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1 The Faculty

1.1 Location

Macdonald Engineering Building
McGill University
817 Sherbrooke Street West
Montreal, QC H3A 2K6
Canada

Telephone: (514) 398-7257

Website: <http://www.engineering.mcgill.ca>

1.2 Administrative Officers

JOHN E. GRUZLESKI, B.Sc., M.Sc.(Queen's), Ph.D.(Tor.),
Eng. **Dean**

FRANK MUCCIARDI, B.Eng., M.Eng., Ph.D.(McG.), Eng.
Associate Dean (Student Affairs)

ARUN K. MISRA, B.Tech.(I.I.T. Kharagpur), Ph.D.(U.B.C.),
P.Eng. **Associate Dean (Academic)**

DAVID COVO, B.Sc.(Arch.), B.Arch.(McG.), M.R.A.I.C.,
O.A.Q. **Director, School of Architecture**

DAVID F. BROWN, B.A.(Bishop's), M.U.P.(McG.),
Ph.D.(Sheffield) **Director, School of Urban Planning**

RICHARD J. MUNZ, B.A.Sc., M.A.Sc.(Wat.), Ph.D.(McG.),
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STUART J. PRICE, B.Sc., Ph.D. (Bristol) **Chair, Department of Mechanical Engineering**

ROBIN A.L. DREW, B.Tech.(Bradford), Ph.D.(Newcastle)
Chair, Department of Mining and Metallurgical Engineering

GEORGE I. FEKETE, B.Eng., M.Eng., Ph.D.(McG.), Eng.
Building Director

STEVE YUE, B.Sc., Ph.D.(Leeds) **Secretary of Faculty**

IDA GODEFROY **Assistant to the Dean**

JUDY PHARO **Faculty Student Advisor**

1.3 Historical Note

The Faculty of Engineering began in 1871 as the Department of Practical and Applied Science in the Faculty of Arts with degree programs in Civil Engineering and Surveying, Mining Engineering and Assaying, and Practical Chemistry. Diploma courses had been offered from 1859, and by 1871 the staff and enrolments had increased sufficiently to justify the creation of the Department. Continued growth led to the formation of the Faculty of Applied Science in 1878. By 1910 there were ten degree programs offered, including Architecture and Railroad Engineering. Subsequent changes in the overall pattern of the University led to the creation of the Faculty of Engineering in 1931 with a departmental structure very similar in name to that which exists at present.

1.4 The Faculty Today

The Faculty currently includes five engineering departments and two schools:

The Departments

- Chemical Engineering
- Civil Engineering and Applied Mechanics
- Electrical and Computer Engineering
- Mechanical Engineering
- Mining and Metallurgical Engineering

The Schools

- Architecture
- Urban Planning

The Faculty serves approximately 2200 undergraduate students and 700 graduate students in a wide variety of academic programs.

Undergraduate programs leading to professional bachelor degrees are offered in all academic units except the School of Urban Planning. These programs are designed to qualify the graduates for immediate employment in a wide range of industries and for membership in the appropriate professional bodies. Additionally, a non-professional degree is offered in the School of Architecture for those who plan to work in related fields not requiring professional qualification. The curricula are also structured to provide suitable preparation for those who plan to continue their education in post-graduate studies either at McGill or elsewhere.

The academic programs, which are described in detail in [section 4](#) are divided into required and complementary sections. The required courses emphasize those basic principles which permit graduates to keep abreast of progress in technology throughout their careers. Exposure to current technology is provided by the wide variety of complementary courses which allow students to pursue in depth a particular interest.

An internship program involving a paid 8 to 16 month industrial work experience is available to Engineering and Science students. Generally students will enter the internship program before starting their final year of undergraduate studies. Details can be found in [section 2.8](#). In addition, CO-OP programs are offered in Mining Engineering and Metallurgical Engineering.

Post-graduate programs leading to Master's and Doctoral degrees are offered in all sectors of the Faculty. Numerous areas of specialization are available in each of the departments and schools. All post-graduate programs including the professional degree program in Urban Planning are described in the Calendar of the Faculty of Graduate Studies and Research.

1.5 Special Facilities and Related Programs

1.5.1 Engineering Information Systems

In addition to the services provided by the Computing Center, the Faculty, in conjunction with its departments and schools, maintains specialized computing and information resources in support of teaching and research. These vary from desktop PCs distributed throughout the Engineering complex to very high performance scientific workstations found in the research laboratories. Each unit organizes and maintains facilities that are designed around specific roles, e.g. CAD/CAM, microelectronic design, software engineering, circuit simulation, process control, polymers, structural mechanics, metal processing, etc., in addition to systems dedicated to administrative support.

The role of the Faculty is to provide access to these resources on a 24-hour basis and to provide computing and information services that are not covered by individual units. Currently this consists of approximately 180 workstations and servers in two general purpose laboratories. A Faculty-wide switched network provides global access to the over 1000 machines in the Engineering complex. The Faculty works in close cooperation with the McGill Computing Centre which provides remote access to the Faculty network.

