



# PROGRAM PLANNING GUIDE

Name: \_\_\_\_\_

ID: 

## Bachelor of Science

### Biochemistry



Biochemistry is the study of all living systems at the molecular level. It looks at the chemical and physical basis of life and how these living systems interact with their environments. Biochemistry will help you develop a strong background in the basic sciences and extensive laboratory skills, while emphasizing the chemical and physical basis of life. As a biochemistry student, you will gain hands-on experience with the latest tools and technology used in chemistry, physics and biological sciences, such as molecular biology, protein crystallography and advanced biophysics.

#### What determines my program requirements?

Please refer to the Academic Calendar ([www.ulethbridge.ca/ross/academic-calendar](http://www.ulethbridge.ca/ross/academic-calendar)) for complete program information.

**Calendar Year:** 2025/2026 - Your calendar year is set to the academic year you are admitted (or readmitted) and you should follow the requirements for that year for the duration of your program.

**Faculty/School:** Faculty of Arts and Science ([www.ulethbridge.ca/artsci](http://www.ulethbridge.ca/artsci))

**Program(s):** Bachelor of Science

**Major(s):** Biochemistry

**Minor:** A defined set of courses, designed to provide depth in a particular discipline, study in an interdisciplinary area, or focus on a theme-related topic. To learn more about optional minors see [www.ulethbridge.ca/ross/minors](http://www.ulethbridge.ca/ross/minors).

#### Am I admissible to this program?

**Admission:** [www.ulethbridge.ca/ross/admissions/undergrad](http://www.ulethbridge.ca/ross/admissions/undergrad)

**Transfer:** [www.ulethbridge.ca/ross/transfer-resources](http://www.ulethbridge.ca/ross/transfer-resources)

#### When/How do I apply to the University?

**Deadlines:** [www.ulethbridge.ca/ross/admissions/undergrad/deadlines](http://www.ulethbridge.ca/ross/admissions/undergrad/deadlines)

**Step-by-Step:** [www.ulethbridge.ca/ross/admissions/step-by-step](http://www.ulethbridge.ca/ross/admissions/step-by-step)

#### Where can I find information on courses?

**Course Catalogue:** [www.ulethbridge.ca/ross/courses](http://www.ulethbridge.ca/ross/courses)

**Registration Guide:** [www.ulethbridge.ca/ross/registration-guide](http://www.ulethbridge.ca/ross/registration-guide)

#### When can I register for classes?

**Register early!** (March for Summer and Fall; November for Winter)

**Registration Dates:** [www.ulethbridge.ca/ross/registration-dates](http://www.ulethbridge.ca/ross/registration-dates)

#### How can I enhance my program?

**Career Bridge:** [www.ulethbridge.ca/career-bridge](http://www.ulethbridge.ca/career-bridge)

**Co-op Education:** [www.ulethbridge.ca/career-bridge/co-operative-education](http://www.ulethbridge.ca/career-bridge/co-operative-education)

**Honours Thesis:** [www.ulethbridge.ca/ross/undergraduate-thesis](http://www.ulethbridge.ca/ross/undergraduate-thesis)

**Double Major:** [www.ulethbridge.ca/ross/double-major](http://www.ulethbridge.ca/ross/double-major)

#### What supports are available to students?

**Student Services:** [www.ulethbridge.ca/campus-life/student-services](http://www.ulethbridge.ca/campus-life/student-services)

**Student Success Centre:** [www.ulethbridge.ca/student-success-centre](http://www.ulethbridge.ca/student-success-centre)

**Accessible Learning:** [www.ulethbridge.ca/ross/alc](http://www.ulethbridge.ca/ross/alc)

**Counselling Services:** [www.ulethbridge.ca/counselling](http://www.ulethbridge.ca/counselling)





## Required courses and notes

Name: \_\_\_\_\_

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### Major Requirements (24 Courses)

