 C6.

2F4/ Sets and Structures. Elementary operations on sets, relations, functions, ordinal and cardinal arithmetic, Axiom of Choice and some of its consequences, the number system, topological concepts in n-space.

2 lects.; both terms.

Prerequisite: Registration in an Honours programme in Mathematics, or permission of the instructor. Not open to students who are registered in, or have completed, Mathematics 2 J6.

2G3/ Intermediate Calculus. Differential calculus of several variables; multiple; theorems; line and surface integrals.

3 lects.; first term.

Prerequisite: Mathematics 1 A6 or 1 C6, Mathematics 1 B4 or Applied Mathematics 1 C6. Not open to students who are registered in, or have completed, Mathematics 2 A4 or 2 A5.

2H6/ Ideas in Mathematics. Selected topics from: set theory, non-Euclidean and projective geometries, number theory, probability and statistics, algebraic systems. No specific background in mathematics is assumed.

3 lects.; both terms.

Prerequisite: Registration in Year II, III, or IV of a non-Science programme.

2J6/ Linear Algebra and Set Theory. Sets, relations, and functions; the Axiom of Choice; the real number system; vector spaces, transformations, matrices and linear equations; eigenvalues and diagonalization of matrices; inner products.

3 lects.; both terms.

Prerequisite: Mathematics 1 A6 or 1 C6, and either Mathematics 1 B4 or Applied Mathematics 1 C6. Not open to students who are registered in, or have completed, Mathematics 2 B4 or 2 F4.

2K3/ Financial Mathematics. Nominal and effective rates of interest and discount, forces of interest and discount, compound interest; annuities certain; amortization, sinking funds; bonds, security evaluation, determination of yields.

3 lects.; first term.

Prerequisite: Mathematics 1 A6 or 1 C6 or 1 F6 or 1 M3, or permission of the instructor.


3 lects.; second term.

Prerequisite: One of Mathematics 1 A6, 1 C6, 1 M3, and one of Mathematics 1 L3, 1 B4, Applied Mathematics 1 C8. Not open to students enrolled in, or having completed Mathematics 2 A4 or 2 A5 or 2 G3.


3 lects.; second term.

Prerequisite: Registration in, or completion of, Mathematics 2 G3. Not open to students who are registered in, or have completed, Mathematics 2 C4 or 3 G3.

3A6/ Real Analysis. Development of the real number system, infinite series, differential and integral functions of several variables, Stieltjes integral, uniform convergence, improper integrals and their applications.

3 lects.; both terms.

Prerequisite: Mathematics 2 A4 or 2 A5, and 2 B4, or registration in a programme in which Mathematics 3 A6 is specified.

3B4/ Foundations of Geometry. Introduction of coordinates into affine and projective planes, Desargues and Pappus properties, ordered planes, fundamental theorems.

Text: Artin, Geometric Algebra

2 lects.; both terms.

Prerequisite: Mathematics 2 B4 and 2 F4, or 2 J6.

3D6/ Mathematical Statistics I. The multivariate normal distribution, point and interval estimation, sampling distributions, tests of hypotheses, elementary linear regression, and other topics.

3 lects.; 1 lab. (1); both terms.

Prerequisite: Mathematics 2 D4, and one of Mathematics 2 A4, 2 A5, 2 G3.

3E4/ Algebra I. Selected topics from: monoids, quotient monoids, groups, Sylow Theorems, free groups, finitely generated abelian groups, divisible groups, rings, factorization, Chinese Remainder Theorem, modules, elementary divisor theorem.

2 lects.; both terms.

Prerequisite: Mathematics 2 F4 or 2 J6.


3 lects.; both terms.

Prerequisite: Mathematics 2 A4 or 2 A5, and 2 C4.

*3H4/ Number Theory. Selected topics from: congruences and residues, continued fractions, approximation of irrationals, arithmetical in selected quadratic number fields, Diophantine equations, partitions, geometry of numbers, quadratic reciprocity.

2 lects.; both terms.

Prerequisite: Permission of the instructor.

*3L4/ Mathematical Logic and Boolean Algebra. Partially ordered sets, lattices, Boolean algebras, subalgebras, homomorphism, congruence relations and ideals, representation theory and connection with Boolean spaces. Elements of classical propositional logic.

2 lects.; both terms.

Prerequisite: Mathematics 2 F4 or 2 J6, or permission of the instructor. Not open to students who have completed Mathematics 3 K4 or 3 M4.

3O6/ Real Analysis. Development of the real numbers; Riemann-Stieltjes integration; Gauss and Stokes theorems; Jacobians, implicit function theorems; Taylor’s expansions, pointwise, uniform, mean convergence; orthogonal functions, Fourier series.

3 lects.; both terms.

Prerequisite: Mathematics 2 A4 or 2 A5 or 2 G3.


2 lects.; both terms.

Prerequisite: Mathematics 2 F4 or 2 J6.

3Q4/ Numerical Analysis I. An introduction to the methods of numerical analysis, including methods for interpolation, numerical differentiation and integration, and the solution of transcendental, differential, and matrix equations.

2 lects.; 1 lab. (3) every other week; both terms.

Prerequisite: Mathematics 2 A4 or 2 A5, and 2 C4; or 2 G3 and 2 O3, and Applied Mathematics 1 H3 or 2 H3. Not open to students registered in, or who have completed, Applied Mathematics 3 F4.

3R3/ **Linear Programming.** The general linear programming problem; simplex procedures, dual problems, degeneracy procedures, parametric linear programming, additional procedures and applications.
3 lects.; first term.
Prerequisite: Mathematics 1A6 or 1C8, and either Mathematics 1B4 or Applied Mathematics 1C8.

3S3/ **Optimization.** Non-linear programming methods; integer programming; quadratic programming, stochastic programming, and dynamic programming.
3 lects.; second term.
Prerequisite Mathematics 2A4 or 2A5 or 2G3 and Mathematics 3R3.

3T3/ **Complex Analysis I.** Analytic functions, power series, elementary conformal mappings, Cauchy’s theorem, residue calculus.
3 lects.; first term.
Prerequisite: Mathematics 2A4 or 2A5 or 2G3.

3 lects.; first term.
Prerequisite: Mathematics 2D4, and one of Mathematics 2A4, 2A5, 2G3.

*3W3*/ **Directed Reading.** Directed reading in areas of interest to the student and instructor.
Prerequisite: Permission of the Chairman of the Department.

*3X3*/ **Life Contingencies I.** Single life functions and probabilities, forces of mortality, commutation functions, life annuities, insurance benefits, premiums, reserves.
3 lects.; first term.
Prerequisite: Mathematics 2D4; Mathematics 2K3 or permission of the instructor.

*3Y3*/ **Life Contingencies II.** Joint life and last survivor functions and probabilities, contingent functions, stationary population theory, multiple decrement theory.
3 lects.; second term.
Prerequisite: Mathematics 3X3.

3Z4*/ **History of Mathematics.** An introduction to the history of mathematics, including interaction with other phases of culture, with special emphasis on the past three centuries.
Text: Boyer, *A History of Mathematics*
2 lects.; both terms.
Prerequisite: At least two second-year Mathematics courses other than Mathematics 2G3, 2H6, 2K3, 2L3.

4A6*/ **Functions of a Complex Variable.** Study of analytic functions, their various representations, and their properties.
3 lects.; both terms.
Prerequisite: Mathematics 3A6.

4B4*/ **Differential Manifolds.** Introduction to differentiable manifolds, differentiable forms.
2 lects.; both terms.
Prerequisite: Mathematics 3P4.

*4C4*/ **Combinatorics and Graph Theory.** Inversion formulæ, systems of distinct representatives, block designs and other configurations, trees, bipartite graphs, connectivity, graph colouring, matrix representations, applications.
3 lects.; both terms.
Prerequisite Mathematics 2A4 or 2A5 or 2G3, and Mathematics 2B4 or 2J6; or permission of the instructor.

4E5*/ **Algebra II.** Semi-simple modules and rings, group theory, polynomial and group rings, ideal theory, Galois theory.
3 lects.; both terms.
Prerequisite: Mathematics 3E4.

4G3*/ **Theory of Games.** Two person zero-sum game, minimax theorem, n person and continuous games, decision functions and applications.
3 lects.; first term.
Prerequisite: Mathematics 2D4, and either Mathematics 3A6 or 306.

4J3*/ **Reliability Theory.** Reliability function, failure distributions, renewal theory, stochastic models, serial and redundant reliability systems, coherent structures and other selected topics.
3 lects.; second term.
Prerequisite: Mathematics 3D6.

4K4*/ **Measure Theory.** Introduction to the theory of measure and integration with applications.
2 lects.; both terms.
Prerequisite: Mathematics 3A6 or 306.

4M3*/ **Mathematical Statistics II.** A sequel to Mathematics 3D6, including multivariate distributions: Normal, Wishart, T2, and others; regression, correlation, factor analysis, general linear hypothesis.
Mechanical Engineering

Professors
M. A. Dokainish
J. L. Duncan
B. Latto
W. R. Newcombe
G. F. Round
J. N. Siddall/Chairman
J. Trusty
R. Sowerby
J. H. T. Wade

Associate Professors
R. L. Judd
D. S. Weaver

Assistant Professors
H. A. ElMaraghy (Part-time)
R. W. Hamilton

CURRICULUM 1978-80

A minimum grade of "D" is normally acceptable for prerequisites specified for Mechanical Engineering courses, except where otherwise indicated. Special cases may be considered by the Department upon request. Enrolment in Mechanical Engineering courses by students in programmes other than Mechanical Engineering and Management may be limited.

2A4/ Engineering Design II. Computations, and projects in mechanical engineering, introduction to the design of mechanisms. Analysis and synthesis of cams, gears, and planar mechanisms. Force analysis of machine members. 2 lects., 1 lab. (3); first term: 1 lab (3); second term. Prerequisite: Applied Mathematics 1C7 or 1C5, Mathematics 1A6, Physics 1A7, or permission of the Department.

2B3/ Mechanical Engineering Measurements. Introduces the engineering student to the theory and practice of engineering measurements, employing many different instruments and measuring techniques. Theory of measurements, precision shop measurements and optical tooling; measurements of pressure, flow, temperature, and power; combustion analysis and gas analysis, measurement of strain and force; elementary statistical analysis. 1 lect., 1 lab. (3); first term: 1 lab. (3); second term. Prerequisite: Applied Mathematics 1C7, Physics 1A7.


3C3/ Manufacturing Engineering. A general introduction to manufacturing engineering encompassing the wide field of activities from iron and steel making through casting, rolling, forging, to cold forming, metal cutting, welding, bonding, electrical machining, surface treatment, mechanical handling, assembly, cleaning, packaging. 3 lects., 1 lab. (3); first term. Prerequisite: Registration in Mechanical Engineering or permission of the department.

3D3/ Mechanical Engineering Thermodynamics. The thermodynamic laws, as developed in Engineering 2W4, are re-examined. Also covered are: Advanced engineering thermodynamic processes, psychometry, introduction to direct energy conversion, and chemical equilibrium, with emphasis on combustion. 3 lects.; second term. Prerequisite: Engineering 2W4.

3E4/ Engineering Design III. Introduction to elements of mechanical analysis. Static and dynamic analysis of machine elements, members and mechanical systems. The laboratory consists of problems and case studies. 3 lects., 1 lab. (3) second term. Prerequisite: Mechanical Engineering 2A4, Engineering 2E3.

3F4/ Fluid Mechanics. Fluid properties and statics are introduced. Basic equations of continuity, energy and momentum for internal and external flows are discussed. Similitude, dimensional analysis and compressible and inviscid flows are introduced. 3 lects., 2 tuts; first term. Prerequisite: Applied Mathematics 2J5 or 2J7.

3M2/3M3/ Composite Laboratory. Laboratory exercises in fluid mechanics, thermodynamics, and solid mechanics. 3M2: 1 lab. (3); both terms. 3M3: 2 labs. (4); both terms. Prerequisite: Registration in Mechanical Engineering or Mechanical Engineering and Management.


4A3/ Advanced Strength of Materials. The application of strength of materials to practical engineering calculations in design and in the working of metals. Plastic deformation and creep. Elastic behaviour and rapid, approximate methods are emphasized more than detailed techniques of numerical analysis. 2 lects.; 1 tut., first term. Prerequisite: Mechanical Engineering 3A3 or equivalent.


4F3/ Engineering Acoustics. Propagation of sound; "near" and "far" fields, the diffuse field, sound attenuation, and transmission loss. Generation of noise by fluid flow, vehicular traffic and industrial machinery. Muffler and barrier design. Measurement techniques and noise analysis. Laboratory demonstrations. 2 lects., 1 lab. or tut.; second term. Prerequisite: Registration in the senior year of Mechanical Engineering or permission of the Department.

4G3/ Theory of Design. The theory and methods of design synthesis are combined with the study of some machine elements to illustrate design topics such as value theory, optimization, probabilistic design and reliability. The laboratory period will be devoted to several short design projects to illustrate the principles of design theory. 2 lects., 1 lab. (3); first term. Prerequisite: Applied Mathematics 3V6 or Applied Mathematics 3J3 and 3P3.

4M4/ Project. A major project will be undertaken which may be related to any option or branch of engineering. It may be of a design nature or of an experimental nature. One afternoon is devoted to this in the first term for information retrieval, a literature survey, planning, and obtaining equipment. 1 lab. (3); first term: 3 labs. (9); second term. Prerequisite: Registration in Mechanical Engineering, or permission of the Department.

4P2/ Composite Laboratory. Laboratory exercises in vibrations, transients, machine structures, controls, heat transfer, gas dynamics, fluid mechanics, and thermodynamics. 1 lab. (3); both terms. Prerequisite: Registration in Mechanical Engineering.


Metallurgy and Materials Science

Professors
J. D. Embury/Chairman
M. L. Ives
D. A. R. Kay
R. Kelly
J. S. Kirkaldy
W-K. Lu
G. R. Piercy
G. R. Purdy
W. V. Smetzer

Associate Professor
P. S. Nicholson

CURRICULUM 1978-80

For prerequisite purposes, a grade of "D" or better is required.

Ceramics

4A1/ Summer Essay. Students are required to work in the ceramic industry the summer before entering Year IV Ceramic Engineering and write a report about their activities. The chairman should be consulted before the end of Year III.

4K4/ Ceramic Projects. Each student will be given either an individual experimental project or an industrial design problem. The results of the experimental project or design problem are to be presented in the form of a thesis at the end of the academic session.

2 labs. (3); both terms.

Prerequisite: Completion of Year III Ceramic Engineering, Metallurgical Engineering, Honour Metals and Materials Science, or permission of the department.

4L4/ General Ceramic Laboratory. A series of laboratories relevant to glass and ceramics technology. In addition, a series of industrial seminars and design problems will be included in the laboratory sessions in term II.

2 labs. (3); both terms.

Prerequisite: Completion of either Ceramics 404 or 4P4, and Materials 382, 392 and 396.

4D4/ Ceramics and Glazes. The production of ceramics; raw materials survey; green-ware production, and firing processes for traditional and space-age ceramics; glasses; enamels and glazes; special techniques for production of ceramic materials of specific properties.

2 lects.; both terms.

Prerequisite: Chemistry 2F3 or 2S8, or permission of the Department.

Offered in 1979-80 alternating with Ceramics 4P4.

4P4/ Glasses and Refractories. Structure and physical properties of glasses. Raw materials used in glass and glass-ceramic production; phase diagrams in glass-forming systems; production and heat treatment. The structure, properties and uses of refractories.

Text: Holloway, The Physical Properties of Glass

2 lects.; both terms.

Prerequisite: Chemistry 2F3 or 2S8, or permission of the Department.

Offered in 1978-79, alternating with Ceramics 404.

Materials

1A6/ The Science of Materials. An introductory course for non-specialists about the structure of materials, its control, and effect on properties. The basic concepts and elementary scientific models are used to explain the behaviour of both natural and man-made materials.

Texts: Ruoff, Introduction to Materials Science

2 lects., one tut. and independent study; both terms.

Prerequisite: Registration in, or completion of, Natural Sciences I. Not open to students who are registered in Engineering, or who are registered in, or have completed, Engineering 203 or 204.


1 lect., 1 tut. (2), 1 lab. (3); second term.

Prerequisite: Completion of at least 13 units of Year I Chemistry,
Mathematics or Physics and registration in a programme administered by the Department of Metallurgy and Materials Science.

**3B2/ Crystallography.** A laboratory course, complemented by lectures, about crystal structure and its determination by X-ray diffraction.

1 lect.; 1 lab. (3); first term.
Prerequisite: Completion of at least 13 units of Year I Chemistry, Mathematics, or Physics.


Text: Denbigh, Principles of Chemical Equilibrium
Reference: Swalin, Thermodynamics of Solids

3 lects.; both terms.
Prerequisite: Chemistry 2P4 or 2T4, or Engineering 2W4, or Physics 2H3 or 2H5, or Chemical Engineering 2D4, 2T4.

**3D3/ Thermodynamics of Materials I.** The first half of Materials 3D6, with emphasis on "classical" topics such as equilibrium, solid solutions, and phase diagrams.

3 lects.; first term.
Prerequisite: Chemistry 2P4 or 2T4 or 2T6, or Engineering 2W4, or Physics 2H3 or 2H5, or Chemical Engineering 2D4, 2T4.


Texts: Necati Ozisik, Basic Heat Transfer
Geiger and Porier, Transport Phenomena in Metallurgy

3 lects.; both terms.
Prerequisite: Applied Mathematics 2J5 or Mathematics 2G3 and 203, or equivalent.

**3G2/ Microstructures Laboratory.** Characterization and measurement of microstructures of metals, alloys and ceramics and their correlation with phase equilibria.

2 labs. (3); second term.
Prerequisite: Completion of at least 13 units of Year I Chemistry, Mathematics or Physics.

**3H3/ Thermodynamics of Materials II.** The second half of Materials 3D6, with emphasis on "atomic" topics such as statistical mechanics, ordering, interfaces, and defects.

3 lects.; second term.
Prerequisite: Chemistry 2P4 or 2T4, or Engineering 2W4, or Physics 2H3 or 2H5, or Chemical Engineering 2D4, 2T4.

**4D3/ Corrosion.** The oxidation of metals and alloys; electrochemical principles and methods applied to aqueous corrosion and its control.

Texts: Fontana and Green, Corrosion Engineering
Haufe, Oxidation of Metals

4 lects.; second term.
Prerequisite: Chemistry 2P4 or 2T4 or Chemical Engineering 2F4, or permission of the Department.

**4E3/ Phase Transformations.** The thermodynamic, kinetic, and crystallographic aspects of phase transformations, with applications to the preparation and properties of materials; solidification, recrystallization, precipitation.

Text: Sherwood, Transformations in Metals

3 lects.; first term.
Prerequisite: Chemistry 2P4 or Physics 2H3 or Materials 3D6 or permission of the Department.

**4M3/ Dislocation Theory.** An introductory course on the behaviour of dislocation in solids. Basic elasticity theory is used to determine the force required to move dislocations and obtain quantitative estimates of the various mechanics of strengthening materials.

Text: Hull, Introduction to Dislocation Theory

3 lects.; first term.
Prerequisite: Materials 3B2 or Engineering 3P3, or permission of the Department.

### Metallurgy

**2C3/ Introduction to Chemical Metallurgy.** The application of chemical principles to metallurgy. Thermodynamics of oxides, sulfides and halides; general classification of extraction processes; electrochemistry; reaction kinetics and their application to heterogeneous reactions; interfacial phenomena; corrosion.

3 lects.; second term.
Prerequisite: Registration in, or completion of, Chemistry 2T4.

**3C3/ Chemical Metallurgy I.** Mineral dressing; stags and mattes; the iron and zinc blast furnaces; extraction from sulphide ores; electro-winning of aluminum and magnesium; halide metallurgy for production of beryllium, titanium, uranium and zirconium.

2 lects., 1 lab. (3); first term.
Prerequisite: Chemistry 2P4 or 2T4, or Engineering 2W4, or permission of the Department.

**3A1/ Summer Essay.** An essay is required of each student entering Year IV of Honours Metallurgy and Materials Science or Metallurgy and Materials Science Major or Metallurgical Engineering. The Chairman must be consulted before the completion of Year III.

**3C4/ Chemical Metallurgy II.** A sequel to Metallurgy 3C3. Refractories and their application; physical chemistry of steelmaking processes; extraction and refining by aqueous reactions; modern analytical techniques.

3 lects. 1 lab. (3); first term.
Prerequisite: Metallurgy 3C3 or registration in Year IV Ceramic Engineering or permission of department.

**4K4/ Thesis.** Each student will have an individual problem which will be mainly experimental in nature. A preliminary report is required before the end of the first term. The results of the investigation must be presented in thesis form at the end of the academic session.

1 lab. (3), first term; 3 labs. (3), second term.
Prerequisite: Completion of Materials 3B2, 3G2 and 3D6 or permission of department.

**3N3/ Kinetics and Reactor Analysis in Metallurgical Systems.** Homogeneous and heterogeneous kinetics. Ideal reactors; mixing; two-phase systems with interfacial reactions; behaviour of batch and continuous steelmaking reactors; packed-bed reactors. Coupling of heat and mass transfer in blast furnace and rotary kiln. Rist Diagram for iron blast furnace.

3 lects.; second term.
Prerequisite: Materials 3E6, which may be taken concurrently, or permission of the instructor.

Offered in 1978-79 and alternate years.

**4Q3/ Case Studies in Metallurgy.** The analysis of current industrial problems in metallurgical engineering. The course will analyze two industrial problems one in chemical and one in physical metallurgy, from the viewpoints of the background science, cost analysis and process design.

2 lects., 1 tut.; second term.
Prerequisite: Materials 3D6, 3E6 and 3G2, or permission of Department.

### Engineering

**203/ Structure and Properties of Materials.** The relationships between the structure of solids and their properties are developed by study of specific mechanical, electrical, magnetic and chemical properties along with the various levels of structural complexity exhibited by solid materials. Independent study is aided by audio-visual materials and regular tutorial assistance.

Self-paced study; first term.

Prerequisite: Completion of at least 12 units of Year I Chemistry, Mathematics, or Physics. Not open to students who are registered in, or have completed, Materials 1A6.

**204/ Structure and Properties of Materials.** Engineering 203 with a laboratory, involving experiments which illustrate the properties of crystals, glasses, magnetic materials, electrical conductors, and steels.

Self-paced study, 1 lab. (3); first term.

Prerequisite: Completion of at least 12 units of Year I Chemistry, Mathematics, or Physics. Not open to students who are registered in, or have completed, Materials 1A6.

**3P3/ Mechanical Behaviour of Materials.** The macroscopic basis of mechanical behaviour of engineering materials. The effect of structure in determining mechanical, electrical, magnetic and chemical properties is considered with emphasis on a quantitative explanation of their behaviour, how to control it, and how to use it effectively.

Text: Solymar and Walsh, Lectures on The Electrical Properties of Materials

3 lects.; second term.
Prerequisite: Engineering 2A4 or 2A5, or Physics 2A6 or 2B6.
Music

Professors
Marta Hidy
A. Walker/Chairman
W. Wallace

Associate Professors
L. Hepner
Z. Konicek

Assistant Professors
R. Duffin/half-time
H. Hartwell
P. Rapoport
Beverly Simmons/half-time

Instructors
Eileen McManamy/piano
R. Bedford/piano
Arlene Wright/basic keyboard skills
Paula Elliott/flute
Jon Peterson/oboe
R. Hansen/horn
A. Dvorak/trumpet, tuba, and recorder
S. Pettes/trumpet and brass ensemble
R. Flock/percussion
P. Brodie/saxophone
Betty Kovacs/vocal methods
D. Driscoll/organ
R. Scott/woodwind methods
S. Weinstangel/violin and string methods
J. Courtney/bassoon
Myrtle Guerrero/piano
Mary Morrison/voice
J. Price/saxophone
Pauline O’Connor/clarinet
D. Allan/concert band
W. Strongman/university choir

Concert Managers
Vivian Campbell
Laszlo Jambor

For Graduate Courses see Calendar of School of Graduate Studies.

Curriculum 1978-80

At least "D" is required in all courses listed under "prerequisite", unless otherwise indicated.

1A6/ Introductory Music. A panoramic survey of music from c. 500 to the present. The course is designed to stimulate the student’s interest in music and to awaken his critical faculties. History, aesthetics, and elementary theory. An elective course for students not registered in Honours Music.
3 lect.; both terms. Prerequisite: Open.

1B4/ History of Music (c. 500-1600). A study of the development of Western music from early Christian times, culminating in the work of Palestrina (d. 1594). Particular attention will be paid to the great schools of composition which emerged during the Middle Ages and the Renaissance. All studies in the history of music will include a consideration of performance practices of the various periods, as well as influences upon music by the other arts and from the social circumstances of the day.
2 lects.; both terms. Prerequisite: Registration in a Music programme.

1C6/ Harmony and Counterpoint. Traditional elementary harmony up to the level of diatonic modulation. Studies will be pursued both in written form and at the keyboard. The contrapuntal idiom of the Renaissance in two voices. Introductory studies in contemporary techniques. All studies in harmony and counterpoint, throughout all four years, will be linked with the creative practices of given historical periods from the Renaissance to the present.
3 lects.; both terms. Prerequisite: Registration in a Music programme.

1D2/ Aural Training and General Musicianship. This course, which is based on the Kodály concept of musical education, is designed to enhance the student’s basic musical skills. It includes simple dictation of melodic, harmonic and rhythmic ideas; sight-singing, with instruction in Tonic Sol-Fa.
1 lect.; both terms. Prerequisite: Registration in a Music programme.

1E4/ Principal Practical Study. The technique and repertoire of any stringed, brass, or woodwind instrument common to the modern orchestra. Saxophone, recorder, voice, organ, or piano also may be studied.
1 30-minute lesson weekly; both terms. Prerequisite: Registration in a Music programme.

1G2/ Ensemble. Student’s own choice of orchestra, band, choir, or any other ensemble approved by the Chairman of the Department. Alternatively, keyboard students enrolled in a Music programme may receive credit for work in accompanying. Acceptance for any ensemble work is subject to a satisfactory audition. Work is evaluated on a Pass/Fail basis only.
2 lects.; both terms. Prerequisite: Registration in a Music programme.

1Q0/ Basic Keyboard Skills. A course designed for music students who are lacking sufficient keyboard skills to pursue historical and theoretical studies in music.
2A6/ History of Music. A study of the major musical periods from 1750 to the present. An elective course for students not registered in Honours Music.
3 lects.; both terms. Prerequisite: Music I A6 or permission of the instructor.

2B4/ History of Music (1600-1750). A study of the development of music from Monteverdi to Bach, in which the chief schools of the Baroque period will be dealt with in depth.
2 lects.; both terms. Prerequisite: Music 1B4.

2C4/ Harmony and Counterpoint. Traditional chromatic harmony. The contrapuntal idiom of the Renaissance in two and three voices. Continuing studies in contemporary techniques.
2 lects.; both terms. Prerequisite: Music 1C6.

2 lects.; both terms. Prerequisite: Music 1D2.

2E4/ Principal Practical Study. 1 half-hour lesson weekly; both terms. Prerequisite: Music 1E4.

2F3/ Opera. An analysis of selected operatic works in their historical context, with a view to determining the nature and limitations of opera as a theatrical form.
1 lect., first term; 2 lects., second term. Prerequisite: Dramatic Arts 1A6 or permission of the instructor. A knowledge of the rudiments of music is desirable, but not
MUSIC

essential. Available only as an elective for students in Music programmes.
Same as Dramatic Arts 2F3.

2G2/ Ensemble. Student's own choice of orchestra, band, choir, or any other ensemble approved by the Chairman of the Department. Alternatively, keyboard students enrolled in a Music programme may receive credit for work in accompanying. Acceptance for any ensemble work is subject to a satisfactory audition. Work is evaluated on a Pass/Fail basis only.
Prerequisite: Registration in a Music programme.

2H4/ Musical Form and Analysis. The forms of music—fugue, symphony, and concerto. A study of musical structure as it emerges through the works of Bach, Mozart, Beethoven, and Brahms.
2 lects.; both terms.
Prerequisite: Registration in a Music programme.

3A6/ Music Education. This course includes a survey of the Carl Orff and Kodaly methods of music education, of the classroom repertory, and of the rudiments of music. An elective course for students not registered in Honours Music.
3 lects.; both terms.
Prerequisite: Music 1A6, or 2A6, or permission of the instructor.

3B4/ History of Music (1750-1880). A study of the development of music from Haydn to Wagner. The course will concentrate on the origins and growth of the great instrumental forms associated with the First Viennese School: i.e., sonata, symphony, and concerto.
2 lects.; both terms.
Prerequisite: Music 2B4.

3C4/ Harmony and Counterpoint. Special studies in the harmonic and contrapuntal idioms of the Baroque. Continuing studies in contemporary techniques.
2 lects.; both terms.
Prerequisite: Music 2C4.

3E4/ Principal Practical Study. 1 half-hour lesson weekly; both terms.
Prerequisite: Music 2E4.

3G2/ Ensemble. Student's own choice of orchestra, band, choir, or any other ensemble approved by the Chairman of the Department. Alternatively, keyboard students enrolled in a Music programme may receive credit for work in accompanying. Acceptance for any ensemble work is subject to a satisfactory audition. Work is evaluated on a Pass/Fail basis only.
Prerequisite: Registration in a Music programme.

3H4/ Musical Form and Analysis. A study of musical structure as it emerges through the music of Bartok, Schoenberg, and Stravinsky.
2 lects.; both terms.
Prerequisite: Music 2H4.

3J4/ Orchestration. A study of the individual instruments of the orchestra. The art of scoring music for full ensemble.
2 lects.; both terms.
Prerequisite: Music 2J4.