1.5.2 Agricultural and Biosystems Engineering

The Faculty of Engineering cooperates with the Faculty of Agricultural and Environmental Sciences in providing courses of instruc-

tion for a curriculum in agricultural and biosystems engineering to meet requirements for a professional degree awarded in the Faculty of Agricultural and Environmental Sciences. The second semester of the penultimate year of the program is given by the Faculty of Engineering on the Downtown Campus. Details of the curriculum are given on [page 433](#) in the Agricultural and Environmental Sciences section.

Some of the courses offered by the Department of Agricultural and Biosystems Engineering may be of interest to students in the Faculty of Engineering. Students may consult the list of technical complementary choices in [section 4.1.1](#).

1.5.3 Department of Biomedical Engineering

Lyman Duff Medical Sciences Building
3775 University Street
Montreal, QC Canada H3A 2B4
Telephone: (514) 398-8278

Engineering undergraduates who are interested in the biomedical applications of engineering techniques should contact the Chair of their department or the graduate Chair of Biomedical Engineering. Some of the courses offered by the BME Department may be of interest to Engineering students, and may be approved as complementary courses. A partial list follows (see Faculty of Graduate Studies and Research Calendar, accessible at <http://www.rock.mcgill.ca>, for more details):

399-501A SELECTED TOPICS IN BIOMEDICAL ENGINEERING.

3(3-0-6)

Instructor: Prof. G.B.Pike

399-503B BIOMEDICAL INSTRUMENTATION AND MEASUREMENT TECHNIQUE. 3(2-1-6)

3(2-1-6)

Instructor: Prof. M. Slawnych

399-519A ANALYSIS OF BIOMEDICAL SYSTEMS & SIGNALS.

3(2-0-8)

Instructor: Prof. R.E. Kearney

1.6 Library Facilities

The University has numerous libraries. Specifically serving Engineering, Architecture and Urban Planning is the Physical Sciences and Engineering Library. Other McGill libraries of interest to students in the Faculty of Engineering are: Blackader-Lauterman Library of Architecture and Art, Walter Hirschfeld Geographic Information Center, and Edward Rosenthal Mathematics and Statistics Library. Further information is available on the Libraries website <http://www.library.mcgill.ca>.

2 General Information

2.1 Admission Requirements

The Faculty of Engineering offers programs leading to the degrees of B.Eng. and B.Sc.(Arch.). Enrolment in some programs is limited.

Specific information on admissions requirements for Quebec students, students from provinces of Canada other than Quebec and applicants from outside of Canada can be found in "Admission Requirements" on page 10[CR] of the General University Information section.

2.2 Exchange Programs

The Faculty of Engineering participates in a number of exchange programs that provide undergraduates with an opportunity to study at École Polytechnique and other Quebec universities, and at selected colleges and universities in the United States, Mexico and Europe. Applicants must have completed at least one year of study and have maintained an average of 3.00 or better. Further information may be obtained from the Student Advisor, Office of the Associate Dean (Student Affairs) or the Exchange Officer, Admissions, Recruitment and Registrar's Office.

2.3 Advanced Credit Examinations

Prior to their first registration, the Faculty of Engineering offers the opportunity for students entering the Faculty from a Quebec CEGEP program to receive advanced credit in 189-260 Intermediate Calculus upon successful completion of the Advanced Credit Examination. The 189-260 Intermediate Calculus examination will cover material that has a similarity to the syllabus of the CEGEP Calculus III course. In all engineering programs, students who are successful in the 189-260 Intermediate Calculus examination will automatically have the number of credits required for the completion of their program reduced by three.

2.4 Registration

Students who are currently registered and intend to return to the same degree program in the following academic session are required to register using the automated registration system MARS. MARS information sheets are available in the Student Affairs Office, Room 376, Macdonald Engineering Building. **It is mandatory for all returning students to see an Academic Advisor in their Department for course confirmation during the first two weeks of the fall semester and, if changes are being made, during the first two weeks of the winter semester.**

Note that registration on MARS is not final until it has been approved by an Academic Advisor.

New students also register by MARS. Information is sent at the time of admission. **All new students must see an academic advisor during the advising period.**

Non-Engineering students should obtain permission from the Associate Dean of their Faculty to register for Engineering courses listed in [section 4](#).

2.4.1 Registration for Continuing Education Courses

Students can register for Continuing Education courses through MARS. Students must refer to the Centre of Continuing Education Calendar and Timetable for course information and deadlines. For further information see the Records Office, Room 376, Macdonald Engineering Building.

2.4.2 Course Withdrawal

Students may withdraw from a course using MARS without academic penalty provided they do so before the end of the seventh week of the semester. Beyond this time their names will appear on the mark reports and, in the event that they do not take the examination, they will be given a J grade.

2.5 Advising

All students are required to seek academic advising about their programs from the Department in which they study. Additional information may be obtained by calling:

General Advising	(514) 398-7256
Architecture	(514) 398-6702
Chemical Engineering	(514) 398-4494
Civil Engineering	(514) 398-6860
Electrical and Computer Engineering	(514) 398-7344
Mechanical Engineering	(514) 398-8070
Metallurgical Engineering	(514) 398-4755 ext. 4365
Mining Engineering	(514) 398-4755 ext. 0573
Urban Planning	(514) 398-4075

In addition to departmental advising, the Faculty offers a free tutorial service, known as ACE, to help students in their first year of studies. Upper year Engineering students and graduate students provide the service daily. Hours will be posted.

