



# Chemistry Plans and 2<sup>nd</sup> Year CHEM Courses



# Degree Programs

## **B.Sc.(Honours) Chemistry:**

- Specialization (SSP): CHEM-P-BSH 90 of 120 course units specified
- Major: CHEM-M-BSH 72 of 120 course units specified

## **Other Chemistry Degree Programs**

- B.Sc. Chemistry/Minor (Science): CHEM-G-BSC, CHEM-Z  
48 of 90 units specified
- B.A. Chemistry/Minor (Arts): CHEM-G-BA, CHEM-Y  
30 course units in CHEM + 6 supporting units

## **B.Sc.(Honours) Environmental Chemistry:**

ECHM-P-BSH 102 of 120 course units specified

# CHEM Major & CHEM Specialization



PLAN	CHEM Major	CHEM Specialization
Specified units	72 units	90 units
Electives	48 units or combination of a minor and electives	30 units
Total units	120 units	120 units

## 1<sup>ST</sup> YEAR

- CHEM 112/6.0
- 3.0 units from MATH 110/6.0, MATH 111/6.0, MATH 112/3.0
- One of: PHYS 104/6.0, PHYS 106/6.0, PHYS 117/6.0
- One of: MATH 120/6.0, MATH 121/6.0 or (MATH 123/3.0 and MATH 124/3.0)
- 9.0 units of electives (and/or minor for CHEM Major)

# Frequency Asked Questions

Q. What if I haven't taken 1<sup>st</sup> year Physics?

A. You can take it in your 2<sup>nd</sup> year or take the online PHYS 118 during the summer.

Q. What if I haven't taken either or both required 1<sup>st</sup> year MATH courses?

A. You can take the courses in 2<sup>nd</sup> year or take the online Calculus (Math 121/6.0) in the summer (May -July)

# CHEM Major & CHEM Specialization



## 2<sup>ND</sup> YEAR

- CHEM 211/3.0, CHEM 212/3.0, CHEM 213/3.0 (Fall term)
- CHEM 221/3.0, CHEM 222/3.0, CHEM 223/3.0 (Winter term)
- 12.0 units of electives (and/or minor for CHEM Major)

## 3<sup>rd</sup> YEAR

- CHEM 311/3.0, CHEM 312/3.0, and CHEM 313/3.0 (Fall term)
- CHEM 321/3.0, CHEM 322/3.0, and CHEM 323/3.0 (Winter term)
- CHEM 397/6.0
- 6.0 units of electives (and/or minor for CHEM Major)

# 4<sup>th</sup> YEAR

## CHEM Major

- 3.0 units of CHEM at the 4<sup>th</sup> year level\*
- CHEM 497/6.0
- 21.0 units of electives and/or minor
- \* Students interested in graduate school should take at least 6.0 further units at the 300- and 400-level

## CHEM Specialization

- 12.0 units of CHEM at the 400 level or above; CHEM\_Sub<sup>s</sup>\*
- 9.0 units of CHEM; CHEM\_Sub<sup>s</sup>\*
- CHEM 497/6.0
- 3.0 units of electives
- \* Maximum of 12 units of CHEM\_Sub<sup>s</sup> (BCHM 218, BCHM at the 300 level or above or PHYS 424)

# Environmental Chemistry Specialization



PLAN: 102.0 units plus electives to a total of 120 units.

## 1<sup>st</sup> YEAR

- BIOL 111/3.0 or BIOL 103/3.0
- CHEM 112/6.0
- GPHY 101/3.0 and GPHY 102/3.0
- GEOL 104/3.0 or GEOL 107/3.0
- One of: PHYS 104/6.0, PHYS 106/6.0, PHYS 117/6.0
- One of: MATH 120/6.0, MATH 121/6.0 or (MATH 123/3.0 and MATH 124/3.0)

## 2<sup>nd</sup> YEAR

- CHEM 211/3.0, CHEM 212/3.0, CHEM 213/3.0 (Fall term)
- CHEM 221/3.0, CHEM 222/3.0, CHEM 223/3.0 (Winter term)
- ENSC 103/3.0 or 203/3.0, GEOL and BIOL courses

# Environmental Chemistry Specialization



## 3<sup>rd</sup> YEAR

- CHEM 311/3.0, CHEM 312/3.0 (Fall term)
- CHEM 321/3.0 (or ENSCH 471/3.0), CHEM 323/3.0, and CHEM 326/3.0 (Winter term)
- CHEM 397/6.0

