

University of  
Lethbridge



## Program Planning Guide

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

ID: \_\_\_\_\_

Calendar Year: 2022/2023

**Major in Biochemistry:**

[www.ulethbridge.ca/artsci/chemistry-biochemistry](http://www.ulethbridge.ca/artsci/chemistry-biochemistry)

**Academic Calendar:**

[www.ulethbridge.ca/ross/academic-calendar](http://www.ulethbridge.ca/ross/academic-calendar)

**High School Admission Requirements:**

[www.ulethbridge.ca/ross/admissions/undergrad/high-school](http://www.ulethbridge.ca/ross/admissions/undergrad/high-school)

**Current and Past Program Planning Guides:**

[www.ulethbridge.ca/ross/ppgs](http://www.ulethbridge.ca/ross/ppgs)

**Co-operative Education:**

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

**Faculty of Arts and Science Advising:**

[www.ulethbridge.ca/artsci/advising](http://www.ulethbridge.ca/artsci/advising)  
artsci.advising@uleth.ca  
403-329-5106  
M2102

**Bachelor of Science**  
**Biochemistry**

This is a planning guide and not a graduation check or guarantee of course offerings. You should have a program check done in your final year of studies. Students are responsible for the accuracy of their own programs. The guide should be used in conjunction with the University of Lethbridge Calendar, which is the final authority on all questions regarding program requirements and academic regulations.

Contact an Academic Advisor ([www.ulethbridge.ca/ross/academic-advising](http://www.ulethbridge.ca/ross/academic-advising)) for advising information.

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

**ID :** \_\_\_\_\_

**Program Requirements**

Completion of at least 40 courses (120.0 credit hours) with cumulative and graduation grade point averages of at least 2.00.

**Major Requirements (24 courses)**

- \_\_\_\_\_ Biochemistry 2000 - Introductory Biochemistry
- \_\_\_\_\_ Biochemistry 3100 - Proteins, Enzymes and Nucleic Acids
- \_\_\_\_\_ Biochemistry 3300 - Bioenergetics and Metabolism
- \_\_\_\_\_ Biology 1010 - Cellular Basis of Life
- \_\_\_\_\_ Biology 1020 - Diversity of Life
- \_\_\_\_\_ Biology 2000 - Principles of Genetics
- \_\_\_\_\_ Biology 2300 - Cell Biology
- \_\_\_\_\_ Biology 3000 - Gene Expression and Regulation
- \_\_\_\_\_ Biology 3210 - Experimental Methods in Molecular and Cellular Biology
- \_\_\_\_\_ Chemistry 1000 - General Chemistry I
- \_\_\_\_\_ Chemistry 2000 - General Chemistry II
- \_\_\_\_\_ Chemistry 2410 - Analytical Chemistry I
- \_\_\_\_\_ Chemistry 2500 - Organic Chemistry I
- \_\_\_\_\_ Chemistry 2600 - Organic Chemistry II
- \_\_\_\_\_ Chemistry 2740 - Physical Chemistry I
- \_\_\_\_\_ Physics 2000 - Introduction to Physics II

- \_\_\_\_\_ Chemistry 3410 - Analytical Chemistry II
- \_\_\_\_\_ <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

**Two of:**

- \_\_\_\_\_ Any Biochemistry course at the 4000 level
- \_\_\_\_\_ Biology 4100 - Advances in Biotechnology
- \_\_\_\_\_ Biology 4130 - Medical Genomics
- \_\_\_\_\_ Biology 4140 - RNA Biology
- \_\_\_\_\_ Biology 4155 - Cannabis and Health
- \_\_\_\_\_ Biology 4180 - Natural Products
- \_\_\_\_\_ Biology 4200 - Techniques in Molecular Biology
- \_\_\_\_\_ Biology 4230 - Molecular and Cellular Biology of Cancer

**One of:**

- \_\_\_\_\_ Mathematics 1560 - Calculus I
- \_\_\_\_\_ Mathematics 1565 - Accelerated Calculus I

**One of:**

- \_\_\_\_\_ Mathematics 2560 - Calculus II
- \_\_\_\_\_ Mathematics 2565 - Accelerated Calculus II

**One of:**

- \_\_\_\_\_ Physics 1000 - Introduction to Physics I (recommended)
- \_\_\_\_\_ Physics 1050 - Introduction to Biophysics
- \_\_\_\_\_ <sup>1</sup> Engineering 2060 - Engineering Mechanics

**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

**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

**Other Courses (minimum 16 courses)**

1. \_\_\_\_\_
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3. \_\_\_\_\_
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15. \_\_\_\_\_
16. \_\_\_\_\_

**Notes**

<sup>1</sup>This course has a prerequisite that is not required for the major. See the Course Catalogue (p. 343) for more information.