3K3/ Instrumental Course Methods: Brass. A study of the basic techniques and the fundamentals of proper breathing, tone production, and care of brass instruments of bands and orchestras through course instruction. No previous study required. The student will take part in simple brass ensemble music. Although concentrating on one instrument the student will receive a working knowledge of them all.
1 lect.; both terms.
Prerequisite: Registration in a Music Programme.

3L3/ Instrumental Course Methods: Woodwind. A study of the basic technique and the fundamentals of proper breathing, tone production, and care of the instruments, through course instruction. No previous study required. Although concentrating on one instrument, the student will receive a working knowledge of them all.
1 lect.; both terms.
Prerequisite: Registration in a Music programme.

3M4/ Instrumental Course Methods: Strings. A study of the basic technique and the fundamentals of proper bowing, fingering, vibrato, and care of string instruments, through course instruction. No previous study required. Although concentrating on one instrument, the student will receive a working knowledge of them all.
2 lects.; both terms.
Prerequisite: Registration in a Music programme.

3N3/ Vocal Course Methods. This course is designed to give the choral conductor an insight into the nature and problems of choruses, their organization, rehearsal discipline, and programme building. It will include fundamentals of voice production, breathing, and diction; principles of sight-reading, a survey of choral literature for various grade levels.
1 lect.; both terms.
Prerequisite: Registration in a Music programme.

3O3/ Conducting and Repertoire Course. Combined student ensemble directed by 3rd and 4th Year conducting students. Orchestral and wind-band repertoire will be studied.
1 lect.; both terms.
Prerequisite: Registration in a Music programme.

3R3/ Research Methods and Bibliography. An examination of the important reference and bibliographic sources available to the student. Various historical, analytical and critical methods of research will be considered. The student will be introduced to the techniques of identifying and dating scores and to methods of utilizing non-music sources for information, e.g. publisher's catalogues and newspapers.
2 lects.; one term.
Prerequisite: Registration in a Music programme.

3T3/ Studies in Canadian Music. An introduction to the musical history of Canada as it emerges from its composers and performers. Students will be expected to analyse selected works in depth.
2 lects.; one term.
Prerequisite: Registration in a Music programme or permission of the instructor.

3U3/ Theory and Practice of Jazz. Melodic improvisation within a harmonic context. Harmonic extensions, substitutions and typical jazz progressions. Analysis of improvisations by Parker, Davis, Rollins and others from the post-1940 period. Extensive outside listening will be required.
2 lects.; one term.
Prerequisite: Registration in a Music programme or permission of the instructor.

4A4/ Free Creative Writing in a Contemporary Idiom. Times to be arranged between student and instructor.
Prerequisite: Registration in a Music programme, and permission of the instructor.

4B4/ History of Music (1880-Present). A study of the development of music from Wagner to the present day. Particular attention will be devoted to the Second Viennese School—Schoenberg, Berg, and Webern—and the arrival of atonality and serialism. The course will also include a discussion of Canadian composers.
2 lects.; both terms.
Prerequisite: Music 3B4.

2 lects.; both terms.
Prerequisite: Music 3C4.

4E4/ Principal Practical Study. 1 half-hour lesson weekly; both terms.
Prerequisite: Music 3E4.

4G2/ Ensemble. Student's own choice of orchestra, band, choir, or any other ensemble approved by the Chairman of the Department. Alternatively, keyboard students enrolled in a Music programme may receive credit for work in accompanying. Acceptance for any ensemble work is subject to a satisfactory audition. Work is evaluated on a Pass/Fail basis only.
Prerequisite: Registration in a Music programme.

4H4/ Musical Form and Analysis. A consolidation of the methodology acquired in previous formal studies through its application to specific problems related either to particular genres or to the music of particular composers or to both.
2 lects.; both terms.
Prerequisite: Music 3H4.

4I4/ Music Aesthetics and Criticism. Concepts of different periods, from Schobie to Hanslick, will be discussed. The art of criticism and evaluation will be studied and practised.
2 lects.; both terms.
Prerequisite: Registration in a Music programme. Not available to students with standing in Music 3I4.

4K3/ Instrumental Course Methods: Brass
1 lect.; both terms.
Prerequisite: Music 3K3.

4L3/ Instrumental Course Methods: Woodwind.
1 lect.; both terms.
Prerequisite: Music 3L3.

4M4/ Instrumental Course Methods: Strings.
2 lects.; both terms.
Prerequisite: Music 3M4.

4N3/ Vocal Course Methods.
1 lect.; both terms.
Prerequisite: Music 3N3.

4O3/ Conducting and Repertoire Course.
1 lect.; both terms.
Prerequisite: Music 3O3.

4P2/ Instrumental Course Methods: Percussion. The rudiments of
Philosophy

Professors

J. H. Noxon/Chairman
A. Shalom
J. E. Thomas
N. L. Wilson

Associate Professors

C. Georgiadis
G. B. Madison
S. M. Najm
M. Radner
J. E. Simpson

Assistant Professors

S. Ajzenstat
C. Beattie
J. R. M. Bristol/part-time
N. J. Griffin
D. L. Hitchcock

Visiting Professor

J. Vuillemin, Fall, 1977

CURRICULUM 1978-80

The Department of Philosophy offers two Year I courses, each of which is designed to introduce the student to the study of philosophy. No student may take more than one of these courses. Enrolment in each course will be limited, if necessary, in order to insure an approximately even distribution of students among the two courses. At registration, students will be asked to state their first and second choices.

The Department of Philosophy offers courses in five major areas of Philosophy, namely History of Philosophy, Logic, Theory of Knowledge, Ethics and Theory of Value, and Metaphysics. Students are advised to include courses from each of these areas in their programmes.

At least "D" is required in all courses listed under "prerequisite", unless otherwise indicated.

1B6/ Philosophy and Society. An introduction to philosophy through the social-political thought of Plato, Hobbes, and Marx, emphasizing human nature in relation to the structure of the world.
2 lecs.; 1 tut.; both terms.
Prerequisite: Open, except to students who have taken or are registered in Philosophy 1B6, 1C6, or 1D6.

1D6/ Problems in Philosophy. A critical investigation of man's claim to know God, himself, and the external world, concentrating on moral, religious, political, and aesthetic values.
2 lecs.; 1 tut.; both terms.
Prerequisite: Open, except to students who have taken or are registered in Philosophy 1A6, 1B6 or 1C6.

2A6/ Ancient Greek Philosophy. A Study of Western philosophical thought from its earliest beginnings to the triumph of Christianity in the Roman Empire, with emphasis on Plato and Aristotle.
3 lecs.; both terms.
Prerequisite: Open to students in Year II or above.

2B3/ Introductory Logic. Sentential and quantification logics are introduced and applied to arguments in English.
3 lecs.; one term.
Prerequisite: Open.

2C6/ Early Modern Philosophy. A study of the development of metaphysical thought, beginning with the rise of science and including representatives of Continental Rationalism and British Empiricism.
3 lecs.; both terms.
Prerequisite: Open.

2D3/ Moral Issues. An introduction to moral philosophy accenting biomedical ethics. Issues like abortion, human experimentation, euthanasia, and genetic screening will be investigated in cooperation with members from the Faculty of Health Sciences.
2 lecs. 1 tut.; one term.
Prerequisite: Open. May be taken by students registered in a programme in Philosophy, but, if both Philosophy 2D3 and Philosophy 2G3 are taken, at least one must be taken as an elective.

1 lec. (2); 1 tut.; both terms.
Prerequisite: Open.

2G3/ Social and Political Issues. A philosophical examination of some contemporary social and political issues, such as social justice, punishment, war, and the legal enforcement of morals.
2 lecs.; 1 tut.; one term.
Prerequisite: Open to students in Year II or above. May be taken by students registered in a programme in Philosophy, but, if both Philosophy 2D3 and Philosophy 2G3 are taken, at least one must be taken as an elective. Not open to students who have taken Philosophy 2D3 prior to 1975-76.

2H3/ Aesthetics. An introduction to some main theories of the nature of art, criticism, and the place of art in life and society.
3 lecs.; one term.
Prerequisite: One previous course in Philosophy or permission of the Department. Not open to students who have taken Philosophy 3C3 prior to 1975-76.

2J3/ Reasoning. This course aims to improve skills in analyzing and evaluating arguments and presentations found in everyday life and academic contexts, and to improve critical judgement.
2 lecs.; 1 tut.; one term.
Prerequisite: Open. May be taken by students registered in Philosophy programmes but as an elective only.

3A6/ History of Modern Philosophy. Kant, Hegel, and a number of their immediate predecessors, including Rousseau, are studied in the context of the Enlightenment, Romanticism, and the French Revolution.
1 lec. (2); both terms.
Prerequisite: Philosophy 203 or permission of the Department.

3B3/ Philosophies of Existence. An examination of the 19th-century forerunners of contemporary existential philosophy, concentrating principally on the thought of Kierkegaard and Nietzsche.
1 lec. (2); one term.
Prerequisite: One previous course in Philosophy.

1 lec. (2); one term.
Prerequisite: One previous course in Philosophy. Offered in alternate years.

3E3/ Plato. A critical examination of Plato's writings with reference to selected central philosophical issues.
1 lec., 1 seminar (2); one term.
Prerequisite: Philosophy 2A6 or permission of the Department. Offered in alternate years.

3F3/ Symbolic Logic. The method of semantic tableaux will be used to prove the completeness and soundness of the classical sen-
tential and functional calculi, Church’s Theorem, and Gödel’s Theorem. A continuation of Philosophy 2B3.
3 lects., one term.
Prerequisite: Philosophy 2B3 or permission of the Department.
Not open to students who have taken Philosophy 2E3 prior to 1975-76.
3GJ/ Types of Ethical Theory. An introduction to influential types of ethical theory emphasizing the meaning of ethical terms, sources of ethical disputes and limits of justification in ethical arguments.
1 lect. (2), one term.
Prerequisite: One previous course in Philosophy or permission of the Department.
3H3/ Philosophy of Religion. A critical inquiry into the reality of God and the rationality of religious belief in the light of the emotional origins of faith.
3 lects.; one term.
Prerequisite: One previous course in Philosophy or permission of the Department.
3KJ/ Philosophy of Education. A study of the fundamental concepts, methods, and aims, of education in relation to a philosophy of man and his place in society.
1 seminar (2), one term.
Prerequisite: One previous course in Philosophy or permission of the Department.
3L3/ Probability and Induction. An introduction to the calculus of probability. The approach will be relatively non-technical, the emphasis being on the philosophical problems associated with probability.
3 lects.; one term.
Prerequisite: Registration in Year III or Year IV or permission of the Department.
3 lects.; one term.
Prerequisite: Philosophy 2A6 or permission of the Department.
Offered in alternate years.
3N6/ Social and Political Philosophy. An examination of such main ideas in social thought as liberty, justice, and equality. Special attention is given to liberalism and socialism.
3 lects.; both terms.
Prerequisite: One previous course in Philosophy or permission of the Department.
3OJ/ Introduction to Theory of Knowledge. A systematic examination of key concepts and problems of knowledge, including such concepts as perception, experience, belief, inference, verifiability and truth.
1 lect. (2); one term.
Prerequisite: One previous course in Philosophy or permission of the Department.
Offered in alternate years.
3QJ/ Logic and Policy. An examination of the concept of rationality as it relates to both individual and social decision making. The von Neumann-Morgenstern method of connecting probabilities with desirabilities will be discussed.
3 lects.; one term.
Prerequisite: Open.
Offered in alternate years.
3RJ/ Bertrand Russell. A survey of Russell’s philosophical thought, including his theory of knowledge and metaphysics and his political and social ideas.
1 lect. (2); 1 seminar; one term.
Prerequisite: One previous course in Philosophy or permission of the Department.
Offered in alternate years.
3WJ/ Reading Course. Topics to be arranged between individual students and instructors.
Prerequisite: Open to senior division students in Philosophy subject to permission of the Department. A written proposal must be submitted to the Department prior to the term in which the course is to be taken.
4AJ/ Descartes. A study of the principal Cartesian texts and concepts with reference to Descartes’ dualism.
Seminar (2); one term.
Prerequisite: Philosophy 2C6 or permission of the Department.
Offered in alternate years.
4B3/ Theory of Value. A study of the respects in which human thought is governed by social ideologies and the implications for morality and religion.
1 lect., 1 seminar (1½); one term.
Prerequisite: Registration in Year III or Year IV of a programme in Philosophy or permission of the Department.
Offered in alternate years.
4CJ/ Epistemology. A critical discussion of selected topics in contemporary contributions to the theory of knowledge.
1 seminar (2); one term.
Prerequisite: Philosophy 3O3 or permission of the Department.
Not open to students who have taken Philosophy 3M5 prior to 1976-77.
Offered in alternate years.
4D3/ Philosophy and Language. A study of relationships among language, knowledge, and reality, centred on Wittgenstein’s Philosophical Investigations.
1 lect., 1 seminar (1½); one term.
Prerequisite: Registration in Year III or Year IV of a programme in Philosophy or permission of the Department.
Offered in alternate years.
Seminar (2½); one term.
Prerequisite: Philosophy 3B3 or permission of the Department.
4F3/ Metaphysics. An investigation of metaphysical concepts, such as substance, individuality, identity, essence, quality, process, mind, time and causality. Some contemporary criticisms of metaphysics will be discussed.
Seminar (5½); one term.
Prerequisite: Registration in Year III or Year IV of a programme in Philosophy or permission of the Department.
Seminar (2½); one term.
Prerequisite: Either Philosophy 2A6 or 3E3 or 3J3 or permission of the Department.
Offered in alternate years.
1 seminar (2); one term.
Prerequisite: Philosophy 2C6 or permission of the Department.
4L3/ Philosophy and Science. Philosophy of science is considered as a branch of the theory of knowledge and developed from the period of Descartes and Kant to the present.
3 lects.; one term.
Prerequisite: One previous course in Philosophy or permission of the Department.
4M3/ Kant. A study of the Critique of Pure Reason with reference to the metaphysical and epistemological problems raised by Hume.
1 seminar (3); one term.
Prerequisite: Philosophy 4R3 or permission of the Department.
Offered in alternate years.
4WJ/ Reading Course. Topics and times to be arranged between individual students and instructors.
Prerequisite: Registration in Year IV of an Honours programme in Philosophy subject to permission of the Department. A written proposal must be submitted to the Department prior to the term in which the course is to be taken.
PHYSICAL EDUCATION

Physical Education

Professors
F. J. Hayden/Director of the School of Physical Education and Athletics
A. J. Smith

Associate Professors
W. H. Fowler
R. M. Hill
R. B. Johnson
J. R. Kennedy
M. E. Keyes/Chairman
J. D. MacDougall
F. A. Moyes
N. B. Oldridge

Assistant Professors
J. S. Frank
B. A. Gowitzke
W. J. Mahoney
P. F. Fabich
D. G. Sale

Instructors
L. Arsenault-Goertz
C. J. M. Kent
M. P. S. Inglis
S. Birrell
J. A. R. A. Jorgensen
Phyllis Frank
S. R. Alaszkiewicz
R. E. Bearpark
M. P. Chisholm
F. A. Moyes
J. A. Carruthers
R. A. Jorgensen
C. A. Miller
Lecturers
A. J. Aslaksen
R. E. Bearpark
S. Birrell
M. P. Chisholm
S. Inglis
J. M. Kent
C. A. Miller

Associate Clinical Professor
A. L. Bass

COURICULUM 1978-80

The following courses are open only to students registered in the four year Bachelor of Physical Education programme, except where otherwise designated.

Required courses are as follows: 1A6, 1C3, 1E3, 2C6, 2D3, 2E3, 2F3, 3A6, 3E3. Elective offerings include: 3B3, 3C3, 3D3, 3F6, 3G3, 3H3, 3J3, 3K3, 3P3, 3Q3, 4A3, 4B6, 4C3, 4D3, 4E6, 4F3, 4G3, 4J3, 4L3, 4Q3, 4P3, 4R3.

COURICULUM (YEAR I)

1A6/ Human Anatomy. A study of macroscopic and microscopic anatomy, with particular reference to the locomotor, nervous, cardiovascular, respiratory, digestive, endocrine, and urogenital systems. 3 hrs. (lects., labs.); both terms.

1C3/ Basic Human Physiology. An introduction to basic physiological and biochemical principles, and their application to neuromuscular, circulatory, and respiratory systems. 3 hrs. (lects., labs.); both terms (integrated with 1E3).

1E3/ Motor Development. A study of physical growth patterns and the manner in which human beings develop perceptual-motor abilities. Age-appropriate motor behaviour, from infancy to old age, is investigated. 3 hrs. (lects., labs.); both terms (integrated with 1C3).

COURICULUM (YEAR II)

2C6/ Physiology of Exercise. An investigation of the effects of exercise on the physiological systems, and the application of physiological principles of human exercise performance. 2 lects., 1 lab. (2); both terms.

2D3/ Philosophy of Physical Education and Sport. Critical examination of the concepts, slogans, and assumptions, associated with physical education and sport, as well as a delineation of one's personal philosophy. 3 hrs. (lect. and discussion); second term.

2E3/ Sociology of Sport. A discussion of the sociological perspective as applied to sport and related physical activities: critical examination of contemporary issues and problems in Canadian society. 3 hrs. (lect. and discussion); first term.

2F3/ History of Physical Education and Sport in Canada. A historical study of the origins and development of modern physical education and sport in Canada, including individual leaders and contributing cultural factors. 3 hrs. (lects., seminars), first term.

COURICULUM (YEAR III)

3A6/ Kinesiology. Motor skills analyzed in terms of elementary mechanics and selected neuro-physiological principles. 4 hrs. (lecture, labs) (2); both terms.

3B3/ Adapted Physical Activity and Movement. An introduction to theories of perceptual motor learning as related to special physical activity programmes. 2 lects., 1 lab.; first term (1978-79); second term (1979-80).

3C3/ Measurement and Evaluation I. Analysis of test results: concepts of correlation, reliability, and validity. 3 hrs. (lects., lab.); first term.

3D3/ Measurement and Evaluation II. Implication of testing in the motor domain; test construction and measurement of individual motor performance and physical activity programmes. 3 hrs. (lects., lab.); second term.

3E3/ Psycho-Motor Aspects of Physical Activity. Motor learning principles and performance determinants are investigated, together with other relevant psychological determinants of gross motor behaviour. 2 lects., 1 lab.; first term.

3F6/ Sport and Physical Education Administration. Theoretical bases and task specifics of administrative practices found in sport and physical education environments. Units include: management, planning, communication, finances, and liability. 3 hrs. (lects., seminars); both terms.

3G3/ Individual Aspects of Play and Game Involvement. Traditional and contemporary concepts related to participation in work, play, and athletic pursuits, are examined and discussed. 2 lects., 1 seminar; first term.

3H3/ Historical Interpretations of Physical Activity. A historical survey of physical education and sport, beginning with ancient Greece, and with special emphasis on recent developments in Europe and North America. 2 lects., 1 seminar; first term.

3J3/ Aesthetics of Sport and Dance. An inquiry into man’s involvement in sport and dance as he seeks to find meaning and reality in these non-verbal forms of expression and communication. 3 hrs. (lect., seminars); second term.

3K3/ Sports Injuries. Methods of dealing competently with sport injuries under following headings: prevention; preliminary assessment and response; first aid; and post-medical care of injured athletes. 1 lect., 1 tut., 1 lab.; second term.

Prerequisite: Permission of instructor. Open to Year IV students 1978-80.

3P3/ Sport and Social Processes. A macro-analysis of sport in society; investigation of the relationship between sport and other social institutions focusing on social processes. (2 lect. 1 seminar); second term.

Prerequisite: With permission of the instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.

3Q3/ Sport and Small Group Dynamics. A micro-analysis of sport in small social systems; investigation of the dynamics of involvement in sport encounters, the team as a small group, and sport sub-cultures. 3 hrs. (lect. and discussion); first term.

Prerequisite: With permission of the instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.

COURICULUM (YEAR IV)

4A3/ Biomechanics of Human Movement. Study of the mechanics (statics and dynamics) of human movement applied to specific position and movement problems. Interaction of selected neuro-physiological mechanisms which may be operative.
3 hrs. (lects., labs., discussion); first term. 
Prerequisite: Permission of instructor. Above average performance in 3A6.

4B6/ Selected Aspects of Adapted Physical Activity. An in-depth study of physical activity and movement designed to meet the needs, interests, and abilities of individuals referable to special physical activity programmes.
2 lects., 1 lab (field work); both terms. 
Prerequisite: Satisfactory completion of Physical Education 3B3, and permission of instructor.

2 lects., 1 lab (2); second term. 
Prerequisite: Permission of instructor, must be Year IV B.P.E. student.

4D3/ Issues in Physical Education. The primary purpose of the course is to identify, clarify, and seek evidence for and against, issues in physical education, athletics, recreation, and sport, with an attempt at resolution of such issues.
3 hrs. (seminars); first term. 
Prerequisite: Open to Year IV B.P.E. students.

4E6/ Acquisition of Physical Skill. Application of principles from learning and social psychology to specific problems in developing skill with special reference to sports, games and dance skill.
2 lects., 1 lab (2); both terms. 
Prerequisite: Physical Education 3E3.

4F3/ Programme Planning and Design. Attention given to programme planning and design of human movement programmes in physical education, sport and recreation.
3 hrs. (lects., seminars); second term.

4G3/ Perspectives in Dance—A Cultural Survey. A survey of dance in selected cultures, studying its role in ritual, in art and in theatre.
3 hrs. (lect., seminars); first term.
Prerequisite: With permission of the instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.

Same as Dramatic Arts 4G3. 

4J3/ Comparative Physical Education and Sport (Selected topics). An examination of contemporary physical education in selected countries, with special attention given to international sports competition.
2 lects., 1 seminar; second term.

4L3/ Health Science: Physical and Environmental. Selected transactions between man, his environs, and disease agents, are explored as these transactions influence human diseases.
3 hrs. (lects., seminars); first term. 
Prerequisite: Open to Year IV B.P.E. students.

4P3/ Health Science: Behavioural. Development of an understanding of those health topics based primarily on the behavioural sciences. Specifically included are mental health, psychoactive drugs, and human sexuality.
3 hrs. (lects., seminars); second term. 
Prerequisite: Open to Year IV B.P.E. students.

4R3/ Individual Study Project. A detailed investigation of a selected theoretical or applied problem mutually acceptable to instructor and student.
Prerequisite: Permission of the Chairman and supervising instructor. Open to Year IV B.P.E. students.

GENERAL REGULATIONS

(1) In order for a student to attend a Level II course, e.g., Hockey, Level II, the permission of the appropriate instructor must be obtained.

(2) Students requiring direct entry into an advanced-level course without meeting the requirements of the appropriate preceding level(s), must satisfy the instructor, both practically and theoretically. The prerequisite standard for advanced level courses does not give credit for, nor does it count as, one of the 14 units required by the Department.

(3) A student wishing to take more than four courses a year, or more than one course per session, must obtain written permission to do so from the Chairman of the Department.

(4) The Physical Education student is expected to satisfy the requirements of each activity course he selects and pursues:

(a) Activity courses are listed under 1UO, 2UO, 3UO, 4UO headings for student record and reporting purposes only. A student having satisfactorily completed all his activity courses in the year, e.g., Year II-2UO, will receive a "complete" designation as a final yearly grade. Alternatively, a student failing to satisfy the requirements of one or more courses taken in the year, will receive an "incomplete" designation as a final yearly grade. Except in Year I, a student is required to withdraw unless he/she completes 1UO activities satisfactorily on the first attempt (during the first year of attendance in B.P.E.).

(b) Course deficiencies must be made up in accordance with the demands of the appropriate instructor. Normally, a student will not be permitted to proceed with the programme if he accumulates more than two deficiencies in one year or carries one or more deficiencies over two years.

(c) Students may replace up to two elective practicum courses. The replacement courses may be from any area, providing numbers 2 and 3 under "Procedure for selection of activity classes" have been fulfilled.

OUTDOOR ACTIVITY COURSES

Courses in outdoor activities, e.g., canoeing, orienteering, sailing, etc., will be offered in a camp situation prior to the commencement of the academic year. Courses in skiing will be offered during the winter, but outside the regular time-tabled programme. It is not compulsory to take a course from the outdoor activity area, but interested students will receive comparable recognition for satisfactory completion of such courses.
PHYSICS

Physics

Professors
E. A. Ballik
R. K. Bhaduri
B. N. Brockhouse
I. D. Brown
D. G. Burke
J. A. Cameron
J. P. Carbotte
W. B. Clarke
M. F. Collins/Chairman
W. R. Daters
J. A. Davies/part-time
B. K. Garside
D. A. Goodings
M. W. Johns
T. J. Kennett
J. A. Kuehner
C. C. McMullen
Y. Nogami
W. V. Prestwich/Associate Chairman
J. Shawchun
D. W. L. Sprung
C. V. Stager
R. G. Summers-Gill
D. W. Taylor
T. Timusk
A. B. Volkov
D. Walton

Associate Professors
A. A. Harms
J. C. Waddington

Assistant Professors
W. E. Harris
T. Khan/part-time
A. Robertson/part-time
P. G. Sutherland
T. Taylor/part-time
M. Vallieres/part-time

Associate Member
D. A. Thompson (Engineering Physics)

Teaching Fellows
Z. Allouanian
C. C. M. Campbell
M. Natarajan-Iygar
M. A. M. Shahabuddin

Senior Demonstrator
E. Cairns

CURRICULUM 1978-80

For prerequisite purposes, a grade of "D" or better is required.

1A7/ Mechanics, Wave Motion, Optics, and Electricity. A course, organized in sections of about 80 students, of lectures, demonstrations, and laboratory work in general physics with stress on wave motion, optics, mechanics, electricity and magnetism, and modern physics. Particularly intended for students proceeding in the physical sciences or engineering. 3 lects.; 1 lab. (3) every other week; both terms. Prerequisite: Level 5 (Grade 13) Physics, and registration in Mathematics 1A6 or 1C6 and in either Applied Mathematics 1C8 or 1C7 or Mathematics 1B4.

1B7/ General Physics I. Lectures, demonstrations, and laboratory work in general physics. This course places less stress on the use of mathematics, and covers a wider range of topics, than Physics 1A7. Intended primarily for students proceeding in the life sciences. 3 lects.; 1 lab. (3) every other week; both terms. Prerequisite: Level 5 (Grade 13) Physics and registration in Mathematics 1A6 or 1C6 or 1F6.

1C5/ Introductory Physics. Lectures and demonstrations in physics, with particular stress on topics in mechanics, wave motion, optics, and electricity, for students without Level 5 (Grade 13) Physics. 3 lects., 1 tut., 1 lab. (3) every other week; both terms. Prerequisite: Registration in Mathematics 1A6 or 1C6 or 1F6.

2A6/ General Physics II. A sequel to Physics 1B7. Electricity and magnetism and radiation physics. Intended primarily for students proceeding in the life sciences. 3 lects.; both terms. Prerequisite: Physics 1A7 or 1B7 and Mathematics 1A6 or 1C6 or 1F6. Not open to students in Honours Chemistry and Physics, Honours Physics, Honours Applied Physics, Physics Major, or Pass Physics.

2B6/ Electricity and Magnetism. Electrostatics, electrodynamics, D.C. and A.C. circuit analysis. 3 lects., first term; 2 lects., second term; 1 lab. (3) every other week; both terms. Prerequisite: Physics 1A7 or 1B7 or 1C8, and concurrent registration in Mathematics 2G3 and 2O3, or equivalent.

2C5/ Mechanics. First term: vectorial treatment of the dynamics of a particle, central field problem. Second term: many-particle systems, introduction to the mechanics of rigid bodies, Lagrange's equations, introduction to the special theory of relativity. 2 lects., 1 tut.; both terms. Prerequisite: Registration in a programme in which Physics 2C5 is required or is a specified option. Not open to students who are registered in, or have completed, Physics 2G5.

2E6/ Introduction to Astronomy and Astrophysics. A survey of general astronomy, including the solar system, stars and stellar evolution, star clusters and galaxies. Modern astrophysics, including radio and x-ray astronomy; pulsars and quasars will also be discussed. 3 lects.; both terms. Prerequisite: Physics 1A7 or 1B7 or 1C8, and Mathematics 1A6 or 1C6 or 1F6.

2G3/ Mechanics of a Particle. Vectorial treatment of the mechanics of a particle in three dimensions. 2 lects., 1 tut., first term. Prerequisite: Physics 1A7 or 1B7 or 1C8, and Applied Mathematics 1C6 or registration in Mathematics 2G3, or equivalent. Not open to students who are registered in, or have completed, Physics 2C5.

2H3/ Thermal Physics. Phenomenological heat; kinetic theory of gases; introduction to thermodynamics. 2 lects., 1 lab. (3); second term. Prerequisite: Physics 1A7 or 1B7 or 1C8, and Mathematics 1A6 or 1C6.

2J3/ The Physical Basis of Musical Sound. The physical properties of sound and radio waves; vibrating bodies and musical instruments; the ear; computer music; the structure of music; acoustics and the design of auditoria. 3 lects. with demonstrations; first term. Prerequisite: Registration in Year II, III, or IV of a non-science programme. Knowledge of mathematics is not required.

2L2/ Rigid Body Motion and Special Relativity. The second term of Physics 2C5. 2 lects.; 1 tut.; second term. Prerequisite: Physics 2G3 and permission of the instructor. Not open to students who are registered in, or have completed, Physics 2C5.


3B6/ Electronics. Network theory and filters, semiconductor devices, amplifier circuits, D.C. power supplies, integrated circuits, operational amplifiers, and digital circuits. 2 lects.; both terms; 1 lab. (2); both terms. Prerequisite: Engineering Physics 2A7 or Physics 2B6.

3H4/ Laboratory. Experiments in atomic physics, optics, mechanics, and heat. 1 lab. (3); both terms. Prerequisite: Physics 2B6.

3K4/ Thermodynamics and Statistical Mechanics. The laws of thermodynamics, with emphasis on the mathematical structure of the theory; classical and quantum statistical mechanics. 2 lects.; both terms. Prerequisite: Physics 2H3, and Mathematics 2G3 and 2O3, or equivalent. Not open to students who have completed Chemistry 3Y3.

