



# UNDERGRADUATE STUDENT HANDBOOK

For students entering the B.Eng. program in Chemical Engineering in September 2020.

*Much information concerning courses and regulations is contained in the current University e-Calendar, which you are advised to consult for additional information or any changes that may occur during your stay within the department.*

*Special note related to COVID-19:*

*Please note that evolving Faculty and governmental regulations may impact some of the statements in this handbook.*

*Anticipated impacts of COVID-19 have been stated in footnotes. Please consult the [Faculty webpage](#) regularly for up-to-date safety measures and regulations.*

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## 1. Teaching personnel in Chemical Engineering

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| <b>Name</b>                            | <b>Room in<br/>M.H.<br/>Wong<br/>Building</b> | <b>Office<br/>phone number</b> | <b>E-mail</b>                     |
|--|---|--------------------------------|-----------------------------------|
| Prof. D. Berk, P.Eng.                  | 4260  | 514-398-4271                   | dimitrios.berk@mcgill.ca          |
| Prof. S. Coulombe, ing.                | 4230  | 514-398-5213                   | sylvain.coulombe@mcgill.ca        |
| Prof. N.-M. Dorval Courchesne, ing. jr | 4180  | 514-398-4301                   | noemie.dorvalcourchesne@mcgill.ca |
| Prof. P.-L. Girard-Lauriault           | 4150  | 514-398-4006                   | pl.girard-lauriault@mcgill.ca     |
| Prof. R.J. Hill                        | 4280  | 514-398-6897                   | reghan.hill@mcgill.ca             |
| Prof. C. Hoesli, ing.                  | 4300  | 514-398-4275                   | corinne.hoesli@mcgill.ca          |
| Prof. A. M. Kietzig, ing.              | 4140  | 514-398-3302                   | anne.kietzig@mcgill.ca            |
| Prof. J. Kopyscinski, P.Eng.           | 4310  | 514-398-4276                   | jan.kopyscinski@mcgill.ca         |
| Prof. R.L. Leask, P.Eng.               | 4120  | 514-398-4270                   | richard.leask@mcgill.ca           |
| Prof. M. Maric, P.Eng.                 | 4270  | 514-398-4272                   | milan.maric@mcgill.ca             |
| Prof. C. Moraes, P.Eng.                | 4330  | 514-398-4278                   | chris.moraes@mcgill.ca            |
| Prof. S. Omanovic, P.Eng.              | 4130  | 514-398-4273                   | sasha.omanovic@mcgill.ca          |
| Prof. A.D. Rey, FRCS                   | 4100  | 514-398-4196                   | alejandro.rey@mcgill.ca           |
| Prof. Ali Seifitokaldani               | 4220  | 514-398-4866                   | ali.seifitokaldani@mcgill.ca      |
| Prof. P. Servio                        | 4110  | 514-398-1026                   | phillip.servio@mcgill.ca          |
| Prof. N. Tufenkji, ing.                | 4160  | 514-398-2999                   | nathalie.tufenkji@mcgill.ca       |
| Prof. V. Yargeau, ing.                 | 3100  | 514-398-2273                   | viviane.yargeau@mcgill.ca         |

## 2. Statement of program educational objectives and learning outcomes

The discipline of chemical engineering is distinctive in being based equally on physics, mathematics, and chemistry. Application of these three fundamental sciences is basic to a quantitative understanding of the process industries. Those with an interest in the fourth fundamental science, biology, will find several courses in the chemical engineering curriculum that integrate aspects of the biological sciences relevant to process industries such as bioprocessing for the biopharmaceutical, food and biomedical industry, as well as environmental engineering. These engineering fundamentals and engineering design principles are supported by teaching of technical operations and economics of the process industries, as well as investigational experimental design, project management, team work and communication skills. The core curriculum concludes with process design courses taught by practicing design engineers.

The McGill University Chemical Engineering undergraduate program focuses on providing strong foundations in engineering science and chemical process design, and the integration of these with complementary areas of study in biochemical engineering, materials engineering, and energy. The program aims to train versatile and conscientious professionals who will work in leading firms and institutions in Québec, Canada and around the world. The overall educational objectives of the program are to train engineers who will:

|   |  |   |
|---|--|---|
| Pursue successful careers as chemical engineers in industry or academia | Positively impact society as leaders that promote safe, sustainable and ethical practices in their field | Be able to work in interdisciplinary teams, effectively communicate to diverse audiences and pursue lifelong learning opportunities |
|---|--|---|

Specifically, at the end of the Chemical Engineering undergraduate program, students should be able to:

1. Use appropriate knowledge and skills to identify, formulate, analyze, and solve complex chemical engineering problems drawing on mathematics, natural sciences, chemical engineering fundamentals and specialized areas of chemical engineering.
2. Apply modern engineering tools including specialized engineering software to solve these problems, and understand the limitations of these tools.
3. Develop solutions for complex, open-ended chemical engineering problems, processes and plant designs, while meeting specified needs with appropriate attention to health and safety risks, applicable standards, economic, resource availability, sustainability as well as environmental, cultural and societal considerations.
4. Conduct investigations of complex engineering or scientific problems by developing and using experimental methods and tools, analyzing and interpreting data, as well as synthesizing the information obtained in order to reach valid conclusions.
5. Communicate effectively via oral and written communication, individually or as a team.
6. Work effectively in teams and assume leadership/coordination roles.
7. Understand the professional and ethical responsibilities of the engineer towards society and the environment, and act accordingly.
8. Appropriately incorporate economics and business considerations into the chemical engineering practice.
9. Recognize the need for lifelong learning and engage in activities related to continuous professional development and learning.

To achieve these goals, the methods implemented by the program aim to:

- Instill students with a strong knowledge of engineering fundamentals and to consolidate this knowledge via problem analysis, hands-on experimental investigation as well as design projects. To ensure that graduates from the program are able to adapt to a variety of professional settings, the students must apply their knowledge in settings that require team work and effective communication.
- Promote interdisciplinary work, independence and leadership. In core courses, students are challenged with complex open-ended engineering problems. In the capstone design project courses, students complete a plant design project under the supervision of an experienced professional engineer.
- Encourage versatility by requiring the completion of technical complementary courses and by offering students the possibility to complete a minor from a list of over twenty options. Students also have the opportunity to obtain hands-on experience working on research projects under the supervision of a faculty member.
- Encourage continuous improvement, self-evaluation and transparency. Students engage in self-evaluation exercises such as quizzes, surveys and self-assessments. Students provide feedback to instructors both via course evaluations and meetings with the curriculum committee each semester.

### 3. Departmental assistance to the students

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#### 3.1 Undergraduate Curriculum Committee (UCC)

The UCC is composed of four students elected by their classes (U1, U2, U3 and U4), the president of the Council, the VP Academic and four staff members. The committee provides a forum for all matters involving undergraduate student/staff interactions.

Elections are held in September (U1, U4) and in March (U2, U3). For the Academic Year 2020-2021, the membership is:

U4 - Ryan Zelnicker

U3 - Ali Beydoun

U2 - Jia Sun

U1 - TBD

President - Matthew Nohos-Katsaros

VP Academic - Greg Brock

#### **Staff:**

Professor Sasha Omanovic (Associate Chair, Undergraduate Program and Chair of UCC)

Professor Chris Moraes

Professor Pierre-Luc Girard-Lauriault

Professor Corinne Hoesli

Corina Sferdenschì (Undergraduate Coordinator)

#### 3.2 Academic advising

Academic Advising is essential to student success. Chemical Engineering advisors are available to answer questions and assist students as needed. If a student needs support on questions related to planning courses, course selection or permit overrides, the first step is to contact the Undergraduate Coordinator for Chemical Engineering at [ugrad.chemeng@mcgill.ca](mailto:ugrad.chemeng@mcgill.ca).

Questions will be answered via email within approximately 24-48 hours (excluding vacation periods when the delays may be longer). The Undergraduate Coordinator may recommend that the student meets with an Academic Advisor in the Department of Chemical Engineering or a Faculty Advisor at MESC (McGill Engineering Student Centre, FDA #22). Students who wish to meet with an Advisor should contact [ugrad.chemeng@mcgill.ca](mailto:ugrad.chemeng@mcgill.ca), and the Undergraduate Coordinator will direct the student to the appropriate advisor in Chemical Engineering (Wong Building).