- \_\_\_\_\_ 1. Biochemistry 2000 - Introductory Biochemistry
- \_\_\_\_\_ 2. Biochemistry 3100 - Proteins, Enzymes and Nucleic Acids
- \_\_\_\_\_ 3. Biochemistry 3300 - Bioenergetics and Metabolism
- \_\_\_\_\_ 4. Biology 1010 - Cellular Basis of Life
- \_\_\_\_\_ 5. Biology 1020 - Diversity of Life
- \_\_\_\_\_ 6. Biology 2000 - Principles of Genetics
- \_\_\_\_\_ 7. Biology 2300 - Cell Biology
- \_\_\_\_\_ 8. Biology 3000 - Gene Expression and Regulation
- \_\_\_\_\_ 9. Biology 3210 - Experimental Methods in Molecular and Cellular Biology
- \_\_\_\_\_ 10. Chemistry 1000 - General Chemistry I
- \_\_\_\_\_ 11. Chemistry 2000 - General Chemistry II
- \_\_\_\_\_ 12. Chemistry 2410 - Analytical Chemistry I
- \_\_\_\_\_ 13. Chemistry 2500 - Organic Chemistry I
- \_\_\_\_\_ 14. Chemistry 2600 - Organic Chemistry II
- \_\_\_\_\_ 15. Chemistry 2740 - Physical Chemistry I
- \_\_\_\_\_ 16. Physics 2130 - Waves, Optics and Sound
- \_\_\_\_\_ 17. **One of:**
  - \_\_\_\_\_ Mathematics 1560 - Calculus I
  - \_\_\_\_\_ Mathematics 1565 - Accelerated Calculus I
- \_\_\_\_\_ 18. **One of:**
  - \_\_\_\_\_ Mathematics 2560 - Calculus II
  - \_\_\_\_\_ Mathematics 2565 - Accelerated Calculus II
- \_\_\_\_\_ 19. **One of:**
  - \_\_\_\_\_ Physics 1000 - Introduction to Physics I (recommended)
  - \_\_\_\_\_ Physics 1050 - Introduction to Biophysics
  - \_\_\_\_\_ <sup>1</sup>Engineering 2060 - Engineering Mechanics
- \_\_\_\_\_ 20. **One of:**
  - \_\_\_\_\_ Biochemistry 3000 - Studies in Biochemistry (Series)
  - \_\_\_\_\_ Biochemistry 3700/Neuroscience 3700 - Introduction to Bioinformatics
  - \_\_\_\_\_ Interdisciplinary Studies 3200 - Genetically Engineered Machines
  - \_\_\_\_\_ Biology 3400 - Principles of Microbiology
- \_\_\_\_\_ 21.-22. **Two of:**
  - \_\_\_\_\_ Biochemistry 3000 - Studies in Biochemistry (Series)
  - \_\_\_\_\_ Biochemistry 3700/Neuroscience 3700 - Introduction to Bioinformatics
  - \_\_\_\_\_ Biochemistry 3990 - Independent Study
  - \_\_\_\_\_ Biochemistry 4990 - Independent Study
  - \_\_\_\_\_ Biochemistry 4995 - Undergraduate Thesis (6.0 credit hours)
  - \_\_\_\_\_ Biology 3005 - Genomes
  - \_\_\_\_\_ Biology 3110 - Cell Signalling
  - \_\_\_\_\_ Biology 3310 - Developmental Biology
  - \_\_\_\_\_ Biology 3400 - Principles of Microbiology
  - \_\_\_\_\_ <sup>1</sup>Biology 3420 - Animal Physiology
  - \_\_\_\_\_ <sup>1</sup>Biology 3460 - Plant Physiology
  - \_\_\_\_\_ Chemistry 3410 - Instrumental Methods of Analysis
  - \_\_\_\_\_ <sup>1</sup>Chemistry 3730 - Physical Chemistry II
  - \_\_\_\_\_ Chemistry 3830 - Inorganic Chemistry I
  - \_\_\_\_\_ Chemistry 3840 - Inorganic Chemistry II
  - \_\_\_\_\_ Chemistry 4000 - Advanced Chemistry (Series)
  - \_\_\_\_\_ Chemistry 4010 - Advanced Chemistry with Laboratory (Series)
  - \_\_\_\_\_ Interdisciplinary Studies 3200 - Genetically Engineered Machines
  - \_\_\_\_\_ Neuroscience 3600 - Fundamental Neurobiology

