Get to know BIOCHEMISTRY

Biochemistry in the 21st century will continue to uncover the biochemical basis for life. Emerging knowledge in biochemistry will help to unravel the molecular basis for diseases such as cancer and hypertension, and in turn lead to the development of new tools for disease detection and new therapies for treatments and cures.

The biochemist applies the basic principles of chemistry, mathematics, physics, and biology to the study of cellular processes; thus a good grounding in these subjects is an integral part of the program. Biochemistry at Queen’s offers a wide scope of diverse topics ranging from molecular genetics and structural biology to the functional basis of enzymes, hormones, and vitamins. These biochemistry courses incorporate an understanding of specific organisms, as well as organ systems such as musculoskeletal and cardiovascular.

The cooperative program in Biochemistry is an option that provides paid work placements totalling 12 months in industry, business, research institutes or government labs providing contacts and experience in the workplace. Participating in the cooperative program requires up to an additional year of study. Biochemistry students in the Specialization plan will undertake 4th year research projects in topics as diverse as protein structure and enzyme function, along with supporting courses.

“A comprehensive program with a modern experimental approach to science.”

A Common START

Students in our Faculty are admitted into Arts, Science or Computing but the focus is on a common first year. Through self-exploration, and while you settle into university life, you have the opportunity to work with our advisors and faculty to discover your real interests and identify opportunities for success. Sometimes that discovery happens fairly quickly, and for other students it takes some work and time before the “ah-ha!” happens – either way your first year at Queen’s will be a great experience.

Queen’s ADMISSION

Students apply to Queen’s Science (QS) through the OUAC (Ontario Universities Application Centre) website (ouac.on.ca). Secondary School prerequisites include English 4U, Advanced Functions 4U, Calculus and Vectors 4U, plus two of Biology 4U, Chemistry 4U, or Physics 4U.

Degree OPTIONS

Bachelor of Science (Honours)
Major / Minor / Specialization in Biochemistry
Bachelor of Science (General)
Internship option available

Course HIGHLIGHTS

The first two years of study in the Biochemistry program involve courses in general chemistry, organic chemistry, mathematics and biology, the latter giving also a first introduction to biochemical themes. The first full complement of courses in biochemistry are offered in the third year program, together with an extensive laboratory course. The fourth year is devoted almost entirely to biochemistry, covering some of the latest advances, and including a large proportion of advanced laboratory experience.
1ST YEAR
In first year take BIOL 102, 103, CHEM 112, MATH 120 or 121, PHYS 106 or 104 or 117.
Each Science Plan will have several required first-year courses, including minors. For details see the Arts and Science Academic Calendar.
Want to enhance your degree? Consider a certificate in Academic Writing or explore other certificates available.

GET RELEVANT EXPERIENCE
Join teams or clubs on campus such as Let’s Talk Science and Queen’s First Aid.
See the AMS Clubs Directory or the Queen’s Get Involved page for more ideas.

GET CONNECTED WITH THE COMMUNITY
Volunteer on or off campus with different community organizations, such as Science Rendezvous and the Queen’s Synthetic Biology Organization.

GET THINKING GLOBALLY
The Queen’s University International Centre is your first stop to learn how to internationalize your degree or to leverage your existing cross-cultural experience.
Speak to a QUIC advisor or get involved in their programs, events and training opportunities.

GET READY FOR LIFE AFTER GRADUATION
Grappling with program decisions? Go to Majors Night or get some help considering career options from Career Services. Attend Biochemistry Information Night in October and Q & A Night in March offered by the DSC. Attend Information Sessions in November and January offered by the Associate Dean.

2ND YEAR
In second year take BCHM 216, CHEM 211, 212, 222, 223, STAT 263.
Biochemistry students must meet minimum GPA requirements in their core courses to proceed to 4th year courses, which are listed on the unit website.
Please see the Academic Calendar to ensure you are taking the correct courses.

GET RELEVANT EXPERIENCE
Consider taking more responsibility within different clubs or extracurriculars, like Queen’s LifeBeat Newspaper. Look into summer jobs by talking to the department or Career Services about work through SWEP or NSERC. Consider entrepreneurial opportunities via programs like the Queen’s Innovation Connector Summer Initiative (QICSI).

GET CONNECTED WITH THE COMMUNITY
Get involved with the BCHM Student Council. Connect with professors at socials or attend speaker events.
Start or continue volunteering with organizations such as Médecins Sans Frontières (Doctors Without Borders).

GET THINKING GLOBALLY
Is an exchange in your future? Start thinking about where you would like to study abroad. Apply in January for a 3rd year exchange through your Faculty’s International Office. If exchange isn’t for you, come talk to QUIC about some other options to gain international experience.

GET READY FOR LIFE AFTER GRADUATION
Explore different careers of interest by reading books in the Career Services Information Area, such as Opportunities in Medical Technology Careers. For more information check out Career Cruising or by finding and connecting with alumni on LinkedIn. Attend Canadians Studying Medicine Abroad offered by the Associate Dean, Life Sciences and Biochemistry.

