

# MECHANICAL ENGINEERING/ RED RIVER COLLEGE POLYTECHNIC ARTICULATION AGREEMENT

## Mechanical Engineering/Red River College Polytechnic Articulation Agreement

Students must complete the courses of the Preliminary Engineering Program and Mechanical Engineering Department Program.

### Degree Requirements

#### Preliminary Engineering Program

The Preliminary Engineering Program is common to all programs in engineering. A student must complete the following list of 13 courses as part of their engineering program in order to graduate with a B.Sc. degree in engineering.

Course	Title	Hours
CHEM 1100	Introductory Chemistry 1: Atomic and Molecular Structure and Energetics <sup>1</sup>	3
CHEM 1122	Introduction to Chemistry Techniques for Engineering 1 <sup>1</sup>	1.5
COMP 1012	Computer Programming for Scientists and Engineers	3
ENG 1430	Design in Engineering	3
ENG 1440	Introduction to Statics <sup>RRC1</sup>	3
ENG 1450	Introduction to Electrical and Computer Engineering <sup>RRC2</sup>	3
ENG 1460	Introduction to Thermal Sciences <sup>RRC3</sup>	3
MATH 1210	Techniques of Classical and Linear Algebra <sup>2</sup>	3
MATH 1510	Applied Calculus 1 <sup>3</sup>	3
MATH 1710	Applied Calculus 2 <sup>3</sup>	3
PHIL 1290	Critical Thinking <sup>4</sup>	3
PHYS 1050	Physics 1: Mechanics	3
Written English Course <sup>5,6</sup>		3

<sup>1</sup> The former CHEM 1300 may be used in lieu of the combination of CHEM 1100 and CHEM 1122.

<sup>2</sup> MATH 1300 is not an acceptable equivalent to MATH 1210.

<sup>3</sup> Students intending to obtain a degree in Engineering are strongly advised to complete MATH 1510 and MATH 1710. However, MATH 1500 or MATH 1230 may be taken in lieu of MATH 1510; MATH 1700 or MATH 1232 may be taken in lieu of MATH 1710. MATH 1524 is not an acceptable equivalent to MATH 1510.

<sup>4</sup> PHIL 1290 is the recommended complementary studies elective. Students may; however, select any course from the Faculties of Arts or Management (Asper School of Business) at the 1000 level or above, except for ARTS 1110.

<sup>5</sup> Course selected from the list of approved Written English Courses for Engineering students.

<sup>6</sup> Three credit hours are required to satisfy the Written English course requirement. Should a student complete a six credit hour course,

the additional three credit hours may be used to satisfy general complementary studies requirements within the student's program.

<sup>7</sup> Equivalent courses offered through Université de Saint-Boniface may be used to satisfy program requirements.

<sup>RRC1</sup> Polytech Equivalent Course: ENGI 1043

<sup>RRC2</sup> Polytech Equivalent Course: ELEC 1061 and ENGI 1076 and ENGI 1048

<sup>RRC3</sup> Polytech Equivalent Course: ENGI 1159

### English and Mathematics Requirements

All students are required to complete the University written English and mathematics requirement within the first 60 credit hours of their program. The requirement is described in the chapter General Academic Regulations and Requirements of this Calendar. In the Engineering programs the mathematics requirement is satisfied by one of MATH 1510 or MATH 1710 (or an equivalent); the written English requirement is satisfied by completing a course selected from the list of approved Written English Courses for Engineering Students listed below.

Note that courses transferred from other institutions are evaluated for content, but are not assessed for the written English requirement unless the student explicitly requests such an assessment. Therefore, students wishing to transfer a course from another institution which may be considered equivalent to a course on the list of Written English Courses for Engineering Students should request that the transfer be assessed as meeting the written English requirement. If the assessed course is found not to meet the requirement, the student will be compelled to complete another course from the list.

### Written English Courses for Engineering Students

Course	Title	Hours
ASIA 1420	Asian Civilizations to 1500 (B)	3
ASIA 1430	Asian Civilization from 1500 (B)	3
CATH 1190	Introduction to Catholic Studies	3
ENGL 1200	Representative Literary Works	6
ENGL 1300	Literature since 1900	6
ENGL 1340	Introduction to Literary Analysis	3
ENGL 1400	Thematic Approaches to the Study of Literature	3
GPE 2700	Perspectives on Global Political Economy	3
GRMN 1300	Masterpieces of German Literature in English Translation (C)	3
GRMN 1310	Love in German Culture in English Translation (C)	3
Any 1000 level HIST course <sup>1</sup>		3-6
Any 2000 level HIST course <sup>1</sup>		3-6
INDG 2020	The Métis in Canada	3
POL 1900	Love, Heroes and Patriotism in Contemporary Poland	3
POL 2600	Polish Culture until 1918	3
POL 2610	Polish Culture 1918 to the Present	3
POLS 1502	Introduction to Political Studies <sup>2</sup>	3
RLGN 1440	Evil in World Religions	3
RLGN 2036	Introduction to Christianity	3
RLGN 2140	Introduction to Judaism	3
RLGN 2160	Hebrew Bible (Tanakh/"Old Testament")	3
RLGN 2170	Introduction to the New Testament	3
RLGN 2222	The Supernatural in Popular Culture	3
RLGN 2590	Religion and Social Issues	3