2.6 Student Activities

The campus offers a wide variety of extra-curricular activities for students. All are encouraged to participate. Many of these are organized within the Faculty under the auspices of the Engineering Undergraduate Society (EUS), or the Architectural Undergraduate Society (AUS). Both of these organizations publish handbooks

describing their operations and the activities of various Faculty clubs and societies. All undergraduate students automatically become members of the EUS or the AUS, as appropriate.

2.7 Scholarships and Bursaries

Scholarships, bursaries and loans are open to students in the Faculty of Engineering. Students should consult the Undergraduate Scholarships and Awards Calendar available from the Admissions, Recruitment and Registrar's Office, and on the Web (<http://www.aro.mcgill.ca>). Specific information concerning these awards may be obtained from the Student Advisor, Office of the Associate Dean (Student Affairs), Faculty of Engineering.

2.8 IYES: Internship Year for Engineering and Science

Employers value experience. The IYES Program allows students to gain professional work experience during the course of their undergraduate studies.

Employment through the IYES Program typically begins in May and continues for up to 16 months (minimum 8 months) including a 4-month probationary training period. While employed by the participating companies, students work on assignments related to their field of study. Projects generally involve research and development or design.

Students switch to the Internship Program from the regular program when they accept an Internship placement. Successful completion of an 8 to 16-month internship will qualify the student to graduate with the Internship Program designation.

Employers choose the most suitable students for their organization through the application, interview and ranking process.

SPECIALIZATION AREAS OF IYES STUDENTS

All students participating in this program must have between 15 and 45 credits remaining to complete their undergraduate studies in the following areas of Engineering or Science:

Atmospheric Science	Computer Science
Biotechnology	Electrical Engineering
Chemical Engineering	Environmental Studies
Chemistry	Mathematics and Statistics
Civil Engineering	Mechanical Engineering
Computer Engineering	Physics

STUDENT BENEFITS

- professional experience related to course of study
- salary within the average range of those for entry level professional positions
- improved chance of obtaining a job upon graduation and at a higher starting salary
- opportunity to test choice of career and assess pertinence of post-graduate study before making a long-term commitment
- opportunity to develop communication skills and to acquire a business perspective that cannot be learned in school and is unlikely to be gained from a summer job
- participation in the IYES Program will be noted on the student's permanent record

COST

- There is no application fee.
- Every student hired through the Program will be assessed a fee of \$700. Students will be billed this amount approximately one month after starting their internship.
- Participating companies are invited to match the student's contribution in the form of a tax deductible donation to IYES.

STUDENT ELIGIBILITY

- Canadian citizens or Permanent Residents of Canada
- full-time registration in an Engineering or Science undergraduate program with fewer than 45 credits and more than 15 credits remaining

- strong leadership/communication skills, good academic record (satisfactory standing)
- remain degree candidate and return to complete studies at McGill (internship students will receive an automatic one-year extension for the completion of their studies). Students are not allowed to complete their undergraduate degree during the internship period.

Further information can be obtained from the internet posting (<http://www.mcgill.ca/stuserv/caps/iyepost.htm>) or by sending an email to info@mecc.mcgill.ca

2.9 Calculators in Faculty Tests and Examinations

The use of calculators during tests and examinations is at the discretion of the course instructor. If a calculator is permitted in the examination, the instructor may require that the students use a Faculty Standard Calculator, i.e. the CASIO fx-991 or the Sharp EL-546. These calculators are non-programmable, inexpensive, available through local dealers, e.g. EUS General Store in McConnell Engineering Building, and have many features of interest to Engineering students. Any model fx-991 or EL-546 is acceptable, regardless of the letter suffix which appears after the model number. All Engineering students are expected to own one of the two Faculty Standard Calculators.

3 Academic Requirements

3.1 Degree Requirements

In order to obtain a Bachelor's degree, students must complete one of the departmental programs described in [section 4](#).

3.1.1 Entrance Requirements

The degree programs in the Faculty of Engineering are designed for students who have completed a general and basic science program. This basic science requirement consists of two semesters of calculus, chemistry, physics, one semester of vectors, matrices and analytical geometry and one semester of humanities or social sciences.

Students entering the Faculty of Engineering from Quebec complete these courses at the CEGEP and enter a seven-semester program.

Students entering from outside Quebec with a high school diploma generally enter an eight-semester program and complete the basic science requirements at McGill.

Students who have completed Advanced Placement Exams, Advanced Levels, the International Baccalaureate, the French Baccalaureate, or McGill placement and/or advanced credit examinations may receive exemptions and/or credits for all or part of the basic science requirements. Similarly, students who have completed courses at other universities or colleges may receive exemptions and/or credits.

3.1.2 Basic Science Requirements for Students Entering from Outside Quebec (8-semester program)

Generally, students admitted to Engineering from outside Quebec are required to complete the basic science requirements outlined below, in addition to the departmental programs described in [section 4](#).

