

University of  
Lethbridge



## Program Planning Guide

**Departments:** Biological Sciences, and Chemistry and Biochemistry

**Calendar Year:** 2018/2019

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

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

# Bachelor of Science Biochemistry

**Major in Biochemistry:**

[www.uleth.ca/artsci/biochemistry](http://www.uleth.ca/artsci/biochemistry)

**Academic Calendar:**

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

**High School Admission Requirements:**

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

**Current and Past Program Planning Guides:**

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

**Faculty of Arts and Science Advising:**

[www.uleth.ca/artsci/advising](http://www.uleth.ca/artsci/advising)  
[artsci.advising@uleth.ca](mailto:artsci.advising@uleth.ca)  
403-329-5106  
SU060

**Co-operative Education:**

[www.uleth.ca/artsci/coop](http://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)**

**Other Courses (minimum 16 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 3000 - Gene Expression and Regulation
- \_\_\_\_\_ 8. Biology 3105 - Signal Transduction
- \_\_\_\_\_ 9. Biology 3210 - Experimental Methods in Molecular and Cellular Biology
- \_\_\_\_\_ 10. Biology 3400 - Principles of Microbiology
- \_\_\_\_\_ 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
- \_\_\_\_\_ 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
  - \_\_\_\_\_ <sup>1</sup>Engineering 2060 - Engineering Mechanics
- \_\_\_\_\_ 21-22. **Two of:**
  - \_\_\_\_\_ Biology 3005 - Genome Maintenance
  - \_\_\_\_\_ Biology 3115 - Principles of Cell Growth
  - \_\_\_\_\_ Biology 3310 - Developmental Biology
  - \_\_\_\_\_ Biology 3420 - Animal Physiology
  - \_\_\_\_\_ Biology 3460 - Plant Physiology
  - \_\_\_\_\_ Chemistry 3410 - Analytical Chemistry II
  - \_\_\_\_\_ <sup>2</sup>Chemistry 3730 - Advanced Physical Chemistry
  - \_\_\_\_\_ Chemistry 3830 - Inorganic Chemistry I
  - \_\_\_\_\_ Chemistry 3840 - Inorganic Chemistry II

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

Two courses (6.0 credit hours) in Biochemistry or Biology (List 1 - Cellular and Molecular Biology) at the 4000 level (see the 2018/2019 Calendar, **Biological Sciences (B.Sc.)**, p. 117, for Biology lists):

- 23. \_\_\_\_\_
- 24. \_\_\_\_\_

**Notes**

<sup>1</sup>Prerequisites required: *Engineering 2000 and Mathematics 1565.*

<sup>2</sup>Prerequisite required: *Mathematics 1410.*

Applied Studies, Independent Studies, and the Undergraduate Thesis may not be counted as part of the minimum requirements for the major; however, they are strongly encouraged for students taking courses beyond this minimum.

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.

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 Faculties of Education (EDUC), Health Sciences (ABHL, ADCS, HLSC, NURS, PUBH, and TREC), and Management (MGT) may be counted towards the Lib Ed Requirement.*

*See the 2018/2019 Calendar, p. 95, 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 or the Faculty of Fine Arts 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 four courses (12.0 credit hours) from disciplines offered outside the Faculty of Arts and Science or the Faculty of Fine Arts 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 Arts and Science courses (30.0 credit hours) 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 2018/2019 Calendar, p. 291, for eligible minors.*

- |          |          |
|----------|----------|
| 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><b>Year 1, Fall</b>  <b>Biology 1020 or Biology 1010</b>  <b>Chemistry 1000</b>  <b>Mathematics 1560 or</b>  <b>Mathematics 1565</b>  <b>Physics 1000</b>                      Lib Ed Requirement course</p>	<p><b>Year 1, Spring</b>  <b>Biology 1010 or Biology 1020</b>  <b>Chemistry 2000</b>  <b>Mathematics 2560 or</b>  <b>Mathematics 2565</b>  <b>Physics 2000</b>                      Lib Ed Requirement course</p>
<p><b>Year 2, Fall</b>  <b>Biology 2000</b>  <b>Chemistry 2410</b>  <b>Chemistry 2500</b>                      Lib Ed Requirement course                      Lib Ed Requirement course</p>	<p><b>Year 2, Spring</b>  <b>Biochemistry 2000</b>                      Biology 3400  <b>Chemistry 2600</b>  <b>Chemistry 2740</b>                      Lib Ed Requirement course</p>
<p><b>Year 3, Fall</b>                      Biochemistry 3100                      Biology 3000                      Biology 3210                      Lib Ed Requirement course                      Lib Ed Requirement course</p>	<p><b>Year 3, Spring</b>                      Biochemistry 3300                      Biology 3105                      Biology or Chemistry 3000-level                      list course                      Lib Ed Requirement course                      Elective</p>
<p><b>Year 4, Fall</b>                      Biology or Chemistry 3000-level                      list course                      Biochemistry or Biology 4000 level                      Elective 3000/4000 level                      Elective 3000/4000 level                      Elective</p>	<p><b>Year 4, Spring</b>                      Biochemistry or Biology 4000 level                      Elective 3000/4000 level                      Elective 3000/4000 level                      Elective 3000/4000 level                      Elective</p>

**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 2018/2019 University of Lethbridge Calendar, School of Liberal Education for complete information.

The Faculty of Arts and Science 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 2018/2019 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).