### 23.-24. Two of:

- \_\_\_\_\_ Any Biochemistry course at the 4000 level

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- \_\_\_\_\_ Biology 4100 - Advances in Biotechnology
- \_\_\_\_\_ Biology 4130 - Medical Genomics
- \_\_\_\_\_ Biology 4140 - RNA Biology
- \_\_\_\_\_ Biology 4155 - Cannabis and Health
- \_\_\_\_\_ Biology 4180 - Natural Products
- \_\_\_\_\_ Biology 4230 - Molecular and Cellular Biology of Cancer

### Notes

<sup>1</sup> This course has a prerequisite or corequisite that is not required for the major.

Applied Studies may not be counted as part of the minimum requirements for the major.

Students should choose appropriate 3000-level Biology or Chemistry courses to meet prerequisites for 4000-level courses in Biochemistry and/or Biology.

It is strongly recommended that students who are planning to pursue graduate studies in Biochemistry consider the Undergraduate Thesis option during the final two terms of their fourth year. Students interested in this option should consult potential supervisors at an early stage to discuss their background preparation. The Undergraduate Thesis course (Biochemistry 4995; 6.0 credit hours) will satisfy the first "Two of" list requirement, above.

### Electives (16 Courses)

- \_\_\_\_\_ 25.-40. Sixteen additional courses (48.0 credit hours) chosen to complete program requirements
- \_\_\_\_\_ 25. \_\_\_\_\_
- \_\_\_\_\_ 26. \_\_\_\_\_
- \_\_\_\_\_ 27. \_\_\_\_\_
- \_\_\_\_\_ 28. \_\_\_\_\_
- \_\_\_\_\_ 29. \_\_\_\_\_
- \_\_\_\_\_ 30. \_\_\_\_\_
- \_\_\_\_\_ 31. \_\_\_\_\_
- \_\_\_\_\_ 32. \_\_\_\_\_
- \_\_\_\_\_ 33. \_\_\_\_\_
- \_\_\_\_\_ 34. \_\_\_\_\_
- \_\_\_\_\_ 35. \_\_\_\_\_
- \_\_\_\_\_ 36. \_\_\_\_\_
- \_\_\_\_\_ 37. \_\_\_\_\_
- \_\_\_\_\_ 38. \_\_\_\_\_
- \_\_\_\_\_ 39. \_\_\_\_\_
- \_\_\_\_\_ 40. \_\_\_\_\_



## Required courses and notes

Name: \_\_\_\_\_

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### Liberal Education List Requirement

Only four courses (12.0 credit hours) in total may be counted from any one discipline toward the Lib Ed Requirement. Disciplines are identified by separate course subject codes. Cross-listed courses count toward the limit for both disciplines (e.g. IGBM 3250/INDG 3250 counts toward the limit for Dhillon School of Business courses and Indigenous Studies).

Only four courses (12.0 credit hours) in total from the Faculty of Education (EDUC), Faculty of Health Sciences (ADCS, HLSC, INHL, NURS, PUBH, and TREC), and the Dhillon School of Business (ACCT, AGEM, FINC, GLBU, HRLR, IGBM, MGT, and MKTG) may be counted towards the Lib Ed Requirement.

To determine if a course has a Liberal Education designation, see School of Liberal Education in the 2025/2026 University of Lethbridge Undergraduate Calendar, [www.ulethbridge.ca/ross/academic-calendar](http://www.ulethbridge.ca/ross/academic-calendar).