180-111B	General Chemistry for Physical Science & Engineering Students	4 credits
180-121A	General Chemistry for Physical Science & Engineering Students	4 credits
189-150A	Calculus A	4 credits
189-151B	Calculus B	4 credits
189-133A/B	Vectors, Matrices & Geometry	3 credits
198-131A	Mechanics and Waves	4 credits
198-142B	Electromagnetism & Optics	4 credits
xxx-xxx	Humanities/Social Sciences course	3 credits

Calculus courses 150/151 are designed for students who have completed a course in high school calculus. If a student has no previous calculus exposure, 150/151 may be replaced with 139/141 (Password card required). In the event that the student has some prior calculus, but is not sufficiently confident to proceed with 150/151, the appropriate sequence is 140/141. Students who complete the Calculus sequence 150/151 will receive exemption with credit from 189-260 (Intermediate Calculus), in the regular Engineering program. Students who are uncertain as to which calculus course sequence is appropriate for them should contact Ms. Pharo, Student Advisor in the Office of the Associate Dean (Student Affairs) (514) 398-7256.

The Humanities/Social Science course may be selected from a list outlined in the "Welcome" book. A copy of the booklet is mailed to all students admitted to the Engineering program at McGill. A Humanities/Social Sciences course is not required of students admitted to Electrical/Computer Engineering.

Students may write McGill Placement Tests to obtain credit for 180-111, 180-121, 189-140, 189-141, 189-133, 198-131 and 198-142, in the event that they have studied similar material previously. Details on the advanced placement examinations are provided in the "Welcome" book.

Students entering with advanced standing credits (Advanced Placements, Advanced Levels, International Baccalaureate examinations, McGill Placement Tests) are required to meet with the Student Advisor, Office of the Associate Dean (Student Affairs), Room 378, Macdonald Engineering Building, to finalize their program of studies. This must be done prior to meeting with the Departmental Advisor.

3.1.3 Architecture – Basic Science Requirements for Students Entering from Outside Quebec (8-semester program)

Generally, students admitted to Architecture from outside Quebec are required to complete the following courses:

180-111B	General Chemistry for Physical Science & Engineering Students	4 credits
180-121A	General Chemistry for Physical Science & Engineering Students	4 credits
189-140A	Calculus I	3 credits
189-141B	Calculus II	4 credits
189-133A/B	Vectors, Matrices & Geometry	3 credits
198-131A	Mechanics and Waves	4 credits
198-142B	Electromagnetism & Optics	4 credits

Students may write McGill Placement Tests to obtain credit for 180-111, 180-121, 189-140, 189-141, 189-133, 198-131 and 198-142, in the event that they have studied similar material previously. Details on the advanced placement examinations are provided in the "Welcome" book.

3.2 Degrees and Requirements for Professional Registration

Professional

- Bachelor of Architecture
- Bachelor of Engineering
- Bachelor of Engineering (Honours)

Non-Professional

- Bachelor of Science (Architecture)

The Bachelor of Architecture degree is being phased out, starting in the academic year 1999-2000, and will be replaced by the professional Master of Architecture I degree as the first professional degree in architecture. The description of the M.Arch. I program can be found in the Faculty of Graduate Studies and Research Calendar.

The B.Eng. programs are accredited by the Accreditation Board of the Canadian Council of Professional Engineers and fulfil the academic requirements for admission to the provincial professional organizations.

3.3 Complementary Studies

Engineering students must complete 6 credits (9 credits in Electrical and Computer Engineering) of additional complementary courses as follows:

- (i) One 3-credit course on the impact of technology on society
- (ii) One 3-credit course (6 credits in Electrical and Computer Engineering, of which a minimum of 3 credits must be from category A described below) in the humanities and social sciences, administrative studies and law.

The three credits under (i) are to be chosen from the following list of courses which relate to the impact of technology on society.

301-528A	History of Housing
302-230B	Environmental Aspects of Technology
302-430A	Technology Impact Assessment
303-469A	Infrastructure & Society
306-308A	Social Impact of Technology
107-220A	Intro. to History & Philosophy of Science I
107-221B	Intro. to History & Philosophy of Science II
146-500B	Interdisciplinary Seminar in the History and Philosophy of Science
154-225A,B	Economics of the Environment
166-235A	Technology and Society
166-312B	Industrial Sociology
166-321B	Women and Work
183-200A	Geographical Perspectives on World Environmental Problems
183-203A	Introduction to Environmental Studies
183-205B	Global Change: Past, Present and Future
183-302B	Environmental Anal. and Mgmt. I: Probs. and Pol.
183-333C	The Habitable City
186-243A,B,L	Environmental Geology (not available to students who have taken or who will take 186-221A, General Geology)
260-270A,B	Religious Ethics and the Environment (Note: A term is offered at Macdonald Campus only)

The course(s) under (ii) are to be chosen from the following: Electrical and Computer Engineering students must select at least one 3-credit course from Category A (Humanities and Social Sciences).