Below you will find a list of the Undergraduate Curriculum Committee (UCC) Members that are responsible for student advising matters:

**Prof. Sasha Omanovic**

Associate Chair, Undergraduate Studies  
Chair of UCC  
General Advising  
Email: [sasha.omanovic@mcgill.ca](mailto:sasha.omanovic@mcgill.ca)

**Prof. Corinne Hoesli**

Member of UCC  
Degree Audits  
Email : [corinne.hoesli@mcgill.ca](mailto:corinne.hoesli@mcgill.ca)

**Prof. Pierre-Luc Girard-Lauriault**

Member of UCC  
Exchanges & Course Equivalencies  
Email: [pierre-luc.girard-lauriault@mcgill.ca](mailto:pierre-luc.girard-lauriault@mcgill.ca)

**Corina Sferdensch**

Undergraduate Coordinator  
Located at MESC, FDA #22  
Email: [ugrad.chemeng@mcgill.ca](mailto:ugrad.chemeng@mcgill.ca)

### 3.3 Degree Planning

During the add/drop period each semester (approximately the first 3 weeks of Fall and Winter terms), the Undergraduate Student Affairs Coordinator is normally available at MESC (FDA 22) to meet with students on a first-come, first-serve basis<sup>1</sup>. The schedule for drop-in hours will be posted outside the MESC office at the start of each term.

We encourage you to meet with the Undergraduate Coordinator at the beginning of each semester to plan out your degree and ask any questions you may have about courses or the program in general.

Degree Evaluations can be conducted via email. The Undergraduate Coordinator will review the degree evaluation requests and return them to the student by email. After the add/drop period ends, students are invited to send any questions they have by email to [ugrad.chemeng@mcgill.ca](mailto:ugrad.chemeng@mcgill.ca).

At the end of the Chemical Engineering Student Handbook, you will find a list of approved Group C technical complementary (TC) courses. If you want to take a Group C TC, please email [ugrad.chemeng@mcgill.ca](mailto:ugrad.chemeng@mcgill.ca).

### 3.4 Exchanges and Study Away

For matters relating to the exchange process, study away and course transfers, please read the [Engineering exchange and study away website](#) that provides a detailed explanation on the steps and processes involved. Students also have the option to come to MESC and meet with a Faculty Advisor for more information<sup>2</sup>.

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<sup>1</sup> Due to the exceptional situation caused by the pandemic this year, the Fall 2020 semester is remote. Therefore, email communication will be sent to students with the procedure to follow for advising appointments. Please note that we will have a hybrid system of advising which will include virtual meetings and some in person meetings as well.

<sup>2</sup> Email communication will be sent to the students regarding the procedure for scheduling an appointment with an advisor.

### 3.4.1 MANDATORY INFORMATION/ADVISING SESSIONS

For incoming new students, the following advising sessions must be attended:

|   |  |
|---|--|
| <p><b>Transfer Credit Session</b><br/>Non-CEGEP students</p> <p><b>The Faculty of Engineering will hold sessions throughout the summer to accommodate demand.</b></p> <p><b>The information is available at the link below:</b><br/><a href="https://www.mcgill.ca/engineering/students/undergraduate/new-students/transfer-credits">https://www.mcgill.ca/engineering/students/undergraduate/new-students/transfer-credits</a></p> | <p><b>Compulsory Advising session *</b><br/>Out of Province and Quebec<br/>CEGEP students</p> <p><b>Wednesday, August 26, 2020, 9:30 a.m.</b></p> <p>Location: Zoom meeting, details will be sent by email</p> |
| <p><b>Individual advising (first-come, first-served basis)</b><br/>Date and Time: <b>Thursday, August 26, 2020, 10:30 a.m. to 12:30 p.m.</b><br/>Location: Zoom meeting, details will be sent by email</p>  |  |

During the add/drop period of each semester, the Undergraduate Student Affairs Coordinator will be available to meet with you on a first-come, first-served basis both in-person and via remote advising. Details will be sent via email.

For any academic advising needs during the year, please send an email to [ugrad.chemeng@mcgill.ca](mailto:ugrad.chemeng@mcgill.ca).

### 3.5 Canadian Society for Chemical Engineering (C.S.Ch.E) McGill Student Chapter

The President of the Student Chapter in 2020-2021 is Matthew Nohos-Katsaros; Prof. Corinne Hoesli is the Faculty Advisor for the Student Chapter. For more information about the role and activities of the Student Chapter, please see: <http://chess.mcgilleus.ca/>.

### 3.6 Financial Aid and Scholarships

Students can apply to loans and bursaries through the [Scholarships and Student Aid Office](#), Brown Student Services Bldg., Suite 3200, 3600 McTavish St. The primary criterion is financial need.

The scholarships awarded through the department and/or the Faculty of Engineering, primarily for outstanding academic achievements, do not require an application by students.

Additional scholarships can be identified and applied for through Career Planning Service (CaPS) and Student Awards. Further information can be found on the following web page:

<http://www.mcgill.ca/engineering/current-students/undergraduate/scholarships-financial-aid/external-scholarships>

### 3.7 Facilities in the department of Chemical Engineering

There are three breakout rooms that are available to Chemical Engineering Undergraduate students in the space across the hallway from Lab Wong 1160. These rooms can accommodate up to 8 people and two of the rooms have flat screen displays for presentations<sup>3</sup>. These rooms are meant for team work, design meetings, preparation

<sup>3</sup> Note that room access or capacity will depend on Faculty and governmental recommendations during COVID-19.

of presentations or for work on projects. They are not social rooms. Please see Ms. Anna Jean Pollock on floor 3A for access. Undergraduate students can also use Room Wong 1130 for course and research related meetings and presentations. The room has to be booked in advance through Ms. Anna Jean Pollock.

The department owns a substantial amount of equipment in its undergraduate and research laboratories. Specialized department services are provided by:

|                                  |                                |
|----------------------------------|--------------------------------|
| Undergraduate Laboratories       | Wong 4200 - Mr. F. Caporuscio  |
| Lab. Equipment & Supplies Stores | Wong 3270 - Ms. L. Volpato     |
| Electronics Shop                 | Wong 3250 - Mr. G. Lepkyj      |
| Analytical Laboratory            | Wong 4200 - Mr. R. Roy         |
|                                  | Wong 4200 - Mr. A. Golsztajn   |
| Administrative Office            | Wong 3060 - Mr. Kevin Mitchell |

## 4. Miscellaneous Information

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### 4.1 French language

Knowledge of French, essential for engineers to work and communicate effectively in Quebec, is a valuable additional qualification to maintain your ability to move freely in Canada, and provides an important additional attribute for working and travelling internationally. If you do not have a working knowledge of French, you will greatly reduce your opportunities for summer or permanent jobs with companies with Quebec operations. It is also necessary for an engineer to show competence in French to become a member of the Order of Engineers of Quebec and thus to be licensed to practice as a professional engineer. Moreover, we live in a dynamic French milieu with social and cultural riches that cannot be enjoyed without a good knowledge of French. It is, therefore, highly advantageous to acquire or improve your ability in French during your years at McGill.

The needs of individual students in this area vary widely. Some need beginner's courses while others require practice in speaking or technical vocabulary, etc. A number of ways of improving skills in French are:

- Write a technical paper in French. Allowance is made in marking of grammar and style when French is not your first language. Please mention this to the professor.
- Take elective courses at Université du Québec à Montréal (UQAM), École Polytechnique de Montréal or Université de Montréal through the Quebec Inter-University Transfer program. Additional information and the necessary form can be found here: <http://www.mcgill.ca/students/iut>
- Take one or more French Department courses
- Be a member of a laboratory group which communicates internally and externally (wherever possible) in French.
- Arrange for a French discussion or practice group.
- Use all opportunities available (e.g. shopping, television, internet, newspapers, radio) to practice and improve your French.

### 4.2 Mental Health Resources

The [Student Wellness Hub](#) provides basic physical and mental health services to the McGill student community. Resources also include peer support groups. Mental health and resilience are important for your well-being and success in the program and beyond.

### 4.3 Equity, diversity and inclusion (EDI)

The Department of Chemical Engineering aims to provide a setting where people of different race, visible minorities, sex, gender, sexual orientation, disabilities are provided equitable access to opportunities. If you witness harassment, discrimination or sexual violence, we encourage you to contact one of your professors, an [Equity and Inclusion Advisor](#) or the Ombudsperson. The McGill EDI strategic plan and other information on EDI resources can be found here: [www.mcgill.ca/equity/](http://www.mcgill.ca/equity/).

McGill University is situated on the traditional territory of the Kanien'kehà:ka, a place which has long served as a site of meeting and exchange amongst nations. We recognize and respect the Kanien'kehà:ka as the traditional custodians of the lands and waters on which we meet today.

#### 4.4 Photocopying

Numerous copying machines are available in the Wong and McConnell Buildings and Libraries and all students can print via the uprint function connected to their Minerva account.

#### 4.5 Oral Presentations

Most classrooms are equipped with projectors for the use of computers in presentations. Other projectors are also available to students from the McGill IT Customer Services They are located at 688 Sherbrooke St. W., 2<sup>nd</sup> floor.