POLITICAL SCIENCE

Political Science

Professors
A. Bromke/Chairman
M. N. Goldstein
G. P. Means
D. Novak
P. J. Potichnyj
M. Stein
T. C. Truman

Associate Professors
W. M. Chandler
H. J. Jacek
T. J. Lewis
R. R. March
K. H. Pringsheim

Assistant Professors
H. Aster
G. B. Breckenridge
S. McNines
S. Miller (part-time)
K. R. Nossai
J. W. Seaman

Lecturers
M. M. Atkinson
W. D. Coleman

CURRICULUM 1978-80
The Department of Political Science offers courses in four main areas: Canadian Politics, Comparative Politics, International Politics and Political Theory. For a list of instructors and the courses falling in each area, students should consult the Department's Handbook for Undergraduates, 1978-79, and 1979-80. This Handbook will be available for undergraduates on or before April 1 of each academic year. Students should also consult the Handbook in order to determine which courses are offered in a given year.

All students are encouraged to seek advice from members of the Department in developing a programme of study. All Honour's students are required to discuss their programme with the Honours Adviser and to have it checked to ensure that it meets with Departmental requirements.

A. 50% minimum is required in all prerequisite courses unless otherwise specified. Students wishing to enter courses without the necessary prerequisites must receive permission from the instructor.

1A6/  An Introduction to the Study of Politics. An introduction to various aspects of political science which students will encounter in subsequent years in the Department. The course is taught in a number of sections; each section is directed by one or two members of the Department.
3 hrs. (lects. and tuts.); both terms.
Prerequisite: Open.

2G6/  Politics in the U.S.A. A study of the development, nature, and functioning of the political system of the U.S.A.
3 hrs. (lects. and tuts.); both terms.
Prerequisite: Open.

3 hrs. (lects.); both terms.
Prerequisite: One previous course in Political Science.

2E6/  International Politics. A study of the institutions and processes of the international political system.
3 hrs. (lects. and tuts.); both terms.
Prerequisite: Political Science 1A6.

2F6/  The Systematic Study of Politics. An introduction to the study of concept and theory formation, and an overview of the scope, methods, and techniques of political science.
3 hrs. (lects. and tuts.); both terms. Prerequisite: Open.
Note: Recommended for all Honours and Combined Honours students.

2G6/  Politics in Canada. A study of the development, nature and functioning of the political system of Canada.
3 hrs. (lects. and tuts.); both terms.
Prerequisite: Open, except to students who have completed Political Science 2G6.

2K5/  Politics in the U.S.S.R. An analysis of the political ideology, institutions, and practices of the U.S.S.R.
3 lects.; both terms.
Prerequisite: Open.

2M6/  Introduction to Far Eastern Political Traditions. A general introduction to the traditional political ideas and institutions of China and several other countries in Northeast Asia.
3 hrs. (lects.); both terms.
Prerequisite: Open.
Offered 1978-79 and alternate years.

2C6/  Introduction to Political Theory. An introduction to modes of thinking theoretically about politics, expressed in political philosophy, ethical theory, history of political thought, political science, and structuralism.
3 hrs. (lects.); both terms.
Prerequisite: Open.

2P6/  Politics in Western Europe. An introduction to comparative political analysis with an emphasis on the politics of France, West Germany, Italy and Great Britain.
3 hrs. (lects.); both terms.
Prerequisite: Open, except to those who are registered in or have completed Political Science 3V6.

3A6/  History of Political Ideas. A study of the political ideas of some eminent thinkers from classical times to the 19th century.
3 lects.; both terms.
Prerequisite: A previous course in Social Science or Philosophy.

3 hrs. (lects and seminars); first term.
Prerequisite: A previous course in Political Science or Asian Studies.

3 hrs. (lects. and seminars); second term.
Prerequisite: A previous course in Political Science or Asian Studies.

3G3/  Introduction to Inductive Statistics. An outline of levels of measurement and descriptive statistics, and a study of the logic of statistical inference and its applications.
3 hrs. (lects. and labs.); first term.
Prerequisite: High school algebra.

3H3/  Statistical Applications. This course builds upon the concepts taught in Political Science 3G3, and examines how statistical techniques can be used to analyze political problems.
3 hrs. (lects.); second term.
Prerequisite: Elementary algebra.

316/  Canadian Political Ideas. The purpose of this course is to discover, understand, and analyze the major ideological trends in Canadian society.
3 hrs. (lects. and seminars); both terms.
Prerequisite: Political Science 2G6.

3K5/  Comparative Politics: Theory and Method. A study of the foundations of the contemporary study of comparative political systems; critical evaluation of approaches and techniques through empirical case studies.
3 hrs. (lects. and seminars); both terms.
Prerequisite: A previous course in Political Science.

3M6/  Comparative Politics: Eastern European Systems. An analysis of the political ideologies, institutions, and practices of selected states of Eastern Europe (excluding the U.S.S.R.)
3 hrs. (lects. and seminars); both terms.
Prerequisite: A previous course in Political Science.

3O6/  Modern Political Thought. A critical analysis of modern political ideas, from the early nineteenth century to the present time, with special emphasis on the theories of modern conservatism, liberalism, socialism, fascism, and democracy.
3 lects.; both terms.
Prerequisite: A previous course in Social Science or Philosophy.

3P6/  Foreign Policy of the U.S.S.R., China, and the West. An examination of the foreign relations of the U.S.S.R. and China with the United States and the West, and with each other.
3 lects.; both terms.

Astronomy and Astrophysics. A quantitative discussion of the solar system, the physics of stars, and cosmology.

1 lect.; both terms.

3 lects.; both terms.

Topics in atomic structure, nuclear physics, and special relativity.

3 lects.; first term.

Prerequisite: Physics 286. Not open to students registered in Physics 3M6.

3R4/ 3Z4/ Physics of the Earth. The origin, age, evolution, and physical properties of the earth.

2 lects.; both terms.

Prerequisite: Physics 286 or Engineering Physics 2A7, and either Physics 2C5 or 2G3. Offered in 1979-80, alternating with Physics 3S4.

Interaction of Radiation with Matter. The interactions of nuclear radiations with matter: detectors, dosimetry, tracer methods, the production and use of X-rays, etc. For students interested in radiation biology, radiochemistry, and geology.

3 lects.; second term.

Prerequisite: Physics 2A6 or 2B6.

Energy Sources and the Physics of Energy Conversion. An application of physical principles to the utilization of fossil, geothermal, nuclear, and solar energy sources.

3 lects.; one term.

Prerequisite: Completion of Natural Sciences I including Physics 1A7 or 1B7 or 1C8. Some knowledge of electricity and thermodynamics beyond Year I will be assumed. This is an open elective which cannot be chosen to satisfy a Physics requirement. Offered in 1979-80, and in alternate years.

Applied Mathematics 386/ Mathematical Physics I. Partial differential equations, orthogonal systems and eigenvalue problems for differential equations, special functions, vector analysis, linear algebra, wave motion, functions of a complex variable.

3 lects.; both terms.

Prerequisite: Mathematics 2A4 or 2A5 or 2C4, or 2G3 and 2C5; Physics 2C5 or 2G3; or permission of the instructor.

4A2/ Special Topics. Independent study of the scientific literature, including the preparation of seminars on assigned topics.

1 lect. or seminar; both terms.

Prerequisite: Registration in a programme in which Physics 4A2 is required or is a specified option.

4B4/ Electromagnetic Theory. Development of Maxwell’s equations; electromagnetic waves; reflection, refraction and dispersion; wave guides; radiation from oscillating dipoles.

2 lects.; both terms.

Prerequisite: Physics 2B6 or Engineering Physics 2A7; Applied Mathematics 3B6.


2 lects.; both terms.

Prerequisite: Applied Mathematics 3B6 and registration in an Honours or Engineering programme, or permission of the instructor.

Digital Logic and Computer Systems. The design and use of digital logic systems and their application to data acquisition and control techniques. The project-oriented laboratory involves both hardware and software.

2 lects., 1 lab. (3); both terms.

Prerequisite: Physics 2B6.

Introductory Nuclear Physics. Nuclear masses and stability; radioactivity and nuclear reactions; elementary nuclear models.

3 lects.; second term.

Prerequisite: Physics 3M6 or 3P3 and registration in an Honours programme or Year IV Physics Major.

Quantum Mechanics. A sequel to Physics 3M6, including general structure of quantum mechanics, matrix mechanics, perturbation theory, and variational method.

3 lects.; first term.

Prerequisite: Physics 3M6 and Applied Mathematics 3B6.

Research Project. An experimental or theoretical project to be arranged by mutual consent of a professor, the departmental chairman, and the student. It may be carried out in a professor’s research area or in health physics, radiology, or nuclear medicine. A report will be required.

2 lects.; both terms.

Prerequisite: Completion of Year III of an Honours programme in Physics with a weighted average of at least 80%, or registration in Year IV of the Health and Radiation Physics Option of the Physics Major Programme.

Techniques of Applied Radioactivity. Radioactive source production techniques, counting systems, dosimetry, activation analysis, imaging, detectors, counting of distributed sources, counting losses, random summing, time mark derivation, isotope dilution techniques, etc.

1 lect., 1 lab. (3) every other week; both terms.

Prerequisite: Physics 2B6 or Engineering Physics 2A7 and permission of the instructor.

Enrolment is limited.

Applied Mathematics 4C4/ Mathematical Physics II. Some mathematical techniques and their applications to physics and engineering.

Typical topics and applications are: integral equations, integral transforms, tensor analysis, calculus of variations, hydrodynamics, elasticity, general relativity, field theory.

2 lects.; both terms.

Prerequisite: Applied Mathematics 3B6 and registration in an Honours or Engineering programme.

Note: The Department reserves the right to withdraw a senior division course which is not specifically required in a Physics programme if the registration falls below four.

Students in senior division Physics programmes will find a number of relevant electives among offerings of the Department of Biology and the Department of Engineering Physics.

For Graduate Courses see Calendar of School of Graduate Studies.
POLITICAL SCIENCE

Prerequisite: Political Science 2E6, 2M5, 2K6, 3E3, 3F3 are recommended.
Offered 1978-79 and alternate years.

3G6/ Politics in Japan. An introductory survey of Japanese political institutions, ideas, and practices, from ancient to modern times. 3 hrs. (lects. and seminars); first term.
Prerequisite: Political Science 2M6. Not open to students who have completed Political Science 2N6.
Offered 1978-79 and alternate years.

3R6/ Democracy and Political Change. An examination of the logical and historical connections between the idea of equality and both liberal and non-liberal forms of democracy. 2 hrs. (lects. and seminars); both terms.
Prerequisite: A previous course in political theory.

3S6/ Comparative Politics: Canada and the U.S.A. An analytical comparison of the structural and functional dimensions of politics in Canada and the U.S.A. 3 hrs. (lects. and seminars); both terms.
Prerequisite: Permission of the instructor.

3U6/ Research Techniques. An examination of various research procedures, multivariate techniques of analysis, and advanced explanation theory. 3 hrs. (lects. and seminars); both terms.
Prerequisite: Political Science 2F6.

3W6/ Comparative Politics: Political Change in France and Germany. A critical examination in a comparative context of the causes and consequences of regime instability. 3 hrs. (lects. and seminars); both terms, alternating with Political Science 3W6.
Prerequisite: A previous course in Political Science.

3X6/ Public Policy Analysis. A critical analysis of the process of public policy formation, the content of public policies, and their impact upon society. 3 hrs. (lects. and seminars); both terms.
Prerequisite: Political Science 2F6 is required. Political Science 2G6 and 2P6 are recommended.

3Y6/ Comparative Legislatures. An institutional and behavioural analysis of legislative bodies and executive-legislative relations in the United Kingdom, Western Europe, Canada, the United States, and developing areas. 3 hrs. (lects. and seminars); both terms.
Prerequisite: A previous course in Political Science.

3Z6/ Public Administration. Bureaucracy, administrative responsibility, policy process, delegated powers, administrative law, staffing and staff relations will be studied in a primarily Canadian context. 3 hrs. (lects. and seminars); both terms.
Prerequisite: Two courses in Political Science.

3A3/ International Politics in the Postwar Period. A survey of international relations since the end of the Second World War, focusing on the Cold War, and its impact on the international system. 3 hrs. (lects. and seminars); first term.
Prerequisite: Political Science 2E6.

3B3/ Approaches to the Study of International Politics. An examination of the theoretical approaches to the study of international relations. 3 hrs. (lects. and seminars); second term, alternating with Political Science 3C3.
Prerequisite: Political Science 2E6.

3C3/ International Organization. An analysis of the origins and development of the United Nations and selected regional organizations. 3 hrs. (lects. and seminars); second term, alternating with Political Science 2B3.
Prerequisite: Political Science 2E6.

3D6/ Political Parties, Movements and Elites in Canada. An analysis of parties, movements and elites in their operation within the Canadian socio-economic and cultural setting. 3 hrs. (lects. and seminars); both terms. Prerequisite: Political Science 2G6. Closed to those who have taken Political Science 2S6.

3E3/ The Foreign Policy Process in Canada. An examination of the influences on foreign policy decision-making in Canada and the elements of Canadian foreign policy. 3 hrs. (lects. and seminars); first term.
Prerequisite: Political Science 2E5 or Political Science 206.

3F3/ Issues in Canadian Foreign Policy. An analysis of recent issues in Canada's external relations designed to indicate themes, problems and constraints in the making and execution of foreign policy in Canada. 3 hrs. (lects. and seminars); second term.
Prerequisite: Political Science 2E6 or Political Science 2G6.

3GG3/ Canadian Federalism. An analysis of the constitutional framework, historical background and evolution of federalism in Canada, emphasizing post-World War II issues. 3 hrs. (lects. and seminars); first term.
Prerequisite: Political Science 2G6.

3H3/ Intergovernmental Relations in Canada. An analysis of selected policy areas focussing on governmental resources, strategies, tactics and the outcomes of bargaining between governments in Canada. 3 hrs. (lects. and seminars); second term.
Prerequisite: Political Science 2G6.

3I6/ Elections and Electoral Behaviour in Canada. A study of the development, nature and functioning of the electoral process in Canada and the basis of voters' decisions. 3 hrs. (lects. and seminars); first term.
Prerequisite: Political Science 2G6.

3JJ3/ Provincial Politics in Canada. A study of the development, nature and functioning of the political systems of the Canadian provinces. 3 hrs. (lects. and seminars); first term.
Prerequisite: Political Science 2G6.

3K6/ Marxism. A study of Marx through a reading of his writings from various stages in his development. 3 hrs. (lects. and seminars); both terms.
Prerequisite: A course in Political Theory or Philosophy or Political Science 2K6. Not open to students who have completed Political Science 4G6.

3L6/ Theories of Mass Society. A study through Tocqueville of equality and liberty in the modern world and the problem posed for constitutional democracy by "mass" cultural and political phenomena. 3 hrs. (lects. and seminars); both terms.
Prerequisite: One course in political or social theory and permission of the instructor. Same as Sociology 3J6.

3M6/ The Politics of Modern and Contemporary China. An introduction to the political ideas, institutions and practices of mainland China and Taiwan in the period from 1911 to the present. 3 lects; both terms.
Prerequisite: Political Science 2M6.

3N6/ Public Law. A study of the nature and function of public law, with special reference to constitutional law and judicial behaviour. 3 hrs. (lects. and seminars); both terms.
Prerequisite: Political Science 2G6. Not open to students who have completed Political Science 2R6.

4A5/ Pressure Group Politics. An analysis of research designed to explain the origins and nature of group influence upon the political process. Original research projects. 3 hrs. (seminar); both terms.
Prerequisite: A previous course in Political Science. Political Science 2F6, 2G6, 2P6, 3X6 and 3Z6 are recommended.

4C6/ Psychology and Politics. A seminar course in personality theories and their application to the study of politics. 3 hrs. (seminar); both terms.
Prerequisite: Permission of the instructor.

4D3/ Comparative Studies in Ethnicity and Politics. A study of the impingement of the ethnic and racial factor upon the political process in comparative contexts, but principally focussing on South Africa. 3 hrs. (seminar); first term.
Prerequisite: Previous course in Political Science. Same as Sociology 4V3.

4E6/ Liberal-Democratic Theory and Market Society. This course seeks to trace the emergence and to assess the adequacy of the contemporary liberal-democratic theory of the welfare and regulatory state. 2-3 hrs. (seminar); both terms.
Prerequisite: Previous course in political theory.

4F6/ Directed Readings and Independent Research for Honours Students. Directed reading and independent study of a research problem through published materials and/or field inquiry. Students will be required to formulate the result of their inquiry in scholarly fashion. Both terms.
Prerequisite: Registration in Year IV Honours Political Science and permission of an instructor of the student's choice.

4J6/ Comparative Politics: Communist Political Systems. A comparative analysis of the political ideologies, institutions, and practices of communist political systems. Seminar; both terms.
Prerequisite: Permission of the instructor.
Offered 1979-80 and alternate years.
PSYCHOLOGY

4M6/ Comparative Foreign Policy. A theory-oriented analysis of selected elements of foreign policy and examination of problems in foreign policy decision-making. 2 hrs. (seminars); both terms. Prerequisite: Political Science 2E6, and a total of six units in international politics at the third-year level. Open only to Year IV students.

4N6/ The Politics of Self-Government. This course will examine the institutions and philosophy of decentralized power in the past and present. Particular attention will be given to the workers councils' movement, and the commune. 3 hrs. (lects. and seminars); both terms. Prerequisite: Previous course in political theory and comparative government. Not open to students who have completed Political Science 3N6.

4O6/ Canadian Public Policy. An examination of the patterns of public policy in Canada and a critical evaluation of several types of explanation. Seminar (3); both terms. Prerequisite: Political Science 2G6 and another course in Political Science beyond Year I. Open only to Year IV students. Not open to students who have completed Political Science 3J6.

4P3/ Political Parties. A critical examination of theoretical approaches to parties and party systems, and a selective application of these ideas to different societies. 3 hrs. (seminar); second term. Prerequisite: Previous course in Comparative or Canadian Politics. Not open to students who have completed Political Science 4P6.

4Q6/ Developing Political Systems. Application of comparative techniques to the analysis of politics in selected systems of the non-Western world. 3 hrs. (seminars); both terms. Prerequisite: Permission of the instructor.

4S6/ Canadian Political Theory. An investigation into the character of Canadian liberalism and the various critiques of liberalism found in the works of G. P. Grant, C. B. Macpherson, George Woodcock and other Canadian political theorists. 3 hrs. (seminar); both terms. Prerequisite: Permission of the Instructor. Same as Religious Studies 4712.

4T6/ Models for Political Analysis. A close examination of the way in which various "models" or modes of explanation are employed in contemporary political analysis. Seminar (2); both terms. Prerequisite: Completion of Political Science 2F6, with a minimum grade of 60%. Open only to Year IV students.

4U6/ Problems of Political Philosophy. A study in detail and in depth of writings by a limited number of political thinkers, focusing upon the central problems of political philosophy. 2 hrs. (seminars); both terms. Prerequisite: A previous course in political theory.

4V6/ International Communist Movement. This seminar is designed to examine the role of Communism as a major force in contemporary international politics. 3 hrs. (seminar); both terms. Prerequisite: Political Science 2E6.

4W6/ Quebec Politics. The political ideology of Quebec-based parties and movements, the impact of industrialization upon Quebec culture, and the economic implications of separatism. The ability to read French would be highly desirable. Seminar (3); both terms. Prerequisite: Political Science 2G6 and another course in Political Science beyond Year I.

4X6/ Comparative Politics: Federal Systems. An examination of federalism and its socio-economic and political determinants in a number of selected federal systems. 3 hrs. (lects. and seminars); both terms. Prerequisite: Two courses in Political Science, 2G6, 2K6, 2P6, 3G6, 3K6, 3M6, 3G33 and 3H34 are recommended.

4Z6/ Honours Essay. A major piece of scholarly writing designed to cap the undergraduate Honours programme in Political Science. Both terms. Prerequisite: Registration in Year IV Honours Political Science.

Psychology

Professors
A. H. Black
L. R. Brooks
D. W. Carment
W. Heron
H. M. Jenkins
A. B. Kristoferson
G. R. Morrison
P. L. Newbigging
J. R. Platt/Chairman
R. M. Pritchard
S. Seigel
G. K. Smith

Associate Professors
L. G. Allan
I. Begg
B. G. Galef
L. Jacoby
M. A. Leon
B. A. Levy
S. W. Link
R. J. Racine
L. E. Roberts

Assistant Professors
R. B. Day
S. Heshka
D. M. Maurer

Associate Members
D. Campbell (Psychiatry)
A. Colt (Medicine)
M. W. Kristoferson (Psychiatry)
L. S. Siegel (Psychiatry)
S. F. Witherspoon (Psychiatry)

CURRICULUM 1978-80

The University reserves the right to limit enrolment in any course. Where priorities have to be established, first consideration will be given to Honours and Pass Psychology students. For prerequisite purposes, a grade of "D" or better is required.

1A6/ General Psychology. A broad survey of the subject matter of psychology. Topics covered include physiological psychology, perception, learning, animal behaviour, development, cognition, psychopathology, and social psychology. 3 hrs. (lects. and tuts.); both terms. Prerequisite: Open.

2A3/ Theories of Human Development. A general survey of human development including a discussion of both cognitive and social processes. 3 lects., first term. This course is given in the second term as Psychology 2J3. Prerequisite: Psychology 1A6.

2B3/ Personality. A survey of historical and current approaches to the study of personality. Topics include dependency, aggression, sexuality, and competence. Psychodynamic, humanistic, and learning theories will be considered. 3 lects.; first term. This course is given in the second term as Psychology 2K3. Prerequisite: Psychology 1A6.

2C6/ Social Psychology. A study of research and theory in areas such as communication, social perception, crowds, social motivation, attitudes, and group processes. 2 lects., 1 tut.; both terms. Prerequisite: Psychology 1A6. Not open to students who are registered in, or have completed, Sociology 2D6.

2D6/ Sensation and Perception. An intensive study of sensory and perceptual processes. The emphasis is on experimental findings, theoretical explanations, and methods employed in the study of these processes. 3 lects.; both terms. Prerequisite: Psychology 1A6.

2G3/ Psychological Statistics. An introduction to descriptive Statistics and to the logic of statistical inference. This course is
intended to provide an understanding of statistical procedures commonly found in the psychological literature.

3 lects.; first term.

Prerequisite: Not open to students in the Faculty of Science other than those in a programme in Psychology, or to students who have completed an equivalent course, or Mathematics 1F6, or who are registered in, or have completed, Psychology 2R6 or Psychology 2R3. Level 5 Mathematics is recommended.

2H3/ Human Learning and Cognition I. Topics included are pattern perception, stages of information processing, memory for meaningful material, and problem solving. Examples are drawn from reading, and perceptual and learning handicaps.

3 lects.; first term.

Prerequisite: Psychology 1A6.

2J3/ Theories of Human Development. The same as Psychology 2A3, but offered in the second term.

2K3/ Personality. The same as Psychology 2B3, but offered in the second term.

2P3/ Human Learning and Cognition II. Selected topics in educational psychology. Topics included are discovery learning, programmed and computer-assisted instruction, evaluation and marking schemes, training in creativity and problem solving.

3 lects.; second term.

Prerequisite: Psychology 2H3.

2R3/ Experimental Design. The same as Psychology 2R6 but taken for three units credit. This course may be required in place of Psychology 2R6 for students transferring to Honours Psychology from other Universities or degree programmes. Such students should consult with the departmental undergraduate advisor.

Prerequisite: Permission of the departmental undergraduate advisor.

2R6/ Statistical Principles in Experimental Design. Statistical analysis with reference to the design and evaluation of experiments in Psychology. Topics include probability theory, discrete and continuous distributions, analysis of variance, regression and curve-fitting, parametric and non-parametric tests.

3 lects.; both terms.

Prerequisite: Registration in Honours Psychology, or completion of one of Mathematics 1M3, 1A6, 1C6, or 1F6; or permission of the departmental undergraduate advisor. Not open to students who have completed Psychology 2G3, Mathematics 2D4, or an equivalent course.


3 lects.; both terms.

Prerequisite: Psychology 1A6. Not open to students who have completed Psychology 2L6.

2U3/ Laboratory in Animal Learning. Students undertake experimental exercises intended to demonstrate principles of simple learning. Experiments are conducted at times of the students' choosing within normal hours of operation.

1 lab. by appointment; first term.

Prerequisite: Completion of Psychology 2L6 (without laboratory credit) or at least one term of Psychology 2T6.

2V3/ Laboratory in Animal Learning. The same as Psychology 2U3, but offered in the second term.

2W6/ Brain and Behaviour. An overview of the brain and the physiological basis of perception, motor activity, memory, learning, and motivation. Psychology students in the Faculty of Science should consider taking Psychology 3F6 in their third year in lieu of this course.

3 lects.; both terms.

Prerequisite: Psychology 1A6. Not open to students who have completed Psychology 3F6.


3 lects.; second term.

Prerequisite: Completion of Psychology 3N3 or completion of, or registration in, Psychology 3N6; or permission of the instructor.

3C6/ Social Psychology Laboratory. Students gather, analyse, and interpret data, and in the second term carry out a research project of their own design.

2 lects.; 1 lab. (3); both terms.

Prerequisite: Psychology 2C6 and 2R6 or 2R3, or permission of the instructor.

3E3/ Sensory Processes and Perception Laboratory. 1 tut.; 1 lab. (3); both terms.

Prerequisite: Psychology 2D6 and Psychology 2G3 or 2R6 or 2R3, or Psychology 3W6; or permission of the instructor.

3F6/ Physiological Psychology I. Topics include membrane physiology, neurochemistry, sensory and motor functions, and the physiology of motivation, learning, and memory. Designed particularly for students in the Faculty of Science.

3 lects.; both terms.

Prerequisite: Registration in Honours or Pass Psychology, or registration in a programme of a Biology or Biochemistry programme, or permission of the instructor.

3K3/ Principles of Psychological Testing. Theory of psychological measurement, with application to the assessment of human characteristics, such as intelligence, personality, and interests.

3 lects.; second term.

Prerequisite: Psychology 2G3 or 2R6 or 2R3, or permission of the instructor.

3M6/ Intellectual Development. Research and theory relevant to intellectual and linguistic behaviour. Topics include the developmental aspects of perception, concept formation, problem solving, logical thought, memory, and language.

3 lects.; both terms.

Prerequisite: Psychology 2G3 or 2R6 or an equivalent course; or registration in Psychology 2G3 or 2R6 and permission of the instructor.

3N6/ Abnormal Psychology. Topics basic to clinical psychology, including models of behavioural disorder, classification of abnormal behaviour, evaluation of diagnostic practice, and determinants and treatment of mental illness.

3 lects.; both terms.

Prerequisite: One of Psychology 2A3, 2B3, 2J3, 2K3, 2L6, or 2T6, or permission of the instructor. Not open to students who have completed Psychology 3N3.

3Q3/ Individual Study I. A laboratory or library project that may extend over both terms. Students intending to register must first consult with a Faculty member or the course co-ordinator.

Prerequisite: Permission of course coordinator.

3R3/ Animal Behaviour I. Research and theory in the field of instinctive behaviour. Adaptive and evolutionary significance of behaviour and interaction between learned and innate behaviour are discussed.

3 lects.; first term.

Prerequisite: Registration in Honours or Pass Psychology, or in a four-year programme in Biochemistry or Biology, or permission of the instructor.

3S3/ Animal Behaviour Laboratory. Experiments involving a wide variety of animal species, both vertebrate and invertebrate.

1 lab. (3); second term.

Prerequisite: Psychology 3R3, and permission of the instructor.

3T3/ Animal Behaviour II. Advanced topics in the study of animal behaviour. Topics discussed will include animal reproduction, communication, and the development of behaviour patterns.

3 lects.; second term.

Prerequisite: Psychology 3S3.

3U3/ Human Memory. Experimental evidence concerning encoding, storage, and retrieval of information from human memory will be examined. Association, organization, and information processing theories will be discussed.

3 lects.; first term.

Prerequisite: Psychology 2G3 or 2R6 or an equivalent course; or registration in Psychology 2G3 or 2R6 and permission of the instructor.

3V3/ Laboratory in Human Memory and Cognition. Experiments illustrating important issues in human memory and cognition. Problems in the design, analysis, and reporting of experiments will be emphasized. Individual projects required.

1 lab. (3); second term.

Prerequisite: Psychology 3U3.

3W6/ Psychophysics and Perception. Theories, methods, and data of psychophysics are presented and used in the analysis of perception, attention, and memory. Quantitative theories and data are stressed.

3 lects.; both terms.

Prerequisite: Psychology 2G3 or 2R6 or 2R3, or permission of the instructor.

3X3/ Selected Topics in Behaviour Modification. Major issues and controversies in contemporary behaviour modification. Consideration is given to rival theoretical accounts, and to experimental bases for such techniques as systematic desensitization, aversion therapy, and punishment.

3 lects.; second term.

Prerequisite: Psychology 2L6 or 2T6, and registration in Honours or Pass Psychology or permission of the instructor.

3Y3/ Selected Topics in Behaviour Theory. Issues of contemporary historical interest to behaviour theory will be examined in depth.

3 lects.; first term.

Prerequisite: Psychology 2L6 or 2T6; registration in Honours or Pass Psychology or permission of the instructor.
4A3/ Contemporary Topics in Historical Perspective. Discussion of the background and current status of several issues of contemporary interest.
3 hrs. (lects. and seminar); second term.
Prerequisite: Registration in Honours Psychology, or permission of the instructor. Psychology 4B3 is recommended.

4B3/ History of Psychology. A historical account of the main lines of development of psychology.
3 lects., first term.
Prerequisite: Registration in Honours Psychology, or permission of the instructor.