A. Humanities and Social Sciences

Any course at the 200 level or above from the departments of:

- Anthropology
- Economics (any 200 or 300 level course excluding 154-208, 217, 227, 259 and 337)
- History
- Philosophy (excluding 107-210)
- Political Science
- Psychology (excluding 204-204, 305 and 435 but including 204-100)
- School of Social Work
- Sociology (excluding 166-350)

or 189-338A History and Philosophy of Mathematics

or 301-350A The Material Culture of Canada

B. Administrative Studies and Law

Faculty of Engineering

300-220A Law for Architects and Engineers

Faculty of Management

270-465B	Technological Entrepreneurship
272-321B	Leadership
275-360A,B	Marketing of Technology
276-562B	Organizational Strategies for Adv. Tech. Firms
279-294A,B,X,Y	Introduction to Labour-Management Relations
280-222A,B,X,Y	Organizational Behaviour
280-320A	Managing Human Resources
280-352A,B,X,Y	Marketing Management I
280-360B	Social Context of Business

C. Language Courses

Any language course which is deemed by the academic advisor to have a sufficient cultural component or, in the case of a student who was not already proficient in a specific language, program credit will be given for the second of two successfully completed, academically approved 3-credit language courses.

3.4 Student Progress

The B.Eng. programs may be completed in seven semesters. The B.Sc.(Arch.) program may be completed in six or eight semesters, depending upon point of entry.

A student must successfully complete the B.Eng. or B.Sc. (Arch.) programs within six years of entry. Candidates admitted to a lengthened program, or to a shortened program because of advanced standing, or who are participating in the IYES program, will have a correspondingly greater or lesser period in which to complete their program. Extensions may be granted by the Committee on Standing in cases of serious medical problems or where other similarly uncontrollable factors have affected a student's progress.

3.4.1 Letter Grades

In the Faculty of Engineering, letter grades are assigned according to the grading scheme adopted by the professor in charge of a particular course. They have the designations:

A, A-	Very Good	J	Unexcused Absence
B+, B, B-	Good	K	Incomplete
C+, C	Satisfactory	KF	Incomplete Failed
D	Conditional Pass	L	Deferred
F	Failed	T	Credit by examination only

Grades A, B and C indicate satisfactory results. Grade D indicates marginal results which may be acceptable for peripheral courses but not for core courses required by the program. The classification of a course as core or peripheral depends on the individual student's program and will be decided by the department concerned. Grade F is a permanent grade indicating unsatisfactory results. Grade J indicates an unexcused failure to submit assignments or an unexcused absence from an examination. It is equivalent to an F grade.

3.4.2 Incomplete Course Deadlines

An incomplete grade is indicated by a K. The maximum delay granted for completion of course work is three months, after which the student will automatically be given a grade of KF (incomplete/fail). The last day for submission of deferred grades is March 31st for A semester courses, August 15th for B semester courses, and December 1st for summer courses. The last date for submission of grades for summer courses for students graduating in November is September 15th.

The L grade indicates a deferred grade because of medical or other valid reason. An L grade will be replaced by a J grade if the student misses the next deferred or regular examination in the course, whichever occurs first.

3.4.3 Satisfactory/Unsatisfactory Option

The Satisfactory/Unsatisfactory Option may be used for elective courses only.

Students must code courses as U/S at the time of registration on MARS. The option will not be added manually to a student's record after the Drop/Add deadline or once a mark has been submitted by the Faculty. Once a mark has been submitted, this option will not be reversed.

1. "Elective" refers to that category of the complementary studies component of the program involving a Social Science/ Humanities course, or a course dealing with the impact of technology on society; or to elective courses taken outside the School of Architecture by architecture students. It does not apply to the "technical electives" or "architectural electives", or to any other category of the Engineering or Architecture programs.
2. A C grade is considered a pass under the University Satisfactory/Unsatisfactory option. (Students should note that the Fac-

ulty of Engineering accepts a D grade as a pass when courses eligible for the S/U option are taken in the conventional manner.)

3. Only students in satisfactory standing will be permitted to take a course under the Satisfactory/Unsatisfactory option. Only one course (3 credits) per term, to a maximum of 10% of a student's credits taken at McGill may be taken this way. Grades will be reported in the normal fashion by the instructor and the grades of C and above will be converted to Satisfactory (S) and grades of D and F will be converted to Unsatisfactory (U).

The decision to have an elective course graded as Satisfactory/Unsatisfactory must be made by the student and added on MARS before the end of the Drop/Add period, and no change can be made thereafter.

4. The courses taken under this option will be excluded from the GPA, but will be included in the number of credits.

NOTE: To be considered for scholarships/renewal of awards, students must complete at least 27 credits in the regular academic session exclusive of courses completed under this option.

3.4.4 Course Credits

The credit assigned to a particular course reflects the amount of effort it demands of the student. One credit normally represents three hours total work per week. This is, in general, a combination of lecture hours and other contact hours such as laboratory periods, tutorials and problem periods as well as personal study hours. As a guide, the average division of time for a course is indicated in hours in the course listing after the course credit. For example, 3(3-0-6) indicates a credit of three units consisting of three lecture hours per week, no other contact hours and six hours of personal study per week.

3.4.5 Grade Point Averages and Extra Courses

The Faculty calculates a semestrial grade point average (SGPA). Any courses taken which lie outside the program are classified as extra, are indicated by an "X" on transcripts and do not affect the grade point average. Students must receive departmental approval for such courses, and the course must be identified and recorded prior to writing the final examination.

