

University of
Lethbridge



Program Planning Guide

Departments: Biological Sciences, and Chemistry and Biochemistry

Calendar Year: 2020/2021

Name: _____

ID: _____

Bachelor of Science Biochemistry

Major in Biochemistry:

www.uleth.ca/artsci/biochemistry

Academic Calendar:

www.uleth.ca/ross/academic-calendar

High School Admission Requirements:

www.uleth.ca/ross/admissions/undergrad/high-school

Current and Past Program Planning Guides:

www.uleth.ca/ross/ppgs

Faculty of Arts and Science Advising:

www.uleth.ca/artsci/advising
artsci.advising@uleth.ca
403-329-5106
M2102

Co-operative Education:

www.uleth.ca/artsci/coop

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 in the Faculty of Arts and Science for advising information.

Name : _____

ID : _____

B.Sc. Biochemistry

Completion of at least 40 courses (120.0 credit hours) with a grade point average of at least 2.00.

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
- _____ 6. Biology 2300 - Cell Biology
- _____ 7. Biology 3000 - Gene Expression and Regulation
- _____ 9. Biology 3210 - Experimental Methods in Molecular and Cellular Biology
- _____ 11. Chemistry 1000 - General Chemistry I
- _____ 12. Chemistry 2000 - General Chemistry II
- _____ 13. Chemistry 2410 - Analytical Chemistry I
- _____ 14. Chemistry 2500 - Organic Chemistry I
- _____ 15. Chemistry 2600 - Organic Chemistry II
- _____ 16. Chemistry 2740 - Physical Chemistry I
- _____ 17. Physics 2000 - Introduction to Physics II
- _____ 18. **One of:**
 - _____ Mathematics 1560 - Calculus I
 - _____ Mathematics 1565 - Accelerated Calculus I
- _____ 19. **One of:**
 - _____ Mathematics 2560 - Calculus II
 - _____ Mathematics 2565 - Accelerated Calculus II
- _____ 20. **One of:**
 - _____ Physics 1000 - Introduction to Physics I (recommended)
 - _____ Physics 1050 - Introduction to Biophysics
 - _____ ¹Engineering 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
 - _____ ¹Biology 3420 - Animal Physiology

- _____ ¹Biology 3460 - Plant Physiology
- _____ Chemistry 3410 - Analytical Chemistry II
- _____ ¹Chemistry 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
- _____ 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

Other Courses (minimum 16 courses)

- | | |
|----------|-----------|
| 1. _____ | 9. _____ |
| 2. _____ | 10. _____ |
| 3. _____ | 11. _____ |
| 4. _____ | 12. _____ |
| 5. _____ | 13. _____ |
| 6. _____ | 14. _____ |
| 7. _____ | 15. _____ |
| 8. _____ | 16. _____ |

Notes

¹This course has a prerequisite that is not required for the major. See the Course Catalogue (p. 281) 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.

See also:

- Bachelor of Science - Biological Sciences
- Bachelor of Science - Chemistry

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 (MGT) may be counted towards the Lib Ed Requirement.

See the 2020/2021 Calendar, p. 71, for more information.

LIST I: Fine Arts and Humanities Courses

- | | |
|----------|----------|
| 1. _____ | 3. _____ |
| 2. _____ | 4. _____ |

LIST II: Social Science Courses

- | | |
|----------|----------|
| 1. _____ | 3. _____ |
| 2. _____ | 4. _____ |

LIST III: Science Courses

- | | |
|----------|----------|
| 1. _____ | 3. _____ |
| 2. _____ | 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. _____ | 7. _____ |
| 2. _____ | 8. _____ |
| 3. _____ | 9. _____ |
| 4. _____ | 10. _____ |
| 5. _____ | 11. _____ |
| 6. _____ | 12. _____ (max.) |

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, ADCS, CDEV, CRED, EDUC, HLSC, MGT, NURS, PUBH, and TREC) will not meet this requirement.

- | | |
|----------|------------------|
| 1. _____ | 9. _____ |
| 2. _____ | 10. _____ |
| 3. _____ | 11. _____ |
| 4. _____ | 12. _____ |
| 5. _____ | 13. _____ |
| 6. _____ | 14. _____ |
| 7. _____ | 15. _____ (min.) |
| 8. _____ | |

____ 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.

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

____ 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, ADCS, CDEV, CRED, EDUC, HLSC, MGT, 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.

Minor (Optional): _____
See the 2020/2021 Calendar, p. 267, for more information.

- | | |
|----------|----------|
| 1. _____ | 4. _____ |
| 2. _____ | 5. _____ |
| 3. _____ | 6. _____ |

Sample Sequencing Plan

Shown below is a sample sequence of courses for your degree. If you follow this plan, you should be able to graduate in four years, provided you complete five courses per 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.

<p>Year 1, Fall Biology 1020 or Biology 1010 Chemistry 1000 Mathematics 1560 or Mathematics 1565 Physics 1000 or 1050 Lib Ed Requirement course</p>	<p>Year 1, Spring Biology 1010 or Biology 1020 Chemistry 2000 Mathematics 2560 or Mathematics 2565 Physics 2000 Lib Ed Requirement course</p>
<p>Year 2, Fall Biology 2000 Biology 2300¹ Chemistry 2410 Chemistry 2500 Lib Ed Requirement course</p>	<p>Year 2, Spring Biochemistry 2000 Chemistry 2600 Chemistry 2740 Lib Ed Requirement course Lib Ed Requirement course</p>
<p>Year 3, Fall Biochemistry 3100 Biology 3000 Biology 3210 Lib Ed Requirement course Lib Ed Requirement course</p>	<p>Year 3, Spring Biochemistry 3300 3000/4000-level list course 3000/4000-level list course Lib Ed Requirement course Elective 3000/4000 level</p>
<p>Year 4, Fall Biochemistry or Biology 4000 level 3000/4000-level list course Elective 3000/4000 level Elective 3000/4000 level Elective</p>	<p>Year 4, Spring Biochemistry or Biology 4000 level Elective 3000/4000 level Elective 3000/4000 level Elective 3000/4000 level Elective</p>

¹ Term of offering may vary.

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 electives 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.

Terms Used

Lib Ed Requirement course: A course that could count toward the Liberal Education List Requirement. You may use courses in your major towards this 12-course requirement. See the 2020/2021 University of Lethbridge Calendar, School of Liberal Education for complete information.

The School of Liberal Education offers Liberal Education 1000 and 2000, specifically designed to introduce first-year students to the wide scope of human knowledge and teach essential university success skills, critical thinking, and integrative thinking (see the 2020/2021 University of Lethbridge Calendar, Course Catalogue). LBED 1000 and 2000 may be used toward satisfying the Lib Ed Requirement.

Elective: A course that you may choose freely from all those available and applicable to your program. Use courses inside or outside your major, bearing in mind any restrictions that may apply (e.g., a maximum of 24 courses from any one discipline).