## 5. Course Organization

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### 5.1 Course Progress

At the first advising session, new students should read the Graduation Requirements form (p. 28-29) which can be used to plan and follow their progress at McGill. Students will record on the form all additional admissions requirements, exemptions or advanced credits and course marks (see Section 6 below). This form will eventually be used in your discussions with an Academic Adviser as part of pre-graduation procedures. Your progress and remaining requirements to complete towards graduation can be seen on Minerva (Main Menu/Student/Student Records Menu/Degree Evaluation).

### 5.2 Course Loads and Length of Program

The normal course load per semester is 15-18 credits. Students taking 11 credits or less per semester are registered as part-time students. Students receiving certain bursaries and loans may be required to maintain full-time status. Check with your financing provider prior to taking less than 12 credits in one semester. International students in Canada on a visa may also be required to maintain full-time status. Contact [International Student Services](#) if you have questions. A student who wishes to register for more than 18 credits in a term may only do so with special permission of MESC.

Students on probationary standing must take a reduced load of no more than 13 credits per semester including repeated courses (see Section 5.6 below). The exact number of credits will be recommended by an Academic Adviser based on the difficulties experienced by the student. Care should be taken in the choice of courses for a reduced load to meet pre-requisites for courses to be taken later in the program. For example, CHEE 204 (given in Winter) is a co-requisite for CHEE 314 (given in Fall) and a pre-requisite for CHEE 390 (given in Fall).

**NOTE:** Please note some students may need to take an additional semester to finish their program in order to decrease their course load throughout their studies. Please contact the Undergraduate Student Affairs Coordinator for further information on how to best plan your schedule if you cannot follow the proposed curriculum.

### 5.3 Course Change Deadlines (2020-2021)

|  | FALL 2020<br>TERM  | WINTER 2021<br>TERM |
|--|--------------------|---------------------|
| Last day to change courses (no financial penalty) (no entry on transcript) | Sept. 15 (Tuesday) | Jan. 19 (Tuesday)   |
| Last day for withdrawal (with refund) – with a W                           | Sept. 22 (Tuesday) | Jan. 26 (Tuesday)   |
| Last day for withdrawal (without refund) – with a W *                      | Oct. 27 (Tuesday)  | Mar. 9 (Tuesday)    |

\* Please note that these dates are different for multi-term courses beginning in both Fall and Winter. Please consult the Course Change tab under Registration in the e-calendar.

Beyond this time, student names will appear on the examination lists, and in the event of students not taking the examination, they will be given a "J" grade.

### 5.4 Course Grades

Course grades (see the University Calendar under General University Information and Regulations) are defined as follows:

**Grades of A, A-, B+, B, B- and C+** indicate the extent to which ability superior to that required to qualify for the professional degree is demonstrated.

**A grade of C** (satisfactory) implies achievement at a level of performance consistent with awarding a B.Eng. degree and thus with the practice of the engineering profession.

**Grades of D and F** indicate the extent of deficiency below the required level.

In the Faculty of Engineering, letter grades are assigned according to the grading scheme adopted by the professor in charge of a particular course. This may not correspond to grades indicated in the “Numerical Scale of Grades” column in Grading and Grade Point Averages in the Undergraduate Calendar. A grade of D indicates marginal performance which is acceptable only for Complementary Studies courses (i.e., Group A Impact of Technology on Society and Group B Humanities and Social Sciences, Management Studies and Law). A grade of D is not acceptable for required (core) courses. For the Department of Chemical Engineering, core courses include all required courses (departmental and non-departmental) as well as technical complementary courses.

**NOTE:** A "D" grade in a pre-requisite course that is a required course in the Chemical Engineering program is considered sufficient to register for the subsequent courses. A "D" grade is, however, does not constitute a passing grade and thus, the course for which a "D" grade was obtained must be passed successfully before graduation.

## 5.5 Reassessment of a grade

You can request a formal reread of a final examination once you have discussed it with your instructor. You must complete a Request for a Reread of a Final Exam form and submit it to the Student Affairs Office (MESC). For an electronic version of the form, please see: <http://www.mcgill.ca/engineering/current-students/undergraduate/courses-registration/exams-assessment/reassessment-grade>.

You may request rereads for only one course per term, unless you obtain permission from the Student Affairs Office (MESC). Grades may be either raised or lowered as the result of a reread. A fee for each reread will be assessed directly to your McGill account if the result remains the same or is lowered. If the grade is raised, there is no charge.

### 5.5.1 REREAD APPLICATION DEADLINES

|                 |                              |
|-----------------|------------------------------|
| Fall courses:   | last working day of March    |
| Winter courses: | last working day of July     |
| Summer courses: | last working day of November |

Non-Engineering courses: Rereads in courses not in the Faculty of Engineering are subject to the deadlines, rules, and regulations of the relevant faculty.

## 5.6 Standings

In the Faculty of Engineering, a decision on the student's academic standing is determined on the basis of CGPA (Cumulative Grade Point Average), according to the criteria listed below. It is your responsibility to assess your academic standing by reviewing your MINERVA transcript at the end of each term once all final grades have been received.

**NOTE:** The Faculty determines academic standing decisions after the completion of each term (Fall, Winter, Summer) based on academic results to date. (Thus, if you have been granted permission to defer one or more examinations, the academic standing decision will be made regardless of such deferrals.) – for the up-to-date information, please see at:

<https://www.mcgill.ca/engineering/students/undergraduate/advising-programs/academic-standing/academic-standing-fall-term-only>

| STANDING     | CRITERIA   |
|--------------|--|
| Satisfactory | <p>CGPA equal to 2.00 or greater (<math>\geq 2.00</math>)</p> <p>Satisfactory Standing permits you to proceed with your studies under the following conditions:</p> <ul style="list-style-type: none"> <li>● 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 and successfully completed.</li> <li>● All other courses in which F grades were obtained must either be repeated successfully prior to graduation or be replaced by some</li> </ul> |



|   |  |
|---|--|
|   | <p>alternative approved course and successfully completed before graduation</p>  |
| <b>Probationary</b>                           | <p>CGPA less than 2.0 (<math>&lt; 2.0</math>) and equal to or greater than 1.20 (<math>\geq 1.20</math>) or TGPA equal to or greater than 2.50 (<math>\geq 2.50</math>) and a CGPA of less than 2.0 (<math>&lt; 2.0</math>)</p> <p>Probationary Standing permits you to proceed with your studies under the following conditions:</p> <ul style="list-style-type: none"> <li>● must reduce your credit load to a maximum of 13 credits per term and must achieve at the end of the term either a CGPA of 2.00 or better, or a TGPA of 2.50 or better in order to continue.</li> <li>● whose TGPA is 2.50 or better, but whose CGPA is less than 2.00 may continue with your studies but will remain on Probationary Standing until such time your CGPA reaches 2.0.</li> <li>● failure to achieve either the TGPA or CGPA requirements noted above will result in you being placed in “unsatisfactory Standing”.</li> <li>● you must consult a faculty or departmental advisor, before withdrawal deadlines, concerning your course selection</li> </ul> |
| <b>Interim Unsatisfactory *<br/>FALL TERM</b> | <p>CGPA less than 1.20 (<math>&lt; 1.20</math>) or TGPA falls below 2.50 (<math>&lt; 2.50</math>) and your CGPA is below 2.00 (<math>&lt; 2.00</math>)</p> <p>Interim Unsatisfactory Standing permits you to proceed with your studies under the following conditions:</p> <ul style="list-style-type: none"> <li>● must reduce your credit load to a maximum of 13 credits per term and must achieve at the end of the term either a CGPA of 2.00 or better, or a TGPA of 2.50 or better in order to continue.</li> <li>● whose TGPA is 2.50 or better, but whose CGPA is less than 2.00 may continue with your studies but will remain on Probationary Standing until such time your CGPA reaches 2.0.</li> <li>● failure to achieve either the TGPA or CGPA requirements noted above will result in you being placed in “unsatisfactory Standing”.</li> <li>● you must consult a faculty or departmental advisor, before withdrawal deadlines, concerning your course selection.</li> </ul>   |
| <b>Unsatisfactory<br/>WINTER TERM</b>         | <p>CGPA less than 1.20 (<math>&lt; 1.20</math>) or TGPA falls below 2.50 (<math>&lt; 2.50</math>) and your CGPA is below 2.00 (<math>&lt; 2.00</math>)</p> <p>Unsatisfactory Standing requires you to withdraw from the Faculty of Engineering for a minimum of one term.</p>  |

\* If you were in Unsatisfactory standing at any time during your previous academic studies and were readmitted to the Faculty of Engineering, you may not continue in your program and will be asked to withdraw from the Faculty of Engineering for a minimum of one term or permanently based on the conditions of your last letter of readmission. Courses for which you are currently registered in will be automatically deleted from your record.