RLGN 2590	Religion and Social Issues	3	MECH 3992	Mechanical Laboratories in Thermofluids	2
RUSN 1400	Masterpieces of Russian Literature in Translation	3	MECH 4860	Engineering Design	5
RUSN 2280	Russian Culture until 1900	3	PHYS 1070	Physics 2: Waves and Modern Physics	3
RUSN 2290	Russian Culture from 1900 to the Present	3	STAT 2220	Contemporary Statistics for Engineers	3
RUSN 2310	Exploring Russia through Film	3	Five Technical Electives (TE) <sup>1,2</sup>		20-22
UKRN 2200	Ukrainian Myth, Rites and Rituals	3	One Course from the list of Indigenous Knowledge Courses <sup>3</sup>		3
UKRN 2410	Ukrainian Canadian Cultural Experience	3	<b>Total Hours</b>		<b>163-165</b>
UKRN 2590	Ukrainian Literature and Film	3	Note: The former CHEM 1310 may be used in lieu of the combination of CHEM 1110 and CHEM 1126.		
UKRN 2770	Ukrainian Culture until 1900	3	<b>Indigenous Knowledge Courses<sup>4</sup></b>		
UKRN 2820	Holodomor and Holocaust in Ukrainian Literature and Culture	3	<b>Course</b>	<b>Title</b>	<b>Hours</b>
WOMN 1500	Introduction to Women's and Gender Studies in the Humanities	3	INDG 1200	Indigenous Peoples in Canada	6
WOMN 1600	Introduction to Women's and Gender Studies in the Social Sciences	3	INDG 1220	Indigenous Peoples in Canada, Part 1	3
WOMN 2560	Women, Science and Technology	3	INDG 1240	Indigenous Peoples in Canada, Part 2	3
			INDG 2012	Indigenous History in Canada	6
			or HIST 2010	Indigenous History in Canada (C)	
			INDG 2020	The Métis in Canada	3
			or INDG 2020	The Métis in Canada	
			POLS 2802	Introduction to Indigenous Politics	3

<sup>1</sup> Unallocated credits may not be used.<sup>2</sup> This course requires a laboratory.

## Mechanical Engineering Department Program

Course	Title	Hours
Students must complete the Preliminary Engineering Program requirements for graduation		37.5
CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties	3
CHEM 1126	Introduction to Chemistry Techniques for Engineering 2	1.5
ENG 2040	Engineering Communication: Strategies, Practice and Design	3
ENG 3000	Engineering Economics	3
ENG 3020	Technology, Society and the Future	3
ECE 3010	Elements of Electric Machines and Digital Systems	4
MATH 2130	Engineering Mathematical Analysis 1	3
MATH 2132	Engineering Mathematical Analysis 2	3
MATH 3132	Engineering Mathematical Analysis 3	3
MECH 2112	Fundamentals of Mechanical and Computer Aided Design	5
MECH 2150	Mechanical Engineering Modelling and Numerical Methods	4
MECH 2202	Thermodynamics	4
MECH 2222	Mechanics of Materials	4
MECH 2262	Fundamentals of Fluid Mechanics	4
MECH 2272	Engineering Materials 1	4
MECH 3170	Project Management	4
MECH 3420	Vibrations and Acoustics	4
MECH 3430	Measurements and Control	4
MECH 3460	Heat Transfer	4
MECH 3482	Kinematics and Dynamics	4
MECH 3492	Fluid Mechanics and Applications	4
MECH 3502	Stress Analysis and Design	4
MECH 3542	Engineering Materials 2	4
MECH 3652	Machine Design	4
MECH 3982	Mechanical Laboratories in Solid Mechanics	2

<sup>1</sup> A minimum of 20 credit hours of technical electives is required with 18 hours required if completing MECH 4162 (5 courses at 4 credit hours each or 3 courses at 4 credit hours each plus MECH 4162 at 6 credit hours).<sup>2</sup> For courses continuing through both terms, credit is given on completion of course.<sup>3</sup> A complementary studies course is any course from the Faculty of Arts or the Faculty of Management at the 1000 level or above, with the exception of ARTS 1110 Introduction to the University which may not be used for credit in the Faculty of Engineering.<sup>4</sup> Student must select one course from the list of Indigenous Knowledge Courses.

RRCC Polytech Equivalent Course: COMM 1234 and ENGI 1051.

RRCC Polytech Equivalent Course: COMP 1153 (course must be taught by a registered professional engineer at RRC Polytech in order to receive transfer credit).

RRCC Polytech Equivalent Course: ENGI 1152 (course must be taught by a registered professional engineer at RRC Polytech in order to receive transfer credit).

RRCC Polytech Equivalent Course: ENGI 1037 (course must be taught by a registered professional engineer at RRC Polytech in order to receive transfer credit).

RRCC Polytech Equivalent Course: ENGI 1046 and ENGI 1101 (course must be taught by a registered professional engineer at RRC Polytech in order to receive transfer credit).

RRCC Polytech Equivalent Course: MATH 1017.

## Concentrations

### Aerospace Option

Complete all 3 TEs in List A. Choose the remaining two TEs from List B. Some courses in List B will be offered in alternating years.

**List A**

Course	Title	Hours
MECH 3520	Aerodynamics	4
MECH 4182	Aerospace Structures: Analysis and Design	4
MECH 4192	Aerospace Materials and Manufacturing Processes	4

**List B**

Course	Title	Hours
MECH 4200	Gas Turbine Propulsion Systems	4
MECH 4452	Aircraft Performance, Dynamics and Design	4
MECH 3582	Manufacturing Planning and Quality Control	4
MECH 4482	Applied Aerospace Instrumentation	4
MECH 4432	Systems Engineering	4
ENG 4110	Operational Excellence	4

**Aerospace Stream**

Choose 3 TEs from the following 5 courses. Choose the remaining two TEs from the same stream, other TEs, or thesis. Some courses will be offered in alternating years.

Course	Title	Hours
MECH 3520	Aerodynamics	4
MECH 4182	Aerospace Structures: Analysis and Design	4
MECH 4192	Aerospace Materials and Manufacturing Processes	4
MECH 4200	Gas Turbine Propulsion Systems	4
MECH 4452	Aircraft Performance, Dynamics and Design	4

**Manufacturing Stream**

Choose three (3) technical electives from the following courses. Some courses may be offered in alternate years.

Course	Title	Hours
MECH 3550	Robotics and Computer Numerical Control	4
MECH 3570	Manufacturing Automation	4
MECH 3582	Manufacturing Planning and Quality Control	4
MECH 3592	Simulation Modeling and Facility Planning	4
MECH 4192	Aerospace Materials and Manufacturing Processes	4
MECH 4330	Contemporary Topics in Manufacturing Engineering I	4
MECH 4342	Contemporary Topics in Manufacturing Engineering II	4

**Materials Stream**

Choose 3 from the following 5 courses. Choose the remaining two TEs from the same stream, other TEs, or thesis. Some courses will be offered in alternating years.