#### 1.-4. List I: Fine Arts and Humanities

- \_\_\_\_\_ 1. \_\_\_\_\_
- \_\_\_\_\_ 2. \_\_\_\_\_
- \_\_\_\_\_ 3. \_\_\_\_\_
- \_\_\_\_\_ 4. \_\_\_\_\_

#### 5.-8. List II: Social Science

- \_\_\_\_\_ 5. \_\_\_\_\_
- \_\_\_\_\_ 6. \_\_\_\_\_
- \_\_\_\_\_ 7. \_\_\_\_\_
- \_\_\_\_\_ 8. \_\_\_\_\_

#### 9.-12. List III: Science

- \_\_\_\_\_ 9. \_\_\_\_\_
- \_\_\_\_\_ 10. \_\_\_\_\_
- \_\_\_\_\_ 11. \_\_\_\_\_
- \_\_\_\_\_ 12. \_\_\_\_\_

### General Requirements

- \_\_\_\_\_ A minimum of 40 courses (120.0 credit hours) with a GPA of at least 2.00.
- \_\_\_\_\_ A maximum of five Independent Study courses (15.0 credit hours) may be completed for credit towards the degree.
- \_\_\_\_\_ A maximum of five Disciplinary Credit Applied Studies courses (15.0 credit hours) may be completed for credit towards the degree. Students may, in addition, complete Applied Studies 2000, 2001, 2010, and 2011.
- \_\_\_\_\_ A maximum of 24 courses (72.0 credit hours) may be completed from any one discipline for credit towards the degree. Disciplines are identified by a specific course label (e.g. KNES, ASTR, and HIST are separate disciplines).
- \_\_\_\_\_ A maximum of 6.0 credit hours in Activity courses (i.e. courses labelled PHAC and MUSE) may be completed for credit towards the degree, except for Kinesiology majors (not more than 15.0 credit hours) and Music majors (not more than 12.0 credit hours).
- \_\_\_\_\_ A maximum of six courses (18.0 credit hours) from disciplines offered outside the Faculty of Arts and Science, Faculty of Fine Arts, or School of Liberal Education may be completed for credit towards the degree (i.e. labelled ACCT, ADCS, AGEM, CDEV, CRED, EDUC, FINC, GLBU, HLSC, HRLR, IGBM, INHL, MGT, MKTG, NURS, PUBH, and TREC). Courses cross-listed between the Faculty of Arts and Science and another Faculty or School do not count towards this limit.
- \_\_\_\_\_ Residence requirement: a minimum of 20 courses (60.0 credit hours) must be completed at the University of Lethbridge, including at least 10 courses (30.0 credit hours) from disciplines offered by the Faculty of Arts and Science, Faculty of Fine Arts, or School of Liberal Education at the 3000/4000 level. At least half of the courses required in the major must be completed at the University of Lethbridge.

A **maximum** of 12 courses (36.0 credit hours) may be completed at the 1000 level (or lower) for credit towards the degree, excluding Activity courses (labelled PHAC and MUSE) and courses numbered in the range of 0520 to 0530.

#### 1.-12. Introductory Course Limit

- \_\_\_\_\_ 1. \_\_\_\_\_
- \_\_\_\_\_ 2. \_\_\_\_\_
- \_\_\_\_\_ 3. \_\_\_\_\_
- \_\_\_\_\_ 4. \_\_\_\_\_
- \_\_\_\_\_ 5. \_\_\_\_\_
- \_\_\_\_\_ 6. \_\_\_\_\_
- \_\_\_\_\_ 7. \_\_\_\_\_
- \_\_\_\_\_ 8. \_\_\_\_\_
- \_\_\_\_\_ 9. \_\_\_\_\_
- \_\_\_\_\_ 10. \_\_\_\_\_
- \_\_\_\_\_ 11. \_\_\_\_\_
- \_\_\_\_\_ 12. \_\_\_\_\_

A **minimum** of 15 courses (45.0 credit hours) from disciplines offered by the Faculty of Arts and Science, Faculty of Fine Arts, or School of Liberal Education at the 3000/4000 level, excluding Activity courses (labelled PHAC and MUSE). Out-of-faculty courses (i.e. labelled ACCT, ADCS, AGEM, CDEV, CRED, EDUC, FINC, GLBU, HLSC, HRLR, IGBM, INHL, MGT, MKTG, NURS, PUBH, and TREC) will not meet this requirement.