**\*\*You must meet with an Academic Advisor if you have specific questions about academic standing.**

## 5.7 Readmission

To return to McGill after an absence from a Fall and/or Winter term of an academic year, you must submit an application for readmission using Minerva's Faculty Transfer/Readmission Menu (Minerva Main Menu/Student/Student Records Menu/Faculty Transfer / Readmission). In your application, state the reasons for your absence from the University and give a summary of your activities during that period using the comment section.

If you withdrew because of illness, you must provide the Student Affairs Office (MESC) with a medical note from a physician to support your application for readmission, stating that you are ready and able to resume studies.

For important deadlines regarding readmission, please see:

<http://www.mcgill.ca/engineering/current-students/undergraduate/advising-programs/readmission-faculty-transfers>

## 5.8 Summer Courses

Summer course offerings are published in the e-calendar and MINERVA early in the winter term. Normally very few engineering courses are offered. CHEM 212 and 234 are usually offered. A considerable number of courses are offered in management (Faculty of Management) and in Arts (Faculty of Arts). Note that prior approval must be obtained from an Academic Adviser for any course that is to count for degree credit.

Courses CHEE 363, CHEE 494, CHEE 495, CHEE 496 are also available in the summer if arrangements can be made with an academic staff member of the Chemical Engineering Department.

For more information about summer courses, please see: <http://www.mcgill.ca/summer/>

## 5.9 Definition of Advanced Credit and Exemption

Students who have previously taken a required course in the program may be granted advanced credit or exemption for that course. For exemptions, the credits of the course must be replaced by an equal or higher number of credits of another course having the same accreditation category breakdown (e.g. Basic Science, Mathematics, Engineering Science, Engineering Design, Complementary Studies). No replacement is needed for advanced credits.

There is no equivalence between Science Math courses and Engineering Math courses for students who do not hold a degree in Science.

Computer courses taken outside McGill, while a student is registered in Engineering, do not count for credit.

## 5.10 Pre-requisites

Students must have the required pre-requisite in their academic history in order to register in a course through Minerva. **No exceptions will be permitted!**

## 6. Specific Program Requirements for the B.Eng Degree in Chemical Engineering

### 6.1 Classification of Courses

The program includes several categories of courses:

- 1) Required Departmental courses
- 2) Required Non-departmental courses
- 3) Technical Complementary (TC) courses
- 4) Complementary Studies (CS)

Courses in categories 1), 2) and 3) are referred to as "core" courses.

#### 6.1.1 REQUIRED DEPARTMENTAL COURSES

|          |   | Course Credit |
|----------|---|---------------|
| CHEE 200 | Chemical Engineering Principles 1             | 3             |
| CHEE 204 | Chemical Engineering Principles 2             | 3             |
| CHEE 220 | Chemical Engineering Thermodynamics           | 3             |
| CHEE 231 | Data Analysis and Design of Experiments       | 3             |
| CHEE 291 | Instrumentation and Measurement 1             | 4             |
| CHEE 310 | Physical Chemistry for Engineers              | 3             |
| CHEE 314 | Fluid Mechanics                               | 3             |
| CHEE 315 | Heat and Mass Transfer                        | 3             |
| CHEE 351 | Separation Processes                          | 3             |
| CHEE 370 | Elements of Biotechnology                     | 3             |
| CHEE 380 | Materials Science                             | 3             |
| CHEE 390 | Computational Methods in Chemical Engineering | 3             |
| CHEE 400 | Principles of Energy Conversion               | 3             |
| CHEE 401 | Energy Systems Engineering                    | 3             |
| CHEE 423 | Chemical Reaction Engineering                 | 3             |
| CHEE 440 | Process Modelling                             | 3             |
| CHEE 453 | Process Design                                | 4             |
| CHEE 455 | Process Control                               | 3             |
| CHEE 456 | Design Project 1                              | 4             |
| CHEE 457 | Design Project 2                              | 5             |
| CHEE 474 | Biochemical Engineering                       | 3             |
| CHEE 484 | Materials Engineering                         | 3             |
| CHEE 491 | Instrumentation and Measurement 2             | 4             |
|          |   | <b>75</b>     |

#### 6.1.2 REQUIRED NON-DEPARTMENTAL COURSES

|          |   | Course Credit |
|----------|---|---------------|
| CHEM 212 | Introductory Organic Chemistry 1              | 4             |
| CHEM 234 | Topics in Organic Chemistry                   | 3             |
| MATH 262 | Intermediate Calculus                         | 3             |
| MATH 263 | Ordinary Differential Equations for Engineers | 3             |

|          |   |   |    |
|----------|---|---|----|
| MATH 264 | Advanced Calculus for Engineers               | 3 |    |
| FACC 100 | Introduction to the Engineering Profession    | 1 |    |
| FACC 250 | Responsibilities of the Professional Engineer | 0 |    |
| FACC 300 | Engineering Economy                           | 3 |    |
| FACC 400 | Engineering Professional Practice             | 1 |    |
| COMP 208 | Computers in Engineering                      | 3 | 24 |

### 6.1.3 TECHNICAL COMPLEMENTARY (TC) COURSES

|   | Course Credit |
|---|---------------|
| Courses to be selected from those approved by the Department (see list below) | 9             |

### 6.1.4 COMPLEMENTARY STUDIES (CS)

|   | Course Credit |
|---|---------------|
| Credits from Group A and Group B of Faculty Announcement (see list below) | 6             |

**TOTAL**                      **114**

## LIST OF TECHNICAL COMPLEMENTARY COURSES

*For up-to-date curriculum, please consult the [University Calendar](#).*

The purpose of this requirement is to provide students with an area of specialization within the broad field of chemical engineering. Alternatively, students use the technical complementary courses (TCs) to increase the breadth of their chemical engineering training. Note that many of the technical complementary courses are offered only in alternate years. Students should, therefore, plan their TCs as far ahead as possible.

If you wish to take a non-CHEE TC listed below or in Appendix A, please be advised that you will have to fill out a Course Authorization Form to request the desired course. You can find this form at the MESC Office, where it can also be submitted.

**Group A:** At least 3 credits from the following:

|          |  |
|----------|--|
| CHEE 301 | Resource Recovery from Waste (3)                           |
| CHEE 511 | Catalysis for sustainable fuels and chemicals (3)          |
| CHEE 512 | Stem Cell Bioprocess Engineering (3)                       |
| CHEE 515 | Material Surfaces: A Biomimetic Approach <sup>+</sup> (3)  |
| CHEE 521 | Nanomaterials and the Aquatic Environment <sup>+</sup> (3) |
| CHEE 541 | Electrochemical Engineering (3)                            |
| CHEE 543 | Plasma Engineering (3)                                     |
| CHEE 563 | Biofluids and Cardiovascular Mechanics <sup>+</sup> (3)    |
| CHEE 582 | Polymer Science & Engineering (3)                          |
| CHEE 584 | Polymer Processing (3)                                     |
| CHEE 585 | Foundations of Soft Matter (3)                             |
| CHEE 587 | Chemical Processing: Electronics Industry (3)              |
| CHEE 591 | Environmental Bioremediation (3)                           |
| CHEE 593 | Industrial Water Pollution Control <sup>+</sup> (3)        |
| CIVE 430 | Water Treatment and Pollution Control <sup>+</sup> (3)     |

|          |  |
|----------|--|
| CIVE 521 | Nanomaterials and the Aquatic Environment <sup>+</sup> (3) |
| MECH 534 | Air Pollution Engineering (3)                              |
| MECH 563 | Biofluids and Cardiovascular Mechanics <sup>+</sup> (3)    |
| MIME 515 | Material Surfaces: A Biomimetic Approach <sup>+</sup> (3)  |

**+ Students may choose only one course in each of the following sets:**

- CHEE 515 or MIME 515
- CHEE 521 or CIVE 521
- CHEE 563 or MECH 563
- CHEE 593 or CIVE 430

**Group B:** Maximum 6 credits from the following:

|          |  |
|----------|--|
| BIEN 550 | Biomolecular Devices (3 credits)                       |
| BIOT 505 | Selected Topics in Biotechnology (3 credits) *         |
| BREE 325 | Food Process Engineering (3 credits)                   |
| BREE 522 | Bio-Based Polymers (3 credits)                         |
| CHEE 363 | Projects Chemical Engineering 1 (2 credits) **         |
| CHEE 494 | Research Project and Seminar 1 (3 credits) **          |
| CHEE 495 | Research Project and Seminar 2 (4 credits) **          |
| CHEE 496 | Environmental Research Project (3 credits) **          |
| CIVE 557 | Microbiology for Environmental Engineering (3 credits) |
| MIME 470 | Engineering Biomaterials (3 credits)                   |
| MIME 558 | Engineering Nanomaterials (3 credits)                  |

\* *BIOT 505 can only be chosen by students taking the Minor in Biotechnology.*

\*\* *Students may choose only one project course: CHEE 363, CHEE 494, CHEE 495, or CHEE 496 (see below for more information).*

**Group C:** The remaining credits, up to a maximum of 3, may be taken from other suitable undergraduate courses in the Faculty of Engineering at the 300-level or higher, with departmental permission. Please see Appendix A for a list of all approved Group C TCs, as of August 2020. If you wish to request a course **not** on this list, you will have to formally submit the request via email to [ugrad.chemeng@mcgill.ca](mailto:ugrad.chemeng@mcgill.ca).