Course	Title	Hours
MECH 4192	Aerospace Materials and Manufacturing Processes	4
MECH 4350	Topics in Engineering Material 1	4
MECH 4360	Topics in Engineering Materials 2	4

MECH 4620	Corrosion of Metals and Alloys	4
MECH 4870	Fracture and Failure of Engineering Materials	4

**Solid Mechanics Stream**

Choose 3 from the following 6 courses. Choose the remaining two TEs from the same stream, other TEs, or thesis. Some courses will be offered in alternating years.

Course	Title	Hours
MECH 4182	Aerospace Structures: Analysis and Design	4
MECH 4472	Mechanical Vibration	4
MECH 4510	Fundamentals of Finite Element Analysis	4
MECH 4532	Advanced Strength of Materials	4
MECH 4550	Noise Control	4
MECH 4672	Advanced Mechanism Design	4

**Thermofluids Stream**

Choose 3 from the following 8 courses. Choose the remaining two TEs from the same stream, other TEs, or thesis. Some courses will be offered in alternating years.

Course	Title	Hours
MECH 4292	IC Engines	4
MECH 4412	Heating, Ventilation and Air Conditioning	4
MECH 4560	Selected Topics in Fluid Mechanics 4M	4
MECH 4680	Energy Conservation and Utilization	4
MECH 4692	Renewable Energy	4
MECH 4694	Advanced Topics in Heat Transfer	4
MECH 4702	Design of Thermal Systems	4
MECH 4822	Numerical Heat Transfer in Fluid Flow	4

**Technical Electives in Mechanical Engineering <sup>1</sup>**

Course	Title	Hours
MECH 3520	Aerodynamics	4
MECH 3550	Robotics and Computer Numerical Control	4
MECH 3562	Introduction to Optimization	4
MECH 3570	Manufacturing Automation	4
MECH 3582	Manufacturing Planning and Quality Control	4
MECH 3592	Simulation Modeling and Facility Planning	4
MECH 4162	Thesis <sup>2</sup>	6
MECH 4182	Aerospace Structures: Analysis and Design	4
MECH 4192	Aerospace Materials and Manufacturing Processes	4
MECH 4200	Gas Turbine Propulsion Systems	4
MECH 4240	Course no longer offered	4
MECH 4292	IC Engines	4
MECH 4310	Contemporary Topics in Mechanical Engineering I	4
MECH 4322	Contemporary Topics in Mechanical Engineering II	4
MECH 4330	Contemporary Topics in Manufacturing Engineering I	4
MECH 4342	Contemporary Topics in Manufacturing Engineering II	4
MECH 4350	Topics in Engineering Material 1	4
MECH 4360	Topics in Engineering Materials 2	4
MECH 4412	Heating, Ventilation and Air Conditioning	4

MECH 4432	Systems Engineering	4
MECH 4452	Aircraft Performance, Dynamics and Design	4
MECH 4472	Mechanical Vibration	4
MECH 4482	Applied Aerospace Instrumentation	4
MECH 4510	Fundamentals of Finite Element Analysis	4
MECH 4532	Advanced Strength of Materials	4
MECH 4542	Principles of Turbomachinery	4
MECH 4550	Noise Control	4
MECH 4560	Selected Topics in Fluid Mechanics 4M	4
MECH 4582	Vehicle Testing, Condition Monitoring, and Fault Analysis	4
MECH 4620	Corrosion of Metals and Alloys	4
MECH 4672	Advanced Mechanism Design	4
MECH 4680	Energy Conservation and Utilization	4
MECH 4692	Renewable Energy	4
MECH 4694	Advanced Topics in Heat Transfer	4
MECH 4702	Design of Thermal Systems	4
MECH 4812	Automotive Engineering	4
MECH 4822	Numerical Heat Transfer in Fluid Flow	4
MECH 4832	Biomaterials in Biomedical Engineering	4
MECH 4870	Fracture and Failure of Engineering Materials	4
MECH 4900	Mechatronics System Design	4

<sup>1</sup> The Department of Mechanical Engineering may not be able to offer all technical electives listed above. Students are urged to consult the Mechanical Engineering office for a current list of technical electives.

<sup>2</sup> Students must be in their graduating year to register for MECH 4162.

<sup>3</sup> Students may NOT use the same technical elective to count toward multiple streams.

## Preliminary Engineering Program

**Campus Address/General Office:** E2-262 EITC

**Telephone:** (204) 474 9807

**Email Address:** eng\_info@umanitoba.ca

**Website:** umanitoba.ca/engineering (<https://umanitoba.ca/engineering/>)

The Preliminary Engineering Program is common to all programs in engineering. Students must complete a minimum of eight (**excluding CHEM 1122**) to be eligible to apply to one of the five degree granting engineering programs. A student must complete the following list of 13 courses as part of their engineering program in order to graduate with a BSc degree in engineering.

Course	Title	Hours
CHEM 1100	Introductory Chemistry 1: Atomic and Molecular Structure and Energetics <sup>1</sup>	3
CHEM 1122	Introduction to Chemistry Techniques for Engineering 1 <sup>1</sup>	1.5
COMP 1012	Computer Programming for Scientists and Engineers	3
ENG 1430	Design in Engineering	3
ENG 1440	Introduction to Statics	3
ENG 1450	Introduction to Electrical and Computer Engineering	3
ENG 1460	Introduction to Thermal Sciences	3
MATH 1210	Techniques of Classical and Linear Algebra <sup>2</sup>	3

MATH 1510	Applied Calculus 1 <sup>3</sup>	3
MATH 1710	Applied Calculus 2 <sup>3</sup>	3
PHIL 1290	Critical Thinking <sup>4</sup>	3
PHYS 1050	Physics 1: Mechanics	3
Written English Course <sup>5,6</sup>		3
<b>Total Hours</b>		<b>37.5</b>

<sup>1</sup> The former CHEM 1300 may be used in lieu of the combination of CHEM 1100 and CHEM 1122.

<sup>2</sup> MATH 1300 is not an acceptable equivalent to MATH 1210.

<sup>3</sup> Students intending to obtain a degree in Engineering are strongly advised to complete MATH 1510 and MATH 1710. However, MATH 1500 or MATH 1230 may be taken in lieu of MATH 1510; MATH 1700 or MATH 1232 may be taken in lieu of MATH 1710. MATH 1524 is not an acceptable equivalent to MATH 1510.