4D6/ Psychology Thesis. Laboratory or library project. Students must first consult a Faculty member or the course co-ordinator. Three copies of a completed thesis must be submitted by the end of classes.
Prerequisite: Registration in Honours Psychology and permission of a Faculty supervisor.

4E7/ Physiological Psychology II. Advanced topics in the neuroscience. Topics include electrophysiology and pharmacology of excitable membranes, synaptic mechanisms, dendritic mechanisms and plasticity.
3 lects., 1 lab (2) alternate weeks; both terms.
Prerequisite: Psychology 3F6. A biological or biochemical background is strongly recommended.

4K3/ Mathematical Theories of Perception. Quantitative models for basic perceptual processes.
3 lects.; second term.
Prerequisite: Permission of the instructor.

4Q3/ Individual Study II. A laboratory or library project that may extend over both terms. Students intending to register must first consult a Faculty member or the course co-ordinator.
Prerequisite: Permission of a Faculty supervisor.

For Graduate Courses see Calendar of School of Graduate Studies.

Religious Studies

Professors
J. G. Arapura
A. E. Combs
G. P. Grant
G. G. Harrop/part-time
Yün-hua Jan/Chairman
B. F. Meyer
J. J. Mol
E. P. Sanders
P. Younger

Associate Professors
L. I. Greenspan
D. R. Kinsley
J. C. Robertson
K. Sivaraman

Assistant Professors
A. Baumgarten
A. M. Cooper
V. P. Gay
P. Granoff
A. Mendelson
K. Shinohara
G. Vallée
I. G. Weeks
W. K. Whillier

Lecturer
G. MacQueen
L. Teskey

Visiting Faculty
R. M. Grant
G. Lüdemann
S. E. McEvenue
J.-E. Ménard
P. O’Cleirigh
B. Przybylski
D. Winston

McMaster Fellow
K. Post

CURRICULUM 1978-80

Students are advised to consult the department’s Handbook, which will be available prior to registration, for a list of the courses offered in the current year. There are no co-requisite requirements for part-time students. The courses offered in the Department, above Year I, are in three different areas of work:

Group A: Courses in Asian Religion;
Group B: Courses in early Mediterranean Religion;
Group C: Courses in Modern Western Religion.

A 50% minimum is required in all prerequisite courses, unless otherwise specified.

Many of the advanced courses in the Department have open prerequisites. Some background in religious studies or philosophy may be helpful.

YEAR I RELIGIOUS STUDIES

1B6/ World Religions. An introduction to religion through an examination of Hinduism, Jainism, Buddhism, Confucianism, Taoism, Shinto, Judaism, Christianity, and Islam.
1 lect., 2 tuts.; both terms.
Prerequisite: Open.

1C6/ Texts, Traditions, and Thought. The study of selected scriptural texts, their place in religious tradition, and their contribution to human thought and life.
RELIGIOUS STUDIES

YEAR II RELIGIOUS STUDIES

GROUP A:

2AA3/ Pathways of Indian Mysticism. An exploration of the unique characteristics of Indian mysticism, both in its philosophical and popular expression through the study of selected mystics and their writings.
2 lects., 1 tut.; first term.
Prerequisite: Open.
Offered in 1978-79.

2AF6/ Death and Dying: A Comparative Religious Enquiry. Death, as a problem and a mystery, will be reflected upon in light of both contemporary knowledge and selected religious literature, Western and Eastern.
2 lects., 1 tut.; both terms.
Prerequisite: Open.
Offered in 1976-79.

2BB3/ Images of the Divine Feminine. The course will focus on the ways in which various religious traditions have perceived the divine in feminine terms. The course will also deal with certain spiritual heroines from among various religious traditions.
2 lects., 1 tut.; first term.
Prerequisite: Open.
Offered in 1978-79.

2BB6/ Introduction to Asian Philosophy. The traditional philosophies of the East, particularly those developed in India (Hindu, Buddhist, and Jain), and the problems of life and meaning in those traditions.
3 lects.; both terms.
Prerequisite: Open.
Offered in 1978-79.

2CC3/ Specialists in the Sacred. A study of common religious types: shamans, mystics, priests, and saints, and an attempt to discern their distinctive characteristics.
2 lects., 1 tut.; second term.
Prerequisite: Open.
Offered in 1978-79.

2OE6/ Religious Traditions of Asia. The history and literature of the major religious traditions of India, China, and Japan.
3 lects.; both terms.
Prerequisite: Open.

2OE7/ Buddhist Art in Asia. Buddhist art in India, Ceylon, Central Asia, China, Korea and Japan; the change and development of Buddhist art reflected in the changing iconography during the migration of Buddhism from India throughout Asia.
2 lects.; second term.
Prerequisite: Open.
Offered in 1978-79.

GROUP B:

2DD3/ The Five Books of Moses. The central teachings of the Pentateuch (Genesis—Deuteronomy) in the religious life and history of ancient Israel and in western thought.
2 lects., 1 tut.; first term.

2EE3/ The Prophets. The role and teaching of biblical prophets in their ancient setting and their impact on modern religious life and thought.
2 lects., 1 tut.; second term.
Prerequisite: Open; either 1C6 or 1D6 is recommended.

3 lects.; both terms.
Prerequisite: Open; 1D6 is recommended.

2FF6/ History of Ancient Judaism. A study of Judaism from the Babylonian Exile through the Hellenistic Period, with emphasis on the growth of religious movements and the political status of Jews and Judaism.
2 lects., 1 tut.; both terms.
Prerequisite: Open; Religion 1D6 and/or a basic course in ancient history is recommended.
Offered in 1979-80.

2G3/ Greek and Roman Background to Early Christianity. Same as Classical Civilization 2P3.
Offered in 1979-80.

2H3/ Greek and Roman Religion. Same as Classical Civilization 2P3.
Offered in 1980-81.

2K6/ Images of Man and the Gods in the Ancient World. A study of the ethical and theological thought of classical writers from Homer to St. Augustine, with special emphasis on the works of Plato.
2 lects., 1 tut.; both terms.
Prerequisite: Open.

GROUP C:

2A6/ Death and Dying: A Comparative Religious Enquiry. Same as 2A6 under Year II, Group A.
Offered 1978-79.

2J6/ An Introduction to the Social Manifestations of Religion. Topics include the social systems of the world religions, their concepts of the good, secularization, and theories of the social origin of religion.
2 lects., 1 tut.; both terms.
Prerequisite: Open.

2L6/ The Question of God in the Technological Age. An exploration of the private and public questions concerning right action in modern Canadian society. What light do religion and philosophy throw on these questions?
2 lects.; 1 tut.; both terms.
Prerequisite: Open.

2O6/ Atheism, Scepticism, and Religious Faith. A study of the modern western struggle of unbelief and belief with the questions of true humanism, science, and God. Readings in the 17th century writers through contemporary theologians.
2 lects.; 1 tut.; both terms.
Prerequisite: Open.
Offered in 1979-80.

2S3/ Autobiographies: the Quest for Meaning. A study of the human drive for identity and meaning, with special reference to the question of God, through an analysis of selected modern autobiographies such as those by Hammarskjöld, Merton, Schweitzer, Buber, and Weil.
2 lects.; 1 tut.; second term.
Prerequisite: Open.
Offered in 1978-79.

2U6/ The Idea of Religion. A study of the emergence of the concept “religion” in western thought since the time of the Romans.
2 lects.; 1 tut.; second term.
Prerequisite: Open.
Offered in 1979-80.

2W6/ Marxism and Religion on Man. A study of the dialogue/controversy about the nature and destiny of man (and authentic and inauthentic living) in modern thought, with special attention to Marxist and Christian thinkers.
2 lects.; 1 tut.; both terms.
Prerequisite: Open.
Offered in 1978-80.

2Y6/ Psychology and Religion. A critical examination of major western psychological theories of religion with special attention paid to the thought of Freud, Jung, Erikson and associated anthropological theories.
2 lects.; 1 tut.; both terms.
Prerequisite: Open.
Offered in 1979-80.
RELIgIOUS STUDIES

YEAR III RELIGIOUS STUDIES

GROUP A:

3A3/ Religion in Contemporary India. A study of major reformers of the Indian tradition, with special attention given to those, such as Gandhi, who have had a major impact upon the political course of modern India. 3 lects.; second term. Prerequisite: Open. First year courses with Asian content or 206 or 206 are recommended. Offered in 1978-79.


3J6/ The Hindu Temple. The art, history, sociological role, and ritual pattern of Hindu temple worship, the most enduring expression of classical religious behaviour in the modern world. 2 lects.; 1 tut.; both terms. Prerequisite: Open. First year courses with Asian content or 206 or 206 are recommended. Offered in 1979-80.

3J6/ Primitive Religions. A critical examination of major anthropological and psychological theories of primitive religion and primitive modes of classification. 2 lects.; 1 tut.; both terms. Prerequisite: Open. Same as Anthropology 3J6. Offered in 1978-79.


3P6/ Indian Philosophy. A concise, connected account of Indian philosophy using Hindu, Buddhist and Jaina canonical writings as well as later philosophical writings. 3 lects.; both terms. Prerequisite: Open. First year courses with Asian content or 206 or 206 are recommended.

3Q6/ The Buddhist Tradition. A course in two parts: an historical and philosophical study of Buddhism in India, its background, founder, teachings and historical development; a study of Buddhism in China and Japan, its introduction, penetration, assimilation, transformation, and encounter with East Asian civilization. 3 lects.; both terms. Prerequisite: Open. First year courses with Asian content or 206 or 206 are recommended. Offered in 1979-80.

3S3/ Hindu Mythology and Cult. A study of central themes of the Hindu tradition as illustrated in Hindu mythology, and various Hindu religious rituals and Hindu devotionalism. 3 lects.; first term. Prerequisite: Open. First year courses with Asian content or 206 or 206 are recommended. Offered in 1978-79.

3V3/ Indian Art and Religion. Indian art in relation to its religious background, the problem of the relationship between art and religion. 2 lects.; first term. Prerequisite: Open. Offered in 1978-79.

3VV6/ Topics in East Asian Thought and Religion. A study of topics from classical Chinese philosophy and Chinese Buddhism followed by discussions of Neo-Confucianism, the interaction between Chinese culture and the indigenous tradition in Japan, and aspects of the transformation of the East Asian tradition in the modern context. 3 lects.; both terms. Prerequisite: Open. First year courses with Asian content or 206 or 206 are recommended. Offered in 1978-79.

3WW6/ Yoga: Theory and Practice. A study of both the theoretical and practical sides of Yoga, beginning with the famous aphorisms of Patanjali, its importance and relevance for today. 2 lects.; second term. Prerequisite: Open. Offered in 1978-79.

3XX3/ Studies in Hindu Sacred Literature: The Visionary Poets of the Rg Veda. General consideration of the nature of the poetic vision and the relationship between the poets and the gods will be followed by a detailed study of two hymns in English translation. 2 lects.; first term. Prerequisite: Open. Offered in 1979-80.

GROUP B:

3H4/ The Triumph of Christianity. A study of the historical reasons why Christianity emerged as the religion which satisfied the quest for salvation, and of the other religions that competed with it. 2 lects.; 1 tut.; first term. Prerequisite: Any of Religious Studies 106, 2003, 2EE3, 2EE6, Classical Civilization 2P3, 3B3, History 1L6, 2L6, or permission of the instructor. Offered in 1978-79.

3M3/ Religion and Literature in Ancient Israel. An exploration of the relation between literary art and religious expression through a consideration of biblical poetry and wisdom literature. 2 lects.; second term. Prerequisite: Religion 1C6 or 106, or 20D3, or 2EE3, or instructor's approval.

3C3/ The Fourth Gospel. An examination of the historical and literary backgrounds of the Gospel of John followed by a study of its context, major themes, and distinctive contribution to Christian thought. 2 lects.; second term. Prerequisite: 106 or 206 or approval of instructor. Offered in 1979-80.

3T3/ Modern Research in the Life and Teachings of Jesus. An examination of the views of representative modern scholars with an analysis of the texts on which their views rest, along with a consideration of the problem of the relationship between faith and historical events. 2 lects.; second term. Prerequisite: 106 or 206 or approval of instructor. Offered in 1979-80.

3X3/ The Letters of Paul. An examination of the principal themes in Paul's letters, with special emphasis on his Christology, anthropology, and soteriology. Modern scholarly views are considered. 2 lects.; second term. Prerequisite: 106 or 1E6 or approval of instructor. Offered in 1979-80.

3YY6/ Biblical Interpretation: Traditional and Contemporary. A seminar on traditional and contemporary modes of interpreting the Hebrew Bible with special reference to the impact of interpretation on religious thought and belief. 1 two-hour seminar; both terms. Prerequisite: Religion 20D3/2EE3, or the equivalent as approved by the Instructor.

GROUP C:

3D6/ The Possibility of Religious Belief. An analytical and constructive approach to the concepts and conditions necessary for responsible religious belief with particular attention given to problems of religious language and the existence of evil. 2 lects.; 1 tut.; both terms. Prerequisite: Open. Offered in 1978-79.

3FF3/ Aspects of Mutuality in 20th Century Literature. An interdisciplinary course offered by the Departments of English, Psychiatry and Religious Studies. It explores the nature of male and female relationships by utilizing literary, psycho-social and religious approaches to 20th century literature, and deals with representative British and American works and genres. 1 lect., 2 tuts.; first term. Prerequisite: Open. Same as English 3EE3. Offered in 1979-78.

3I3/ Religion in Canada. A review and appraisal of the sociological literature on religion in Canada, with attention given to a comparison of Canada with other western countries. 2 lects.; 1 tut.; second term. Prerequisite: Open.

3J6/ Religion and Modern Society. An introduction to the thoughts and theories of scholars who have studied the relation between religion and modern society. In the first term, emphasis will be placed on pre-World War II writings. In the second term, the empirical materials of the sociology of religion since World War II will be surveyed. 2 lects.; 1 tut.; both terms. Prerequisite: Any of Year I Religious Studies, Philosophy, Sociology or Anthropology. Same as Sociology 3M6. Offered in 1979-80.
RELIGIOUS STUDIES

3JJ6/ Primitive Religion. Same as 3JJ6 under Year III, Group A
Offered in 1978-79.

3KK3/ Medieval Christian Thought. A course focusing on the development of Christian thought in the middle ages as it was manifested both in popular and learned religions.
2 lects., 1 tut.; first term.
Prerequisite: Open.
Offered in 1978-80.

3L6/ The Nature of Human Nature. An exploratory attempt to understand the notion of "being human" by examining its realization in the thought of select Asian and European religious writers.
2 lects., 1 tut.; both terms.
Prerequisite: Open.
Offered in 1978-79.

3M6/ The Jewish People and the Modern World. A topical study including Judaism and the Enlightenment, the rise of Zionism, the Jews and modern revolution and the Holocaust.
2 lects., 1 tut.; both terms.
Prerequisite: Open.
Offered in 1978-80.

3N3/ The Orthodox Church in Russian Culture. The history, nature, and doctrines of the Russian Orthodox Church, emphasizing its influence in the cultural life of Russia from the 10th century until the present.
2 lects., 1 tut.; first term.
Prerequisite: Open to students in Year II or above.
Same as Russian 3S3
Offered in 1978-79.

3OQ6/ Western Religious Thought—Development of the Christian Traditions between 100 and 800. This course will deal with Patristic literature. Special attention will be given to Gnosticism and to the discussion of the Gnostic interpretation of Christianity in the writings of some Church Fathers.
2 lects., 1 tut.; both terms.
Prerequisite: Open.
Offered in 1978-79.

2 lects., 1 tut.; second term.
Prerequisite: Open. History 2A6 is recommended.
Offered in 1978-80.

3R3/ Religion and Identity. An examination of the roles or functions of religion in the development of personal and group identities, using both empirical and theoretical materials.
2 lects., 1 tut.; first term.
Prerequisite: Open.
Same as Sociology 3R3
Offered in 1978-79.

3RR3/ Religion and Society Seminar. Selected topics and authors in the social scientific analysis of religion, e.g., Freud, Weber, Marx. Topics chosen to accommodate student and faculty research interests.
One 2 hour seminar each week; second term.
Prerequisite: 313 and 3R3 (or concurrent registration in them), or approval of instructor.
Offered in 1978-80.

2 lects., 1 tut.; first term.
Prerequisite: Open.
Offered in 1978-80.

3ZZ6/ Special Topics in Religious Studies. A course in which special topics as selected by the Department on a year to year basis are examined through lecture and seminar, often under the direction of invited, visiting faculty. Further information is available in the Religious Studies Handbook or from the Departmental Undergraduate Advisor.
1 seminar both terms.
Prerequisite: as may be specified in the Handbook.

YEAR IV RELIGIOUS STUDIES

Fourth year honours students in Religious Studies are normally expected to register (1) in one or more advanced study course(s) listed below, and (2) in two three-unit required seminars.

ADVANCED STUDY COURSES:

The format of these courses will vary from year to year depending partly on the number of students interested in participating in them. Thus, a given advanced study course may take the form of a seminar in one year and that of a reading course in another. Students are advised to consult and plan their programme with the Undergraduate Advisor.

Prerequisite: Permission of the instructor and the Undergraduate Advisor.

GROUP A:

4AA6/ Advanced Study in Hindu Religious History
4BB6/ Advanced Study in Buddhist and East Asian Religious History
4E6/ Advanced Study in Indian Philosophy

GROUP B:

4B5/ Advanced Study in Medieval Christian Thought

GROUP C:

4D06/ Advanced Study in Religion and Western Thought
4EE6/ Advanced Study in Religion and Western Society

4TT6/ Canadian Political Theory. An investigation into the character of Canadian liberalism and the various critiques of liberalism found in the works of G. P. Grant, C. B. Macpherson, George Woodcock and other Canadian political theorists.
3 hrs. (seminar); both terms.
Prerequisite: Permission of the instructor.
Same as Political Science 458.

DEPARTMENTAL:

4W6/ Advanced Study of Religion
4Y3/ Advanced Study of Religion

SEMINARS:

4FF3/ Approaches to the Study of Religion. A seminar required for all fourth year honours students in Religious Studies in which important works representing different methodologies for the study of religion will be examined and discussed in detail.
1 (2 hr.) seminar; first term.
Prerequisite: Enrolment in Honours Religious Studies or permission of the Instructor.

4GG3/ Honours Seminar. A seminar required for all fourth year honours students in Religious Studies in which the substance of the advanced research conducted in Advanced Study courses by participants will be presented and discussed by all members of the seminar.
Prerequisite: Enrolment in Honours Religious Studies.
1 (2 hr.) seminar; second term.

HEBREW

2A6/ Hebrew. The inductive study of the Hebrew language, leading to the mastery of the general principles of grammar and syntax. Prose work throughout the year.
3 lects.; both terms.
Prerequisite: Open.

3A8/ Intermediate Hebrew. Extensive readings in Biblical prose (selections from some or all of the following: The Pentateuch, Former Prophets, Ruth and Esther), and some readings in the second term in Rabbinic literature (Mishna and Aggada). Both terms.
Prerequisite: Hebrew 2A6 or Equivalent.

Chinese 4A6/ Introduction to Literary Chinese. Standard introductory course, covering the essentials of Chinese grammar and including basic readings. The textbook used is Shadick's "A First Course in Literary Chinese".
3 lects.; both terms.
Prerequisite: Open.

Sanskrit 4A6/ Introduction to Sanskrit Grammar. Basic course in the elements of Sanskrit Grammar. No previous knowledge of Sanskrit is required.
3 lects.; both terms.
Prerequisite: Open.

NEW TESTAMENT AND KOINE GREEK

ROMANCE LANGUAGES

4 lects.; both terms.
Prerequisite: Open except to students who have completed Greek 2C6.
Formerly Greek 2C6.
3 lects.; both terms.
Prerequisite: Greek 1D6. Not open to students who have completed Greek 3B6.
Formerly Greek 3B6.

For Graduate Courses, see Calendar of School of Graduate Studies.

CURRICULUM 1978-80

FRENCH

At least "D" is required in all courses listed under "prerequisite," unless otherwise indicated.

BEGINNERS' LANGUAGE COURSES

1Y3/ Introductory Grammar for Reading French. Designed to provide a working knowledge of French grammar for purposes of translating French into English; deals with the written language only.
2 tuts.; both terms.
Prerequisite: Open, except to graduates of Level 4 (Grade 12) or Level 5 (Grade 13). French. Standing in French 1Y3 does not allow registration in a French Honours or Pass programme.
Enrolment is limited.

1Z6/ Beginners' Intensive French. An intensive course for developing the four language skills (listening, speaking, reading and writing) with emphasis on the first two. This course is not designed for preparation for entrance into French Honours or Pass Programmes.
5 hrs. (lab. practice included); both terms.
Not available to graduates of Level 4 (Grade 12) or Level 5 (Grade 13) French or to students with standing in French 1D6.
The normal sequel to this course is French 2Z2.
Enrolment is limited

INTERMEDIATE AND ADVANCED LANGUAGE AND LITERATURE COURSES

1A6/ Introduction to French Studies. For intending French Honours students. Advanced language study and practice, and the study of modern French and French Canadian texts, emphasizing the methodological basis for work in future Years.
4 tuts.; both terms.
Prerequisite: French 1A6 or 186. Not open to students with standing in French 1A6 or 186. Not open to students with standing in French R-group.

1A6 or 186. Not open to students with standing in French R-group.

4 tuts.; both terms.
Prerequisite: Level 4 (Grade 12) or Level 5 (Grade 13) French, or permission of the Department.

With the approval of the Department, French 1B6 may be accepted for admission to Year II of Honours programmes in French.

2A4/ French Language Practice.
2 tuts., 1 lab.; both terms.
Prerequisite: Registration in Year II of any Honours programme in French or permission of the Department.

A standing of not less than 60% in French 2A4 is required for registration in Year III of any Honours programme in French.

2C3/ French Oral Practice.
2 tuts.; both terms.
Prerequisite: Registration in Year II of any programme in French and permission of the Department (limited enrolment).

2D3/ Mediaeval French Literature in Translation I. An introduction to the rich and complex literary culture of Mediaeval France by the study of selected works in modern translations.
3 lects.; one term.
Prerequisite: Open.
Not available for Q or R-group credit to students with standing in French 203.

2E4/ French Language Practice.
2 tuts., 2 labs.; both terms.
Prerequisite: French 1A6 or 186.

A standing of not less than 60% in French 2E4 plus Honours standing in the Pass French R-group will permit registration in Year III of any Honours programme in French.

2F3/ The Civilization of French Canada I. The church, the family and nationalism in the evolution of Quebec; their reflection in French Canadian literature, painting and architecture.
3 lects.; one term.
Prerequisite: French 1A6 or 186. Not open to students with standing in French 2F4.

2FF3/ The Civilization of French Canada II. Such social factors as language and education in the evolution of contemporary Quebec; their reflection in French Canadian literature, journalism, music and cinema.
3 lects.; one term.
Prerequisite: French 1A6 or 186. Not open to students with standing in French 2F4.
ROMANCE LANGUAGES

2J3/ Nineteenth-Century French Literature I. Selected novels, plays and poems representative of the main currents of nineteenth-century French literature.
3 lects.; one term.
Prerequisite: French 1A6 or 1B6. Not open to students with standing in French 2J4.

2J3/ Nineteenth-Century French Literature II. Selected themes appearing in the works of the major French writers of the nineteenth century.
3 lects.; one term.
Prerequisite: French 1A6 or 1B6. Not open to students with standing in French 2J4.

2G3/ France as a Nation. Perspectives on the culture and civilization of France, past and present.
3 lects.; one term.
Prerequisite: French 1A6 or 1B6.

2O3/ Mediaeval French Literature in Translation II. Representative works of mediaeval French literature, studied in terms of their cultural significance and literary techniques.
3 lects.; one term.
Prerequisite: Open. Not available for Q or R-group credit to students with standing in French 2O3.

2P3/ Eighteenth-Century French Literature in Translation. The study of major writings of the eighteenth century in their literary, social and intellectual context. Authors include Montesquieu, Voltaire, Diderot and Rousseau.
3 lects.; one term.
Prerequisite: Open, except to students registered in a French programme.

3 lects.; one term.
Prerequisite: French 1A6 or 1B6. Not open to students with standing in French 3W3, 3W4 or 4F4.

2W3/ Twentieth-Century French Literature II. Aspects of the development of twentieth-century literature since the Second World War.
3 lects.; one term.
Prerequisite: French 1A6 or 1B6. Not open to students with standing in French 3W3, 3W4 or 4F4.

3 lects.; one term.
Prerequisite: French 1A6 or 1B6. Not open to students with standing in French 2Z4.

2Z26/ Sequel to Beginners' Intensive French.
3 tuts.; 2 labs.; both terms.
Prerequisite: French 126. Enrollment is limited.

3A3/ Stylistic Studies in the Language of French Poets. Analysis of selected poems of major poets of the modern French era, with stress on such aspects as versification "rules", rhythms and sound effects, vocabulary structures, imagery and word-positioning.
Seminar; one term.
Prerequisite: Registration in any programme in French and permission of the Department (limited enrolment). Offered in alternate years.

3AA5/ The Modern French-Canadian Novel. Representative novels from Quebec by well-known contemporary authors (Blais, Carrier, and Godbout among others), with emphasis upon the relationship between technique and meaning.
3 lects.; one term.
Prerequisite: French 2F4, 2F3 or 2FF3; or permission of the Department.

3B3/ Semantics. An introduction to the study of meaning in language. Examples will be drawn from English, French and other European languages.
3 lects.; one term.
Prerequisite: A Year I language other and English, or permission of the Department.

3B3/ Contemporary Quebec Theatre. Contemporary experimental theatre, and representative playwrights such as Marcel Dubé and Michel Tremblay.
3 lects.; one term.
Prerequisite: French 2F4, 2F3 or 2FF3; or permission of the Department.

3C4/ French Language Practice. 3 hrs.; both terms.
Prerequisite: Registration in Year III of any programme in French or permission of the Department.
A standing of not less than 60% in French 3C4 is required for registration in Year IV of any Honour programme in French.

3CC3/ Translation Techniques. Oral and written translations, covering a number of styles (descriptive, narrative, abstract, journalistic, etc.), training in the use of pertinent reference material (grammars, dictionaries).
3 tuts.; one term.
Prerequisite: Registration in Year II or III of any programme in French and permission of the Department (limited enrolment).

3D3/ Practical and Corrective Phonetics of French. A laboratory course; ear training, with some dictation; pronunciation exercises (vowel quality, consonantal articulation; syllabification; rhythm; accent; word-linking; etc.); and the basic patterns of intonation, with interpretative reading of texts.
3 tuts.; in laboratory; one term.
Prerequisite: Registration in Year II or III of any programme in French, and permission of the Department (limited enrolment). Offered in alternate years.

3G3/ General and Comparative Phonetics. Elementary questions of phonetic theory (physiological basis, speech sounds in isolation and in sequence, the syllable, the phoneme, prosodic features, graphemics); followed by a comparison of the modern French and English systems of sounds.
3 lects.; one term.
Prerequisite: French 1A6 or 1B6 or permission of the Department.

3K3/ Eighteenth-Century French Literature I. The early eighteenth century with emphasis on writings by the foremost writers of the time: Montesquieu, Marivaux and Prevost, and on the early writings of Voltaire.
3 lects.; one term.
Prerequisite: 19 units of French or permission of the Department. Not open to students with standing in French 2K4 or 2K6.

3K3/ Eighteenth-Century French Literature II. Texts representing the main aspects of Enlightenment thought and literature from the publication of the preliminary discourse of the Encyclopédie to the Revolution.
3 lects.; one term.
Prerequisite: 19 units of French or permission of the Department. Not open to students with standing in French 2K4 or 2K6.

3L3/ French Syntax. An introduction to the basic concepts of linguistics, followed by practical problems in the description of French syntax. This is not a language practice course.
2 lects.; 1 tut.; one term.
Prerequisite: Registration in any French programme or permission of the Department. Not open to students with standing in French 3L4.

3 lects.; one term.
Prerequisite: 19 units of French.

3 lects.; one term.
Prerequisite: 19 units of French.

3N3/ Teaching French as a Second Language: Problems and Methods. An examination of various aspects of second language acquisition as applied to the teaching of French.
Seminar; one term.
Prerequisite: French 3G3 or 3L3 or 3L4, or Anthropology 2M6, and permission of the Department and registration in any programme in French (limited enrolment).

3NK3/ Teaching French as a Second Language: Practical Training. This course is designed to enable students to put into practice, in simulated classroom situations, the theories presented in French 3N3.
Seminar; one term.
Prerequisite: French 3N3 and registration in any programme in French and permission of the Department (limited enrolment).

3Q3/ Seventeenth-Century French Literature I. A study of selected plays of Corneille, Mollière and Racine.
3 lects.; one term.
Prerequisite: 19 units of French or permission of the Department. Not open to students with standing in French 3J3 or 3Q4.

3Q3/ Seventeenth-Century French Literature II. A consideration of selected themes as they appear in the works of the major French writers of the seventeenth century.
3 lects.; one term.
Prerequisite: 19 units of French or permission of the Department. Not open to students with standing in French 3J3 or 3Q4.

3R3/ Mediaeval French Language. This basic introduction to the Old French language provides a reading knowledge of mediaeval French.
ROMANCE LANGUAGES

3L/ Balzac's Novels. An attempt to render La Comédie Humaine intelligible in terms of structure and praxis.
3 lects.; one term.
Prerequisite: Registration in any programme in French, or permission of the Department.

3H3/ Quebec Poetry. An analysis of selected writings of Nelligan, Saint-Denys Garneau, Anne Hebert, and the group of poets known as I'Hexagone, emphasizing poetic techniques and the complex development of the French language from the spoken Latin of Gaul to Early Modern French.
Offered in alternate years.