3.4.6 Standings

The Faculty of Engineering makes Academic Standing Decisions after the completion of each semester (Fall, Winter, Summer). A student's academic standing is based on the CGPA (Cumulative Grade Point Average) according to the following criteria.

Satisfactory standing:
CGPA equal to 2.00 or better

Probationary standing:
CGPA < 2.00

Unsatisfactory standing:
CGPA < 1.20 first semester – normally re-admitted to probationary standing by Faculty decision. See below for further information.

Students in satisfactory standing may proceed with the following conditions:

- i) All core courses in which D or F grades were obtained must either be repeated successfully (grade C or better) or be replaced by an alternative approved course which is completed successfully.
- ii) All other courses in which F grades were obtained must either be repeated successfully at some point before graduation or be replaced by some alternative approved course which is completed successfully before graduation.

Students placed on either probationary or unsatisfactory standing will receive notification from the Faculty through the mail.

Students on probationary standing may proceed for one semester. Students must reduce their credit load to a maximum of 13 credits per semester and must achieve at the end of the semester either a CGPA of 2.00 or better, or a SGPA (semestrial) of 2.50 or better

in order to continue. A student whose SGPA is 2.50 or better, but whose CGPA is less than 2.00, may continue on probationary standing.

Students placed on probationary standing who need to reduce their credit load, but are unable to drop course(s) via MARS, must complete a Course Authorization Form and submit it to the Student Affairs-Records Office, rooms 376/378 Macdonald Engineering Building. The course(s) will then be deleted manually from the student's record.

While on probationary standing, failure to achieve either the SGPA or CGPA noted above will result in unsatisfactory standing, at which point, the student will be asked to withdraw from the Faculty. Currently registered courses will be deleted automatically from the student's record by the Faculty.

IMPORTANT:

Architecture, Civil, Mechanical, Mining and Metallurgical Engineering students placed on unsatisfactory standing must receive departmental support for readmission. Request for readmission must be made in writing to the Student Affairs-Records Office. Readmission will be considered by the Committee on Standing. If readmitted, a student must obtain a SGPA or CGPA of 2.00 or better during all subsequent semesters in order to remain in the Faculty of Engineering. If the student does not achieve either of these GPAs, he/she will be asked to withdraw permanently from the Faculty of Engineering.

Chemical, Electrical and Computer Engineering students placed on unsatisfactory standing will be permanently withdrawn from the department with no possibility of readmission.

For further information, students may consult the Student Affairs-Records Office, Faculty of Engineering, rooms 376/378 Macdonald Engineering Bldg.

3.4.7 Repeated Courses

Students who fail to achieve the required results in a course must either repeat it successfully or complete a substitute course approved by their department. For students who fail prerequisite courses which are offered in only one semester, the departments responsible may, in appropriate cases, arrange "reading courses" during the other semester or during the summer months. Such courses taken during a regular semester constitute a normal part of the candidate's work load. If the student is on probation, these courses must be included in the workload reduction.

3.4.8 Reassessment and Reread of a Grade

In accordance with the Charter of Student Rights, and subject to the conditions stated therein, students have the right to consult any written submission for which they have received a mark and the right to discuss this submission with the examiner. If, after discussion with the instructor, a student decides to request a formal reread of a final exam, the student must apply in writing, complete the Reread form and submit it to the Student Affairs-Records Office, Faculty of Engineering, room 376 Macdonald Engineering Building.

The following conditions apply:

- requests for rereads in more than one course per term will not be accepted, unless permission is given by the Faculty of Engineering;
- grades may be either raised or lowered as the result of a reread;
- rereads in courses not in the Faculty of Engineering are subject to the deadlines, rules and regulations of the relevant faculty;
- any request to have term work re-evaluated must be made directly to the instructor concerned.

The deadlines to make an application for formal reread of a final exam are:

- the last day of March for fall courses,
- the last day of July for winter courses, and
- the last day of November for summer courses.

A \$35 fee for each reread will be assessed directly to the student's McGill account if the result remains the same or is lowered. If the grade is increased, no charge is made.

For further information, students may consult the Student Affairs-Records Office, Faculty of Engineering, rooms 376/378 Macdonald Engineering Building.

3.4.9 Supplemental Examinations

Courses administered by the Faculty of Engineering do not have supplemental examinations; however, Engineering students may be eligible to write supplemental examinations in courses administered by the Faculties of Arts and Science (typically Humanities and Social Science courses and pre-engineering courses).

The following conditions apply:

- students must be in satisfactory or probationary standing; those with an unsatisfactory standing are not permitted to write supplementals;
- students are permitted to write a supplemental for courses in which they have received a mark of D, F, J or U;
- students must write the supplemental exam at the time of the next supplemental examination period;
- special permission of the Associate Dean (Student Affairs), Engineering, is required if a student wishes to write supplemental exams totaling more than seven (7) credits;
- only one supplemental examination is allowed in a course;
- the supplemental result may or may not include the same proportion of class work as did the original grade. The instructor will announce the arrangements to be used for the course by the end of the course change period;
- the supplemental result will not erase the grade originally obtained; both the original mark and the supplemental result will be calculated in the CGPA;
- additional credit will not be given for a supplemental exam where the original grade for the course was a D and the student already received credit for the course.