<sup>4</sup> PHIL 1290 is the recommended complementary studies elective. Students may; however, select any course from the Faculties of Arts or Management (Asper School of Business) at the 1000 level or above, except for ARTS 1110.

<sup>5</sup> Course selected from the list of approved Written English Courses for Engineering students.

<sup>6</sup> Three credit hours are required to satisfy the Written English course requirement. Should a student complete a six credit hour course, the additional three credit hours may be used to satisfy general complementary studies requirements within a student's program.

<sup>7</sup> Equivalent courses offered through Université de Saint-Boniface may be used to satisfy program requirements.

## Faculty Academic Regulations

### Admission to the Price Faculty of Engineering

The following is a summary of the admission requirements. Equivalent academic courses completed at recognized universities elsewhere will be considered. All admission requirements, as well as application deadline dates and forms, are included in an applicant information bulletin that is available from the Admissions Office, Enrolment Services, 424 University Centre; this information is also posted on the university's website (<https://umanitoba.ca/admissions/>).

### Direct Admission into the Price Faculty of Engineering from High School

Applicants may apply directly to the Preliminary Engineering Program from a Manitoba high school (or the equivalent) and must meet the General Entrance and Specific Admission Requirements for the Price Faculty of Engineering. The General Admission Requirement is a Manitoba (or equivalent) high school graduation. The Specific Admission Requirements is a minimum 80% average over the following four subjects, with no less than 70% in each course: Chemistry 40S, Precalculus Mathematics 40S, Physics 40S, and English 40S. In cases where the number of eligible applicants exceeds the available spaces, applicants will require higher averages than stipulated to be successful in the admissions competition.

Please see the website ([https://umanitoba.ca/student/admissions/media/direct\\_entry\\_bulletin.pdf](https://umanitoba.ca/student/admissions/media/direct_entry_bulletin.pdf)) for more detailed information.

### All Other Admissions

A minimum of 8 of the 12 courses in the Preliminary Engineering Program (<https://catalog.umanitoba.ca/undergraduate-studies/engineering/preliminary-engineering-program/>), each with a minimum grade of "C", and a minimum Adjusted Grade Point Average (AGPA) of 2.0. In addition,



if the total number of credit hours attempted by the student in all courses that apply in the Price Faculty of Engineering meets or exceeds 72, then the ratio of those credit hours passed (from all courses with a grade of "C" or better that are applicable to the student's potential Engineering program) to total credit hours attempted must be greater than or equal to 75%. Furthermore, if the student has attempted less than 72 credit hours, the total number of failed credit hours (from all courses with a grade of "D" or "F" that are applicable to the student's potential Engineering program) must not exceed 18 credit hours in order to be eligible to be considered for admission.

Acceptance to Engineering programs is competitive. Courses must be completed within ten years of the application date in order to be considered for transfer credit.

### English and Mathematics Requirements

All students are required to complete the University written English and mathematics requirement within the first 60 credit hours of their program. The requirement is described in the chapter General Academic Regulations and Requirements of this Calendar. In the Engineering programs the mathematics requirement is satisfied by one of MATH 1510 or MATH 1710 (or an equivalent); the written English requirement is satisfied by completing a course selected from the list of approved Written English Courses for Engineering Students listed below.

Note that courses transferred from other institutions are evaluated for content, but are not assessed for the written English requirement unless the student explicitly requests such an assessment. Therefore, students wishing to transfer a course from another institution which may be considered equivalent to a course on the list of Written English Courses for Engineering Students should request that the transfer be assessed as meeting the written English requirement. If the assessed course is found not to meet the requirement, the student will be compelled to complete another course from the list.

### Written English Courses for Engineering Students

Course	Title	Hours
ASIA 1420	Asian Civilizations to 1500 (B)	3
ASIA 1430	Asian Civilization from 1500 (B)	3
CATH 1190	Introduction to Catholic Studies	3
ENGL 1200	Representative Literary Works	6
ENGL 1300	Literature since 1900	6
ENGL 1340	Introduction to Literary Analysis	3
ENGL 1400	Thematic Approaches to the Study of Literature	3
GPE 2700	Perspectives on Global Political Economy	3
GRMN 1300	Masterpieces of German Literature in English Translation (C)	3
GRMN 1310	Love in German Culture in English Translation (C)	3
Any 1000 level HIST course <sup>1</sup>		3-6
Any 2000 level HIST course <sup>1</sup>		3-6
INDG 2020	The Métis in Canada	3
POL 1900	Love, Heroes and Patriotism in Contemporary Poland	3
POL 2600	Polish Culture until 1918	3
POL 2610	Polish Culture 1918 to the Present	3
POLS 1502	Introduction to Political Studies <sup>2</sup>	3
RLGN 1440	Evil in World Religions	3
RLGN 2036	Introduction to Christianity	3

RLGN 2140	Introduction to Judaism	3
RLGN 2160	Hebrew Bible (Tanakh/"Old Testament")	3
RLGN 2170	Introduction to the New Testament	3
RLGN 2222	The Supernatural in Popular Culture	3
RLGN 2590	Religion and Social Issues	3
RUSN 1400	Masterpieces of Russian Literature in Translation	3
RUSN 2280	Russian Culture until 1900	3
RUSN 2290	Russian Culture from 1900 to the Present	3
RUSN 2310	Exploring Russia through Film	3
UKRN 2200	Ukrainian Myth, Rites and Rituals	3
UKRN 2410	Ukrainian Canadian Cultural Experience	3
UKRN 2590	Ukrainian Literature and Film	3
UKRN 2770	Ukrainian Culture until 1900	3
UKRN 2780	Ukrainian Culture from 1900 to the Present	3
UKRN 2820	Holodomor and Holocaust in Ukrainian Literature and Culture	3
WOMN 1500	Introduction to Women's and Gender Studies in the Humanities	3
WOMN 1600	Introduction to Women's and Gender Studies in the Social Sciences	3
WOMN 2560	Women, Science and Technology	3

<sup>1</sup> Unallocated credits may not be used

<sup>2</sup> This course requires a laboratory

### Academic Regulations

The provisions of the, General Academic Regulations (<https://catalog.umanitoba.ca/undergraduate-studies/general-academic-regulations/>), and the, University Policies and Procedures, (<https://catalog.umanitoba.ca/undergraduate-studies/policies-procedures/>) apply to all students. In addition, the Price Faculty of Engineering has regulations and requirements, published below, which apply specifically to its students. Notwithstanding the regulations given in this section, the Faculty Council of Engineering reserves the right to rule on individual cases in exceptional circumstances.