**Research project courses:** Enrolment in a Research Project course (CHEE 363, CHEE 494, CHEE 495, or CHEE 496) requires a confirmation email sent by your supervisor to the UG coordinator ([ugrad.chemeng@mcgill.ca](mailto:ugrad.chemeng@mcgill.ca)). Once the confirmation is received the UG coordinator will provide you with the necessary override to register. Finding a professor who is willing to supervise a project is the responsibility of the student. Professors from other Departments can co-supervise projects, but the principal supervisor must be a professor in the Department of Chemical Engineering.

**Other complementary courses:** In selecting non-departmental complementary courses, students must verify with the department concerned that they have the pre-requisites and that they will be accepted for enrolment into the desired courses. Some departments place limits on enrolment and give preference to their own students.

For course listings and regulations related to Complementary Studies (Impact of Technology on Society courses and Humanities and Social Sciences, Management Studies and Law courses), students should refer to the “Complementary Studies” section of the B. Eng. Chemical Engineering program requirements in the University e-calendar and the list below:

## LIST OF COMPLEMENTARY STUDIES FOR CHEMICAL ENGINEERING STUDENTS

Non-CEGEP students:

9 credits of Complementary Studies (CS) are required in addition to the core courses of the chemical engineering program. Of these, 3 credits must be chosen from Group A "Impact of Technology on Society Courses" below. The remaining 6 credits must be taken from Group B “Humanities and Social Sciences, Management Studies and Law”.

CEGEP students:

6 credits of Complementary Studies (CS) are required in addition to the core courses of the chemical engineering program. Of these, 3 credits must be chosen from Group A "Impact of Technology on Society Courses" below. The remaining 3 credits must be taken from Group B “Humanities and Social Sciences, Management Studies and Law”.

Please Note: If you are uncertain whether or not your transfer credits can fulfill a CS requirement, please contact the MESC office or email [ugrad.chemeng@mcgill.ca](mailto:ugrad.chemeng@mcgill.ca) to confirm how these credits count towards your program.

### Group A - Impact of Technology on Society Courses

|           |   |
|-----------|---|
| ANTH 212  | Anthropology of Development (3 credits)                             |
| BTEC 502  | Biotechnology Ethics and Society (3 credits)                        |
| CIVE 469  | Infrastructure and Society (3 credits)                              |
| ECON 225  | Economics of the Environments (3 credits)                           |
| ECON 347  | Economics of Climate Change (3 credits)                             |
| ENVR 201  | Society and Environment (3 credits)                                 |
| GEOG 200  | Geographical Perspectives: World Environmental Problems (3 credits) |
| GEOG 203  | Environmental Systems (3 credits)                                   |
| GEOG 205  | Global Change: Past, Present and Future (3 credits)                 |
| GEOG 302  | Environmental Management 1 (3 credits)                              |
| MGPO 440* | Strategies for Sustainability (3 credits)                           |
| PHIL 343  | Biomedical Ethics (3 credits)                                       |
| RELG 270  | Religious Ethics and the Environment (3 credits)                    |
| SOCI 235  | Technology and Society (3 credits)                                  |
| SOCI 312  | Sociology of Work and Industry (3 credits)                          |
| URBP 201  | Planning the 21st Century City (3 credits)                          |

### Group B - Humanities and Social Sciences, Management Studies and Law

Anthropology (ANTH)

Economics (any 200- or 300-level course excluding ECON 227 and ECON 337)

History (HIST)

Philosophy (excluding PHIL 210 and PHIL 310)

Political Science (POLI)

Psychology (excluding PSYC 204 and PSYC 305, but including PSYC 100)

Religious Studies (RELG) (excluding courses that principally impart language skills such as Sanskrit, Tibetan, Tamil, New Testament Greek, and Biblical Hebrew)

\*\*\*School of Social Work (SWRK)

Sociology (excluding SOCI 350)

OR 3 credits from the following:

- ARCH 528 History of Housing (3 credits)
- BUSA 465 Technological Entrepreneurship (3 credits) \*
- CLAS 203 Greek Mythology (3 credits)
- ENVR 203 Knowledge, Ethics and Environment (3 credits)
- ENVR 400 Environmental Thought (3 credits)
- FACC 220 Law for Architects and Engineers (3 credits)
- FACC 500 Technology Business Plan Design (3 credits)
- FACC 501 Technology Business Plan Project (3 credits)
- HISP 225 Hispanic Civilization 1 (3 credits)
- HISP 226 Hispanic Civilization 2 (3 credits)
- INDR 294 Introduction to Labour-Management Relations (3 credits) \*
- INTG 201 Integrated Management Essentials 1 (3 credits) \*\*
- INTG 202 Integrated Management Essentials 2 (3 credits) \*\*
- MATH 338 History and Philosophy of Mathematics (3 credits)
- MGCR 222 Introduction to Organizational Behaviour (3 credits) \*
- MGCR 352 Principles of Marketing (3 credits) \*
- ORGB 321 Leadership (3 credits) \*
- ORGB 423 Human Resources Management (3 credits) \*

\* Note: Management courses have limited enrolment and registration dates. See Important Dates at <http://www.mcgill.ca/importantdates>.

\*\* Note: INTG 201 and INTG 202 are not open to students who have taken certain Management courses. Please see the INTG 201 and INTG 202 course information for a list of these courses.

\*\*\* If you are uncertain whether or not a course principally imparts language skills, please speak to an advisor in the McGill Engineering Student Centre (Frank Dawson Adams Building, Room 22).

The above list is subject to revision; please see the Faculty of Engineering undergraduate section of the Undergraduate Programs, Courses and University Regulations for updates.

## 6.2 Curriculums

Below you will find the 2020-2021 Academic Program Curriculums for both CEGEP-entry students and non-CEGEP entry students. Please note that these curriculums can also be found at the MESOC offices (FDA, #22), as well as online at the [Undergraduate Engineering webpage](#).