3Y3/ French Cinema. A survey of French film from 1896 to the present day, with particular emphasis upon such major figures as Renoir, Clair, Bresson, Truffaut and Resnais.
1 lect., 1 tut., plus one weekly evening film screening; one term.
Prerequisite: Permission of the Dramatic Arts Chairman (limited enrolment).
Not available for Q or R group credit for students in French Pass or Honours Programmes. Same as Dramatic Arts 3Y3.

4A4/ French Language Practice.
3 hrs.; both terms.
Prerequisite: Registration in Year IV of any Honours programme in French.

4BB3/ Comparative Stylistics and Translation Techniques. A course designed for the systematic comparison of French and English for the advancement of translators and interpreters.
3 tuts.; one term.
Prerequisite: Registration in Year IV of any programme in French; successful completion of French 3CC3, or permission of the Department.

Seminar; one term.
Prerequisite: French 3RR3 and permission of the Department (limited enrolment). Offered in alternate years.

4E3/ History of the French Language after 1600. Among the topics discussed will be: vocabulary growth, loan words, slang, popular, literary, and regional language; syntax and phonetic changes.
Seminar; one term.
Prerequisite: 19 units of French and permission of the Department (limited enrolment). Offered in alternate years.

4G3/ Short Stories of French Canada. A study of traditional and modern storytelling in French Canada, with the folktales as the basic model.
Seminar; one term.
Prerequisite: French 2FF4, 2FF3 or 2FF3 and permission of the Department (limited enrolment). Offered in alternate years.

4H3/ Quebec Poetry. An analysis of selected writings of Nelligan, Saint-Denys Garneau, Anne Hebert, and the group of poets known as I'Hexagone, emphasizing poetic techniques and the socio-cultural context of Quebec.
Seminar; one term.
Prerequisite: French 2F4, 2F3 or 2FF3 and permission of the Department (limited enrolment). Offered in alternate years.

Seminar; one term.
Prerequisite: 19 units of French and permission of the Department (limited enrolment). Offered in alternate years.

Seminar; one term.
Prerequisite: 19 units of French and permission of the Department (limited enrolment). Not open to students with standing in French 4J4.

4K3/ Advanced Semantics. An in-depth study of semantic theories and their practical application in individual group research projects.
Seminar; one term.
Prerequisite: French 3BB3 and permission of the Department (limited enrolment). Offered in alternate years.

4LL3/ Special Topics in French African and Caribbean Literature. An in-depth exploration of a major theme or period in French African or Caribbean literature. Topics will change from year to year.
Seminar; one term.
Prerequisite: 19 units of French, French 2Z3 and permission of the Department (limited enrolment). Offered in alternate years.

4N3/ Twentieth-Century French Novel I. Bankruptcy of the classical novel and attempts to find a new form.
3 lects.; one term.
Prerequisite: 19 units of French. Not open to students with standing in French 4N4. Offered in alternate years.

Seminar; one term.
Prerequisite: 19 units of French and permission of the Department (limited enrolment). Offered in alternate years.
Not open to students with standing in French 4N4.

4O3/ Twentieth-Century French Theatre. A study of the ideas and dramatic techniques of the playwrights of the modern period who have influenced the development of today's theatre in France.
3 lects.; one term.
Prerequisite: 19 units of French. Not open to students with standing in French 4O4.

Seminar; one term.
Prerequisite: 19 units of French and permission of the Department (limited enrolment). Offered in alternate years.

4R3/ Studies in Mediaeval French Literature. The Lais of Marie de France: a selection from 'short stories' in verse to illustrate the author's conception of love, her portrayal of characters, and her use of Celtic themes, including supernatural elements.
Seminar; one term.
Prerequisite: French 3RR3 and permission of the Department (limited enrolment).

4S3/ Topics in Mediaeval French Literature.
1978-79—Mediaeval French Poetry. This course illustrates the range of mediaeval French poetry from the tender love-lyrics of the poet-Prince, Charles d'Orléans, to the pathos and obscenity of the criminal Villon.
1979-80—Mediaeval French Theatre. The development of mediaeval French dramatic themes and techniques, from religious dramas to secular comedies.
Seminar; one term.
Prerequisite: French 3RR3 and permission of the Department (limited enrolment).

4T3/ Zola. A close reading of selected novels of Emile Zola and an appraisal of recent critical studies of his work.
Seminar; one term.
Prerequisite: 19 units of French and permission of the Department (limited enrolment). Not open to students with standing in French 3ZZ.
Offered in alternate years.

4U3/ Nineteenth-Century French Novel after Balzac. This course attempts to determine whether Stendhal, Flaubert, Zola and Maupassant altered the underlying structure of the novel form that Balzac had created. 3 lects.; one term.
Prerequisite: French 3U3. Not open to students with standing in French 2T4. Offered in alternate years.

4V3/ Voltaire. Specific texts related to the works of other writers of the time.
Seminar; one term.
Prerequisite: 19 units of French and permission of the Department (limited enrolment). Not open to students with standing in French 4V4. Offered in alternate years.

4W3/ Sartre's Essays. An examination of Sartre's political and social thought as reflected in certain volumes of his Situations.
Seminar; one term.
Prerequisite: 19 units of French and permission of the Department (limited enrolment). Not open to students with standing in French 4W4. Offered in alternate years.

4X3/ Critical Trends (theory and practice) in Modern French Literary Criticism including Structuralism.
Seminar; one term.
Prerequisite: 19 units of French and permission of the Department (limited enrolment). Offered in alternate years.

4XX3/ Critical Trends (theory and practice) in Modern French Literary Criticism from Structuralism to Semiotics.
Seminar; one term.
**INTERMEDIATE AND ADVANCED LANGUAGE AND LITERATURE COURSES**

**ITALIAN**

Note: At least "D" is required in all courses listed under "prerequisite", unless otherwise indicated.

**BEGINNERS’ LANGUAGE COURSES**

1Z6/ Introductory Italian. An intensive beginners' course, designed for students from non-Italian background. This course gives the student a basic knowledge of Italian grammar, while emphasizing spoken Italian.
   - 3 lects.; 2 labs.; both terms.
   - Prerequisite: Not open to graduates of Grade 13 Italian, Italian 1Q6 or students with standing in or registered in Italian 1Z26.
   - Students with Grade 12 Italian are required to take a placement test during registration week. Enrolment is limited.

1ZZ6/ Introductory Italian for Dialect Speakers. The same course as Italian 1Z6, but designed for those students who come from an Italian background and who understand or speak an Italian dialect.
   - 3 lects.; 2 labs.; both terms.
   - Prerequisite: Not open to graduates of Grade 13 Italian, Italian 1Q6 or students with standing in or registered in Italian 1Z26.
   - Students with Grade 12 Italian are required to take a placement test during registration week. Enrolment is limited.

**INTERMEDIATE COURSES**

1A6/ Intermediate Italian. Review of Grammar; basic Italian syntax and introduction to composition.
   - 3 hrs.; both terms.
   - Prerequisite: Grade 13 Italian or Italian 1Q6 or 1Z6, or permission of the Department. Not open to students with standing in Italian 2Z6.

   - 3 hrs.; both terms.
   - Prerequisite: Italian 1Z6 or permission of the instructor. Available as an elective only.

2D6/ Advanced Italian Language. Composition, phonetics, oral practice. This course aims also at developing a sensitivity to the importance of style and establishing a discipline in writing.
   - 3 tuts.; both terms.
   - Prerequisite: Italian 1A6 or permission of the Department.

2E6/ Introduction to Italian Literature. A study of the development of Italian literature from its beginnings to the twentieth century. Special emphasis will be placed on major authors and works.
   - 3 lects.; both terms.
   - Prerequisite: Italian 1A6 or registration in any Pass or Honours programme in Italian, or permission of the Department. Not available to students with standing in Italian 2F6.

   - 3 lects.; one term.
   - Prerequisite: 12 units of Italian or permission of the Department.
   - Not available to students with standing in Italian 3F6.
   - Offered in alternate years.

3D4/ Italian Language Practice. Composition, stylistics, oral practice. The purpose of the course is to develop a sense of style in the written language.
   - 2 tuts.; both terms.
   - Prerequisite: Italian 2D6 or permission of the Department.

   - 3 lects.; one term.
   - Prerequisite: Registration in any Pass or Honours programme in Italian or permission of the Department.
   - Offered in alternate years.

313/ Dante I. The historical background of the Divina Commedia; selected cantos from "Inferno" and "Purgatorio".
   - 3 lects.; one term.
   - Prerequisite: 12 units of Italian or permission of the Department.
   - Not available to students with standing in Italian 2A6 or 3B6.

**ADVANCED COURSES**

3K3/ Boccaccio. This course deals with Boccaccio's principal work, The Decameron, with particular attention to its linguistic and aesthetic significance.
   - 3 lects.; one term.
   - Prerequisite: 12 units of Italian or permission of the Department.
   - Not available to students with standing in Italian 2A6 or 3B6.

   - 3 lects.; one term.
   - Prerequisite: Italian 1A6, 2E6 or permission of the Department.
   - Alternates with Italian 4N3.

3M3/ Twentieth-Century Italian Novel. A study of the major Italian authors of the 20th century with some emphasis placed on neorealism and its influence on contemporary Italian culture.
   - 3 lects.; one term.
   - Prerequisite: Registration in any Pass or Honours programme in Italian or permission of the Department.
   - Not available to students with standing in Italian 2D6 or 3K3.
   - Offered in alternate years.

3N3/ Nineteenth-Century Italian Literature. A study of the main literary currents of the century with emphasis on Alferi's tragedies, and on Goldoni's reform in comedy.
   - 3 lects.; one term.
   - Prerequisite: Registration in any Pass or Honours programme in Italian or permission of the Department.
   - Not available to students with standing in Italian 4D4.
   - Offered in alternate years.

3O3/ Renaissance I. An introduction to the epic with emphasis on Ariosto and Tasso.
   - 3 lects.; one term.
   - Prerequisite: 12 units of Italian or permission of the Department.
   - Not available to students with standing in Italian 4G4.
   - Offered in alternate years.

3P3/ Contemporary Italian Drama. A study of the influence of Pirandello on contemporary Italian dramatists, mainly Betti and Fabri.
   - 3 lects.; one term.
   - Prerequisite: Registration in Year III or IV of any programme in Italian or permission of the Department.

4C3/ The Literature of the Risorgimento. A study of the period of 1816-1873 in Italian Literature through selected texts, with reference to the political and social background.
   - 3 lects.; one term.
   - Prerequisite: Registration in Year II or IV of any programme in Italian or permission of the Department.

4J3/ Contemporary Poetry. A study of the major Italian authors of the 20th century; Saba, Montale, Ungaretti, Quasimodo.
   - 3 lects.; one term.
   - Prerequisite: Registration in Year II or IV of any programme in Italian, or permission of the Department.
   - Offered in alternate years.

4L4/ Introduction to Italian Philology. Elements of descriptive and historical Italian grammar; dialects; early documents of Italian.
   - 2 tuts.; both terms.
   - Prerequisite: Registration in any Honours programme in Italian or permission of the Department.

4M3/ Composition, Stylistics, Oral Practice. An essay-writing course based primarily on 20th-century Italian writers and on various topics.
   - 3 tuts.; one term.
   - Prerequisite: Registration in Year IV Honours Italian, or 2D6 with a mark of 75, or permission of the Department.

4N3/ Topics in Italian Literature. A review of the long-debated problem of the nature of a national Italian language. Readings will include Dante's De vulgari eloquentia, selections from Bembo. Castelvecchio, Trissino, Machiavelli, Salviani, Cesiari, Monti, Manzoni, Ascoli, de Mauro and others.
   - 3 lects.; one term.
   - Prerequisite: Italian 1A6, 2E6 or permission of the Department.
   - Offered in alternate years. Alternates with Italian 3L3.

   - 3 lects.; one term.
   - Prerequisite: Italian 1A6, 2E6 or permission of the Department.

4P3/ Dante II. The vision of Dante. Readings from Vita Nuova, Convivio and Paradiso.
   - 3 lects.; one term.
   - Prerequisite: Registration in Year III or IV of any programme in
ROMANCE LANGUAGES

Italian or permission of the Department. Not available to students with standing in Italian 4F4.

4Q3/ Renaissance II. A study of the Renaissance theatre, with particular emphasis on Machiavelli, Ruzante, Bibbiena, Aretino. 3 lcts.; 1 term.
Prerequisite: Registration in Year III or IV of any Pass or Honours programme in Italian, or permission of the Department. Offered in alternate years.

4X3/ Independent Study. In consultation with members of the Section of Italian, students will pursue research in areas of particular interest to them.
Prerequisite: Registration in Year IV Honours Italian.

SPANISH

At least "D" is required in all courses listed under "prerequisite", unless otherwise indicated.

BEGINNERS' LANGUAGE COURSE

1Z6/ Beginners' Intensive Spanish. A course designed to cover the rudiments of the language, to teach correct expression on paper and in conversation and to provide preparation for more advanced work in Spanish.
4 hrs.; both terms.
Prerequisite: Open to students taking Spanish for the first time. Enrolment is limited; 25 per section.
(Two sections of this course will be taught by the audio-visual method. These sections will meet 5 hrs. per week.)

INTERMEDIATE AND ADVANCED LANGUAGE AND LITERATURE COURSES

1A6/ Intermediate Spanish. Review of grammar, composition, oral practice; selected readings from contemporary Spanish and Spanish American authors. 5 hrs. (1 lct., 3 tuts., conversation); both terms.
Prerequisite: Grade 13 Spanish or GCE equivalent, or Spanish 1Z6 or permission of the Department.

2A6/ Language Practice. A course devoted to the expansion of vocabulary, the improvement of comprehension, the development of style in written Spanish, and the achievement of greater confidence in the spoken language.
2 tuts., 1 hr. conversation; both terms.
Prerequisite: Spanish 1A6.

2B3/ Introduction to the Culture of Spain. Selected readings relating to the geography, history, politics, literature and art of Spain. 3 lcts.; 1 term.
Prerequisite: Spanish 1Z6 or 1A6 or permission of the Department.

2C3/ Introduction to the Culture of Spanish America. A course dealing with the geography, history, politics and art of Spanish America: 3 lcts.; 1 term.
Prerequisite: Spanish 1Z6 or 1A6 or permission of the Department.

2D4/ Oral Practice. A course for students interested in developing their fluency, confidence and vocabulary in spoken Spanish.
2 hrs.; both terms.
Prerequisite: Spanish 1A6 and registration in a Pass or Honours Spanish programme.

3A4/ Further Language Practice. A course which provides opportunities to develop a deeper awareness of style and greater command of the spoken language.
2 tuts.; both terms.
Prerequisite: Spanish 1A6.

3 hrs.; 1 term.
Prerequisite: Spanish 1978-79: The Novel of the Twentieth Century. The literary impact of the Spanish Civil War, with emphasis on tremendismo and the novela social. Works by Cela, Goytisolo, Lafoset and Deibies will be included.
3 hrs.; 1 term.
Prerequisite: Spanish 1A6 plus six units of Spanish beyond 1A6.

3BB3/ Modern Spanish Literature II. 1978-79: The Novel of the Nineteenth and Twentieth Centuries. The development of the modern novel in Spain viewed through selected works by Galdós, Clarín, Unamuno and Baroja.
3 hrs.; 1 term.
1979-80: Prose of the Nineteenth Century.

Selected works from Larra to Clarín. Special attention will be given to stylistic trends and intellectual history. Emphasis will be on Galdós, Clarín, Valera and Ibáñez.
3 hrs.; 1 term.
Prerequisite: Spanish 1A6 plus six units of Spanish beyond 1A6.

3C3/ Modern Spanish American Literature I. 1978-79 and 1979-80: The Short Story. A study of a literary genre cultivated by masters such as Borges, Cortázar, García Márquez, Ruffo and Donoso.
3 hrs.; 1 term.
Prerequisite: Spanish 1A6 plus six units of Spanish beyond 1A6.

3CC3/ Modern Spanish American Literature II. 1978-79 and 1979-80: The Novel. The Spanish American novel from the Mexican Revolution to 'magic realism'. Authors such as Azuela, Guirados, Carpenter, Ruffo and Sábado will be considered.
3 hrs.; 1 term.
Prerequisite: Spanish 1A6 plus six units of Spanish beyond 1A6.

3E3/ Introduction to the Golden Age I. The Picaresque Novel, with emphasis on the intellectual history of the sixteenth and seventeenth centuries and the development of the narrative techniques which launch the modern novel.
3 hrs.; 1 term.
Prerequisite: Spanish 1A6 plus six units of Spanish beyond 1A6.

3E3/ Introduction to the Golden Age II. El Quijote. An analytical study of Cervantes' masterpiece with some consideration of the interpretations and viewpoints of major critics.
3 hrs.; 1 term.
Prerequisite: Spanish 1A6 plus six units of Spanish beyond 1A6.

4A4/ Advanced Language Practice. A course concerned mainly with composition, stylistics and the finer nuances of Spanish syntax.
2 tuts.; both terms.
Prerequisite: Spanish 3A4, or equivalent from Year III Elsewhere Programme.

3 hrs.; 1 term.
1979-80: Chroniclers and Travellers of Spanish America. A study of various chronicles from the points of view of history and myth, and an examination of their relevance to Hispanic literature.
3 hrs.; 1 term.
Prerequisite: Spanish 1A6 and 12 units of Spanish beyond 1A6, or registration in Year IV of an Honours Spanish programme.

3 hrs.; 1 term.
1979-80: Spanish American Poetry. A study of the major trends. Such poets as Rubén Darío, Vallejo and Neruda will be included.
3 hrs.; 1 term.
Prerequisite: Spanish 1A6 and 12 units of Spanish beyond 1A6, or registration in Year IV of an Honours Spanish programme.

3 hrs.; 1 term.
1979-80: Spanish Poetry of the Golden Age. Themes and techniques from the Renaissance to the Baroque. The poetry of García Lorca, Fray Luis, San Juan de la Cruz, Herrera and Gongora will be studied.
3 hrs.; 1 term.
Prerequisite: Spanish 1A6 plus 12 units of Spanish beyond 1A6, or registration in Year IV of an Honours Spanish programme.

3 hrs.; 1 term.
3 hrs.; 1 term.
Prerequisite: Spanish 1A6 and 12 units of Spanish beyond 1A6, or registration in Year IV of an Honours Spanish programme. The 1978-79 option not available for Q-group credit to students with standing in 3D3.

413/ Topics in Twentieth-Century Spanish Literature. 1978-79: The Novel after 1939. Critical analysis at major post-civil war novels. Works by such authors as Cela, Goytisolo, Lafort, Deibes and Matute will be studied. 3 hrs.; one term. 1979-80: Generation of 1898. The major themes reflecting the ideological crises which arose with the loss of empire, as seen through such authors as Unamuno, Machado, Valle-Inclan, Baroja and others. 3 hrs.; one term. Prerequisite: Spanish 1A6 and 12 units of Spanish beyond 1A6, or registration in Year IV of an Honours Spanish programme.

403/ Independent Study. A reading and/or research programme under the supervision of a member of the Department, leading to a major paper. Students must already have completed a course on their chosen topic with a mark of 80% or more either here or in Year III Elsewhere Programme. Approval of a topic by the Spanish Section must be obtained by the end of December, after which a supervisor will be appointed. Prerequisite: Registration in Year IV of an Honours Spanish programme.

For Graduate Courses see Calendar of School of Graduate Studies.

Russian

Professor
L. J. Shein

Associate Professors
S. Cioran
G. Thomas/Chairman

Assistant Professors
N. Kolesnikoff
W. Smyrniw

Lecturer
W. Zao (part-time, Chinese)

CURRICULUM 1978-80

At least “D” is required in all courses listed under “prerequisite”, unless otherwise indicated.

BEGINNERS’ LANGUAGE COURSE

1Z6/ Beginners’ Intensive Russian. An introduction to basic conversational Russian as spoken in the Soviet Union today. The basic skills of speech and aural comprehension, plus the essential grammar of Soviet Russian. 4 hrs. (lects. and lab. practice); both terms. Prerequisite: Open.

BEGINNERS’ CIVILIZATION COURSE

1B6/ Aspects of Russian Culture. A survey of major developments in Russian philosophy, religion, literature and the arts from the tenth century to the present day. 3 lects.; both terms. Prerequisite: Open.

INTERMEDIATE AND ADVANCED LANGUAGE, LITERATURE AND CIVILIZATION COURSES

2A6/ Nineteenth-Century Russian Literature in Translation. A survey, with special concentration on Gogol, Turgenev, Tolstoy, and Dostoyevsky. 2 lects., 1 tut.; both terms. Prerequisite: Open.

2C6/ Intermediate Language Study. 3 lects., 1 lab.; both terms. Prerequisite: Grade 13 Russian, or Russian 1Z6, or permission of the Department.

2E3/ Russian Short Story. An introduction to the Russian literary language and a thematic study of nineteenth century short stories. Readings in the original. 2 lects., 1 tut.; one term. Prerequisite: Russian 1Z6, or permission of the Department.

2F6/ Introduction to Slavic Linguistics. An introduction to the Slavic languages emphasizing their historical development from a common source and including material about their structure and development as literary languages. 3 lects.; both terms. Prerequisite: Linguistics 1A6 or permission of the instructor. Offered in alternate years.

3A3/ Prose Literature of the 20th Century. Reading in original, analysis of texts and style. 1 lect., 1 tut.; one term. Prerequisite: Russian 2C6 and 2E3.

3C6/ Advanced Language Study. 3 lects., 1 lab.; both terms. Prerequisite: Russian 2C6.

3F3/ Special Topics in Russian Language or Literature 1978-79. The Russian language in Soviet Society, including changes since 1917, with special emphasis on developments caused by societal factors, and on dialects and sub-standard usage, colloquial language and officialese. 3 lects.; one term. Prerequisite: Russian 2C6, or permission of the Department. Offered in alternate years.
2 lects., 1 tut.; one term.
Prerequisite: Open to students in Year II or above. Offered in alternate years.

3J3/ The Orthodox Church in Russian Culture. The history, nature, and doctrines of the Russian Orthodox Church; emphasizing its influences in the cultural life of Russia from the 10th century until the present.
2 lects.; 1 tut.; one term.
Prerequisite: Open to students in Year II or above. Same as Religion 3N3. Offered in alternate years.

3K6/ Twentieth Century Russian Literature in Translation. Prominent Soviet writers, such as Gorky, Leonov, Sholokhov, Pasternak, and Solzhenitsyn, viewed against the broader cultural, historical, and social spectrum. Soviet films will supplement the lectures and readings.
2 lects., 1 tut.; both terms.
Prerequisite: Open to students in Year II or above.

4C6/ Conversation and Advanced Composition.
3 lects., both terms.
Prerequisite: Russian 3C6.

4E3/ Russian Drama since 1800.
2 lects., 1 tut.; one term.
Prerequisite: Russian 2C6 and 2E3. Offered in alternate years.

4F3/ Special Topics in Russian Language or Literature. 1979-80: Humour and satire in Soviet literature. All readings in the original.
2 lects., 1 tut.; one term.
Prerequisite: Russian 2C6 and 2E3. Offered in alternate years.

2 lects., 1 tut.; one term.
Prerequisite: Open to students in Year II or above. Offered in alternate years.

CHINESE

1Z6/ Elementary Chinese. An introduction to basic pronunciation, conversation patterns and reading skills.
3 hrs. (including language lab); both terms.
Prerequisite: Permission of instructor. Alternates with Chinese 2Z6.

2Z6/ Intermediate Chinese. The course will enable a student to speak, write, and read Mandarin Chinese. Methods and technique of translation of minor materials in Chinese is also discussed.
3 hrs. (including language lab); both terms.
Prerequisite: Chinese 126 and permission of the instructor. Alternates with Chinese 1Z6.

UKRAINIAN

1Z6/ Introduction to Ukrainian. Basic elements of Ukrainian grammar, elementary composition, selected prose readings.
4 hrs. (including language lab); both terms.
Prerequisite: Open. Not available to students with standing in Ukrainian 1Q6. Offered in alternate years.

2A6/ Intermediate Ukrainian. Review of grammar, oral practice, and compositions; readings in the original from representative authors.
4 hrs. (including language lab); both terms.
Prerequisite: Ukrainian 1Z6, or permission of the Department. Not available to students who have standing in Ukrainian 1B6. Offered in alternate years.

2A6/ Advanced Ukrainian. Review of syntax, study of idiomatic expression, weekly composition exercises, intensive oral practice in the language lab, and in conversational class, readings in major 19th and 20th century authors.
2 tuts., 1 hr. conversation; both terms.
Prerequisite: Ukrainian 2A6, or permission of the instructor.

Science

CURRICULUM 1978-80

Science 2A6, 2B3, 2C6, 2D6, 2E6, 2G3, 2H3, 2J3 and 2K3 are primarily designed for students in the Humanities and Social Sciences, to give an appreciation of important areas of modern science. These courses do not assume any specific background in science. Enrolment in each is limited to 100 students, but most of the courses are not oversubscribed.

Other Science courses that may be of interest to students in the Humanities and Social Sciences are: Biology 1G6, Introduction to Biology; Biology 1F3, Ecology; Chemistry 1B7, General Chemistry; Geography 2W3, Water Resources and Hydrology in Canada; Geology 1B6, General Geology; Geology 2B3, Optical Crystallography; Mathematics 1F6, Calculus and Statistics; Mathematics 2H6, Ideas in Mathematics; and Physics 2J3, The Physical Basis of Musical Sound.

2A6/ The Nature of Matter. Contemporary ideas about the structure of the atoms and molecules; the collective behaviour of large numbers of atoms in solids, liquids, and gases and the technological implications of such behaviour.
3 lects.; both terms.
Prerequisite: Registration in Years II, III, or IV, of a non-science programme. No mathematics is required.

2B3/ Parasites, Animals, and Man. A survey of animal parasites, with special emphasis on parasites infecting man and his domestic animals.
3 lects.; second term.
Prerequisite: Registration in Years II, III, or IV, of a non-science programme.

2C6/ The Nature of the Solid Earth. Origin of the earth; development of the earth’s crust; processes in and on the earth illustrating scientific thought and methodology in the earth sciences.
3 lects.; both terms.
Prerequisite: Registration in Years II, III, or IV, of a non-science programme. No mathematics required. Not open to students who have completed, or are registered in, Geology 1A6 or 1B6.

2D6/ The Physics of Astronomy. The scientific method illustrated by astronomy and astrophysics. Physical principles of the motion of planets; the structure and evolution of stars and the universe. 3 lects., including films, planetarium, and observations; both terms.
Prerequisite: Registration in Years II, III, or IV, of a non-science programme. Grade 12 mathematics required.

2E6/ Space and Time. Aristotle’s, Newton’s, and Einstein’s views of space and time. Different behaviour of very small and very large objects. Reversibility of space and time.
3 lects.; both terms.
Prerequisite: Registration in Years II, III, or IV, of a non-science programme. No mathematical background is assumed.

2G3/ Man’s Supply of Food. Man’s food requirements; how food is produced; alternative approaches to alleviating world hunger.
3 lects. or 2 lects., 1 tut.; first term.
Prerequisite: Registration in Year II, III, or IV, of a non-science programme.

2H3/ Viruses and the Nature of Life. Viruses as agents for the transfer and utilization of biological information; their role in diseases of man, animals, and plants.
3 lects.; second term.
Prerequisite: Registration in Year II, III, or IV, of a non-science programme. Offered in 1978-79 and in alternate years.

2J3/ Physics Looks at the Energy Crisis. Man’s supply of fossil fuels is dwindling. Alternatives (e.g., solar, wind, nuclear reaction; fusion) will be examined; from the point of view of a physicist.
3 lects.; second term.
Prerequisite: Registration in Year II, III, or IV, of a non-science programme. No mathematics beyond Grade 12 required. Offered in 1978-79 and in alternate years.

3 lects. or 2 lects. and 1 tut.; first term.
Prerequisite: Open, except to students who have completed, or are registered in, Biology 1C6.
Social Science

CURRICULUM 1978-80

2E3/ Selected Topics in Interdisciplinary Studies I. An interdisciplinary examination of selected topics of current interest to social scientists. Topics will vary from year to year. Students interested in this course should consult the Office of the Associate Dean of the Faculty of Social Sciences (Studies) concerning the topics to be examined in any year. 3 hrs. (lecs. and seminars); one term. Prerequisite: Permission of the Co-ordinator.

2F3/ Selected Topics in Interdisciplinary Studies II. Same as Social Science 2E3. 3 hrs. (lecs. and seminars); one term. Prerequisite: Permission of Co-ordinator.

2T6/ Social/Political Ideas I. An interdisciplinary approach to the study of the major social and political ideas of the Western traditions. 3 hours (seminars and tutorials); both terms. Prerequisite: Permission of the Instructor.

3T6/ Social/Political Ideas II. Advanced interdisciplinary study of the major social and political ideas of the Western tradition. 3 hours (seminars and tutorials); both terms. Prerequisite: Permission of the Instructor.

Social Work

Professors
C. Greenland
H. L. Penny
M. Wheeler

Associate Professors
J. M. Jones/Director of School of Social Work
K. L. Kinnan
J. McE. Macintyre

Assistant Professors
W. Lee
P. Nevidon
J. Rice
M. Santilli
B. Stein
D. J. Tucker
S. Watt
W. Weeks

Lecturer
M. Orton/part-time

Associate Members
J. A. Byles (Psychiatry)
M. L. Kliman (Economics)

CURRICULUM 1978-80

Except when otherwise designated, the following courses are open only to students registered in the four-year Combined Pass Arts and Social Work programme, or registered in the BSW programme for a second degree.

2B6/ Social Welfare—General Introduction. Purposes and values of social welfare programmes and services. Social welfare policy and the social security system in Canada in historical perspective. Lects. and discussion; both terms.

2C6/ Theory for Social Work Practice. Knowledge base; social work values, fields of practice and types of intervention. Human growth and development. Interpersonal communication skills. Lectures, films, discussions, small task groups; both terms.