**Limited Access will not affect registration for the current Academic Year, which includes Fall, Winter, and Summer terms. See University Policy and Procedures – Repeat Course Policy – Section 2.5 (a) Limited Access (<https://catalog.umanitoba.ca/undergraduate-studies/policies-procedures/repeated-course-policy/>).**

### Appeals

Students who feel that they have received unfair treatment in a course should appeal to the instructor. If the matter is not thereby resolved, it should be raised with the Department Head and subsequently the Associate Dean (Undergraduate Programs).

A student's academic status is based on academic performance. Students who feel that there are circumstances that have affected their academic performance should write to the Associate Dean (Undergraduate Programs), Chair of the Committee on Standing and Appeals, E1-262 EITC. Information regarding this process is available from the Undergraduate Student Services Office, E1-262 EITC and may be viewed through web site (<https://umanitoba.ca/engineering/student-experience/>).

## Attendance and Approved Leaves

### Attendance and Participation in Courses

Regular attendance and participation is expected of all students in all courses. Excused absences for medical or compassionate reasons must follow the UM policies. When the number of unexcused absences and/or incomplete coursework in any course exceeds 10 percent, the instructor shall report the case to the Department Head. If a student's attendance or work continues to be unsatisfactory, the case will be referred to the Associate Dean Undergraduate Programs who may initiate debarment of the student. Students who are debarred for inadequate attendance and participation prior to the VW deadline can choose to VW the course. Students who are debarred after the VW deadline will receive a failing grade.

### Leaves of Absence

Students may choose not to register for courses in any term at their own discretion. However, doing so will not extend a student's time to completion as set out in Requirements for the Bachelor's Degree (p. 8).

In exceptional cases, students may make a written application to the Associate Dean (Undergraduate Programs) for a Leave of Absence from their studies when significant circumstances (i.e. parental, medical or compassionate) affect their ability to continue in their program. Supporting documentation may be required. Leaves of absence must correspond with the start and end of (an) academic term(s) for a period of time normally not to exceed one (1) year. The limit on a student's time to complete their Engineering program, as set out in Requirements for the Bachelor's Degree (p. 8), will be extended by the duration of the approved Leave of Absence.

For situations affecting a student's ability to complete courses already in progress, see Withdrawal from Courses (p. 9).

Notwithstanding a Leave of Absence, student may choose not to register for courses in any term at their own discretion. However, doing so *will not* extend a student's time to completion as set out in Requirements for the Bachelor's Degree (p. 8)..

## Categories of Students

A student shall normally register for three to six courses in a term. Registration for more than six or fewer than three courses in a term must be approved by the Department Head or, in the preliminary program, by the Associate Dean (Undergraduate Programs). Students must also receive approval for registration in courses that are not part of the regular degree program.

All undergraduate programs offered by the Price Faculty of Engineering are full-time programs. Engineering considers registration in 15 credit hours per term to be a full course load. Full-time status is defined as being registered in at least 60 percent of this load, or 9 credit hours per term. Scholarships and other awards may require registration in more than this minimum.

## Complementary Studies Electives

Complementary studies electives are an integral part of the curriculum. Their purpose is to broaden the student's experience beyond the purely scientific and technical content of engineering. They include studies in engineering economics and the impact of technology on society, as well as the central issues, methodologies and thought processes characteristic of the humanities and social sciences. Opportunities for development of the student's oral and written communication skills are also provided. The complementary studies elective requirements may vary from one program to another. Course numbers beginning with a

0 (i.e. ENGL 0930) are not allowed as complementary studies electives and ARTS 1110 cannot not be used for credit in the Price Faculty of Engineering.

## Procedure Regarding the Inclusion of Elective Courses Taken Towards a Student's Degree Requirements

### Upon Admission Into Engineering

At the time of admission, students may choose to apply (transfer) some or all eligible non-Engineering elective courses (i.e., complementary studies electives, science electives, free electives) taken prior to their admission to the Faculty towards their current Engineering degree program. All attempts for those selected courses shall be applied to the student's degree program and included in the calculation of Degree Grade Point Average (DGPA).

### After Admission Into Engineering

Grades for all eligible courses (i.e., technical electives, complementary studies electives, science electives, free electives) attempted following admission to Engineering shall be included in and applied to a student's current degree program.

Special cases for either circumstance may be considered at the discretion of the Price Faculty of Engineering Associate Dean (Undergraduate Programs).

## Course Selection

When arranging a program of study, a student must satisfy the following requirements:

1. All prerequisite and corequisite course requirements must be met.
2. All previously failed compulsory courses must be repeated. Students repeating a course previously taken are subject to Limited Access. Limited Access information may be viewed on the Registrar's Office web site (<https://umanitoba.ca/registrar/registrar/>).
3. Students are not normally allowed to repeat courses graded "C" or higher, except under special circumstances with the approval of the Department Head, or for students in the Preliminary Engineering Program, of the Associate Dean (Undergraduate Programs).
4. Failed elective courses may be repeated or replaced with alternative elective courses, however, all attempts will be included in the degree grade point average calculation.

**Prerequisite Course:** A prerequisite course must have been completed with a "C" grade or better before a subsequent course can be attempted. Under exceptional circumstances, a course instructor may waive, subject to approval by the Department Head (or designate), a prerequisite requirement.

**Corequisite Course:** A corequisite course must be taken concurrently or before its companion course. Under exceptional circumstances, a course instructor may waive, subject to approval by the Department Head (or designate), a corequisite requirement.

## Examinations

### Deferred Examinations

If you miss a final examination for medical or compassionate reasons, you may be granted a deferred examination. Applications for a deferred examination after the examination has been missed must be filed within 48 hours of the date of the missed examination. A medical certificate or other appropriate documentation may be required.