## 4<sup>th</sup> YEAR

- CHEM 497/6.0
- ENSC 430/6.0 or ENSC 501/6.0
- The plan also includes a number of BIOL, GEOL, and GPHY option courses



# Chemistry Minor Plans



B.Sc. Chemistry/Minor (Science): CHEM-G-BSC,  
CHEM-Z 48 of 90 units specified

B.A. Chemistry/Minor (Arts): CHEM-G-BA, CHEM-Y  
30 course units in CHEM + 6 supporting units

- You can combine a CHEM Minor with any Major in the Faculty of Arts and Science, except Biochemistry (too much overlap).
- CHEM Minors with Majors in Physics and Math have some overlap with 100 level PHYS and MATH courses\*
- CHEM Minors with Majors in Biology or Life Sciences also have some overlap with CHEM 112 (and CHEM 281/282)\*

\*Need to take extra course(s) in Minor Plan

# Science Minor

## 48.0 units specified:

- CHEM 112/6.0
- One of: PHYS 104/6.0, PHYS 106/6.0, PHYS 117/6.0
- One of: MATH 120/6.0, MATH 121/6.0 or (MATH 123/3.0 and MATH 124/3.0)
- CHEM 211/3.0, CHEM 212/3.0, CHEM 213/3.0, CHEM 221/3.0, CHEM 222/3.0, CHEM 223/3.0
- 9.0 units of CHEM at the 300 level
- 3.0 units from CHEM 398/3.0, CHEM 399/3.0, CHEM 397 (6.0)

# Arts Minor

## 36.0 units specified:

- CHEM 112/6.0
- One of: MATH 120/6.0, MATH 121/6.0 or (MATH 123/3.0 and MATH 124/3.0)
- 3.0 units of CHEM at the 300 level
- 21.0 units of CHEM

# Concurrent Education Students



Chemistry as your **1<sup>st</sup> Teachable Subject:**

CHEM Major

Chemistry as your **2<sup>nd</sup> Teachable Subject:**

CHEM Minor (either Science or Arts)

# Plan Selection Process

Important date(s)	Step in the plan selection process
May 27- June 7	Plan selection for Arts and Science and ConEd students entering 2 <sup>nd</sup> year
June 10-14	Departments make decisions on students on their pending lists
June 24	Course timetable available on SOLUS
July 15	Students access the Student Centre to view enrollment appointment times; students may begin loading classes into their shopping cart on SOLUS
July 26	Appointment times issued to all 2 <sup>nd</sup> year students

**MAKE SURE YOU REGISTER AT YOUR APPOINTMENT TIME TO GUARANTEE A SPOT IN 2<sup>nd</sup> YEAR CHEM COURSES !!**

# 2024-2025 Chemistry Plan Thresholds

PLAN	CODE	PROGRAM	AUTOMATIC ACCEPTANCE			PENDING LIST		
			Cum. GPA	CHEM 112	MATH 121*	Cum. GPA	CHEM 112	MATH 121* or 112**
Major	CHEM-M-BSH	B.Sc. (Hons)	2.7	C+	Pass	1.9	C-	Pass
SSP	CHEM-P-BSH	B.Sc. (Hons)	2.7	C+	Pass	1.9	C-	Pass
GEN (Sci)	CHEM-G-BSC	B.Sc.	2.1	C	-----	1.6	C-	-----
Minor (Sci)	CHEM-Z		2.1	C	-----	1.6	C-	-----
GEN (Arts)	CHEM-G-BA	B. A.	2.1	C	-----	1.6	C-	-----
Minor (Arts)	CHEM-Y		2.1	C	-----	1.6	C	-----
SSP	ECHM-P-BSH	B.Sc. (Hons.)	No automatic acceptance		-----	1.9	N/A	N/A

\* Or MATH 120 or (MATH 123 and MATH 124)

\*\* Or MATH 110 or MATH 111

# Frequency Asked Questions

- Q. If I am on the pending list, what are my chances of getting accepted into the CHEM Major or SSP program?
- A. In the past several years, we have accepted students with a GPA of 2.0 or higher (minimum requirement for pending list is 1.9).
- Q. What if my GPA is less than 1.9, but I am still interested in a CHEM Major or SSP plan?
- A. If your GPA is between 1.6 and 1.9, and your CHEM 112 mark is at least C-, you can apply for a CHEM General plan, which will allow you to register for CHEM 2xy courses with the other CHEM Major, SSP, and Minor students.

