

✓ YEAR ONE - Fall	✓ YEAR ONE - Winter
CHEM 1201 - General Chemistry - Structure & Bonding	CHEM 1202 - General Chemistry - Intro to Quantitative Chemistry
MATH 1200 - Calculus for Scientists I	PHYS 1202 - Classical Physics II
PHYS 1201 - Classical Physics I	COMP 2001 - Computer-Based Problem Solving
GNEED Foundation Cluster 1: one of GNEED 1101 or 1103	MATH 2200 - Calculus for Scientists II
GNEED Foundation Cluster 4: one of GNEED 1401, 1403 or 1404	GNEED Foundation Cluster 2: one of GNEED 1201, 1202, or 1203

Many courses are prerequisites for upper year courses. **As you plan your courses be sure to check prerequisites at <http://catalog.mtroyal.ca>**

✓ YEAR TWO – complete the following courses*
CHEM 2101 - Organic Chemistry I – <i>Fall**</i>
CHEM 2301 - Analytical Chemistry I – <i>Fall**</i>
CHEM 2601- Physical Chemistry – <i>Fall**</i>
PHYS 2201 - Acoustics, Optics & Radiation – <i>Fall**</i>
CHEM 2102 - Organic Chemistry II – <i>Winter**</i>
CHEM 2302 - Analytical Chemistry II – <i>Winter</i> (Community Service Learning/CSL course)**
BCEM 2201 - General Biochemistry – <i>Winter**</i>
MATH 3200 - Mathematical Methods – <i>Winter**</i>
MATH 1203 - Linear Algebra for Scientists & Engineers**
GNEED Foundation Cluster 3: one of GNEED 1301, 1303, or 1304

\*The *Fall/Winter* notations indicate when you should be planning to take core courses. Certain core courses may have prerequisites that need to be completed in a particular sequence to avoid delays in graduation. **In addition, some courses are only offered once per year.** If there is no notation, this course should be completed in year two but may be offered in either semester. It is your responsibility to plan your schedule and make sure that you are meeting necessary requirements. Consider consulting your advisor if you are uncertain or require clarification.

**\*\*Do not delay 2<sup>nd</sup> year core courses as it can result in scheduling conflicts with senior courses, delaying graduation by at least one semester, often one year**

YEAR THREE – complete the following courses*	
✓ CORE Requirements:	✓ General Education and Electives:
CHEM 2401 - Inorganic Chemistry**	GNEED Tier 2 Cluster 2:
CHEM 3200 - Research Methods (CSL course)	GNEED Tier 2 Cluster 3:
CHEM 3601 - Thermodynamics	GNEED Tier 2 Cluster 4:
CHEM 3202 - Spectroscopic Methods	Elective course:
CHEM 3602 - Elementary Quantum Mechanics	Elective course:

**\*\*Do not delay 2<sup>nd</sup> year core courses as listed in the guide, doing so can result in scheduling conflicts with senior courses, delaying graduation by at least one semester, often one year**

YEAR FOUR – complete the following courses*	
✓ CORE Requirements:	✓ General Education and Electives:
CHEM 4701 – Molecular Modelling	GNEED Tier 3 (Cluster ___):
CHEM 5200 – CSL Project (CSL course)	GNEED Tier 3 (Cluster ___):
One of: CHEM 4103 – Adv. Organic Synthesis <b>or</b> CHEM 4301 – Adv. Analytical Chemistry	GNEED Tier 3 (Cluster ___):
Senior General Chemistry Option	Elective course:
Senior General Chemistry Option	Elective course:

Senior General Chemistry Options are listed in the right margin on this page.

Take two Tier 3 courses from a minimum of two different clusters, take the third Tier 3 course from any cluster.

## PLEASE READ:

**Prerequisites and course descriptions: can be found in the Academic Calendar under the 'courses' link at <https://catalog.mtroyal.ca>**

**General Education:** General Education approved courses, otherwise known as "GNEED requirements", are designed to give you a well-rounded knowledge base and are organized into 4 thematic clusters. Each Cluster has 3 levels: tier 1 (foundation), tier 2 and tier 3.

Cluster 1: Numeracy & Scientific Literacy  
Cluster 2: Values, Beliefs & Identity  
Cluster 3: Community & Society  
Cluster 4: Communication

Students must take a foundation level from each of the four clusters, three tier 2 GNEEDs (one from each of cluster 2, 3, and 4), and a total of three tier 3 GNEEDs from at least two clusters, for a total of 10 GNEED courses. For more information and a list of GNEED courses, visit [mru.ca/gned](http://mru.ca/gned) and click 'courses' on the left-hand navigation.

**Junior courses:** are courses at the 1000 level. Students are allowed a maximum of sixteen junior courses for graduation purposes.

**Electives:** an elective is any three-credit course. It is advised that students select senior level electives wherever possible to avoid exceeding the sixteen junior course limits.

**Advising Plan:** Students are strongly advised to follow the progression of classes and course load indicated. Deviation from the recommended course pattern may result in scheduling conflicts with senior major courses.

**Community Service Learning:** three CSL courses are needed to receive this citation on your transcript, learn more here: [mru.ca/csl](http://mru.ca/csl)

**Senior General Chemistry Options, choose 2 from:**

BCEM 4212 - Biochemical Pharmacology  
CHEM 4103 - Advanced Organic Synthesis  
CHEM 4213 - Drug Discovery  
CHEM 4301 - Advanced Analytical Chemistry  
CHEM 4411 - Organometallic Chemistry  
CHEM 4602 - Advanced Quantum Mechanics  
CHEM 4603 - Symmetry and Spectroscopy  
CHEM 4801 - Nuclear Chemistry