(Please refer to the General Academic Regulations-Deferred Examinations (<https://catalog.umanitoba.ca/undergraduate-studies/general-academic-regulations/#Deferred-Exams>) for more information)

Deferred Examinations are normally scheduled to take place within 30 working days from the end of the examination series from which the examination was deferred. The date of the deferred examination for a particular course will be set by the Dean's Office **no later than January 15, May 15 or Sept 15 and in consultation with the instructor.**

### Supplemental Examinations

A student who has attempted to meet all requirements for the degree and has a single failure in an Engineering course taken in their final academic year may apply for a supplemental examination in that course. Supplemental examinations may not be requested for any other reason. A student shall only be permitted to exercise the privilege of writing a supplemental examination once in their degree program.

The grade for a course in which a supplemental examination is written shall be calculated in the following manner, with the grade reported being the greater of these two calculations:

1. The supplemental examination shall have the same percentage weighting as the original examination;
2. The supplemental examination shall have the percentage weighting equal to the combined weight of the original examination and all term tests.

Both the original course grade and the supplemental examination course grade are retained on the student's record, and both are used in the calculation of TGPA and DGPA.

In the event that the supplemental examination is not successfully passed, the course must be repeated again in a subsequent term.

The supplemental examination privileges apply only to courses offered by the Price Faculty of Engineering.

### Challenge for Credit

Courses offered in Engineering may not be challenged for credit.

### Grading and Assessment

All grades awarded by instructors for undergraduate courses offered in the Price Faculty of Engineering are reviewed by examiners' boards, which comprise all of the instructors in the student's program year. After approval by department councils, grades are presented to the Faculty Council of Engineering for acceptance. Grades are published subsequent to their approval by the Faculty Council of Engineering.

Following are the descriptions of grade point averages used for evaluation **at end of** each of the terms (Fall, Winter, **and** Summer):

### Term Grade Point Average (TGPA)

The Term Grade Point Average (TGPA) is computed from all of the final grades in all undergraduate courses completed during a given academic term.

### Degree Grade Point Average (DGPA)

The Degree Grade Point Average (DGPA) is computed from the final grades obtained in all courses attempted, including applicable courses transferred from other faculties and other institutions, as part of a student's current degree program. Where a course has been repeated or replaced by an approved substitution or equivalent course, all attempts shall be included in the computation.

### Cumulative Grade Point Average (CGPA)

The Cumulative Grade Point Average (CGPA) is computed from the final grades in all undergraduate courses attempted at the University of Manitoba and courses transferred from other faculties and other institutions.

### Dean's Honour List

A continuing student who achieves a Term Grade Point Average (TGPA) of 3.50 or higher in their most recent academic term will be placed on the Dean's Honour List. The assessment is based on a minimum of 12 credit hours completed in that term. In addition, a graduating student who achieves a Degree Grade Point Average (DGPA) of 3.5 or higher in their final academic evaluation will graduate on the Dean's Honour List and receive a notation indicating this on their final term transcript.

### Awards

A number of scholarships, bursaries and other academic awards are available to Engineering students. For information concerning awards (prizes, scholarships, and bursaries), please visit the Faculty web site (<https://umanitoba.ca/engineering/student-experience/scholarships-and-awards/>).

### Minors in Engineering

In meeting the specific requirements for any minors available to Engineering students, no more than 50% of the credit hours required for a minor may be common with those forming part of a student's regular Engineering program. Normal pre-requisites and class size restriction apply to courses taken towards minors.

### Arts Minor

A Minor in Arts is available to Engineering students. The minor consists of 18 credit hours of Arts courses, including a minimum of 6 credit hours in the Humanities and 6 credit hours in the Social Sciences; students must meet all pre-requisite requirements and all courses must be at the 1000 level or higher. ARTS 1110 may not be included in the minor. Depending on the approval of the Engineering department, courses used for the minor may also be used to fulfill program requirements in Engineering.

### Computer Science Minor

A Minor in Computer Science is available to Engineering students. The minimum requirement is 18 credit hours of computer science courses subject to the following constraints:

1. Courses COMP 1012, COMP 1020, and COMP 2140 are compulsory;
2. Nine (9) additional credit hours of COMP courses at the 2000 level or above; and
3. registration in computer science courses will be controlled by normal pre-requisites and class size restrictions.

### Earth Sciences Minor

The Minor in Earth Sciences includes the following set of courses:

1. GEOL 1340;
2. One of the following three courses: GEOL 1400, GEOL 1410 or GEOL 1420;
3. Twelve (12) credit hours of 2000-level or above courses in Earth Sciences

### Leadership for Business and Organizations Minor

The minor in Leadership for Business and Organizations offered by the Faculty of Management is available to Engineering students. The minor consists of 18 credit hours of approved coursework. Please see the

Leadership for Business and Organizations Minor for Non-Business Students under Faculty of Management/I.H. Asper School of Business.

### Management Minor

The Minor in Management offered by the Faculty of Management is available to Engineering students. The minor consists of any 18 credit hours of Management courses; students must meet all prerequisite requirements. Depending on the approval of the Engineering department, courses used for the minor may also be used to fulfill program requirements in Engineering. Admission requirements for the minor are based on all courses transferred to Engineering or completed while in Engineering; the requirements are a minimum of 30 credit hours applied to their degrees with a minimum Degree Grade Point Average (DGPA) of 3.00. Up to 10 spaces are available each year for engineering students on a competitive basis. Applications can be made in the Engineering Dean's office by May 30th. Students not granted a reserve space in the minor, but who have successfully completed 18 credit hours of Management courses at the time of graduation, will qualify for the Management Minor.

#### Notes:

1. Civil Engineering students only may use CIVL 2780 for credit towards the Management Minor in Engineering.
2. Mechanical Engineering students only may use MECH 3170 for credit towards the Management Minor in Engineering.

### Mathematics Minor

A Minor in Mathematics is available to Engineering students. The minimum requirement is 24 credit hours of mathematics courses subject to the following constraints:

1. the students must notify their home department that they are pursuing the minor;
2. up to 12 credit hours of mathematics courses in a student's engineering program may be counted toward the minor;
3. the student must complete at least 6 credit hours of courses from the mathematics department at the 3000 level or higher that are not included as part of the curriculum in the student's engineering program; and
4. approval of the Department of Mathematics is required for courses outside of the regular engineering program.