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.

**Completion of the Liberal Education List Requirement (Lib Ed 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.

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

See the 2022/2023 Calendar, p. 81, for more information.

\_\_\_\_\_ Four Fine Arts and Humanities courses:

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

\_\_\_\_\_ Four Social Science courses:

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

\_\_\_\_\_ Four Science courses:

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

Not more than 12 courses (36.0 credit hours) may be completed at the 1000 level (or lower) [0500 - 1999] for credit towards the degree, excluding Activity courses (labelled PHAC and MUSE) and courses numbered in the range of 0520 to 0530.

1. \_\_\_\_\_
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11. \_\_\_\_\_
12. \_\_\_\_\_

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

1. \_\_\_\_\_
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15. \_\_\_\_\_

\_\_\_\_\_ Not more than five Independent Study courses (15.0 credit hours) may be completed for credit towards the degree.

\_\_\_\_\_ Not more than 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.

\_\_\_\_\_ \* Not more than 24 courses (72.0 credit hours) may be completed from any one discipline for credit towards the degree.

\_\_\_\_\_ Not more than six 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).

\_\_\_\_\_ Not more than six courses (18.0 credit hours) from disciplines 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 ABHL, ACCT, ADCS, AGEM, CDEV, CRED, EDUC, FINC, HLSC, HRLR, IGBM, IMGT, MGT, MKTG, NURS, PUBH, and TREC). Courses cross-listed between the Faculty of Arts and Science and another Faculty do not count towards this limit.

\_\_\_\_\_ Residence requirement:

**Degree:** 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.

**Major:** at least half of the courses required in the major must be completed at the University of Lethbridge.

\*Disciplines are identified by a specific course label (e.g. KNES, ASTR, and HIST are separate disciplines).

\_\_\_\_\_ **Minor (Optional):** \_\_\_\_\_  
See the 2022/2023 Calendar, p. 323, for more information.

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

## Sample Sequencing Plan

Shown below is a sample sequence of courses for your degree. Consult timetables for course offerings, prerequisites, and corequisites before registering each term. This is just one example of how you could complete your major and degree requirements; you may find that a different sequence works as well as this one.

### **Year 1, Fall**

Biology 1020 or Biology 1010  
 Chemistry 1000  
 Mathematics 1560 or Mathematics 1565  
 Physics 1000 or 1050  
 Lib Ed Requirement course

### **Year 2, Fall**

Biochemistry 2000  
 Chemistry 2410  
 Chemistry 2500  
 Lib Ed Requirement course  
 Lib Ed Requirement course

### **Year 3, Fall**

Biochemistry 3300  
 Biology 3000  
 Biology 3210  
 Lib Ed Requirement course  
 Lib Ed Requirement course

### **Year 4, Fall**

Biochemistry or Biology 4000 level  
 3000/4000-level list course  
 Elective 3000/4000 level  
 Elective 3000/4000 level  
 Elective

### **Year 1, Spring**

Biology 1010 or Biology 1020  
 Chemistry 2000  
 Mathematics 2560 or Mathematics 2565  
 Physics 2000  
 Lib Ed Requirement course

### **Year 2, Spring**

Biology 2000  
 Biology 2300  
 Chemistry 2600  
 Chemistry 2740  
 Lib Ed Requirement course

### **Year 3, Spring**

Biochemistry 3100  
 3000/4000-level list course  
 3000/4000-level list course  
 Lib Ed Requirement course  
 Elective 3000/4000 level

### **Year 4, Spring**

Biochemistry or Biology 4000 level  
 Elective 3000/4000 level  
 Elective 3000/4000 level  
 Elective 3000/4000 level  
 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.