The supplemental examination period for A courses is during the months of April and May, and for B and D courses during the last week of August. It is the student's responsibility to find out the date and time of the supplemental exam. Supplemental exam applications are available from the Student Affairs-Records Office, Faculty of Engineering, Room 376 Macdonald Engineering Building. Alternately, students may print out the Supplemental Examination Request Form from the Faculty web site and return it by mail or submit it to the Records Office.

The deadline for submission of applications is March 1 for A courses and July 15 for B and D courses.

There is a \$35 non-refundable fee per each supplemental exam, which is charged directly to the student's McGill student account.

Students should consult the Student Affairs-Records Office, Faculty of Engineering, for more information.

3.4.10 Deferred Examinations

Students who miss a final examination due to illness must submit a medical certificate to the Student Affairs-Records Office (Room 376/378 Macdonald Engineering Building) within one week of the examination and apply for a deferred examination. The medical certificate must state the date of the missed examination, and the nature and duration of the illness. Students are advised that deferrals are granted only for compelling reasons.

Students granted a deferral will be given an AL@ grade which will be replaced by a AJ@ should the students miss the next deferred or regular examination in the course, whichever occurs first. If the student becomes ill during a formal examination, he/she should inform the invigilator. If necessary, the student will be escorted to the Health Service. As above, the student must submit a medical certificate to the Records Office within one week of the exam. Note that if the student completes the exam in routine fashion, the grade received cannot be changed.

The Faculty of Engineering makes an Academic Standing Decision after the completion of each semester, regardless of deferrals.

Further information on Deferred Examinations can be found on page 27[CR] of the General University Information of the Calendar.

4 Academic Programs

Please note:

- Denotes courses not offered in 2000-01
- ⊙ Elective courses
- Courses with Limited Enrolment

Where asterisks appear with a prerequisite, they have the following significance:

* a D grade is acceptable for prerequisite purposes.

** under special circumstances, the Department may permit this course to be taken as a co-requisite.

The curricula and courses described in the following pages have been approved for the 2000-01 session, but the Faculty reserves the right to introduce changes as may be deemed necessary or desirable.

4.1 Faculty Courses

A number of Faculty courses are offered and are listed below. These courses are of a more general nature than the departmental courses.

300-220A LAW FOR ARCHITECTS AND ENGINEERS. 3(3-0-6)

Aspects of the law which affect architects and engineers. Definition and branches of law; Federal and Provincial jurisdiction, civil and criminal law and civil and common law; relevance of statutes; partnerships and companies; agreements; types of property, rights of ownership; successions and wills; expropriation; responsibility for negligence; servitudes/easements, privileges/liens, hypothecs/mortgages; statutes of limitations; strict liability of architect, engineer and builder; patents, trade marks, industrial design and copyright; bankruptcy; labour law; general and expert evidence; court procedure and arbitration.

Mtre J.A. Woods

□ 302-230B ENVIRONMENTAL ASPECTS OF TECHNOLOGY. 3(3-0-6)

The impact of urbanization and technology on the environment. Topics include urbanization: causes, effects, land use regulations; transportation technology and environmental implications; environmental impact of energy conversions; energy policy alternatives; formulation of energy and environmental policy; air pollution: sources, effects, control; water pollution: sources, effects, control. Limited enrolment, MARS passwords distributed after the first class.

Professor Volesky

□ 302-430A TECHNOLOGY IMPACT ASSESSMENT. 3 (3-1-5)

The power of technology to shape our physical, economic and social environment: historical - effects of technological transitions (e.g. industrial revolution, post-industrial era) on culture and ecology; practical-technology impact assessment (TIA), methodologies, public participation, engineering contributions, regulations; implications of TIA on social and economic development, and to the education and career of the engineer. Limited enrolment. Restricted to final year students. Mars passwords distributed in Department of Chemical Engineering.

Ms. Ladanowski

303-469A INFRASTRUCTURE & SOCIETY. 3(3-2-4) (Prerequisite:

306-310A,B) Infrastructure systems, historical background and socio-economic impact; planning, organization, communication and decision support systems; budgeting and management; operations, maintenance, rehabilitation and replacement issues; public and private sectors, privatization and governments; infrastructure crisis and new technologies; legal, environmental, socio-economic and political aspects of infrastructure issues; professional ethics and responsibilities; case studies.