### Music Minor

The Minor in Music requires 18 credit hours of MUSC courses and students are subject to the regulations set by the Marcel A. Desautels Faculty of Music. Please see Music Minors (<https://catalog.umanitoba.ca/undergraduate-studies/music/music-minor-students-other-faculties/>) for students in the Price Faculty of Engineering, Faculty of Arts and Faculty of Science under the Marcel A. Desautels Faculty of Music.

### Recreation Studies Minor

The Minor in Recreation Studies requires 18 credit hours of approved coursework. Students are subject to the regulations set by the Faculty of Kinesiology and Recreational Management. See Minor (<https://catalog.umanitoba.ca/undergraduate-studies/kinesiology-recreation-management/recreation-studies-minor/>) in for a list of course requirements.

### Professional Registration

In order to practice engineering in any province or territory in Canada, it is necessary to be a member of the professional engineering association of that province or territory. The requirements for membership are acceptable academic preparation and a subsequent period of acceptable

engineering experience gained under the supervision of a registered professional engineer. The undergraduate programs in Biosystems, Civil, Computer, Electrical, and Mechanical Engineering are accredited by the Canadian Engineering Accreditation Board (CEAB), reflecting acceptable academic preparation for membership in the association of professional engineers in any province or territory in Canada. Through a mutual recognition agreement, these programs are also recognized as satisfying accreditation requirements in many other countries such as the United States, the United Kingdom, Ireland, New Zealand, Australia, and Hong Kong.

Graduates of an accredited program are eligible to apply for membership as an engineering intern, in the association of professional engineers in their province of residence in Canada. After a period of acceptable experience, they are eligible to apply to the association for registration as a professional engineer in that province.

### Requirements for the Bachelor's Degree

The requirement for a Bachelor of Science degree in Engineering is a grade of "C" or better in all courses in the student's program. All students are governed by the rules in effect at the time of their first registration in Engineering.

A student must complete at least 50 per cent of an engineering degree program as a full-time student in the Price Faculty of Engineering. Unless otherwise approved by the Dean of Engineering, students must complete all degree requirements within seven calendar years after being accepted into an Engineering departmental program.

### Degree with Distinction

A student who on graduation achieves a Degree Grade Point Average (DGPA) of 3.80 or higher is awarded the degree "With Distinction."

### Criteria for Medal Awards

The Price Faculty of Engineering Program Medal shall be awarded to the graduating student in each engineering program who has achieved the highest Degree Grade Point Average (DGPA) (minimum of 3.80) with no distinction as to full- or part-time status. The Program Medal will be awarded at spring convocation to the student who has completed that program in the past academic year (including October and February graduands).

The University Gold Medal for the Price Faculty of Engineering shall be awarded to the graduating student in the Price Faculty of Engineering who has achieved the highest Degree Grade Point Average (DPGA) (minimum of 3.80) for the entire program with no distinction as to full- or part-time status.

### Student Progress and Academic Status

A student's academic status shall be evaluated at the conclusion of every academic term in which they receive a final grade in a minimum of 6 credit hours of course material, with the assessment being based on the resulting Term Grade Point Average (TGPA) in those courses.

Notwithstanding the above, students will become Ineligible to Proceed in Engineering if at any time the ratio of credit hours passed (from all courses with a grade of "C" or better that are applicable to the student's Engineering program) to total credit hours attempted for that student drops below 75% and the student has attempted a minimum of 72 credit hours.

The academic assessments are as follows:

#### Preliminary Program:



**Good Academic Standing**

A student with a TGPA of 2.00 or higher is in Good Academic Standing. This will be notated as "Faculty Minimum Met" or "Satisfactory" on the student academic transcript.

**Academic Warning**

The first time the student's TGPA drops below 2.00, they will receive an Academic Warning. Students who receive such a warning are required to meet with an academic advisor.

**Academic Probation**

The second time that a student's TGPA drops below 2.00, the student will be placed on Academic Probation. The student will be required to meet with an academic advisor who will assign remedial actions which may include but are not limited to follow-up meetings, participation in skill building workshops determined by the advisor such as study skills, time management, academic writing, test/exam preparation, career development and planning and/or referrals to student support resource units.

**Ineligible to Proceed in the Preliminary Program**

The third time that a student's TGPA drops below 2.00, the student will be Ineligible to Proceed in the Preliminary Engineering program.

**Departmental Programs and Post-baccalaureate Diploma Students:****Good Academic Standing**

A student with a TGPA of 2.00 or higher is in Good Academic Standing. This will be notated as "Faculty Minimum Met" or "Satisfactory" on the student academic transcript.

**Academic Probation**

The first time that a student's TGPA drops below 2.00, the student will be placed on Academic Probation. The student will be required to meet with an academic advisor who will assign remedial actions which may not include but are not limited to follow-up meetings, participation in skill building workshops determined by the advisor such as study skills, time management, academic writing, test/exam preparation, career development and planning and/or referrals to student support resource units.

**Required to Withdraw**

The second time that a student's TGPA drops below 2.00, the student will be Required to Withdraw. Students who receive such a suspension shall be ineligible to take courses offered by the Price Faculty of Engineering from the end of the term for which the suspension was issued through to the start of that same term in the subsequent academic year (normally, a period of 8 months.)

In order to be reinstated following the suspension period, the student must submit a written request for reinstatement to the Associate Dean (Undergraduate Programs). Applications must be received between 45-60 days in advance of the effective date of reinstatement; requests made earlier than 60 days in advance will not be accepted.

**Ineligible to Proceed in Engineering**

The third time that a student's TGPA drops below 2.00, the student will be Ineligible to Proceed in their Engineering program.

**Starting Afresh**

Students who have become Ineligible to Proceed in Engineering may apply to the Dean for permission to start their degree afresh, should they wish to return to the Price Faculty of Engineering. At the discretion of the Dean, a student may start afresh in an engineering program after a minimum period of two years from their last academic assessment by

the Price Faculty of Engineering, and may request to transfer up to 40 credit hours in which a minimum grade of "C+" was achieved. All previous courses will remain on the student's academic transcript, but will not be applied to their new program.