# 2<sup>nd</sup> Year Courses



## FALL TERM

- CHEM 211/3.0 Main Group Chemistry
- CHEM 212/3.0 Principles of Chemical Reactivity
- CHEM 213/3.0 Introduction to Chemical Analysis

## WINTER TERM

- CHEM 221/3.0 Materials, Solutions, and Interfaces
- CHEM 222/3.0 Methods of Structure Determination
- CHEM 223/3.0 Organic Reactions

CHEM 281/3.0 and 282/3.0 are organic chemistry courses for students in Biology and Life Sciences – **do not register in these courses for a CHEM plan !!!**



# 3<sup>rd</sup> Year Courses



## Fall term

- CHEM 311/3.0 Mechanistic Organic Chemistry
- CHEM 312/3.0 Transition Metal Chemistry
- CHEM 313/3.0 Quantum Mechanics

## Winter term

- CHEM 321/3.0 Instrumental Chemical Analysis
- CHEM 322/3.0 The Chemical Bond: Computation and Spectroscopy
- CHEM 323/3.0 Biological Chemistry
- CHEM 326/3.0 Environmental and Green Chemistry
- CHEM 397/6.0 Experimental Chemistry (Fall/Winter)

# TOP 5 REASONS to study CHEMISTRY

- 1 Chemistry opens very broad career options.
- 2 With extensive experimental training, Chemistry studies are very hands on, and fun!
- 3 Queen's Chemistry department is a very supportive and nurturing environment; our graduating class is small and close-knit.
- 4 All Major and Specialization Chemistry students conduct research in 4th year as part of their plan (CHEM 497).
- 5 Queen's Chemistry graduates are accredited by the Canadian Society for Chemistry.



# What will I learn?

A degree in Chemistry can equip you with valuable and versatile skills, such as:

- Academic and technical skills to conduct research, understand scientific journal articles, trouble-shooting, clearly explain and interpret research data
- Organizational skills to compile, organize and maintain accurate records
- Ability to operate laboratory equipment and to employ appropriate scientific lab techniques
- Proficiency in mathematical and logical analysis
- Sensitivity to the health and safety of others - safe handling, storage and disposal of hazardous chemicals
- Written and oral communication skills to prepare and present reports from research ideas and information using current technology
- Observation and decision-making skills
- Team working in a multidisciplinary context
- Resource and time management
- Practical and fundamental knowledge of all subdisciplines of chemistry

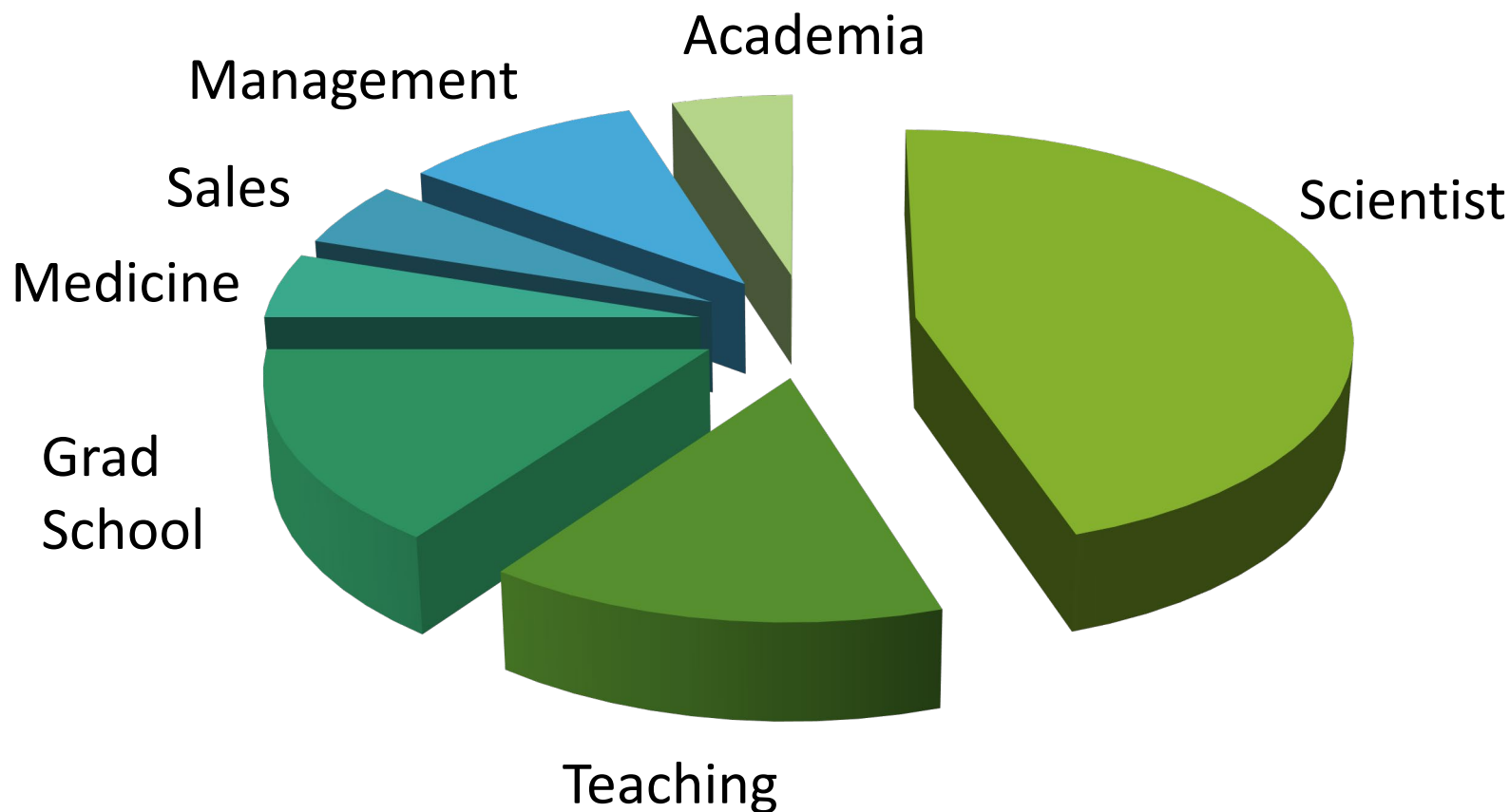
# Where can I go with my degree in Chemistry?