## 6.2.1 CEGEP ENTRY (SEPTEMBER ADMISSION)

|                            |   |            |   |
|----------------------------|---|------------|---|
| <b>Semester 1 (Fall)</b>   |   | 17         | Prerequisites/Co-requisites                             |
| CHEE 200                   | Chemical Engineering Principles 1             | 3          | -   |
| CHEE 291                   | Instrumentation and Measurement 1             | 4          | C - CHEE231   |
| CHEM 212                   | Introductory Organic Chemistry 1              | 4          | P - CHEM 110 or equivalent / C - CHEM 120 or equivalent |
| CHEE 231                   | Data Analysis and Design of Experiments       | 3          |   |
| MATH 262                   | Intermediate Calculus                         | 3          | P - MATH 141 or equivalent, MATH 133 or equivalent      |
| <b>Semester 2 (Winter)</b> |   | 16         | Prerequisites/Co-requisites                             |
| CHEE 204                   | Chemical Engineering Principles 2             | 3          | P - CHEE 200  |
| CHEE 220                   | Chemical Engineering Thermodynamics           | 3          | P - CHEE 200 / C - MATH 262                             |
| CHEM 234                   | Topics in Organic Chemistry                   | 3          | P - CHEM 212  |
| COMP 208                   | Computers in Engineering                      | 3          | P - MATH 140, MATH 141 / C - MATH 133                   |
| FACC 100                   | Introduction to the Engineering Profession    | 1          | -   |
| MATH 263                   | Ordinary Differential Equations for Engineers | 3          | C - MATH 262  |
| <b>Semester 3 (Fall)</b>   |   | 15         | Prerequisites/Co-requisites                             |
| CHEE 314                   | Fluid Mechanics                               | 3          | C - CHEE 204, MATH 264                                  |
| CHEE 370                   | Elements of Biotechnology                     | 3          | -   |
| CHEE 380                   | Materials Science                             | 3          | -   |
| CHEE 390                   | Computational Methods in Chemical Engineering | 3          | P - CHEE 204, COMP 208, MATH 263 / C - MATH 264         |
| FACC 250                   | Responsibilities of the Professional Engineer | 0          | P - FACC 100 or BREE 250                                |
| MATH 264                   | Advanced Calculus for Engineers               | 3          | P - MATH 262 / C - MATH 263                             |
| <b>Semester 4 (Winter)</b> |   | 18         | Prerequisites/Co-requisites                             |
| CHEE 310                   | Physical Chemistry for Engineers              | 3          | C - CHEE 220  |
| CHEE 315                   | Heat and Mass Transfer                        | 3          | P - CHEE 314  |
| CHEE 351                   | Separation Processes                          | 3          | P - CHEE 220 / C - CHEE 204, CHEE 315                   |
| CHEE 484                   | Materials Engineering                         | 3          | P - CHEE 380  |
| CHEE 474                   | Biochemical Engineering                       | 3          | P - CHEE 370/ C - CHEE315                               |
| FACC 300                   | Engineering Economy                           | 3          | -   |
| <b>Semester 5 (Fall)</b>   |   | 17         | Prerequisites/Co-requisites                             |
| CHEE 400                   | Principles of Energy Conversion               | 3          | P - CHEE 315/ C - CHEE 390, CHEE 484                    |
| CHEE 423                   | Chemical Reaction Engineering                 | 3          | P - CHEE 310, CHEE 315                                  |
| CHEE 453                   | Process Design                                | 4          | C - CHEE 315, CHEE 351                                  |
| CHEE 455                   | Process Control                               | 3          | P - CHEE 291/ C - CHEE 423, CHEE 453                    |
| CHEE 456                   | Design Project 1                              | 4          | C - CHEE 453  |
| <b>Semester 6 (Winter)</b> |   | 15         | Prerequisites/Co-requisites                             |
| CHEE 401                   | Energy Systems Engineering                    | 3          | P - CHEE 400  |
| CHEE 440                   | Process Modelling                             | 3          | P - CHEE 423, MATH 264                                  |
| CHEE 457                   | Design Project 2                              | 5          | P - CHEE 456  |
| CHEE 491                   | Instrumentation and Measurement 2             | 4          | P - CHEE 231, CHEE 291/ C - CHEE 423, CHEE 455          |
| <b>Semester 7 (Fall)</b>   |   | 16         | Prerequisites/Co-requisites                             |
| FACC 400                   | Engineering Professional Practice             | 1          | P - FACC 100, FACC 250, and 60 program credits          |
| CHEE xxx                   | Technical Complementary                       | 3          | -   |
| CHEE xxx                   | Technical Complementary                       | 3          | -   |
| CHEE xxx                   | Technical Complementary                       | 3          | -   |
| CS                         | Complementary Studies Group A (Impact)        | 3          | -   |
| CS                         | Complementary Studies Group B (HSSML) - 2     | 3          | -   |
| <b>Total credits:</b>      |   | <b>114</b> |   |



## NON-CEGEP ENTRY (SEPTEMBER ADMISSION)

|                            |   |            |   |
|----------------------------|---|------------|---|
| <b>Semester 1 (Fall)</b>   |   | 18         | Prerequisites/Co-requisites                               |
| CHEM 110                   | General Chemistry                             | 4          | P - College level math & physics or instructor permission |
| MATH 133                   | Linear Algebra and Geometry                   | 3          | P - A course in functions                                 |
| MATH 140                   | Calculus 1                                    | 3          | P - High-school calculus                                  |
| PHYS 131                   | Mechanics and Waves                           | 4          | C - Calculus course [MATH 140]                            |
| FACC 100                   | Intro to the Engineering Profession           | 1          | -   |
| CS                         | Complementary Studies Group B (HSSML) - 1     | 3          | -   |
| <b>Semester 2 (Winter)</b> |   | 18         | Prerequisites/Co-requisites                               |
| CHEM 120                   | General Chemistry 2                           | 4          | P - College level math & physics or instructor permission |
| MATH 141                   | Calculus 2                                    | 4          | P - MATH 140  |
| PHYS 142                   | Electromagnetism and Optics                   | 4          | P - PHYS 131 / C - MATH 141                               |
| CS                         | Complementary Studies Group A (Impact)        | 3          | -   |
| CS                         | Complementary Studies Group B (HSSML) - 2     | 3          | -   |
| <b>Semester 3 (Fall)</b>   |   | 17         | Prerequisites/Co-requisites                               |
| CHEE 200                   | Chemical Engineering Principles 1             | 3          | -   |
| CHEE 291                   | Instrumentation and Measurement 1             | 4          | C - CHEE231   |
| CHEM 212                   | Introductory Organic Chemistry 1              | 4          | P - CHEM 110 / C - CHEM 120                               |
| CHEE 231                   | Data Analysis and Design of Experiments       | 3          |   |
| MATH 262                   | Intermediate Calculus                         | 3          | P - MATH 141, MATH 133                                    |
| <b>Semester 4 (Winter)</b> |   | 18         | Prerequisites/Co-requisites                               |
| CHEE 204                   | Chemical Engineering Principles 2             | 3          | P - CHEE 200  |
| CHEE 220                   | Chemical Engineering Thermodynamics           | 3          | P - CHEE 200 / C - MATH 262                               |
| CHEM 234                   | Topics in Organic Chemistry                   | 3          | P - CHEM 212  |
| COMP 208                   | Computers in Engineering                      | 3          | P - MATH 140, MATH 141 / C - MATH 133                     |
| MATH 263                   | Ordinary Differential Equations for Engineers | 3          | C - MATH 262  |
| FACC 300                   | Engineering Economy                           | 3          | -   |
| <b>Semester 5 (Fall)</b>   |   | 18         | Prerequisites/Co-requisites                               |
| CHEE 314                   | Fluid Mechanics                               | 3          | C - CHEE 204, MATH 264                                    |
| CHEE 370                   | Elements of Biotechnology                     | 3          | -   |
| CHEE 380                   | Materials Science                             | 3          | -   |
| CHEE 390                   | Computational Methods in Chemical Engineering | 3          | P - CHEE 204, COMP 208, MATH 263/C - MATH 264             |
| MATH 264                   | Advanced Calculus for Engineers               | 3          | P - MATH 262 / C - MATH 263                               |
| FACC 250                   | Responsibilities of the Professional Engineer | 0          | P - FACC 100 or BREE 250                                  |
| CHEE xxx                   | Technical Complementary                       | 3          | -   |
| <b>Semester 6 (Winter)</b> |   | 18         | Prerequisites/Co-requisites                               |
| CHEE 310                   | Physical Chemistry for Engineers              | 3          | C - CHEE 220  |
| CHEE 315                   | Heat and Mass Transfer                        | 3          | P - CHEE 314  |
| CHEE 351                   | Separation Processes                          | 3          | P - CHEE 220 / C - CHEE 204, CHEE 315                     |
| CHEE 484                   | Materials Engineering                         | 3          | P - CHEE 380  |
| CHEE 474                   | Biochemical Engineering                       | 3          | P - CHEE 370/ C - CHEE 315                                |
| CHEE xxx                   | Technical Complementary                       | 3          | -   |
| <b>Semester 7 (Fall)</b>   |   | 18         | Prerequisites/Co-requisites                               |
| CHEE 400                   | Principles of Energy Conversion               | 3          | P - CHEE 315 / C - CHEE 390, CHEE 484                     |
| CHEE 423                   | Chemical Reaction Engineering                 | 3          | P - CHEE 310, CHEE 315                                    |
| CHEE 453                   | Process Design                                | 4          | C - CHEE 315, CHEE 351                                    |
| CHEE 456                   | Design Project 1                              | 4          | C - CHEE 453  |
| CHEE 455                   | Process Control                               | 3          | P - CHEE 291/ C - CHEE 423, CHEE 453                      |
| FACC 400                   | Engineering Professional Practice             | 1          | P - FACC 100, FACC 250, and 60 program credits            |
| <b>Semester 8 (Winter)</b> |   | 18         | Prerequisites/Co-requisites                               |
| CHEE 401                   | Energy Systems Engineering                    | 3          | P - CHEE 400  |
| CHEE 440                   | Process Modelling                             | 3          | P - CHEE 423, MATH 264                                    |
| CHEE 457                   | Design Project 2                              | 5          | P - CHEE 456  |
| CHEE 491                   | Instrumentation and Measurement 2             | 4          | P - CHEE 231, CHEE 291 / C - CHEE 423, CHEE 455           |
| CHEE xxx                   | Technical Complementary                       | 3          | -   |
| <b>Total credits:</b>      |   | <b>143</b> |   |

### 6.3 Minors

Minors are coherent sequences of courses taken in addition to the courses required for the B.Eng., B.S.E., or B.Sc. (Arch.) degree. Minors normally consist of 18–24 credits, allowing 9–12 credits of overlap with the degree program. The real credit cost to the student is typically 9–15 credits, representing one term beyond the B.Eng., B.S.E., or B.Sc. (Arch.) degree program. All courses in a minor must be passed with a grade of C or better.