**Limit on Time in the Preliminary Engineering Program**

Students admitted to the Preliminary Engineering Program shall have two years to complete the minimum course requirements and submit an application for possible acceptance into an Engineering program. In the case of students admitted to the program through the Engineering Access Program the limit shall be three years.

Students who fail to meet this criterion shall be required to withdraw from Engineering. Such students may subsequently apply to an engineering program after successfully completing all courses forming the Preliminary Engineering Program.

**Students Applying to an Engineering Program**

Students will be accepted into department programs based on the following criteria. Students who have completed 8-12 Preliminary Engineering Program courses by May 1st of each academic year will be ranked and admitted on a competitive basis based on the average of the best eight marks in courses in the Preliminary Engineering Program.

Students applying from programs, faculties, colleges, or other institutions will have all courses or equivalent courses that are required in a particular engineering program transferred in, including failed grades ("D's" and "F's") in those courses. In addition, if the total number of credit hours attempted by the student in all courses that apply in the Price Faculty of Engineering meets or exceeds 72, then the ratio of those credit hours passed (from all courses with a grade of "C" or better that are applicable to the student's potential Engineering program) to total credit hours attempted must be greater than or equal to 75%. Furthermore, if the student has attempted less than 72 credit hours, the total number of failed credit hours (from all courses with a grade of "D" or "F" that are applicable to the student's potential Engineering program) must not exceed 18 credit hours in order to be eligible to be considered for admission. Students are advised to consult with the Engineering Undergraduate Student Affairs Office if there is concern as to their standing under this rule.

Direct entry engineering students must submit an application for admission through the on line process (<https://umanitoba.ca/explore/undergraduate-admissions/apply/>), indicating their program(s) of choice. The application fee for direct entry engineering students applying to an engineering program is waived. Students from University 1 and other faculties must apply for admission through the on line process (<https://umanitoba.ca/explore/undergraduate-admissions/apply/>) as well and will be subject to an application fee.

**Use of Calculating Devices**

For courses offered by the Price Faculty of Engineering in which the use of devices capable of calculations is permitted in tests or examinations, such devices must be incapable of receiving and/or transmitting signals. Instructors wishing to restrict devices to certain capabilities must inform students, in writing, within the first week of term. Questions concerning the suitability of any given device should be directed to the course instructor(s).

**Withdrawal from Courses**

The responsibility for initiating withdrawals rests solely with the student, and no voluntary withdrawals are permitted after the deadlines for voluntary withdrawal without academic penalty (please refer to the General Academic Regulations (<https://catalog.umanitoba.ca/>)).

undergraduate-studies/general-academic-regulations/)). For documented medical or compassionate reasons, Authorized Withdrawals may be permitted by the Dean's Office, Price Faculty of Engineering.

A student who, after registering for courses, in any term, becomes Ineligible to Proceed in Engineering will be withdrawn from his or her courses for the effective term as well as any subsequent terms, including Summer Session.

## Co-operative Education and Industrial Internship Programs

### Contact and Program Information

**Director:** Carolyn Geddert, P.Eng., Engineer-in-Residence

**Tel.** 204 474 8948

**Email:** carolyn.geddert@umanitoba.ca

**Cooperative Education Administrator:** Megan Johnson

**Telephone:** 204 480 1069

**Email:** megan.johnson@umanitoba.ca

The Price Faculty of Engineering offers a Co-operative education and Industrial Internship Program (Co-op/IIP) designed to complement and enrich the academic program with work experience. The work terms provide students with practical experience, assistance in financing their education, and guidance for future career specialization.

Applications are accepted for Co-op/IIP every fall. Co-op/IIP supports the application and participation of all students who meet the requirements and wish to apply. Application to Co-op/IIP is a process. The Co-op/IIP Office will work with you. Please connect with our staff via email: [engineeringcoop@umanitoba.ca](mailto:engineeringcoop@umanitoba.ca) and refer to the web site (<https://umanitoba.ca/engineering/co-operative-education/>) for the benefits of Co-op/IIP.

Successful applicants to Co-op/IIP have:

- Attended an information session.
- Been accepted as an undergraduate student into an Engineering Department.
- Completed all 13 Preliminary Engineering Program courses before their first work term.
- Completed 42 credit hours towards your degree by the end of the Fall term. Students must return for at least one academic term following the completion of their final work term placement. (Application early in a student's degree program will support the completion of 3 work terms.)
- Been assessed as in Good Academic standing (GPA above 2.0). I.E. not on Probation or Academic Warning.
- Agree to follow all rules and regulations of the program as detailed in the Rules and Regulations

In addition to students following regular departmental programs, Internationally Educated Engineers Qualification (<http://umanitoba.ca/engineering/ieeq/>) (IEEQ) Program participants may also be approved for participation in Co-op/IIP upon written approval of the IEEQ Director.

Work placements must be confirmed to be appropriate by the Co-op/IIP office in order to be credited as a Co-op/IIP work term.

Upon securing a job placement, Engineering students enroll in the course ENG 4800 and subsequently the specific work term of employment ENG 4810, ENG 4820, ENG 4830, ENG 4840.

Students who are unable to maintain the standards of the Co-op/IIP will be transferred back into the regular program.

The course and grade requirements for completion of the Co-op/IIP are the same as those required for the regular program. However, in order to satisfy course prerequisite requirements, timetables may differ from the regular program. Co-op/IIP students are evaluated in the same manner as regular students and all rules and regulations of the Price Faculty of Engineering apply.

Students who are placed on Academic Warning or Academic Probation may either be removed from Co-op/IIP or have their acceptance deferred until they have completed two consecutive terms with an Academic Standing of "Satisfactory".

Students who are Required to Withdraw will immediately become ineligible for Co-op/IIP and will remain ineligible after re-instatement to the Price Faculty of Engineering.

Written reports must be completed at the end of each four month work term. Each successfully completed four month work term and its corresponding report receives a Pass/Fail grade and is rated at one credit hour. Graduates who successfully complete at least three work terms and the required work term reports will have the Co-operative Education Option acknowledged on their B.Sc. graduation parchment.

For more information regarding the Co-op/IIP rules, benefits, regulations and requirements, please refer to the web site (<https://umanitoba.ca/engineering/co-operative-education/>).