3C3/ Social Aspects of Health and Disease. Exploration of the meaning of health and sickness in our society. Organization and delivery of health care. Consideration of ethical and other issues. (Lectures, discussion and selective use of community resources; first term.) Prerequisite: Permission of the instructor for all students. This course may be taken as an elective for B.A. credit by undergraduates not in Social Work. Enrolment is limited.

3D9/ The Practice of General Social Work I. Social work intervention processes; development of basic skills in formation of relationships with individuals, families, groups and communities. Students participate in training learning goals and experiences. Seminars, workshops, field practice one day per week; both terms. Prerequisite: Social Work 2B6, 2C6. Enrolment is limited.


3J3/ Technology and Social Welfare. Problems of social policy posed by the impact of technology in such areas as work and leisure, income maintenance, participation in decision making and social planning. Seminars, second term. Prerequisite: Permission of the instructor for all students. This course may be taken as an elective for B.A. credit by undergraduates not in Social Work. Enrolment is limited.

3K3/ Methods of Applied Social Research. Examination of the conceptual framework of scientific inquiry relating to social work research and practice. Survey of selected research from other disciplines relevant to social work. Seminars; second term.

3M3/ Family in Social Work Practice. Examination of relevant aspects of family theory for social work practice; models of family intervention and therapy; agencies and programmes serving families. Seminars; first or second term. Prerequisite: Sociology 2U3 is recommended as preparation for this course.

3O3/ Human Sexuality. Basic information on anatomy, physiology, psychology and sociology of sexuality and fertility. Attitudinal self-awareness, communication skills, values regarding sexual identity and roles; analysis of policy issues. Seminars; second term.

3P3/ Directed Readings in Social Work. Completion of a major project focusing on a selected social work problem or issue. Prerequisite: Permission of the supervising instructor. Enrolment is limited.

4D12/ The Practice of General Social Work II. Combined field experiences and seminars to deepen understanding and refine practice skills. Students spend two days per week in social agencies, or with other organizations, in supervised practice. Option of equivalent block placement in second term. Seminars, group supervision, field practice; both terms.


4H3/ Human Service Organizations: Structures and Processes. Relationships of structures and processes to patterns of service delivery. Knowledge and skills necessary for organizational diagnosis; empirical study of an organization is required. Seminars; second term.

Sociology

Professors
H. M. Brotz
F. E. Jones
P. C. Pineo

Associate Professors
P. Archibald
R. E. Blumstock
R. A. Brymer
J. W. Haas
F. J. Henry
R. W. Hornsby
V. W. Marshall
D. R. L. Matthews
G. Rosenblum
W. B. Shaffir
P. Sheriff/Chairperson
D. L. Smith
J. Syng

Assistant Professors
W. Clement
C. Cuneo

B. Edginton
R. Howard
C. L. Jones
G. Knight
C. G. Legendre
C. Levitt
R. A. Ripton
M. L. Stephenson
V. Walters

Lecturer
E. Derow

Associate Members
L. Greenspan/Religious Studies
J. Mol/Religious Studies

CURRICULUM 1978-80

Students should consult the Department's Handbook for Undergraduates, 1978-79 or 1979-80 which will be available prior to registration, for fuller course descriptions and any changes in the list of courses offered in 1978-79 or 1979-80. Students are encouraged to seek advice from members of the Department in developing a programme of studies.

The University reserves the right to limit enrolment in any course. Sociology 1A6 and several other courses are divided into independent sections. For more information, see the Handbook for Undergraduates. This booklet gives course descriptions for the various Sociology 1A6 sections.

A 50% minimum is required in all prerequisite courses unless otherwise specified. There are no co-requisite requirements for part-time students.

1A6: An Introduction to Sociology. A survey of the areas of research which interest the sociologist. Interpretation of human action from the standpoint of the group. Emphasis is given to contemporary culture and society, although there is reference to primitive cultures and societies.
2 hrs.; both terms.

1A6: Sociological Inquiry. Sociological literature is examined as a source of unsolved research questions, rather than as a reservoir of information. Emphasis is placed upon the development of classic problems and the discovery and formation of new issues in various areas of the discipline.
3 hrs. (lects. and discussion); both terms.

1A6: Deviant Behaviour. An analysis of deviant behaviour and conformity in relation to social structure and processes, and a discussion of problems of control within the social system.
3 hrs. (lects. and discussion); both terms.

1A6: The Human Group. An examination of the individual in social interaction, with emphasis upon group processes, socialization, and the development of the self.
3 hrs. (lects. and discussion); both terms.

1A6: Social Movements. A theoretical and descriptive examination of social movements and collective behaviour, with special emphasis on resultant social developments.
3 hrs. (lects. and discussion); both terms.

1A6: The Structure of Canadian Society. An examination of the major institutions of Canadian society. Consideration will be given to elite recruitment and to the dynamics of contemporary patterns of change.
3 hrs. (lects. and discussion); both terms.

213/ The Sociology of Organizations I. A theoretical and empirical
analysis of formal and informal organizational structures and processes in the major sectors of modern industrial society. 3 hrs. (lects. and discussion); second term. Prerequisite: Sociology 1A6, 2B3 or permission of the instructor. Not open to those students who have taken Sociology 3P3. (Formerly Sociology 3P6.)

2J3/ Current Problems in Sociological Analysis. Selected problems in contemporary sociology. Topics will vary and the Department should be consulted for details for any particular year. 3 hrs. (lect. and discussion); first term. Prerequisite: Sociology 1A6 or permission of the instructor.

2K3/ Current Problems in Sociological Analysis. Selected problems in contemporary sociology. Topics will vary, and the Department should be consulted for details in any particular year. 3 hrs. (lect. and discussion); second term. Prerequisite: Sociology 1A6 or permission of the instructor.

2M6/ Industrialization and Development. Introduction to theories of modernization and underdevelopment with comparative empirical content. 3 hrs. (lects. and discussion); both terms. Prerequisite: Sociology 1A6 or permission of the instructor.

206/ Social Stratification. A broad comparative study of social class and social mobility. 3 hrs. (lects. and discussion); both terms. Prerequisite: Sociology 1A6 permission of the instructor.

2P6/ The Sociology of Education. A comprehensive analysis of educational institutions in modern industrial society. 3 hrs. (lects. and discussion); both terms. Prerequisite: Sociology 1A6 or permission of the instructor. Enrolment in this course may be limited.

2Q3/ Sociology of Women. An analysis of the status and objective condition of women in Canada (including theories of socialization and of stratification); discussion, in relation to these, of the subjective experience of being a woman in Canada. 3 hrs. (lects. and discussion); first term. Prerequisite: Sociology 1A6 or permission of the instructor. Not open to students who have completed Sociology 2J3 in 1973-74. Enrolment in this course may be limited.

256/ Introduction to Sociological Theory. An introduction to the foundations, rise and development of sociological theory. 3 hrs. (lects. & discussion); both terms. Prerequisite: Sociology 1A6 or permission of the instructor. Not open to students who have completed or are completing Sociology 2S3 or 3A6.

2U3/ Sociology of the Family. An analysis of kinship and family units in comparative and contemporary perspective. 3 hrs. (lects. and discussion); first term. Prerequisite: Sociology 1A6 or permission of the instructor. Not open to students who have taken Sociology 3D3 in 1977 or prior.

2V6/ Occupations and Professions. An examination of the occupational structure of industrial society, the changing nature of work, and problems associated with such change. 3 hrs. (lects. and discussion); both terms. Prerequisite: Sociology 1A6 or permission of the instructor. Not open to students who have taken Sociology 3Q3.

2X3/ Psychoanalytic Approaches to Literary and Cultural Texts. Same as English 2U3.

2Y3/ Introduction to Quantitative Studies. The course is designed to develop those skills necessary to understand and evaluate research studies in sociology using quantitative methods. Descriptive statistics and basic inferential techniques will be examined. 3 hrs. (lects. and discussion); first term. Prerequisite: Registration in any Year II Sociology programme and Sociology 1A6. Not open to students who have taken or are taking a statistics course.

2Z3/ Introduction to Sociological Research. This course is designed to develop those skills necessary to pursue and understand research. Several general methods of sociological research will be examined. 3 hrs. (lects. & discussion); second term. Prerequisite: Sociology 1A6 or permission of the instructor.

3A3/ European Sociological Theory. An advanced examination of classical and contemporary European sociological theory. 3 hrs. (lects. & discussion); first term. Prerequisite: Sociology 253 or 256 or permission of instructor. Not open to students who have taken Sociology 3A6.

3B3/ Selected Topics in the Sociology of Education. An examination of selected topics in the sociology of education. 3 hrs. (seminars and discussion); second term. Prerequisite: Sociology 1A6 and either 2P6, 2O6, 213 or permission of instructor. Enrolment in this course may be limited.

3C6/ Socio-Economic Development. A socio-historical analysis of some of the major processes involved in economic development and social change in their national and international contexts. 3 hrs. (lects. and seminars); both terms. Prerequisite: Sociology 2M6 or permission of instructor.

3D3/ Special Topics in Sociology of the Family. An advanced course allowing detailed study of selected topics in the Sociology of the Family. 3 hrs. (lects. & discussion); second term. Prerequisite: Anthropology 2F3 or Sociology 2U3. Enrolment in this course may be limited.

3E3/ Age Related Studies. Investigation of selected phenomena related to age structures and age groupings. Focus varies yearly. 3 hrs. (lects. and discussion); second term. Prerequisite: Sociology 1A6 or permission of the instructor. Enrolment in this course may be limited.

3F6/ Political Sociology. A survey of social and state institutions, focusing on current debates in the field. 3 hrs. (lects. and discussions), both terms. Prerequisite: Sociology 1A6 or permission of the instructor. Enrolment in this course may be limited.

3G3/ Sociology of Health Care. The organization of health care, with particular emphasis on the place of professionals in medical care organizations, and the varieties of occupational mechanisms for health care delivery as these affect the patient. Prerequisite: Sociology 1A6 or permission of the instructor. Enrolment in this course may be limited.

3H6/ Research Techniques and Data Analysis. A comprehensive introduction to the principles of research methods and data analysis in the social sciences. 3 hrs. (lects. and labs.); both terms. Prerequisite: Sociology 1A6 or permission of the instructor.


3J3/ Special Topics in Sociological Analysis. An examination of selected topics of contemporary interest to sociologists. Students should consult the Department concerning the topics to be examined. 3 hrs. (lects. and discussion); first term. Prerequisite: Sociology 1A6 or permission of the instructor.

3K3/ Special Topics in Sociological Analysis II. Same as Sociology 3K3.

3L3/ Selected Topics in Occupational Sociology. An advanced course allowing detailed study of one or more topics of special interest. 3 hrs. (lects. and discussion); second term. Prerequisite: Sociology 2V6 or 3Q3 or permission of the instructor.

3M6/ Religion and Modern Society. An analysis of the relation between religions and society. 3 hrs. (lects. and discussion); both terms. Prerequisite: Sociology 1A6 or permission of the instructor. Same as Religious Studies 3J3.

3N3/ The Sociology of Knowledge. An analysis of the role of ideas in the development of social institutions and the impact of society upon the formation of belief systems and expressive forms. 3 hrs. (lects. and discussion); second term. Prerequisite: Sociology 1A6 or permission of the instructor.

3O3/ Advanced Sociological Research. This course will provide a more detailed study of selected qualitative methods in Sociology. 3 hrs. (lects. and discussion); first term. Prerequisite. Sociology 223.

3P3/ North American Sociological Theory. An advanced examination of classical and contemporary North American sociological theory. 3 hrs. (lects. & discussion); second term. Prerequisite: Sociology 253 or 256, or permission of the instructor. Not open to students who have taken Sociology 3A6.


3S3/ Creativity and Human Interaction. Same as English 3K3.

3T3/ The Sociology of Urban Areas. Sociological analysis of urban structure and development, and the social consequences of urbanization. 3 hrs. (lects. and discussion); first term. Prerequisite: Sociology 1A6 or permission of the instructor. Enrolment in this course may be limited.

3U6/ Theories of Mass Society. This course will be a careful study of a few books by writers who have looked at the possible tension
between equality and liberty in the modern world and at the problem posed for constitutional democracy by "mass" cultural and political phenomena.

3 hrs. (lects. & discussion); both terms.

Prerequisite: A previous course in Sociological or Political theory and the consent of the instructor.

Same as Political Science 4L6.

3V6/ Comparative Social Structure. The similarities and differences of various modern industrial societies will be examined through discussion of various postulated determinants of the structure and processes of such societies.

3 hrs. (lects. & discussion); both terms.

Prerequisite: Sociology 2M6. Not open to students who have taken Sociology 3F6.

3Y3/ The Sociology of Organization II. An advanced course which allows detailed examination of relevant theories and research, including those to which the student was introduced to in Sociology 2M3.

3 hrs. (lects. & discussion); second term.

Prerequisite: Sociology 2M3 or permission of the instructor. 

Enrolment in this course may be limited.

3Z3/ Ethnic Relations. An analysis of political, social, and economic change in selected locales.

3 hrs. (lects. and discussion); first term.

Prerequisite: Sociology 2E6 or permission of instructor.

Enrolment in this course will be limited.


3 hrs. (seminar); first term.

Prerequisite: Sociology 2S3 or 2S6 and registration in Year IV Honours Sociology.

4B6/ Field Study Methodology. This course provides students an opportunity to engage in first hand sociological research using field study methods, particularly participant observation.

1 seminar (3); both terms.

Prerequisite: Registration in Year IV Honours Sociology or permission of instructor.

4C6/ Selected Problems in Sociological Research. Students will undertake a class project.

1 seminar (3); both terms.

Prerequisite: Sociology 3H6.


1 seminar (3); second term.

Prerequisite: Registration in Year IV Honours Sociology and Sociology 2S3 or 2S6, or permission of the instructor.

4E3/ Computer Application. A class in sociological research involving computer use.

1 seminar (3); first term.

Prerequisite: Registration in Year IV Honours Sociology and Sociology 3H6 or permission of the instructor.

4F3/ Special Topics in Comparative Sociological Research I. A critical discussion, centring on selected books and articles, of various strategies using comparative methods for studying societies.

3 hrs. (seminar); first term.

Prerequisite: Registration in Year IV Honours Sociology and Sociology 2M3.

4H3/ Selected Topics in the Sociology of Organizations. An advanced course allowing detailed study of aspects of organizational analysis of special interest.

3 hrs. (seminar); second term.

Prerequisite: Registration in Year IV Honours Sociology and Sociology 2M3, or permission of the instructor.

4I3/ Special Topics in Sociological Theory. An advanced critical analysis of special topics/issues in sociological literature. The content of this course will vary from year to year; please consult the departmental handbook.

3 hrs. (seminar); first term.

Prerequisite: Sociology 2S3 or 2S6 and registration in Year IV Honours Sociology or permission of the instructor.

4J3/ Selected Topics in Sociology I. Topics of contemporary interest to sociologists, with emphasis upon current theory and research. Students should consult the Department concerning the topics to be examined.

1 seminar (3); first term.

Prerequisite: Registration in Year IV Honours Sociology or permission of instructor.

4K3/ Selected Topics in Sociology II. Same as Sociology 4J3.

1 seminar (3); second term.

Prerequisite: Registration in Year IV Honours Sociology or permission of instructor.

4L3/ Special Topics in Comparative Sociological Research II

Same description as Sociology 4F3.

3 hrs. (seminar); second term.

4M3/ Independent Research I for Honours Students. Independent study of a research problem through published materials and/ or field inquiry. Students will be required to write up the results of their inquiry in scholarly form.

One term.

Prerequisite: Permission of the instructor plus Year IV Honours Sociology or Departmental permission.


One term.

Prerequisite: Registration in Year IV Honours Sociology and permission of an instructor of the student's choice.

4Q3/ Individual and Society I. An intensive examination of selected problems involving the relationship of individuals to social structures.

1 seminar (3 hrs.); first term.

Prerequisite: Registration in Year IV Honours Sociology or permission of the instructor.

4R3/ Individual and Society II. An intensive examination of selected problems involving the relationship of individuals to social structures.

1 seminar (3 hrs.); second term.

Prerequisite: Registration in Year IV Honours Sociology or permission of the instructor.

4S3/ Special Topics in Canadian Society I. An examination of questions which have sociological relevance for Canadian society.

The specific questions may vary in different years.

1 seminar (3); first term.

Prerequisite: Registration in Year IV Honours Sociology or permission of the instructor.

4T3/ Special Topics in Canadian Society II. An examination of questions which have sociological relevance for Canadian society.

The specific questions may vary in different years.

1 seminar (3); second term.

Prerequisite: Registration in Year IV Honours Sociology or permission of the instructor.

4U3/ Special Topics in Canadian Society III. An examination of questions which have sociological relevance for Canadian society.

The specific questions may vary in different years.

1 seminar (3); first term.

Prerequisite: Registration in Year IV Honours Sociology or permission of the instructor.

4V3/ Special Topics in Racial and Ethnic Relations. A study of the influence of ethnic and racial factors in various societies.

1 seminar (3); first term.

Prerequisite: Registration in Year IV Honours Sociology or permission of the instructor.

4X3/ Labour and Society. The course will focus on the emergence of labour organizations during the course of modernization and the factors determining the political outlook of labour.

1 seminar (3); first term.

Prerequisite: Registration in Year IV Honours Sociology or permission of the instructor.
General Information

University Library

The Library is now more than a century old, its beginning dating back to the 1860’s and Woodstock College, which with the Toronto Baptist College became McMaster University. After McMaster came from Toronto to Hamilton in 1930, the Library was housed in University Hall. In 1951 it was moved to its own building, Mills Memorial Library, gift of the Davella Mills Foundation of Montclair, New Jersey, and memorial to Mr. and Mrs. David B. Mills. Since then, extensions have more than tripled the available space of this general University library.

The Science and Engineering Library formerly housed on the second floor of the Burke Science Building moved into a new building during the summer of 1978. Other libraries on the campus which provide specialized service are: the Map Library in the Burke Science Building, the Health Sciences Library in the large Health Sciences and Medical Centre complex, and the Innis Room (Business) in Kenneth Taylor Hall.

In 1977, the Library contained nearly 1,000,000 printed volumes of which 90% were catalogued, over 900,000 microfilm cards and reels, 86,000 maps; 10,000 sound recordings; 6,500 films, filmstrips, slides and videotapes; 9,000 sheets of music; 12,000 satellite photos; and more than 1,300,000 items of manuscript and archival material. Current periodical subscriptions number more than 10,000.

In 1978 the McMaster University Library was accepted as a member by the Association of Research Libraries, an organization which represents the leading research libraries of North America.

All catalogued books and microforms in the McMaster system are listed in the card catalogue in Mills Library, which is supplemented with computer-produced lists of periodicals and microform catalogues of government documents. Each special library has its own complete catalogue. Access to the stacks is open to all library users. Beginning in May 1978 all new catalogue entries will be on microfiche, based on the Unicat-Telecat System of which McMaster has been a member since its beginning. The Science & Engineering Library catalogue is completely on microfiche. (see appended information) The Division of Archives and Research Collections in Mills Library contains rare books, manuscripts, and special book and archival collections which afford many opportunities for original research. Of outstanding interest are the Bertrand Russell Archives, a massive collection of correspondence and manuscripts supported by books, journal articles, secondary literature, tapes, films and personal mementa. The 35,000 volume collection of eighteenth-century material is one of the major Canadian collections in the field. Among modern material are the papers of Vera Brittain, Samuel Beckett, Margaret Laurence, Anthony Burgess, Pierre Berton, Farley Mowat, Peter Newman and many others. Business interests are reflected in such files as the General Steel Wares Archives, and Canadian social and political interests in papers from the Canadian Union of Students, the Cooperative Commonwealth Federation, the Quebec radical archives, and other related collections.

PUBLICATIONS

McMaster University Library Research News
Russell, the Journal of the Bertrand Russell Archives
Micrographs with the imprint of the McMaster University Library Press

University Art Gallery

The University Art Gallery, opened in 1965, is located in Togo Salmon Hall. It provides 3,900 square feet of fully illuminated wall and floor space, together with all professional facilities required for the presentation of a year-round programme of exhibitions organized by McMaster or brought to McMaster from such sources as The National Gallery of Canada and the Art Gallery of Ontario. It houses the University’s art collection which consists of over 1,500 examples of painting, sculpture and print making including a section on Canadian Art and a major group of over 140 German Expressionists prints. The gallery is open to the public daily except Fridays and Saturdays. Further information can be obtained from the Curator at local 4685.

Residences

For many years, the University has owned and operated residences for students, both men and women, on campus. The rooms are provided with staple articles of furniture—tables, chairs, beds, mattresses, pillows, and all necessary bedding. Roomers are required to supply towels at their own expense. The services of the infirmary, which is staffed by graduate nurses, are available to all students.

The women’s residences (752 beds) are administered by the Dean of Women, and the men’s residences (646 beds) by the Dean of Men. The co-ed residence (236 beds) is administered by the Dean of Students.

An additional 503 beds are available in an apartment-style residence, with stove and refrigerator, draperies and wall-to-wall carpeting. All other furnishings are supplied by students themselves. Enquiries from both men and women should be directed to the Dean of Men.

Students applying to McMaster will receive a letter of instruction concerning application for residence. When students receive their Letters of Acceptance, forms concerning residence application will be enclosed. Confirmation of residence will require a deposit, which will be applied to residence fees. If space is available and available, this deposit is not refundable.

Students wishing to stay in residence during summer school should apply in advance by writing directly to the Conference Office, Commons Building, room B101B. It is urged that this be done at the earliest possible date before Summer School registration.

Athletics

So that all students have the opportunity to keep fit, compete in athletics at their own level, and enjoy sports of their choosing, the School of Physical Education and Athletics offers a variety of programs.

For those who wish to relax and enjoy their leisure time, a wide recreational programme is offered, including everything from sauna baths and swimming to squash and weight training. Most of the traditional club activities are offered and instruction is provided to assist beginners with the skills involved.

For those with a more competitive outlook, a highly developed and very popular intramural programme is in full swing from early fall until late spring.

For those students who possess still higher skills, the intercollegiate programme provides an exciting challenge to both men and women. The fine performances of student athletes and the social involvement of student spectators are focal points of student life on campus.

Services to the students

DEAN OF STUDENTS, DEAN OF MEN, AND DEAN OF WOMEN

The Dean of Men, Dean of Students and Dean of Women are available to all students with grievances, problems or questions of a varied nature. Requests for emergency financial assistance through small University loans or bursaries should be made to these offices. The office of the Dean of Students is in the Commons Building, Room 101A, the office of the Dean of Men is in the Commons Building, Room 101E, and the office of the Dean of Women is in the Divinity College, Room 236. See also Residences.
GENERAL INFORMATION

CHAPEL SERVICES

On each weekday of the university session, there is a chapel service at 10:30 a.m. in the Divinity College Chapel. These services are conducted by members of the student body or by members of the faculty. The Chapel is open for private devotions each weekday from 8:15 a.m. to approximately 10 p.m. After 5 p.m., it may be necessary to enter the chapel through the Divinity College building.

UNIVERSITY CHAPLAINS

Catholic and Protestant chaplains on campus provide for a wide range of student services in worship, discussion groups, pastoral counselling, and social action. At least one of the chaplains is available during the day in the office, and students can always call the chaplain's residences for appointments at other times. The chaplains support many student activities as well as caring for personal and religious needs. Their office is in Hamilton Hall, room 312; telephone ext. 4207, 4208.

STUDENT COUNSELLING SERVICE

The staff members of the Student Counselling Service provide a wide range of counselling and psychological services for students who are encountering difficulties in their private lives, in their relationships with others, or in the pursuit of their educational goals. Educational and career planning services are also provided, as well as individual and group programmes for students who would like help with their reading, writing, speaking, study and other academic skills. Group programmes in human relations, assertiveness training and other special interest areas are also offered.

Problems which students commonly bring to the office revolve around such concerns as unsatisfactory social relationships, feelings of isolation and depression, study and learning difficulties, undefined interests and abilities, major course and career decisions, and conflicts over family, sexual and other personal matters.

As part of the total counselling programme, the office also operates a comprehensive educational and career information service in which students are given individual interviews and assistance.

All contacts and transactions between students and counsellors are made under voluntary, private, and confidential conditions. Whenever required, students are given assistance in locating other specialized helping sources both on and off campus.

The office also serves as an administration centre for such frequently required qualifying tests as the Graduate Record Examination, the Miller Analogies Test, the Medical College Admission Test, and the Law School Admission Test.

Students who wish to talk with a counsellor are invited to visit the office in Hamilton Hall, room 302 or telephone 525-9140, ext. 4711, to arrange an appointment. Students who have urgent personal problems or are seeking specific information will be seen by a staff member either upon arrival or with as little delay as possible.

OVERSEAS STUDENTS' ADVISER'S OFFICE

This office is available to all overseas students for consultation, advice, and direction, in a wide range of problems. The office is responsible for orientation programmes and special assistance for accommodation. The office is located in Divinity College, room 223.

STUDENT HEALTH SERVICE

The University wishes to cooperate in guarding the health of its students. Students entering the University for the first time are required to file with the Student Health Service a health record. Throughout the academic term, the University Medical Officer holds daily office hours, Monday, Tuesday, Thursday, 9:30 a.m. to 3:00 p.m. and Wednesday, Friday, 9:30 a.m. to 1:00 p.m. Registered nurses are on duty 24 hours a day, seven days a week. Any student may use these services for consultation and treatment of injury or illness. Psychiatric services are available.

The Student Health Service also provides a 21-bed infirmary for the treatment of short-term illnesses or accidents.

The Student Health Service Office is located on the ground floor in the south wing of McKay Hall (Telephone 522-0942, day or night, or 525-9140, ext. 4441/4442).

OFF-CAMPUS HOUSING SERVICE

The University attempts to assist students in obtaining off-campus living accommodation. The Off-Campus Housing Service provides lists of available lodgings and other appropriate assistance. The Off-Campus Housing Service is located in the Commons Building, room 101B, ext. 4347.

STUDENT PLACEMENT SERVICE

The Canada Manpower Centre, in conjunction with the University, has made available on campus a Student Placement Office.

Students desiring assistance in finding suitable employment are interviewed by the Placement Officer to determine interests, abilities, and qualifications. These students may then be introduced by the Placement Officer to appropriate employers. This is done by direct referral to local or out-of-town employers, or through interviews scheduled for visiting recruiters. Almost all of the major national employers are active in this recruiting, and a large number of these firms send a recruiter to the University.

The Student Placement Service concentrates mainly on the placement of graduating students. However, assistance in finding summer jobs and part-time employment is also given to undergraduates.

All students are encouraged to register with the office during their freshman year, and to become familiar with the office facilities, even though they are not seeking immediate employment. Office hours are 8:30 a.m. to 4:30 p.m., Monday through Friday.

FOOD SERVICE

The University operates a number of eating places on campus serving a variety of food items. Dining rooms for the use of students registered in meal plans are located in the Refectory and in the Commons Building. Students not normally eligible for meal plans may purchase plans through the Department of Food Services in the Commons Building. The University reserves the right to limit the number of meal plans as and when it sees fit. Several coffee shops are strategically located throughout the campus, in Senior Science Building, Togo Salmon Hall, Kenneth Taylor Hall, and the lower level of the Refectory Building (Rathskellar). There is also food service available in a student-operated facility in Wentworth House, and in the cafeterias in McMaster University Medical Centre. Supplementing these facilities are vending machines at many locations about the campus dispensing cigarettes, drinks, sandwiches and pastries.

The Food Services Board of Management, made up of students and non-students, formulates policy for food services. Students are urged to address comments and suggestions to the Board's attention.

BOOKSTORE

The University Bookstore, owned and operated by the University, is located in the lower level of Gilmour Hall. In addition to course books, the Bookstore maintains a wide range of supplementary reading materials, both academic and general. Stationery supplies and other items are also stocked. Charge accounts may be opened after registration, and students, faculty, and staff of McMaster are allowed a 10% discount on all books.

POST OFFICE

Located in the basement of Gilmour Hall, the Post Office offers full postal service.

Student government and activities

The McMaster Students Union Inc. operates, directly or indirectly, all student clubs and organizations, and a variety of
student services, concerts, and similar events. The Student Union also owns and operates the Silhouette newspaper and McMaster Radio, CFMU, 93.3 FM. All full-time undergraduate registered students are members in good standing and, as such, entitled to all its benefits and services. The MSU is owned and operated by the undergraduate body. The Union itself is governed by the Student Representative Assembly, a council of up to 35 undergraduates. All but two are elected in February by their fellow students in the various faculties; each has a proportionate number of seats relating directly to the size of the faculty. The president and treasurer of the MSU are the remaining two members of the SRA. The president is elected in January by the entire student body, and the treasurer is elected by the SRA from the general student body. Students having questions about student government, or wishing to bring a matter before the SRA, should contact their representative.

The duties of the SRA are to vote on all matters of policy for the MSU. It is the SRA, for example, which decides how funds will be allocated, what programmes undertaken, and who will run them. The SRA elects from its own ranks members of the Student Executive Committee, which is charged with making recommendations on most matters to the full SRA.

STANDING COMMITTEES

Under the direction of the Student Representative Assembly, four standing committees have been formulated, covering the spheres of academics, student services, finances and external affairs. Composition of the committees is a combination of student assembly members and interested MSU members at large. Undergraduate student involvement is encouraged at the committee level. Vacancies are announced in the student newspaper, The Silhouette. All inquiries should be directed to the MSU Office, 217, Hamilton Hall.

Within the MSU, several commissions have been established to organize and run certain services and activities: The Programming Director organizes social and educational programmes for MSU; the Director is available to assist any organization or undergraduate to organize an event. The Ticket Commission organizes the sale of tickets for MSU-sponsored campus-wide events. The Club Commission co-ordinates for MSU all campus clubs and activities. The Public Relations Commission is responsible for all media and press relations, and for advertising MSU and Union-related events. The Ombudsman/Researcher and the Financial Researcher do research into student concerns and help students with problems they have with the University and OSAP. The Student Employment Commission is the arm through which undergraduates obtain part-time employment on campus. All commissioners, and further information about them, are available in the MSU office, Hamilton Hall, room 217.