Professor Mirza

306-221A,B ENGINEERING PROFESSIONAL PRACTICE. 1(1-0-2)
Professional practice and ethics, professional liability, occupational health and safety, environmental responsibility. University Code of Student Rights and Responsibilities. **Professor Ouellett**

306-308A SOCIAL IMPACT OF TECHNOLOGY. 3(3-0-6) (Enrolment encouraged by students outside the Faculty of Engineering.) Critical examination of the socio-economic costs and benefits of technology, case studies of old engineering works and new technologies. The integration of applied ethics and engineering practice, analysis of basic concepts of technology assessment, the inter-connected processes of risk assessment, management, and communication. **Professor Finch**

306-310A,B ENGINEERING ECONOMY. 3(3-1-5) Introduction to the basic concepts required for the economic assessment of engineering projects. Topics include: accounting methods, marginal analysis, cash flow and time value of money, taxation and depreciation, discounted cash flow analysis techniques, cost of capital, inflation, sensitivity and risk analysis, analysis of R and D, ongoing as well as new investment opportunities. **Professors Bilodeau and Laplante**

4.1.1 Faculty Technical Complementaries

Each Engineering program requires a certain number of technical complementary courses. Departments list the approved courses together with the program descriptions that appear in the following sections. In addition, some programs permit students to select one or more courses from the faculty-wide listing of technical complementaries that follow. Students should check the program description to determine if a course may be selected from the following list. It is advisable that students discuss their choice with an academic advisor, review the prerequisite requirements for the course choices, and if in doubt approach the course instructor to ensure that they have the appropriate background for the course selection. Refer to the following departmental sections for prerequisites and course descriptions.

Agricultural and Biosystems Engineering

330-435A,B	Soil and Water Quality Management
336-200B	Elements of Agricultural Engineering
336-217B	Hydrology and Drainage
336-314B	Agricultural Structures
336-322A	Agro-Food Waste Management
336-325A	Food Engineering
336-330B	GIS and Biosystems Management
336-411A	Off-Road Power Machinery
336-412A	Agricultural Machinery
336-416A	Engineering for Land Development
336-500B	Advanced Applications of Microcomputers in Agriculture
336-504B	Instrumentation and Control
336-518A	Pollution Control for Agriculture
336-530B	Advanced Food & Fermentation Engineering

Architecture

301-350A	The Material Culture of Canada
301-377B	Energy, Environment & Buildings
301-378A	Site Usage
301-526B	Philosophy of Structures
301-527B	Civic Design
301-528A	History of Housing

Chemical Engineering

302-200A	Introduction to Chemical Engineering
302-204B	Chemical Manufacturing Processes
302-220B	Chemical Engineering Thermodynamics
302-230B	Environmental Aspects of Technology
302-430A	Technology Impact Assessment
302-438B	Engng. Principles in Pulp & Paper Processes
302-452B	Particulate Systems
302-471A	Industrial Water Pollution Control
302-472B	Industrial Air Pollution Control
302-481A	Polymer Engineering
302-487A	Chem. Processing in the Electronics Industry
302-581B	Polymer Composites Engineering

302-370A	Elements of Biotechnology
302-474A	Biochemical Engineering

Civil Engineering

303-207A	Solid Mechanics
303-208A	Civil Engineering Systems Analysis
303-225B	Environmental Engineering
303-311A	Geotechnical Mechanics
303-317A	Structural Engineering I
303-323A	Hydrology & Water Resources
303-327B	Fluid Mechanics & Hydraulics I
303-430A	Water Treatment & Pollution Control
303-433B	Urban Planning
303-451A	Geoenvironmental Engineering
303-469A	Infrastructure & Society
303-526B	Solid Waste Management
303-540A	Urban Transportation Planning
303-541B	Rail Engineering

Computer Science

308-203A,B	Introduction to Computing II
308-250A	Introduction to Computer Science
308-273A,B	Introduction to Computer Systems
308-302A,B	Programming Languages and Paradigms
308-305A	Computer System Architecture
308-350A	Numerical Computing
308-360A	Algorithm Design Techniques
308-424A	Topics in Artificial Intelligence I

Electrical and Computer Engineering

304-404A	Control Systems
304-411A	Communications Systems I
304-412B	Discrete Time Signal Processing
304-425A	Computer Organization and Architecture
304-427B	Operating Systems
304-428B	Software Engineering Practice
304-461	Electric Machinery
304-462B	Electromechanical Energy Conversion
304-526B	Artificial Intelligence

Mechanical Engineering

305-409B	Numerical Methods in Mech. Eng.
305-471A	Industrial Engineering
305-472A	Case Studies in Project Mgmt
305-474B	Operations Research
305-522B	Production Systems
305-554A	Microprocessors for Mech. Sys.
305-577A	Optimum Design

Metallurgical Engineering

306-250A	Introduction to Extraction Metallurgy
306-311T	Modelling and Automatic Control
306-317A	Materials Characterization
306-341B	Introduction to Mineral Processing
306-362A	Engineering Materials
306-367B	Electronic Properties of Materials
306-412C	Corrosion and Degradation
306-555A	Thermal Remediation of Wastes
306-560B	Joining Processing

Mining Engineering

306-200A,B	Mining Technology
306-320B	Extraction of Energy Resources
306-322B	Rock Fragmentation
306-323B	Rock/Soil Mass Characterization
306-325A	Mineral Industry Economics
306-333B	Materials Handling
306-420B	Feasibility Study

Urban Planning

409-501A,B	Principles and Practice of Planning I
409-505B	Geographic Information Systems
409-612A	History and Theory of Planning
409-614B	Urban Environmental Planning
409-619B	Transport and Land Development
409-621B	Theories of Urban Form