A degree in Chemistry can take your career in many directions. Many students choose to continue their academic inquiry with M.Sc./Ph.D. studies. Our students are equipped with a strong foundation for careers in:

- Environmental research
- Forensic science
- Environmental sustainability
- Materials science
- Patent law
- Pharmaceuticals
- Pharmacy
- Public health
- Quality control
- Sustainability design



# What do the graduates of Chemistry programs do with their degrees?



# Undergraduate Research Opportunities in Chemistry

CHEM 497 - all Major and Specialization students complete a research project in a faculty member's lab and present their results in a poster (December) and an oral presentation of their written thesis (April).



# Undergraduate Research Opportunities in Chemistry

- SWEP (Student Work Experience Program) –
  - several faculty each year have SWEP projects that employ summer students
- NSERC USRA (Undergraduate Student Research Awards)
  - awarded to students to carry out summer research work in the Department
- Volunteering in Labs



# Professional Internship



## **B.Sc. (Hons., Chemistry) with Professional Internship**

The Professional Internship in the Faculty of Arts and Science (QUIP) is the combination of any Major (or Specialization) with a paid internship (12- or 16-month duration) between 3<sup>rd</sup> and 4<sup>th</sup> year.

Chemistry leads the Faculty in numbers of interns placed.

- arranged through Career Services (QUIP)
- remain a registered student
- usually start May (16 month) or September (12 month) after 3<sup>rd</sup> year
- register in the Internship program in Fall term of 3<sup>rd</sup> year (Career Services workshops) and in INTN 301-305 Professional Internship I-V (different components of 12 and 16 month internships)



# Accelerated Master's Program



A “program” introduced last year in Chemistry is the Accelerated Master's Program:

Allows students to complete a M.Sc. Degree in a shorter length of time by:

- Counting graduate courses taken during their 4<sup>th</sup> year both as electives in their undergraduate program and as courses required in their M.Sc. Program
- Using their CHEM 497 research project (and possibly work done as a 3<sup>rd</sup> year summer student) as a foundation for their Master's research work

Rather than starting a M.Sc. in September after graduating and taking 2 years to complete the M.Sc. degree, students can start in May after graduation and take as few as 4 terms to complete their M.Sc. degree.

# Need more information about Chemistry Programs?

## Contact:

- Diane Beauchemin, Chair of Undergraduate Studies in Chemistry, [ugchair@chem.queensu.ca](mailto:ugchair@chem.queensu.ca)
- Meredith Richards, Chemistry Undergraduate Assistant, [ugadm@chem.queensu.ca](mailto:ugadm@chem.queensu.ca)

## See:

<https://www.chem.queensu.ca/undergraduate>

## Plan Selection:

<https://www.queensu.ca/artsci/undergrad-students/plan-selection>