SERVICES

The MSU also provides for undergraduates these services:

The Downstairs John, located in the basement of Wentworth House, is open noon to midnight, weekdays and Saturdays, for food, draft beer, liquor, wine, and relaxation. A McMaster student identity card is required for admission; each student may invite one guest. The Rathskellar is located in the basement of the Refectory. The "Rat" is a quiet, folkly alternative to the "John's" rock and roll and is open Monday through Saturday in the evening with live entertainment. A McMaster student identity card is required for admission. The Poor Boys is located on the 4th floor of Hamilton Hall and offers folk music 3 nights a week. The Day Care Centre, operated by MSU for the children of McMaster students, faculty members, and staff, is located in MacNeill Baptist Church, King Street at Cline Avenue in Westdale. For further information, phone 256-1544. The Bread Bin, a grocery store in Hamilton Hall, room 101, stocks groceries, tobacco, and sundries, all sold on a non-profit basis. The Sexual Education Centre provides information and/or referral upon request. A service operated for the whole campus community, the Centre is located in Hamilton Hall, room 317; telephone 522-5053 or ext. 2041.

Campus Cinema provides all members of the McMaster community with low cost, popular films twice weekly. The MSU runs a small library and study area on the 4th floor of Hamilton Hall.

In addition to most of the above services, and the MSU itself, Hamilton Hall is the home of many other student organizations and services. Undergraduates are encouraged to familiarize themselves with the building, organizations and services.

ONTARIO PUBLIC INTEREST RESEARCH GROUP

The purpose of OPIRG is to articulate and pursue, through the media, government bodies, the courts, and other legal means, the concern of students and the community at large about issues of substantial public interest. Issues OPIRG is concentrating on include environmental health hazards, consumer protection, the food industry in Canada, and the role of corporate and government power in the lives of average citizens. OPIRG is non-partisan, non-profit research and public education oriented. It is directed by staff and an elected board of directors drawn mainly from undergraduate students.

Parking

Travel to and from the University on foot, by public transportation and in car pools is encouraged in order to minimize the accumulation of motor vehicles on Campus. Since many people find it necessary to use their motor vehicle, however, the University operates a parking service which is available to faculty, staff, students and visitors.

Limited parking facilities are available on campus, for which parking permits are required. These may be obtained from the Parking Administration Office in the E.T. Clarke Centre upon payment of the prevailing parking charge and upon presentation of a current student identification card and vehicle registration.

Drivers are responsible for becoming familiar with parking regulations. Violations are subject to fine. Disregard of violation charges may result in suspension of parking privileges, tow-away at owner's expense, and/or prosecution under the Petty Trespass Act of Ontario.

Discipline

The regulation of discipline within the University is delegated by the Senate to the President and Faculty, and by them is entrusted to the Dean of Students, and through him to the Dean of Women and the Dean of Men.

Consultation will be held with the Students' Executive Council when circumstances warrant.

Fines may be imposed for breaches of university regulations and, in more serious cases, a student may be placed on probation or a recommendation may be made to the President for the suspension of university privileges. It is expected that students will co-operate in encouraging a wholesome student opinion, observing all regulations, and in every way upholding the good name of the University.

McMaster University Alumni Association

Giving and receiving. These are the twin facets of the role of members of the McMaster University Alumni Association, which seeks to serve its members, and seeks ways and means for its members to serve their University. Founded in 1895, just eight years after McMaster was incorporated, the association now includes more than 30,000 alumni.

The affairs of the association are managed by its council, which includes elected officers and representatives, branch presidents, committee chairpersons, and the alumni representatives on McMaster's Board of Governors and Senate. Between the regular meetings each year of this council, the association is directed by an executive committee which includes the officers and selected councillors.
At the grassroots level, several geographic branches operate; most active are those in Hamilton, Toronto, London and New York City. Each of the growing number of professional branches includes alumni who shared a common discipline while at McMaster, nursing, medicine, divinity, business and physical education chapters are, or will be, active.

The link between the association and the University is provided by the Office of Alumni Affairs, located on the second floor of the Alumni Memorial Hall. Initiating and coordinating alumni activities and providing the association, its branches and committees, with support services, this office has the continuous task of maintaining up-to-date records of all graduates and former students.

Together, this office and the association attempt to be responsive to the many and diverse interests of the alumni by providing continuing education programmes, publishing a quarterly magazine, arranging for alumni travel opportunities, sponsoring an annual Grad's Day (when all alumni are encouraged to return to campus for reunions), among other activities.

In turn, the association works to benefit the alma mater by encouraging alumni to acquaint worthy students with the advantages of attending the University, enlisting members to serve McMaster students as volunteer career counsellors, electing able representatives to the University Board of Governors and Senate, and inviting alumni to give financial support to the University.

Of course, such efforts represent only the tip of the iceberg; there is much more of value that can be accomplished in the future through the energetic involvement of more alumni.

To spur such commitment among future alumni, the association intends to become involved in a substantive and helpful way in student life on campus. This outreach to students is being spearheaded by a Student-Alumni Relations Committee, an informal group of interested recent and future alumni which encourages...the active interest of McMaster students.

Secondary school teaching

Students interested in secondary school teaching and in taking qualifying courses at an authorized Ontario college of education, should consult the following basic pamphlets, which are available from the registrar at the universities mentioned:

Calendar of the Faculty of Education, University of Toronto, Toronto, Ontario.

Calendar of the Faculty of Education, Queen's University, Kingston, Ontario.


Calendar of the Faculty of Education, Lakehead University, Thunder Bay, Ontario.

Calendar of the School of Education, University of Ottawa, 1245 Kilborn Avenue, Ottawa, Ontario.

These calendars may also be consulted in the Registrar's Office and in the offices of the deans of studies at McMaster. The deans of studies can advise regarding the interpretation of these documents with respect to programmes offered at McMaster.

In addition, further information may be obtained from:

The Director,
Teacher Education and Certification Branch,
177th Floor, Mowat Block,
Queen's Park,
Toronto, Ontario,
M7A 1L2

Students interested in receiving further information with respect to Type "B" certificates for secondary school teaching should consult any of the following:

The Director,
Committee of Advanced Standing,
The Faculty of Education,
University of Toronto,
Toronto, Ontario,
M5S 1A1

The Associate Registrar,
Althouse College of Education,
University of Western Ontario,
London, Ontario.
N6A 3K7

The Faculty of Education,
Queen's University,
Kingston, Ontario.
K7L 3N6

Faculty of Education,
Lakehead University,
Thunder Bay, Ontario.
P7B 5E1

School of Education,
University of Ottawa,
1245 Kilborn Avenue,
Ottawa, Ontario.
K1N 6N5

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C. R. Riehm, B.A., Ph.D.
C. V. Stager, B.Sc., Ph.D.
I. D. Spencer, B.Sc., Ph.D., D.Sc.

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A. E. Combs, A.B., M. Div., Ph.D.
A. A. Kubursi, Ph.D.
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E. Szathmary, B.A., Ph.D.
M. Keyses, B.A., M.A.
F. E. Jones, M.A., Ph.D.

REPRESENTING THE FACULTY OF THEOLOGY

G. G. Harrop, B.A., B.D., Ph.D.

REPRESENTING THE UNDERGRADUATE STUDENTS OF THE UNIVERSITY

A. Arend
T. Reynolds
R. Thaler
G. Pazionis
S. Shallhorn
L. Mills

REPRESENTING THE GRADUATE STUDENTS OF THE UNIVERSITY

D. Buchanan
I. Inhatowycz
Z. Elrazaz
K. Chapman

REPRESENTING THE GRADUATES OF THE UNIVERSITY

M. E. Burville (Mrs.) ('50), B.A., M.A.
R. Ito, B.A. ('49)
S. McAuley, B. Comm.
W. Scarrow, B.A. ('49)

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A. N. Bours /Chairman
A. A. Lee/Vice-chairman
J. P. Evans/Secretary

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Manuel Zack, M.A./Assistant to the President
E. C. Higbee, B.S., M.S., Ph.D./Assistant to the President (Special Projects)
A. A. Lee, B.A., B.D., M.A., Ph.D./Vice-president (Academic)
D. Melvin Hedden, B.Sc./Vice-president (Administration)
John P. Evans, B.Com., M.A./Assistant Vice-president (Academic Services)
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John A. MacFarlane, B.A., C.A. / Assistant Vice-president (Administration)
S. E. Emberley / Assistant to the Vice-Presidents—Facilities Planning
The Reverend Ivan C. Morgan, B.A., B.D., Th.M., D.D. / Principal of the Divinity College
Alexander L. Darling, B.Sc., M.Ed. / Registrar
Leslie A. Prince, C.D., C.C.M. / Dean of Students
J. H. Moore, B.A. / Director of Information, Development & Alumni Affairs
L. V. Auger, B. Eng. / Director of Planning and Physical Plant

Faculty
as of January 15, 1978

(With year of first appointment to McMaster staff.)

FACULTY OF BUSINESS

R. C. Joyner / D.F.C., B.A., M.A., Ph.D., Dean of the Faculty of Business.
D. J. Johnston / B.Com., M.B.A., Associate Dean of the Faculty of Business, (On leave, 1977-78).
R. J. Spence / B.A., M.B.A., Ph.D., Acting Associate Dean of the Faculty of Business.

Instructional staff

Adams, Roy / B.A. (Penn State), M.A., Ph.D. (Wisconsin), Assistant Professor of Industrial Relations, 1973.
Agarwal, Naresh Chand / B.A., M.A. (Delhi), Ph.D. (Minnesota), Assistant Professor of Organizational Behaviour, 1974.
Alvazian, Varouj / B.S. (Massachusetts Institute of Technology), M.A., Ph.D. (Ohio State), Assistant Professor of Finance and Business Economics, 1975.
Archer, Norman Phillip / B.Sc. (Alberta), M.S. (New York), Ph.D. (McMaster), Assistant Professor of Management Science, 1975.
Banting, Peter Myles / B.A., M.B.A. (McMaster), Ph.D. (Michigan State), Associate Professor of Marketing, 1967.
Basu, Sanjoy / B.Comm. (Calcutta), M.B.A. (McMaster), M.S., Ph.D. (Cornell), Assistant Professor of Accounting, 1974.
Cahill, Jeffrey L. / B.A. (York), M.B.A., Ph.D. (Toronto), Assistant Professor of Finance and Business Economics, 1976.
Deal, Kenneth Raymond / B.S., M.B.A., Ph.D. (State University of New York at Buffalo), Assistant Professor of Management Science, 1973.
Hayashi, Kichiro / B.A. (Kobe), M.B.A., Ph.D. (Indiana), Assistant Professor of Marketing, 1975.
Jain, Harish Chand / B.Com. (Delhi), M.B.A. (Indiana), Ph.D. (Wisconsin), Associate Professor of Organizational Behaviour, 1970.
Johnston, Donald John / B.Com., M.B.A. (Queen’s), C.A., Assistant Professor of Accounting, (On leave, 1977-78), 1968.
King, A. John / B.Com. (University of Western Australia), M.B.A. (Chicago), Assistant Professor of Accounting, 1977.
Klein, Heinz / Reifezugsins (Humanistisches Gymnasium, Munchen-Pasing), Diplom-Kaufmann, Dr. oec. publ. (Munich), Assistant Professor (part-time) of Management Science, 1978.
Laiken, Stanley Norman / B.A. (Western), M.B.A. (Pennsylvania), Ph.D. (Western), Associate Professor of Finance, 1972.
Lembke, Valdean / B.Sc. (Iowa State), M.B.A., Ph.D. (Michigan), Visiting Associate Professor of Accounting, 1977.
Lowry, Douglas / B.A., B.D. (Toronto), Ph.D. (Massachusetts Institute of Technology), Special Lecturer in Business Policy, 1977.


Richardson, Albert William/B.Sc., M.B.A., Ph.D. (McMaster), Assistant Professor of Accounting, 1974.


Sandal, Anna Gray/B.S. (Auburn), Ph.D. (North Carolina), Associate Professor of Business Economics, 1969.


Szentendrovi, Andrew Zoltan/M.A., Ph.D. (Kolozsvar), Professor of Production and Management Science, (On leave, 1977-78), 1962.

Tihanyi, Eva/B.A. (Karl Marx), M.A., Ph.D. (Saskatchewan), Associate Professor of Finance, (On leave, 1977-78), 1971.

Torrance, George Walter/B.A.Sc., M.B.A., Ph.D. (State University of New York at Buffalo), Professor of Production and Management Science, 1967.


Wesolowsky, George Orest/B.A.Sc. (Toronto), M.B.A. (Western), Ph.D. (Wisconsin), Associate Professor of Management Science, 1970.

Yagil, Joseph/B.A., M.B.A. (Hebrew University of Jerusalem), Lecturer in Finance.

FACULTY OF ENGINEERING


J. W. Speirs/M.Eng., P.Eng., Assistant to the Dean of Engineering.

Instructional staff

Ahmad, Ibrahim Ali/B.Sc. (Cairo), M.Sc. (Florida), Assistant Professor Applied Mathematics, 1977.


Allen, Brian Lee/B.Sc. (Alberta), M.S., Ph.D. (California, Berkeley), S.A., Assistant Professor of Civil Engineering and Engineering Mechanics, 1971.

Anderson, John Bailey/M.S., Ph.D. (Cornell), Assistant Professor of Electrical Engineering, 1972.


Balk, Edward Alexander/B.Sc. (Queen’s), D.Phil. (Oxford), P.Eng., Professor of Engineering Physics and Physics, 1969.


Banerjee, Sanjoy/B.Tech. (Hons.) (Indian Institute of Technology, Kharapur), Ph.D. (Warwick), Professor of Engineering Physics, and the Westinghouse Company of Canada Chair in Nuclear Engineering, 1976.


Benedek, Andrew/B.Eng. (McGill), Ph.D. (Washington), Associate Professor of Chemical Engineering, 1970.


Brash, John Law/B.Sc., Ph.D. (Glasgow), Professor of Chemical Engineering and Pathology, 1972.

Cameron, John Alexander/B.A. (Toronto), Ph.D. (McMaster), Professor of Physics, 1964.


Chisholm, Stephen Hugh/B.A.Sc. (Toronto), Ph.D. (London), Associate Professor of Electrical Engineering, 1964.


Davies, John Arthur/M.A., Ph.D. (Toronto), Professor of Engineering Physics and Physics (part-time), 1970.


De Buda, Rudi/Ph.D. (Technical University of Vienna), Ph.D. (Vienna), P.Eng., Professor of Electrical Engineering (part-time), 1970.


Dokainish, Mohammed Ali/B.Sc. (Cairo), M.Sc. (Toronto), Ph.D. (Toronto), P.Eng., Professor of Mechanical Engineering, 1964.


El Maragh, Hoda Abdel-Kader/B.Sc. (Cairo), M.Sc., Ph.D. (Manchester), Professor of Mechanical Engineering, 1970.

Dunnett, Charles William/B.A. (McMaster), M.A. (Toronto), D.Sc. (Aberdeen), Professor of Epidemiology and Biostatistics and Professor of Applied Mathematics, 1974.

El Maragh, Hoda Abdel-Kader/B.Sc. (McGill), M.Sc., Ph.D. (McMaster), Assistant Professor of Chemical Engineering, 1977.


Fawzi, Tharwat Hussein/B.Sc. (Hons.), M.A.Sc., Ph.D. (Toronto), Assistant Professor of Electrical Engineering, 1977.

Feuerstein, William A./B.Chem.Eng. (City College of New York), M.S. (Newark College of Engineering), Ph.D. (Massachusetts), Associate Professor of Chemical Engineering, 1970.


Fleming, William Herbert/M.Sc., Ph.D. (McMaster), Associate Professor of Applied Mathematics, 1966.

Gadamer, Ernst Oscar/M.A., Ph.D. (Toronto), Associate Professor of Engineering Analysis, 1962.


Hafez, Mahmoud Mostafa/B.Sc., M.Sc. (Cairo), Ph.D. (Czechoslovak Academy of Sciences), Assistant Professor of Chemical Engineering, 1977.


Hambly, Robert William/B.Sc. (Hons.), (Art Center College of Design, Los Angeles), Assistant Professor of Industrial Design, 1977.
McCallion, William / M.A. (McMaster), Professor of Mathematics, 1943.


Milner, Morris / B.Sc.Eng., Ph.D. (Witwatersrand), Associate Professor of Electrical Engineering and Medicine, 1974.

Missirlis, Yannis F. / Diploma in Chem.Eng. (National Technical University, Athens), M.Sc. (Syracuse), Ph.D. (Rice), Assistant Professor of Engineering Physics, 1974.


Pearce, Frank John / B.Sc. (Concordia), Professor of Metallurgy and Materials Science (part-time), 1976.

Pengelly, Lionel David / B.Sc. (Toronto), M.Sc. Ph.D. (McGill), Associate Professor of Medicine and Engineering Physics, 1971.


Redish, Kenneth Adair / B.Sc. (London), Associate Professor of Applied Mathematics, 1967.

Reid, John / B.A. (Oxford), M.Sc., Ph.D. (McMaster), Assistant Professor of Engineering Physics (part-time), 1976.


Roud, George Frederick / B.Sc., Ph.D., D.Sc. (Birmingham), P.Eng., Professor of Mechanical Engineering, 1967.

Sarna, Sushil K. / B.Sc. (Delhi), M.Sc., Ph.D. (Alberta), Associate Professor of Electrical Engineering and Surgery, 1974.


Simha, Naresh Kumar / B.Sc. (Buenaras), Ph.D. (Manchester), Professor of Electrical Engineering, 1965.


Smith, Alan Andrew / B.Sc. (Glascow), Ph.D. (Strathclyde), P.Eng., Professor of Civil Engineering and Engineering Mechanics, 1969.


Soltisef, Nicholas / B.Sc., Ph.D. (Sydney), Associate Professor of Applied Mathematics, 1971.


Sprung, Donald Whitfield Loyd / B.A. (Toronto), Ph.D. (Birmingham), Professor of Physics, 1962.


Summers-Gill, Robert George / M.A. (Saskatchewan), Ph.D. (California), Professor of Physics, 1956.
FACULTY

Szendrovits, Andrew Zoltan/ M.A., Ph.D. (Kolozvar), Professor of Production and Management Science, 1962.
Taylor, Desmond Patrick/ M.Sc. (Queen's), Ph.D. (McMaster), P.Eng., Assistant Professor of Electrical Engineering, 1972.
Thompson, David Allan/B.Sc., Ph.D. (Reading), Associate Professor of Engineering Physics, 1973.
Trojan, Olen Alexander/B.A.Sc., M.A., Ph.D. (Toronto), P.Eng., Associate Professor of Engineering Physics (part-time), 1970.
Vaid, Yoginder Pal/B.Sc. (Panjab University, India), Post-Graduate Diploma (University of Roorkee, India), M.A.Sc., Ph.D. (University of British Columbia), Associate Professor of Civil Engineering and Engineering Mechanics, 1976.
Volkov, Anatole Boris/Ph.D. (Prague), P.Eng., Professor of Mechanical Engineering, 1959.
Weaver, David Stewart/M.A.Sc. (Toronto), Ph.D. (Waterloo), P.Eng., Associate Professor of Applied Mathematics, 1971.
Wood, Derick/B.Sc., Dipl. in Electronic Computing, Ph.D. (Leeds), Associate Professor of Applied Mathematics, 1970.
Woods, Donald Robert/B.Sc. (Queen's), M.S., Ph.D. (Wisconsin), P.Eng., Professor of Chemical Engineering, 1964.
Wright, Joseph Douglas/B.Sc. (Alberta), Ph.D. (Cambridge), P.Eng., Associate Professor of Chemical Engineering (part-time), 1969.
Yellowley, Ian/B.Sc. (Nottingham), M.Sc. (U.M.I.S.T.), Assistant Professor of Mechanical Engineering (part-time), 1975.
Yip, Patrick Cheung-Yum/B.Sc. (Memorial), M.A.Sc., Ph.D. (McMaster), Assistant Professor of Applied Mathematics, 1970.

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FACULTY OF HUMANITIES

A. Berland/M.A., M.Litt., Dean of Humanities.
M. P. Halsall/M.A., Ph.D., Associate Dean of Humanities (Studies) (On leave, 1977-78).

Professors Emeriti

Dulmage, Horace Anson/B.A., B.D. (McMaster), Ph.D. (Chicago), Emeritus Professor of Philosophy.
Freeman, Harold Austin/B.A. (Saskatchewan), M.A. (Toronto), Emeritus Professor of French.
Haddow, George Caldwell/M.A. (Toronto and Oxford), Emeritus Professor of English.
Martin, Albert Pray/A.B. (Brown), A.M., Ph.D. (Wisconsin), Emeritus Professor of German.
Murphy, Dorothy Stanton/B.A. (Toronto and Oxford), M.A. (Oxford and Toronto), Emeritus Professor of English.
Stock, Marie Louise/B.A. (Queen's), M.A. (McGill), Ph.D. (Columbia), Emeritus Professor of French.
Waters, Frederick William/B.A., B.D. (McMaster), Ph.D. (Yale), Emeritus Professor of Philosophy.

Instructional Staff

Ahmed, Marie M./L.ès L., M.ès L., (Sorbonne), Lecturer in French, 1970.
Ajzenstaf, Samuel/M.A. (Toronto), Assistant Professor of Philosophy, 1964.
Alessio, Antonio Gregorio/D.Litt. (Genoa), Professor of Italian, 1970.
Barrett, David P./B.A., M.A., M.Phil. (Toronto), Lecturer in History, 1976.
Bayard, Caroline A./L.ès L., M.ès L. (Toulouse), Ph.D. (Toronto), Assistant Professor of French, 1977.
Beattie, Catherine B.A. (McMaster), M.A. (Guelph), Lecturer in Philosophy, 1975.
Bedford, Reginald/Instructor in Music (part-time), 1971.
Betti, Vincent/A.B., Lès L. (Laval), Director of French Language Institute and Assistant Professor of Romance Languages, 1973.
Blakey, Brian/M.A., Ph.D. (Manchester), Professor of French, 1969.
Blewett, David Lambert/M.A. (Manitoba), Ph.D. (Toronto), Assistant Professor of English, 1969.
Brasch, James Daniel/B.A. (State Univ. of New York), M.A. (Colgate), Ph.D. (Wisconsin), Associate Professor of English, 1966.
Bristol, John Robin Murray/M.A., Ph.D. (Toronto), Assistant Professor of Philosophy (part-time), 1966.
Brodie, Paul/instructor in Music (part-time), 1975.
Browning, John Dudley/B.A., M.Phil. (London), Ph.D. (Essex), Associate Professor of Spanish, 1965.
Cain, Thomas Henry/M.A. (Toronto), Ph.D. (Wisconsin), Associate Professor of English, 1966.
Campbell, John Pollock/M.A. (Glasgow), A.M., Ph.D. (Yale), Associate Professor of History, 1961.
Carr, Donald Frederick/ M.A. (Queens), M.F.A. (Chicago), Assistant Professor of Art and Art History, 1971.
Chappell, Clement Gerald/ B.A. (McMaster), A.M., Ph.D. (Harvard), Associate Professor of German, 1966.
Cioran, Samuel David/ B.A. (McMaster), Ph.D. (Toronto), Associate Professor of Russian (On Leave, 1977-78), 1972.
Cioran, Sharon/ B.A. (McMaster), M.Phil. (London), Assistant Professor of English, 1976.
F.R.S.C., Professor of French, 1962.
Cro, Stello/ L. en L. (Buenos Aires), Dott. Ling. e Lett. (Venice), Associate Professor of Italian, 1972.
Dale, James/ M.A., Ph.D. (Cambridge), Associate Professor of English, 1967.
Daly, James William/ M.A., Ph.D. (Toronto), Professor of History, 1964.
Demmer, Karl (Kentucky)/ Ph.D. (John Hopkins), Professor of German, 1951.
Driscoll, Dennis J./ Instructor in Music (part-time), 1977.
Duffin, Ross W./ B.Mus., M.A. (Stanford), Assistant Professor of Music (half-time), 1977.
Cine, Katherine Margaret Delacour/ B.A., D.Phil. (Oxon), Assistant Professor of Classics, 1969.
Dvorak, Antal/ Instructor in Music (part-time), 1972.
Elliott, Paula/ Instructor in Music (part-time), 1972.
Emmett, Nathalie Donnet/ B.S. (New York), M.A. (Adelphi College), Lecturer in Dramatic Arts (part-time) and Director of Theatre Events, 1971.
Erasmia, Gabriele/ B.A. (Yale), M.A., Ph.D. (Minnesota), Assistant Professor of Italian, 1972.
Flock, Roger/ Lecturer in Music (part-time), 1974.
Foster, Wes/ Instructor in Music (part-time), 1974.
Fritz, Paul Samuel/ B.A. (Queen’s), M.A. (Wisconsin), Ph.D. (Cambridge), Associate Professor of History, 1966.
Galloway, Hugh G./ Dipl. Art. (Edinburgh), Assistant Professor of Art, 1971.
Giorgiados, Constantine/ M.A. (Warsaw), Ph.D. (London), Associate Professor of Philosophy, 1967.
Gonzalez-Nicolau, Maria-Ampano/ Lic. en F.L., Dra. en Fil. y Let. (Barcelona), Associate Professor of Spanish (part-time), 1965.
Griffin, Nicholas J./ B.A. (Leicester), Ph.D. (Australia), Assistant Professor of Philosophy, 1976.
Grinnell, George James/ B.S. (Columbia), M.A. Ph.D. (California), Assistant Professor of History, 1967.
Hampel, Lorenz Earle/ M.A. (Toronto), Associate Professor of Spanish, 1947.
Hanley, William F./ B.A. (Toronto), M.es L. (Sorbonne), D.Phil. (Oxford), Assistant Professor of French, 1977.
Hidy, Marta (Mrs. A. Dvorak)/ Mus.Mas. (Budapest), Professor of Music, 1965.
Hitchcock, David Lancelot/ B.A. (McMaster), Ph.D. (Claremont), Assistant Professor of Philosophy, 1968.
Hoey, Thomas Francis/ B.A. (Montreal), M.A. (Toronto), Ph.D. (Harvard), S.T.L., Ph. L. (Immaculate Conception Seminary, Montreal), Professor of Classics, 1968.
Jackson, Berners Archdale Wallace/B.A., (McMaster), D.Phil. (Oxford), Professor of English, 1956.
Jeeves, William Norman/ M.A. (Cambridge), L.s l. (Bordeaux), Assistant Professor of French, 1975.
John, Brian/ M.A., Dipl.Ed. (University College of North Wales), Ph.D. (Wales), Professor of English, 1968.
Johnston, Robert Harold/ B.A. (Toronto), M.A., Ph.D. (Yale), Assistant Professor of History, 1969.
Jose, Charles Ernest/ B.A. (Western), Assistant Professor of French (On Leave, 1977-78), 1967.
Kaczynski, Bernice M./ B.A. (Pittsburgh), M.Phil., Ph.D. (Yale), Assistant Professor of History, 1977.
Kingsfot, Peter/ B.A. Ph.D. (London), Associate Professor of Classics, 1962.
Kliffer, Michael David/ B.A. (British Columbia), M.A. (Michigan), Ph.D. (Cornell), Assistant Professor of French, 1976.
Knight, Christine/ Lecturer in Dramatic Arts, (part-time) 1977.
Knoxleat, Myrtle/ Instructor in Music (part-time), 1976.
Kolesnikoff, Nina S. / M.A. (Moscow State), Ph.D. (Alberta), Assistant Professor of Slavonic, 1967.
Konicke, Zdenek/ Diploma in Music (Prague), Associate Professor of Music, 1972.
Kovacs, Betty/ Instructor in Music (part-time), 1975.
Lawson, James Burhans/ B.A. (New York State Teachers’ College), M.A. (Johns Hopkins), Associate Professor of German, 1955.
Lee, Alvin Archie/ B.D., M.A., Ph.D. (Toronto), Professor of English, 1960.
Levenstein, Harvey A./ B.A. (Toronto), M.S., Ph.D. (Wisconsin), Associate Professor of History (On Leave, 1977-78), 1972.
Madison, Gary Brent/ M.A. (Marquette), Ph.D. (Paris), Associate Professor of Philosophy, 1970.
Martinez, Pilar/ M.Chem. (Madrid), M.Litt. (Middlebury), Ph.D. (Madrid), Associate Professor of Spanish, 1965.
McDowell, Mark W./ B.Mus. (Toronto), Lecturer in Music (part-time), 1976.
Metford, John A. S./ B.A., M.A. (Western), Ph.D. (Nice), Assistant Professor of French, 1977.
Mieczynski, John/ B.F.A. (Buffalo), Assistant Professor of Art (On Leave, second term, 1977-78), 1967.
Morgan, Owen Rees/ M.A. (Nottingham), Associate Professor of French, 1963.
D. W. L. Sprung/ B.A., Ph.D., Dean of Science. C. C. McMullen/ M.Sc., Ph.D., Associate Dean of Science Studies. A. Corsini/ B.Sc., Ph.D., F.C.I.C., Assistant Dean of Science (Studies). Professor Emeritus
Britton, Francis Ronald/ B.Sc. (Wales), M.A. (McMaster), Ph.D. (Toronto), Emeritus Professor of Mathematics.