Minors available in Chemical Engineering:

- Arts Minor
- Biomedical Engineering Minor
- Biotechnology Minor
- Chemistry
- Computer Science Minor
- Construction Engineering and Management Minor
- Economics Minor
- Environmental Engineering Minor
- Minor in Environment
- Management Minor
- Materials Engineering Minor
- Mathematics Minor
- Minor in Mining
- Minor in Nanotechnology - *New*
- Physics Minor
- Software Engineering Minor
- Technological Entrepreneurship Minor

For complete descriptions of these minors, see the Faculty of Engineering's "[Minor Programs](#)" page.

In addition, students are permitted to register for Minor Concentrations offered through the various departments in the Faculty of Arts. Students are advised to seek approval from the specific department in the Faculty of Arts as well as MESC, prior to embarking on these Minors.

Students intending to register for a Minor Concentration must complete a Course Authorization Form and submit it to MESC. If subsequently the plan is changed, the student must submit a new Course Authorization Form indicating their desire to drop the Minor. Failure to do so may result in delayed graduation.

In order to register for one of the four minors offered by the Faculty of Management, non-Management students must complete and submit the corresponding application to the B.Com Student Affairs Office, Bronfman 110. Information on these Minors can be found at this [webpage](#).

Students are responsible for verifying that they have met the requirements of their Minor before applying for graduation. Students must see an advisor from the department through which their Minor is offered.

## 6.4 Course Exemptions for CEGEP Graduates

New students who have completed CEGEP level courses in Organic I and/or II and who are entering the Department of Chemical Engineering in Fall 2020, or who intend to complete the [Minor program in Biomedical Engineering](#), will have two options available to satisfy these program requirements.

| OPTION 1  | OPTION 2  |
|---|---|
| <p>You may write a McGill Placement Examination in Organic Chemistry I and II (CHEM 212, CHEM 222 (234) at McGill University in August 2020. Should you register to take one or both of these McGill Placement Examinations, and successfully achieve a passing grade in said course/s you will:</p> <ul style="list-style-type: none"> <li>• be granted full transfer credit on the basis of this examination/s;</li> <li>• have the transfer credit reflected on your McGill transcript;</li> <li>• have your program credit requirements decreased to reflect these transfer credits.</li> </ul> | <p>You must register for CHEM 212 Organic and CHEM 234 Organic II during your studies at McGill as outlined in your program requirements.</p> |

For application procedures and details related to the time, place and location of the McGill Placement Examinations please VIEW the following [link](#) and [register](#) accordingly.

## 6.5 Transfer of credits

For information on transfer credit for French Baccalaureate, International Baccalaureate exams, Advanced Placement exams, Advanced Levels and Science Placement Exams, see <http://www.mcgill.ca/students/transfercredit/prospective/> and select your basis of admission.

### a) Transfer from Science Programs to the B.Eng. in Chemical Engineering Programs

Students who have completed all or most of the requirements for the B.Sc. in Chemistry and other chemistry-oriented disciplines (Major or Honours) may qualify for admission to a reduced B.Eng. program. A typical program is listed in this Handbook.

### b) Transfer of Credits for Courses Completed Outside this Department

Students should note that a minimum of 60 credits completed at McGill University are required for a McGill degree. While registered in the B.Eng. program, core courses may not be taken outside the department. For the Department of Chemical Engineering, core courses include all required courses (departmental and non-departmental) as well as technical complementary courses (departmental). Engineering students are permitted to take any Freshman (U0) or General Complementary (Impact or Humanities and Social Sciences) course outside McGill. For additional information, please see the Student Exchanges and Study Away page on the Faculty of Engineering website.

**NOTE:** It is the responsibility of students to request such course exemptions or advanced credit and to ensure that they are properly recorded in the department and the Faculty. Students must complete and submit the Request for Transfer Credit or Exemption form to MESC (Rm. 22, Frank Dawson Adams Building). A request can only be considered granted and recorded when it appears on the student's McGill transcript or their Degree Evaluation report.



For students of high academic standing who qualify for an equivalence of 41 credits as detailed above, the following 76-credit program applies, provided there are no timetable conflicts.

|  |   |                   |   |
|--|---|-------------------|---|
| <b>Semester 1 (Fall)</b>                               |   | 15                | Prerequisites/Co-requisites                     |
| CHEE 200   | Chemical Engineering Principles 1             | 3                 | -   |
| CHEE 231   | Data Analysis and Design of Experiments       | 3                 | -   |
| CHEE 314   | Fluid Mechanics                               | 3                 | C - CHEE 204, MATH 264                          |
| CHEE 370   | Elements of Biotechnology                     | 3                 | -   |
| CHEE 380   | Materials Science                             | 3                 | -   |
| <b>Semester 2 (Winter)</b>                             |   | 16                | Prerequisites/Co-requisites                     |
| CHEE 204   | Chemical Engineering Principles 2             | 3                 | P - CHEE 200                                    |
| CHEE 220   | Chemical Engineering Thermodynamics           | 3                 | P - CHEE 200 / C - MATH 262                     |
| CHEE 315   | Heat and Mass Transfer                        | 3                 | P - CHEE 314                                    |
| CHEE 351   | Separation Processes                          | 3                 | P - CHEE 220 / C - CHEE 204, CHEE 315           |
| CHEE 484   | Materials Engineering                         | 3                 | P - CHEE 380                                    |
| FACC 100   | Introduction to the Engineering Profession    | 1                 | -   |
| <b>Semester 3 (Fall)</b>                               |   | 17                | Prerequisites/Co-requisites                     |
| CHEE 423   | Chemical Reaction Engineering                 | 3                 | P - CHEE 310, CHEE 315                          |
| CHEE 453   | Process Design                                | 4                 | C - CHEE 315, CHEE 351                          |
| CHEE 390   | Computational Methods in Chemical Engineering | 3                 | P - CHEE 204, COMP 208, MATH 263 / C - MATH 264 |
| CHEE 400   | Principles of Energy Conversion               | 3                 | P - CHEE 315/ C - CHEE 390, CHEE 484            |
| CHEE 456   | Design Project 1                              | 4                 | C - CHEE 453                                    |
| FACC 250 Responsibilities of the Professional Engineer |   | 0                 | P - FACC 100 or BREE 250                        |
| <b>Semester 4 (Winter)</b>                             |   | 18                | Prerequisites/Co-requisites                     |
| CHEE 401   | Energy Systems Engineering                    | 3                 | P - CHEE 400                                    |
| CHEE 440   | Process Modelling                             | 3                 | P - CHEE 423, MATH 264                          |
| CHEE 457   | Design Project 2                              | 5                 | P - CHEE 456                                    |
| CHEE 474   | Biochemical Engineering                       | 3                 | P - CHEE 370/ C - CHEE315                       |
| CHEE 491   | Instrumentation and Measurement 2             | 4                 | P - CHEE 231, CHEE 291 / C - CHEE 423, CHEE 455 |
| <b>Semester 5 (Fall)</b>                               |   | 10 <sup>(4)</sup> | Prerequisites/Co-requisites                     |
| CHEE 455   | Process Control                               | 3                 | P - CHEE 291/ C - CHEE 423, CHEE 453            |
| FACC 300   | Engineering Economy                           | 3                 | -   |
| FACC 400   | Engineering Professional Practice             | 1                 | P - FACC 100, FACC 250, and 60 program credits  |
| CHEE xxx   | Technical Complementary                       | 3                 | -   |
|  | <b>Total credits:</b>                         | <b>76</b>         |   |

Programs of those who have studied Chemistry at other universities must be examined in detail to determine how many credits, up to the maximum of 41, may be allowed in their case. Although the above program, in some instances, does not respect the course pre-requisites, they are upheld where possible. Students admitted with advanced standing should, with their Academic Adviser, plan a program in the awareness of the possible difficulties of taking courses out of the pre-requisite sequence. The Adviser must approve this action.

<sup>4</sup> Note that 12 credits are required to remain registered as a full-time student.

## 7. IMPORTANT NOTES FOR STUDENTS

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### Do your degree evaluations early!!!!

Students are responsible to ensure that they meet the course requirements for the B.Eng. They must complete the appropriate check list (p. 28-29) and demonstrate that they met the degree requirements in each category of courses e.g. core, technical, minor program, complementary courses, etc.

Students are advised to meet with an academic adviser and verify their final year course selection prior to the commencement of their U-3 year. Timetable conflicts may cause difficulties in some cases if course selection is not planned well in advance.