3RD YEAR
Complete all Plan requirements/core courses. Meet the minimum grade requirements for fourth year BCHM courses.
Take BCHM 313, 315, 316, 317. Specialization students must also take 3.0 units from another 300-level lab.
Need help mapping all of your core, option, supporting and elective courses (including those not listed above) to make sure you will have what you need to complete your degree? Use the Course Mapping Tool on the Arts and Science website.

GET RELEVANT EXPERIENCE
Stay during the summer as an assistant to a faculty member or apply for an external summer research opportunity. Contact the Life Sciences and Biochemistry Program Office for information.
Consider applying to our unique 8 month biochemistry co-op program or to a 12-16 month QUIP internship between your third and fourth year.

GET CONNECTED WITH THE COMMUNITY
Go to conferences such as the Queen’s Undergraduate Conference on Healthcare if interested.
Do targeted networking with alumni working in careers of interest by joining the LinkedIn group Queen’s Connects. Connect with professors at events or workshops hosted by the DSC.

GET THINKING GLOBALLY
Build your intercultural competence by getting involved with other cultures or by practicing and improving your language skills. Check QUIC’s resources for ideas to go abroad, volunteer or attend one of their events.

GET READY FOR LIFE AFTER GRADUATION
Start focusing on areas of interest. Research education requirements for careers of interest. If needed, prepare to take any required tests (like the MCAT or GMAT) and get help thinking about grad school from Career Services.

4TH OR FINAL YEAR
Specialization students must take BCHM 410, 411, 421, 422, 432, 442. Majors must take BCHM 410, 411, 432, 441.
By fourth year you should be working on your remaining option and elective courses. Make sure to map your minor and / or certificate(s) as well.
Apply to graduate in SOLUS.

C O N S I D E R A 1 2 - 1 6 M O N T H Q U I P I N T E R N S H I P
Investigate requirements for full-time jobs or other opportunities related to careers of interest. Assess what experience you’re lacking and fill in gaps with volunteering, clubs, or internships – check out the Career Services skills workshop for help. Participate in inquiry@queen’s undergraduate student conference.

GET RELEVANT EXPERIENCE
Consider joining professional associations like the Canadian Society for Biochemistry and Molecular Biology and the International Union of Biochemistry and Molecular Biology.
Join groups on LinkedIn reflecting specific careers or topics of interest in Biochemistry.

GET CONNECTED WITH THE COMMUNITY
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Join groups on LinkedIn reflecting specific careers or topics of interest in Biochemistry.

GET READY FOR LIFE AFTER GRADUATION
Apply to jobs or future education, or make plans for other adventures. Get help from Career Services with job searching, resumes, interviews, grad school applications, or other decisions. Attend Town Hall meetings offered by the Associate Dean and provide input into the Program.

Where could I go after graduation?

Academia
Agricultural sciences
Biomedical engineering
Biotechnology
Business
Dentistry
Education
Epidemiology
Food science and technology
Forensic science
Forestry
Genetics
Graduate studies
Journalism
Law
Nutrition & dietetics
Pharmacy
Pharmaceuticals
Public health
Research
Sales, retail and wholesale
Textile industry
Veterinary medicine

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Some careers may require additional training.

Visit careers.queensu.ca/majormaps.html for the online version with links!
Biochemistry
MAJOR MAP

How to use this map
Use the 5 rows of the map to explore possibilities and plan for success in the five overlapping areas of career and academics. The map just offers suggestions – you don’t have to do it all! To make your own custom map, use the My Major Map tool.

A balanced approach leads to long-term success. While you will learn a lot from your studies, taking time to get relevant experience outside of the classroom, build your network, and gain international experience, will position you to be more competitive in your job search or grad school applications.

Get started thinking about the future now – where do you want to go after your degree? Having tentative goals (like careers or grad school) while working through your degree can help with short-term decisions about courses and experiences, but also help you keep motivated for success.

Get the help you need
Queen’s provides you with a broad range of support services from your first point of contact with the university through to graduation. At Queen’s, you are never alone. We have many offices dedicated to helping you learn, think and do.

Ranging from help with academics and careers, to physical, emotional, or spiritual resources – our welcoming living and learning environment offers the programs and services you need to be successful, both academically and personally, and Queen’s wants you to succeed! Check out the Student Affairs website for available resources.

Succeed in the workplace

What employers want
Take the time to think about the unique skills you have developed at Queen’s, starting with the skills list here for ideas. Explaining your strengths with compelling examples will be important for applications to employers and further education. For help, check out the Career Services skills workshop.

What can I learn studying BIOCHEMISTRY?
- Knowledge of the chemical and biological processes within the human body and other organisms
- Understanding of organic, analytical and physical chemistry and biology (genetics)
- Understanding of general physics and mathematics
- Ability to use statistics and computer programs for data processing
- Familiarity with a laboratory environment and ability to troubleshoot laboratory equipment and instruments
- Knowledge of quality control and safety regulations
- Quantitative skills to solve quantitative problems
- Oral and written communication to write and summarize reports, along with giving oral presentations
- Time and resource management

The Canadian Council of Chief Executives list the top 6 skills sought by employers as:
1. People skills
2. Communication skills
3. Problem-solving skills
4. Analytical abilities
5. Leadership skills
6. Industry-specific knowledge