Instructional staff
FACULTY

Balik, Edward Alexander/ B.Sc. (Queen's), D.Phil. (Oxford), Professor of Engineering Physics and Physics, 1969.
Bayley, Stanley Thomas/ B.Sc., Ph.D. (London), Professor of Biology, 1967.
Beeg, Ian Macdonald/ M.A., Ph.D. (Western), Associate Professor of Psychology, 1971.
Behara, Minaketan/ M.Sc. (Utkal), Dr rer. oec. (Saarland), Associate Professor of Mathematics, 1965.
Behrens, Ernest August/ D. Phil. nat. (Hamburg), Professor of Mathematics, 1965.
Bell, Arthur Russell/ M.Sc. (Wellingtion, M.S. (Wisconsin), Ph.D. (Stanford), Professor of Chemistry, 1964.
Bennett, Colin/ B.Sc., Ph.D. (Newcastle), Associate Professor of Mathematics, 1976.
Bhaduri, Rajat Kumar/ M.Sc. (Calcutta), Ph.D. (McMaster), Professor of Physics, 1968.
Brand, Luis Alberto/ B.Sc., D.Sc. (Montevideo, Uruguay), Professor of Biochemistry, 1969.
Brockhouse, Bertram Neville/ B.A. (British Columbia), M.A., Ph.D. (Toronto), D.Sc. (Waterloo), F.R.S.C., F.R.S., Professor of Physics, 1962.
Brooks, Lee Richard/ A.B. (Columbia), M.S., Ph.D. (Brown), Professor of Psychology, 1964.
Brown, Ian David/ B.Sc., Ph.D. (London), Professor of Physics, 1962.
Bruns, Gunter Wilhelm Adolf/ Dr rer. nat. (Berlin), Professor of Mathematics, 1961.
Bunting, Brian Talbot/ M.A. (Sheffield), Ph.D. (London), Professor of Geography, 1968.
Burghardt, Andrew John/ B.A. (Harvard), M.S., Ph.D. (Wisconsin), Professor of Geography, 1981.
Burke, Dennis Garth/ B.E., M.Sc. (Saskatchewan), Ph.D. (McMaster), Professor of Physics, 1965.
Cameron, John Alexander/ B.A. (Toronto), Ph.D. (McMaster), Professor of Physics, 1964.
Carbotte, Jules Pierre/ B.Sc. (Manitoba), M.Sc., Ph.D. (McGill), F.R.S.C., Professor of Physics, 1965.
Carment, David William/ B.A. (Saskatchewan), M.A., Ph.D. (Toronto), Professor of Psychology, 1957.
Chen, Thomas Tie/ B.Sc. (Chung-Hsing, Taiwan), M.A. (SUNY, Plattsburg), Ph.D. (Alberta), Assistant Professor of Biology, 1977.
Childs, Ronald Frank/ B.Sc./ B.Sc. (Bath Univ. of Technology), Ph.D. (Nottingham), Associate Professor of Chemistry, 1968.
Choe, Tae Ho/ B.S., M.A. (Kyungpoook), Ph.D. (Florida), Associate Professor of Mathematics, 1967.
Chorneyko, Ihor Zinovie/ M.A. (Saskatchewan), Ph.D. (Alberta), Associate Professor of Mathematics, 1960.
Clarke, William Brian/ B.A. (Dublin), Ph.D. (McMaster), Professor of Physics, 1965.
Clifford, Paul Michael/ B.Sc. (Southampton), Ph.D. (London), Professor of Geology, 1962.
Collins, Malcolm Frank/ M.A., Ph.D. (Cambridge), Professor of Physics, 1969.
Csima, Joseph/ Dipl. (Eotvos, Budapest), Ph.D. (Toronto), Associate Professor of Mathematics, 1967.
Datars, William Ross/ M.Sc. (McMaster), Ph.D. (Wisconsin), Professor of Physics, 1962.
Davidson, Douglas/ B.Sc. (Durham), D.Phil. (Oxford), Professor of Biology, 1969.
Davies, Douglas MacKenzie/ B.A., Ph.D. (Toronto), Professor of Biology, 1951.
Davies, John Anthony/ B.A. (Bristol), M.Sc. (McGill), Ph.D. (London), Professor of Geography, 1966.
Davies, John Arthur/ M.A., Ph.D. (Toronto), Professor of Engineering Physics and Mathematics (part-time), 1970.
Davison, Thomas Matthew Kerr/ B.Sc. (Sir George Williams), M.A., Ph.D. (Toronto), Associate Professor of Mathematics, 1968.
Dayon, Peter Thomas/ B.Sc. (Birmingham), D.Phil. (Cambridge), Associate Professor of Chemistry, 1967.
Dear, Michael James/ B.A. (Birmingham), Master of Philosophy in Town Planning (London), M.A., Ph.D. (Pennsylvania), Assistant Professor of Geography, 1974.
Dingle, Allan Douglas/ B.Sc. (McMaster), M.Sc. (Illinois), Ph.D. (Brandeis), Associate Professor of Biology, 1965.
Embry, John David/ B.Sc. (Manchester), Ph.D. (Cambridge), Professor of Metallurgy and Materials Science, 1966.
Epand, Richard Mayer/ A.B. (Johns Hopkins), Ph.D. (Columbia), Associate Professor of Biochemistry, 1974.
Ferrier, Barbara Mary/ B.Sc., Ph.D. (Edinburgh), Professor of Biochemistry (part-time), 1969.
Fleming, William Herbert/ M.Sc., Ph.D. (McMaster), Associate Professor of Applied Mathematics, 1966.
Ford, Derek Clifford/ B.A., D.Phil. (Oxford), Professor of Geography, 1959.
Freeman, Karl Boruch/ B.A., Ph.D. (Toronto), Professor of Biochemistry, 1965.
Fritz, Klaus/ Dipl.Chem., Dr rer. nat. (Mainz), Professor of Chemistry, 1967.
Gadamer, Ernst Oscar/ M.A., Ph.D. (Toronto), Associate Professor of Engineering Analysis, 1962.
Galef, Bennett Godfrey/ A.B. (Princeton), M.A., Ph.D. (Pennsylvania), Associate Professor of Psychology, 1968.
Garbade, Brian Keith/ B.A., Ph.D. (Oxford), Professor of Physics and Engineering Physics, 1968.
Gentilcore, Rocco Louis/ B.A. (Toronto), Ph.D. (Maryland), Professor of Geography, 1958.
Ghosh, Har Prasad/ M.Sc., D.Phil. (Calcutta), Professor of Biochemistry, 1969.
Goodings, David Ambery/ B.A. (Toronto), Ph.D. (Cambridge), Professor of Physics, 1969.
Graham, Frank Lawson/ B.Sc. (Manitoba), M.A., Ph.D. (Toronto), Assistant Professor of Biology and Pathology, 1975.
Graham, Ronald Powell/ M.A. (Queen's), A.M., Ph.D. (Columbia), F.C.I.C., Professor of Chemistry, 1942.
Greandan, John Edward/ B.A. (Bucknell), Ph.D. (Tufts), Associate Professor of Chemistry, 1974.
Grundy, Harry Douglas/ B.Sc., Ph.D. (Manchester), Associate Professor of Geology, 1968.
Habib, Edwin B./ B.Sc. (Birmingham), Ph.D. (McMaster), Visiting Associate Professor of Physics (part-time), 1975.
Hall, Ross Hume/ B.A. (British Columbia), M.A. (Toronto), Ph.D. (Cambridge), Professor of Biochemistry, 1967.
Hambleton, Ian/ M.Sc. (Toronto), Ph.D. (Yale), Assistant Professor of Mathematics, 1975.
Hannell, Francis George/ B.Sc., Ph.D. (Bristol), Professor of
FACULTY

Geography, 1963.

Harms, Archie Arkadius/ B.Sc. (British Columbia), M.S.E., Ph.D. (Washington), P.Eng., Associate Professor of Physics and Engineering Physics, 1969.

Harris, G. C./ B.Sc. (London), Associate Professor of Biology, 1969.

Harris, William Edgar/ B.Sc. (Alberta), M.Sc., Ph.D. (Toronto), Assistant Professor of Physics, 1976.

Harvey, John Wilcox/ B.Sc., Ph.D. (McMaster), Special Lecturer in Physics and Engineering Physics, 1974.

Heinig, Hans Paul/ B.Sc. (McMaster), M.A. (Western), Ph.D. (Toronto), Associate Professor of Mathematics, 1965.

Heron, Bernard Roy Woodburn/ M.A., Ph.D. (McGill), Professor of Psychology, 1966.


Hileman, Orville Edwin/ B.S.Ed. (Bowling Green State), Ph.D. (Case Institute of Technology), Associate Professor of Chemistry, 1964.

Hillcoat, Brian Noon/ B.Sc., B.S., B.Sc., M.D. (Queensland), Ph.D. (Australian National University), Professor of Biochemistry, 1968.

Howarth, Philip John/ B.A. (Cambridge), Dipl. in Education (Oxford), Dipl. in Photomontage, Ph.D. (Glascow), Associate Professor of Geography, 1968.

Humphreys, David Alan/ M.Sc. (London), Ph.D. (McMaster), Associate Professor of Chemistry, 1965.

Husain, Taqdir/ M.A. (Aligarh), Ph.D. (Syracuse), Professor of Mathematics, 1964.

Ihrig, Edwin Charles/ M.A. (Maryland), Ph.D. (Toronto), Associate Professor of Applied Mathematics, 1976.

Ismail, Mourad El-Houssieny/ B.Sc. (Cairo), M.Sc., Ph.D. (Alberta), Assistant Professor of Applied Mathematics, 1976.

Ives, Michael Brian/ B.Sc., Ph.D. (Bristol), Professor of Metallurgy and Materials Science, 1961.

Jackson, Howard Lawrence/ B.A.M. (Western), M.A. (Queen's), Assistant Professor of Engineering Physics, 1960.

Jaco, Larry Joe/ B.Sc. (Washburn), M.A. (Southern Illinois), Associate Professor of Psychology, 1975.

Jenkins, Herbert Miles A.B. (Oberlin), Ph.D. (Harvard), Professor of Psychology, 1963.

Jensen, Doris Elaine Nestler/ M.A. (Toronto), Ph.D. (British Columbia), Associate Professor of Biology, 1963.

Johns, Martin Wesley/ M.A. (McMaster), Ph.D. (Toronto), D.Sc. (Brandon), F.R.S.C., Professor of Physics, 1947.

Jones, Peter Richard/ B.A. (St. Andrew), M.A., Ph.D. (Pensylvania), Assistant Professor of Geography, 1975.

Jopko, Anton Michael/ M.Sc., Ph.D. (McMaster), Assistant Professor of Applied Mathematics (part-time), 1976.

Kay, David Alan Reid/ B.Sc., Ph.D. (Glascow), Professor of Metallurgy and Materials Science, 1969.

Keech, Gerald Ian/ B.Sc. (Toronto), M.Sc., Ph.D. (McMaster), Professor of Applied Mathematics, 1960.

Kelly, Roger/ M.A. (Saskatchewan), Ph.D. (McGill), Professor of Metallurgy and Materials Science, 1967.

Kennett, Terence James/ M.Sc., Ph.D. (McMaster), Professor of Physics and Engineering Physics, 1959.

Kenworthy, Derek John/ M.A., Ph.D. (Oxford), Associate Professor of Applied Mathematics, 1960.

Kershaw, Kenneth Andrew/ B.Sc. (Manchester), Ph.D. (N Wales), D.Sc. (Wales), Professor of Biology, 1969.


King, Leslie John/ M.A. (New Zealand), Ph.D. (Iowa), Professor of Geography, 1970.


Klein, Michael Lawrence/ B.Sc., Ph.D. (Bristol), Professor of Chemistry (part-time), 1977.


Kuehner, John Alvan/ B.Sc. (Bishop's), M.A. (Queen's), Ph.D. (Liverpool), F.R.S.C., Professor of Physics, 1966.


Lane, Norman Douglas/ B.A. (Queen's), M.A., Ph.D. (Toronto), Professor of Mathematics, 1952.

Laposa, Joseph David/ B.Sc. (St. Louis), M.S. (Chicago), Ph.D. (Loyola), Associate Professor of Chemistry, 1967.

Leon, Michael/ B.S. (Brooklyn College), Ph.D. (Chicago), Associate Professor of Psychology, 1972.

Levy, Betty Ann/ B.A. (Dalhouse), M.A., Ph.D. (Toronto), Associate Professor of Psychology, 1970.

Liaw, Kao'Lee/ B.S. (National Taiwan), M.A. (Kansas State), Ph.D. (Clark), Assistant Professor of Geography, 1974.

Link, Stephen Warren/ B.A. (Colorado), Ph.D. (Stanford), Associate Professor of Psychology, 1967.

Linz, Rubens Gouveia/ B.A., Ph.D. (Sao Paulo), Professor of Mathematics, 1967.


Lott, John Norman Arthur/ B.Sc. (British Columbia), M.S., Ph.D. (California, Davis), Associate Professor of Biology, 1969.

Lu, Wei-Koa/ B.S. (Chen-Kung), Ph.D. (Minnesota), Professor of Metallurgy and Materials Science and Steel Company of Canada Chair of Metallurgy, 1965.

Macdonald, Peter Duncan Macgregor/ M.Sc. (Toronto), D.Phil. (Oxford), Assistant Professor of Applied Mathematics, 1971.


Mak, Stanley M./ M.Sc. (Saskatchewan), Ph.D. (Toronto), Professor of Biology, 1967.

Masterson, John Stuart/ B.Sc. (London), M.B.A. (McMaster), Assistant Professor of Applied Mathematics (part-time), 1971.


McCallon, William James/ M.A. (McMaster), Professor of Mathematics, 1943.

McCandless, Esther Leib/ B.S. (Bethany), M.S., Ph.D. (Cornell), Professor of Biology, 1964.

McCann, Samuel Brian/ B.Sc. (Wales), Ph.D. (Cambridge), Professor of Geography, 1967.

McCarr, Brian Edward/ B.Sc. (British Columbia), Ph.D. (Stanford), Assistant Professor of Chemistry, 1976.

McCullough, John James/ B.Sc., Ph.D. (Queen's, Belfast), Professor of Chemistry, 1965.

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McMullen, Carman Calvert/ M.Sc., Ph.D. (McMaster), Professor of Physics, 1960.

McNutt, Robert Harold/ B.Sc. (New Brunswick), Ph.D. (M.I.T.), Associate Professor of Geology, 1985.

Mead, Ernest Roy/ M.A., Ph.D. (Western), Associate Professor of Mathematics, 1969.


Miller, John James/ B.A., Ph.D. (Toronto), Professor of Biology, 1947.


Morton, Richard Alan/ M.S., Ph.D. (Chicago), Associate Professor of Biology, 1965.

Moule, David Cecil/ B.Sc., Ph.D. (McMaster), Professor of Chemistry (part-time), 1969.


Muller, Bruno Johann Wilhelm/ B.S. (Gottingen), M.S., Ph.D. (Mainz), Professor of Mathematics, 1966.

Neilson, Thomas/ B.Sc., Ph.D. (Glascow), Professor of Biochemistry, 1968.


Nicholson, Patrick Stephen/ B.Sc. (Leeds), M.Sc., Ph.D. (California, Berkeley), Associate Professor of Metallurgy and
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Norris, Darrell Alan/B.A. (Cambridge), M.A. (McGill), Ph.D. (McMaster), Assistant Professor of Geography, 1974.
Oaks, Bernice Ann/B.A. (Toronto), M.A., Ph.D. (Saskatchewan), Professor of Biology, 1965.
Papageorgiou, George John/Dipl. in Architecture (National Technical University, Athens), M.C.P. Ph.D. (Ohio State), Associate Professor of Geography, 1970.
Pearce, Frank John/B.Sc. (Concordia), Professor of Metallurgy and Materials Science (part-time), 1976.
Platt, John Raymond/B.A. (Kansas), Ph.D. (Texas), Professor of Psychology, 1971.
Prestridge, William Vernon/B.Sc., Ph.D. (McMaster), Professor of Physics, 1967.
Prevec, Ludvik Anthony/M.A., Ph.D. (Toronto), Associate Professor of Biology, 1967.
Pritchard, Roy Maxwell/B.Sc., Ph.D. (Reading), Professor of Psychology, 1965.
Racine, Ronald Jay/B.Sc. (Oregon), M.Sc., Ph.D. (McGill), Associate Professor of Psychology, 1972.
Redish, Kenneth Jay/B.Sc. (London), Associate Professor of Applied Mathematics, 1967.
Reeds, Lloyd George/M.A., Ph.D. (Toronto), Professor of Geography, 1948.
Risk, Michael John/B.Sc. (Toronto), M.Sc. (Western), Ph.D. (Southern California, L.A.), Associate Professor of Geography, 1971.
Roberts, Larry Evan/B.A., Ph.D. (Minnesota), Associate Professor of Psychology, 1965.
Robertson, Andrew/B.Sc., Ph.D. (McMaster), Assistant Professor of Physics (part-time), 1976.
Schwarz, Henry Philip/B.A. (Chicago), M.Sc., Ph.D. (California Institute of Technology), Professor of Geology, 1962.
Shawchuk, John B.Sc. (Toronto), M.A.Sc., Ph.D. (Waterloo), P.Eng., Professor of Physics and Engineering Physics, 1966.
Siegel, Shepard/A.B. (New York), M.S., Ph.D. (Yale), Professor of Psychology, 1968.
Singh, Rama Shankar/B.Sc. (Agra), M.Sc. (Kanpur), Ph.D. (California, Davis), Assistant Professor of Biology, 1975.
Smith, Grant Kenwood/B.Sc., Ph.D. (McGill), Professor of Psychology, 1964.
Solntseff, Nicholas B.Sc., Ph.D. (Sydney), Associate Professor of Applied Mathematics, 1971.
Sorger, George Joseph/B.Sc. (McGill), M.S., Ph.D. (Yale), Associate Professor of Biology, 1966.
Sprung, Donald Whitfield Loyal/B.A. (Toronto), Ph.D. (Birmingham), Professor of Physics, 1962.
Stager, Carl Vinton/B.Sc. (McMaster), Ph.D. (M.I.T.), Professor of Physics, 1963.
Stewart, James Drewry/B.Sc., Ph.D. (Toronto), M.S. (Stanford), Associate Professor of Mathematics, 1969.
Summers-Gill, Robert George/M.A. (Saskatchewan), Ph.D. (California), Professor of Physics, 1956.
Sutherland, Peter Gordon/B.Sc. (McGill), M.S., Ph.D. (Illinois), Assistant Professor of Physics, 1976.
Takahashi, Iwao/B.A. (Hokkaido), M.S.A. (Kyushu), Ph.D. (Montreal), Professor of Biology, 1964.
Taylor, Stuart Martin/B.A. (Bristol), M.A., Ph.D. (British Columbia), Assistant Professor of Geography, 1974.
Taylor, Terence/B.Sc. (Waterloo), Ph.D. (McMaster), Assistant Professor of Physics (part-time), 1975.
Threlkeld, Stephen Francis Hilary/M.Sc. (Alberta), Ph.D. (Cambridge), Professor of Biology, 1961.
Timus, Thomas/B.A. (Toronto), Ph.D. (Cornell), Professor of Physics, 1965.
Tomlinson, Richard Howden/B.Sc. (Bishop’s), Ph.D. (McGill), F.C.I.C., Professor of Chemistry, 1952.
Vallières, Michel/B.Sc. (Laval), Ph.D. (Pennsylvania), Assistant Professor of Physics (part-time), 1975.
Volkov, Anatole Boris/B.S. (North Carolina), M.S., Ph.D. (Wisconsin), Professor of Physics, 1964.
Waddington, James Charles/B.Sc. (Queen’s), Ph.D. (McMaster), Associate Professor of Physics, 1971.
Walton, Derek/B.Sc., M.Sc., (Toronto), Ph.D. (Harvard), Professor of Physics, 1968.
Westik, Nick Henry/B.Sc. (Alberta), M.A., Ph.D. (Johns Hopkins), Associate Professor of Chemistry, 1967.
Westermann, Gerd Ernst Gerald/B.Sc. (Braunschweig), Dipl. Geol., D.Sc. (Tubingen), Professor of Geology, 1957.
Westermann, Jean Earldene Mills/B.Sc. (Western), M.A. (Mount Holyoke), Ph.D. (Toronto), Associate Professor of Biology, 1965.
Woo, Ming-ko/M.A. (Hong Kong), Ph.D. (British Columbia), Assistant Professor or of Geography, 1972.
Wood, Christopher Michael/M.Sc. (British Columbia), Ph.D. (East Anglia), Assistant Professor of Biology, 1976.
Wood, Derick/B.Sc., Dipl. in Electronic Computing, Ph. (Leeds), Associate Professor of Applied Mathematics, 1970.
Yarwood, Anthony John/B.Sc., Ph.D. (Birmingham), Associate Professor of Chemistry, 1965.
Yip, Patrick Cheung-Yum/B.Sc. (Memorial), Ph.D. (McMaster), Assistant Professor of Applied Mathematics, 1970.

**FACULTY OF SOCIAL SCIENCES**

R. C. Molvar/M.A., Ph.D., F.R.S.C., Dean of Social Sciences.
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**Instructional Staff**

Alaszkiewicz, Judy/B.A. (Western), Lecturer in Physical Education, 1977.
Arapura, John G./B.D. (Serampore College, and Bishop’s College, Calcutta), S.T.M. (Union Theological Seminary), M.A., Ph.D. (Columbia), Professor of Religious Studies, 1965.
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Lanfranco, Samuel L./ B.A. (Fresno), M.A., Ph.D. (Berkeley), Assistant Professor of Social Sciences, (On leave, 1977-78), 1967.


Levitt, Cyril H./ M.A. (Waterloo), Ph.D. (Freie Universität, Berlin), Assistant Professor of Sociology, 1976.

Lewis, Thomas J./ B.A. (Carleton), Ph.D. (Suny, Buffalo), Associate Professor of Political Science, 1969.

MacDougall, James D./ B.A., B.P.H.E. (Queen’s), M.A. (Oregon), Ph.D. (Wisconsin), Associate Professor of Physical Education, 1970.


MacQueen, Graeme B./ B.A. (McMaster), Lecturer/Assistant in Religious Studies, 1974.

Macleod, William J./ B.A. (Carleton), B.P.E. (McMaster), M.Ed. (Suny, Buffalo), Assistant Professor of Physical Education, 1964.

March, Roman R./ B.A. (Manitoba), M.A. (Carleton), Ph.D. (Indiana), Associate Professor of Political Science, 1968.


Matthes, D. Ralph L./ B.A. (Memorial), M.A., Ph.D. (Minnesota), Associate Professor of Sociology, (On leave, 1977-78), 1971.

McInnes, Simon M./ M.A. (Bishop’s), Assistant Professor of Political Science, 1977.


Mendelson, Alan/ B.A. (Kenyon College), M.A. (Brandeis), Ph.D. (Chicago), Assistant Professor of Religious Studies, 1976.

Mestelman, Stuart R./ B.A. (Pittsburgh), M.S., Ph.D. (Purdue), Associate Professor of Economics, 1969.


Miller, Stefania/ M.A. (McMaster), Ph.D. (Toronto), Assistant Professor of Political Science, 1972.


Muller, R. Andrew/ B.A., M.D. (Ph.D. (Toronto), Assistant Professor of Economics, 1972.

Nevidon, Patricia T./ B.A. (Western), M.S.W. (Toronto), Assistant Professor of Social Work, 1974.

Noble, William C./ B.A. (Toronto), Ph.D. (Calgary), Associate Professor of Anthropology, 1968.

Nossal, Kim R./ M.A., Ph.D. (Toronto), Assistant Professor of Political Science, 1976.

Novak, Derry/ B.A. (Toronto), Professor of Political Science, 1952.

Oksanen, Ernest H./ B.A. (Queen’s), M.A. (Michigan), Ph.D. (Queen’s), Professor of Economics, 1964.

Oldridge, Neil B./ B.A. (Rhodes), M.A. (Florida), Ph.D. (Wisconsin), Associate Professor of Physical Education, 1972.


Pineo, Peter C./ B.A. (British Columbia), M.A. (McGill), Ph.D. (Chicago), Professor of Sociology, 1968.


Pothier, Peter J./ B.A. (Temple), M.A., Ph.D. (Columbia), Professor of Political Science, 1964.

Preston, Richard J./ M.A., Ph.D. (North Carolina), Associate Professor of Anthropology, 1971.

Pringsheim, Klaus H.C./ B.A. (California, Los Angeles), M.A. (Columbia), Associate Professor of Political Science, 1966.


Ramsden, Peter G./ B.A. (Toronto), M.A. (Calgary), Ph.D. (Toronto), Assistant Professor of Anthropology, 1976.

Rice, James J./ B.A. (Sir George Williams), B.S.W., M.S.W. (Calgary), Ph.D. (Exeter), Assistant Professor of Social Work, 1977.

Ripton, Reginald A./ B.A. (Western), M.A. (McGill), Assistant Professor of Sociology, 1972.

Robb, Andrew L./ M.A. (British Columbia), Ph.D. (Essex), Associate Professor of Economics, 1971.

Robertson, John C./ B.A. (Texas Wesleyan College), B.D. (Southern Methodist), S.T.M., M.A., Ph.D. (Yale), Associate Professor of Religious Studies, 1968.

Rodman, William L./ B.A. (Sydney), M.A., Ph.D. (Chicago), Assistant Professor of Anthropology, 1972.

Rogers, E. S./ B.A. (Middlebury College), M.A., Ph.D. (New Mexico), Professor of Anthropology, (part-time), 1975.


Sale, Digby/ B.P.H.E. (Toronto), M.A. (Western), Assistant Professor of Physical Education, 1967.


Santilli, Muriel/ B.A. (Hunter College), M.A. (Columbia), M.S.W. (Suny, Buffalo), Assistant Professor of Social Work, 1974.

Scammell, William M./ B. Com. Sc. (Queen’s, Belfast), Ph.D. (Wales), Professor of Economics, 1969.

Scarth, William M./ B.A. (Queen’s), M.A. (Essex), Ph.D. (Toronto), Associate Professor of Economics (On leave, 1977-78), 1971.

Seaman, John W./ B.A. (Mount Allison), M.A. (Dalhousie), Ph.D. (Toronto), Assistant Professor of Political Science, 1972.

Shaffir, William B./ M.A., Ph.D. (McGill), Associate Professor of Sociology, 1972.


Shinohara, Koichi/ B.L., M.L. (Tokyo), Ph.D. (Columbia), Assistant Professor of Religious Studies, 1972.

Sivaraman, Krishna/ M.A. (Anna University), M.A. (Madras), Ph.D. (Banaras), Associate Professor of Religious Studies, 1972.

Slobodin, Richard B./ B.A., M.S. (City College of New York), Ph.D. (Columbia), Professor of Anthropology, 1964.

Smith, Alan J./ B.A., M.Ed. (Toronto), D.Ed. (Suny, Buffalo), Professor of Physical Education, 1951.

Smith, Dusky L./ B.A. (Central State College, Oklahoma), M.A. (Ohio State), Ph.D. (Suny, Buffalo), Associate Professor of Sociology, 1969.

Spencer, Byron G./ B.A. (Queen’s), Ph.D. (Rice), Professor of Economics, 1966.


Stein, Michael B./ B.A. (Toronto), Ph.D. (Princeton), Professor of Political Science, 1977.

Stephenson, Marylee G./ B.A. (California, Berkeley), M.A. (Essex), Ph.D. (British Columbia), Associate Professor of Sociology, 1973.


Stortroen, Charles E./ B.A. (Luther), M.A. (Minnesota), Associate Professor of Anthropology, 1964.


Szathmary, Emoke E./ B.A., Ph.D. (Toronto), Associate Professor of Anthropology, 1975.


Thompson, Robert W./ B.A. (Toronto), M.A. (Queen’s), Ph.D. (London), Professor of Economics, 1953.

Walters, Vivienne/B.A., M.A. (Sheffield), Ph.D. (McGill), Assistant Professor of Sociology, 1977.
Weeks, Ian G./M.A., Ph.D. (Melbourne), Assistant Professor of Religious Studies, 1970.
Williams, James R./M.A., Ph.D. (Minnesota), Professor of Economics, 1965.
Woroby, Tamara/M.A., Assistant Professor of Economics, 1977.

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This partial list includes the names only of those staff members to whom the student is most apt to turn for assistance.

Bridle, H.D./Assistant Registrar (Liaison & Admissions)
Cooke, W.M., B.Sc./Assistant Registrar (Schedules)
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Harrison, B., B.A./Dean of Men
Heinzl, R., M.A./Director of Student Counselling Services
Jewell, C. G., B.Sc./Liaison Officer
Mansell, S./Manager, Student Placement
Masterson, J./Computer Centre
Moore, J., B.A./Director of Information, Development & Alumni Affairs
Mousley, W.H., C.A./Director of Financial Services
Prince, L.A./Dean of Students
Rochkin, Eddyte/Admissions Officer
Scott, Sheila (Mrs. Frank M.), B.A./Dean of Women
Tynowski, Olga/Academic Awards Officer
Walker, F.J./Assistant Registrar (Records)
Ward, Norma J., B.A./Liaison Officer

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Bedford, George L./Manager, Academic Support Systems, 1PS
Fleming, William Herbert, M.Sc., Ph.D./Associate Director
Gowland, Douglas M./C.A., C.M.C./Associate Director (IPS), IPACS
Keech, Gerald Lester/B.A.Sc., M.Sc., Ph.D./Director
Kenworthy, Derek John/B.A., D.Phil./Computing Consultant
Kumar, Kuldeep/M.B.A., B.Tech./Systems Supervisor (IPS)
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O’Day, Patrick J./Operations Manager, Information Processing Services
Redish, Kenneth Adair/B.Sc./Computing Consultant
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Stadelman, Barbara/Keypunch Supervisor
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Stephens, John S./B.Sc., Ph.D./Assistant Director (TCS), IPACS
Wakeham, Lorna/Control & Accounting Supervisor

REACTOR

Davis, Morley, B.Sc./Reactor Supervisor
Ernst, Peter Irving Clayton, B.Eng., M.Sc./Chief Reactor Supervisor
Fleming, William Herbert, M.Sc., Ph.D./Reactor Consultant
Harvey, John W., B.Sc., Ph.D./Senior Health Physicist
Marshall, Kenneth/Assistant Supervisor
McDougall, John Blackwood, B.Sc./Reactor Superintendent
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