## 8. APPENDIX A – Group C TC Options

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For all approved outside TCs courses listed below, students must fill out a Course Authorization Request Form (available at MESC) and submit it to the Undergraduate Coordinator at MESC.

|          |            |          |          |
|----------|------------|----------|----------|
| BMDE 501 | BMDE 503   | BMDE 504 | BMDE 505 |
| BMDE 508 | BMDE 509   | BREE 535 | CIVE 323 |
| CIVE 451 | CIVE 519 * | MIME 588 | CIVE 584 |
| CIVE 652 | ECSE 321   | ECSE 426 | MECH 360 |
| MECH 447 | MIME 320   | MIME 341 | MIME 345 |
| MIME 350 | MIME 452   | MIME 576 | BREE 315 |
| MIME 511 | MECH 383   | MIME 352 | CIVE 558 |

\* *Barbados Field Study Course – before it can be approved, a description of the project and a confirmation of the project and that the student is indeed working on the project is needed from the project supervisor.*

**NOTE:** Any course not on this list must be approved by the department before it can be counted as a Group C TC; please contact [ugrad.chemeng@mcgill.ca](mailto:ugrad.chemeng@mcgill.ca) to formally request a course to be reviewed as a Group C TC.

## 9. APPENDIX B – Graduation checklist (114 credit programme - CEGEP Students)

| <b>Name:</b>                            |   | <b>ID:</b> |      |       |
|---|---|------------|------|-------|
| <b>Admission requirements (if any):</b> |   |            |      |       |
| <b>Advanced credits / exemptions:</b>   |   |            |      |       |
| Course                                  |   | Cr         | Mark | Notes |
| CHEE 200                                | Chemical Engineering Principles 1             | 3          |      |       |
| CHEE 204                                | Chemical Engineering Principles 2             | 3          |      |       |
| CHEE 220                                | Chemical Engineering Thermodynamics           | 3          |      |       |
| CHEE 231                                | Data Analysis and Design of Experiments       | 3          |      |       |
| CHEE 291                                | Instrumentation and Measurement 1             | 4          |      |       |
| CHEE 310                                | Physical Chemistry for Engineers              | 3          |      |       |
| CHEE 314                                | Fluid Mechanics                               | 3          |      |       |
| CHEE 315                                | Heat and Mass Transfer                        | 3          |      |       |
| CHEE 351                                | Separation Processes                          | 3          |      |       |
| CHEE 370                                | Elements of Biotechnology                     | 3          |      |       |
| CHEE 380                                | Materials Science                             | 3          |      |       |
| CHEE 390                                | Computational Methods in Chemical Engineering | 3          |      |       |
| CHEE 400                                | Principles of Energy Conversion               | 3          |      |       |
| CHEE 401                                | Energy Systems Engineering                    | 3          |      |       |
| CHEE 423                                | Chemical Reaction Engineering                 | 3          |      |       |
| CHEE 440                                | Process Modelling                             | 3          |      |       |
| CHEE 453                                | Process Design                                | 4          |      |       |
| CHEE 455                                | Process Control                               | 3          |      |       |
| CHEE 456                                | Design Project 1                              | 4          |      |       |
| CHEE 457                                | Design Project 2                              | 5          |      |       |
| CHEE 474                                | Biochemical Engineering                       | 3          |      |       |
| CHEE 484                                | Materials Engineering                         | 3          |      |       |
| CHEE 491                                | Instrumentation and Measurement 2             | 4          |      |       |
|   |   |            |      |       |
| CHEE xxx                                | Technical Complementary                       | 3          |      |       |
| CHEE xxx                                | Technical Complementary                       | 3          |      |       |
| CHEE xxx                                | Technical Complementary                       | 3          |      |       |
|   |   |            |      |       |
| CHEM 212                                | Introductory Organic Chemistry 1              | 4          |      |       |
| CHEM 234                                | Topics in Organic Chemistry                   | 3          |      |       |
| MATH 262                                | Intermediate Calculus                         | 3          |      |       |
| MATH 263                                | Ordinary Differential Equations for Engineers | 3          |      |       |
| MATH 264                                | Advanced Calculus for Engineers               | 3          |      |       |
| FACC 100                                | Introduction to the Engineering Profession    | 1          |      |       |
| FACC 300                                | Engineering Economy                           | 3          |      |       |
| FACC 400                                | Engineering Professional Practice             | 1          |      |       |
| COMP 208                                | Computers in Engineering                      | 3          |      |       |
|   |   |            |      |       |
| CS                                      | Complementary Studies Group B (HSSML) - 2     | 3          |      |       |
| CS                                      | Complementary Studies Group A (Impact)        | 3          |      |       |
|   |   |            |      |       |
| Minor in:                               |   |            |      |       |
| Free complementary courses (if any):    |   |            |      |       |



## 10. APPENDIX C – Graduation checklist (143 credit programme - non-CEGEP Students)

| Name:                            |   | ID: |      |       |
|----------------------------------|---|-----|------|-------|
| Admission requirements (if any): |   |     |      |       |
| Advanced credits / exemptions:   |   |     |      |       |
|                                  |   |     |      |       |
| Course                           |   | Cr  | Mark | Notes |
| CHEM 110                         | General Chemistry                             | 4   |      |       |
| CHEM 120                         | General Chemistry 2                           | 4   |      |       |
| MATH 133                         | Linear Algebra and Geometry                   | 3   |      |       |
| MATH 140                         | Calculus 1                                    | 3   |      |       |
| MATH 141                         | Calculus 2                                    | 4   |      |       |
| PHYS 131                         | Mechanics and Waves                           | 4   |      |       |
| PHYS 142                         | Electromagnetism and Optics                   | 4   |      |       |
|                                  |   |     |      |       |
| CHEE 200                         | Chemical Engineering Principles 1             | 3   |      |       |
| CHEE 204                         | Chemical Engineering Principles 2             | 3   |      |       |
| CHEE 220                         | Chemical Engineering Thermodynamics           | 3   |      |       |
| CHEE 231                         | Data Analysis and Design of Experiments       | 3   |      |       |
| CHEE 291                         | Instrumentation and Measurement 1             | 4   |      |       |
| CHEE 310                         | Physical Chemistry for Engineers              | 3   |      |       |
| CHEE 314                         | Fluid Mechanics                               | 3   |      |       |
| CHEE 315                         | Heat and Mass Transfer                        | 3   |      |       |
| CHEE 351                         | Separation Processes                          | 3   |      |       |
| CHEE 370                         | Elements of Biotechnology                     | 3   |      |       |
| CHEE 380                         | Materials Science                             | 3   |      |       |
| CHEE 390                         | Computational Methods in Chemical Engineering | 3   |      |       |
| CHEE 400                         | Principles of Energy Conversion               | 3   |      |       |
| CHEE 401                         | Energy Systems Engineering                    | 3   |      |       |
| CHEE 423                         | Chemical Reaction Engineering                 | 3   |      |       |
| CHEE 440                         | Process Modelling                             | 3   |      |       |
| CHEE 453                         | Process Design                                | 4   |      |       |
| CHEE 455                         | Process Control                               | 3   |      |       |
| CHEE 456                         | Design Project 1                              | 4   |      |       |
| CHEE 457                         | Design Project 2                              | 5   |      |       |
| CHEE 474                         | Biochemical Engineering                       | 3   |      |       |
| CHEE 484                         | Materials Engineering                         | 3   |      |       |
| CHEE 491                         | Instrumentation and Measurement 2             | 4   |      |       |
|                                  |   |     |      |       |
| CHEE xxx                         | Technical Complementary                       | 3   |      |       |
| CHEE xxx                         | Technical Complementary                       | 3   |      |       |
| CHEE xxx                         | Technical Complementary                       | 3   |      |       |
|                                  |   |     |      |       |

Continued on the next page.....

| Course                               |   | Cr | Mark | Notes |
|--------------------------------------|---|----|------|-------|
| CHEM 212                             | Introductory Organic Chemistry 1              | 4  |      |       |
| CHEM 234                             | Topics in Organic Chemistry                   | 3  |      |       |
| MATH 262                             | Intermediate Calculus                         | 3  |      |       |
| MATH 263                             | Ordinary Differential Equations for Engineers | 3  |      |       |
| MATH 264                             | Advanced Calculus for Engineers               | 3  |      |       |
| FACC 100                             | Introduction to the Engineering Profession    | 1  |      |       |
| FACC 300                             | Engineering Economy                           | 3  |      |       |
| FACC 400                             | Engineering Professional Practice             | 1  |      |       |
| COMP 208                             | Computers in Engineering                      | 3  |      |       |
|                                      |   |    |      |       |
| CS                                   | Complementary Studies Group B (HSSML) - 1     | 3  |      |       |
| CS                                   | Complementary Studies Group B (HSSML) - 2     | 3  |      |       |
| CS                                   | Complementary Studies Group A (Impact)        | 3  |      |       |
|                                      |   |    |      |       |
| Minor in:                            |   |    |      |       |
| Free complementary courses (if any): |   |    |      |       |