#### 1.-15. Senior Course Requirement

- \_\_\_\_\_ 1. \_\_\_\_\_
- \_\_\_\_\_ 2. \_\_\_\_\_
- \_\_\_\_\_ 3. \_\_\_\_\_
- \_\_\_\_\_ 4. \_\_\_\_\_
- \_\_\_\_\_ 5. \_\_\_\_\_
- \_\_\_\_\_ 6. \_\_\_\_\_
- \_\_\_\_\_ 7. \_\_\_\_\_
- \_\_\_\_\_ 8. \_\_\_\_\_
- \_\_\_\_\_ 9. \_\_\_\_\_
- \_\_\_\_\_ 10. \_\_\_\_\_
- \_\_\_\_\_ 11. \_\_\_\_\_
- \_\_\_\_\_ 12. \_\_\_\_\_
- \_\_\_\_\_ 13. \_\_\_\_\_
- \_\_\_\_\_ 14. \_\_\_\_\_
- \_\_\_\_\_ 15. \_\_\_\_\_

### Optional Minor:

For information about minors see **Minors** in the 2025/2026 University of Lethbridge Calendar, [www.ulethbridge.ca/ross/academic-calendar](http://www.ulethbridge.ca/ross/academic-calendar). Consult with an Academic Advisor if you wish to add a minor to your program.

#### 1.-6. Required Courses

- \_\_\_\_\_ 1. \_\_\_\_\_
- \_\_\_\_\_ 2. \_\_\_\_\_
- \_\_\_\_\_ 3. \_\_\_\_\_
- \_\_\_\_\_ 4. \_\_\_\_\_
- \_\_\_\_\_ 5. \_\_\_\_\_
- \_\_\_\_\_ 6. \_\_\_\_\_



Name: \_\_\_\_\_

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Shown below is the recommended sequence of courses for your degree. Consult timetables for course offerings, prerequisites, and corequisites before registering each term as some courses may have limited offerings (ie. once a year, alternating years, or only offered in the Fall or Winter terms).

Consult with an Academic Advisor in your faculty if you wish to alter this sequence with regard to the specifically listed courses.

**Note that this sequence was prepared based on course scheduling at the time of publication and may change during your studies.**

### First Year

**Biology 1010**

**Biology 1020**

**Chemistry 1000**

**Chemistry 2000**

One of: **Mathematics 1560** or **Mathematics 1565**

One of: **Mathematics 2560** or **Mathematics 2565**

One of: **Physics 1000** or **Physics 1050**

**Physics 2130**

Lib Ed Requirement course

Lib Ed Requirement course

### Second Year

**Biochemistry 2000**

**Biology 2000**

**Biology 2300**

**Chemistry 2410**

**Chemistry 2500**

**Chemistry 2600**

**Chemistry 2740**

Lib Ed Requirement course

Lib Ed Requirement course

Lib Ed Requirement course

### Third Year

Biochemistry 3100

Biochemistry 3300

Biology 3000

Biology 3210

3000/4000-level list course

3000/4000-level list course

Lib Ed Requirement course

Lib Ed Requirement course

Lib Ed Requirement course

Elective 3000/4000 level

### Fourth Year

Biochemistry or Biology 4000 level

Biochemistry or Biology 4000 level

3000/4000-level list course

Elective 3000/4000 level

Elective 3000/4000 level

Elective 3000/4000 level

Elective 3000/4000 level

Elective 3000/4000 level

Elective

Elective

**Note:** Courses in bold in Years 1 and 2 of the sample sequence are prerequisite(s) for required courses and should be completed early in your program. Students are advised to review the prerequisites for elective courses within the major and plan accordingly.

Students are strongly advised to consult with the Department of Biological Sciences and the Department of Chemistry and Biochemistry regarding the sequencing of the above courses. In particular, students attending on a part-time basis should consult with the Coordinator of Biochemistry.