Bachelor of Science
Biochemistry

Calendar Year: 2004-2005
Faculty: Arts & Science

The Biochemistry major is a multidisciplinary program offered primarily by the Department of Biological Sciences and the Department of Chemistry and Biochemistry. The program provides background for a wide range of careers in science. It also provides excellent preparation for graduate study in the life sciences and for professional programs in Medicine and Veterinary Science.

For students whose objective is to enter one of the latter professional programs, it is possible simultaneously to complete the requirements for the Biochemistry major and the requirements for entering the professional program. Most students who enter one of these professional programs have completed an undergraduate degree program. Consequently, it is a good strategy to pursue a balanced approach between the requirements for entrance to the professional program and the requirements of the major.

Entrance to either a professional program or graduate studies in the life sciences is highly competitive. Generally, one of the factors that is considered for entrance is the ability of a student to handle a full load of academic courses. Specifically, it is expected that one has taken a full load of five academic courses during each Fall and Spring semester. This is an important consideration both for entrance into such programs and in competition for scholarships. Thus it is not advisable during regular semesters to take a reduced load of three or four courses, for example, in order to try to improve one's grades.

Students interested in Medicine (University of Alberta or University of Calgary) or Veterinary Medicine (University of Saskatchewan) should consult the appropriate Program Planning Enclosure, available at the Student Program Services Office (SU060).

High School Courses
Several university-level science courses have high school-level courses as recommended background or prerequisites. Students are advised to complete recommended background courses before registering in the university-level course; students *must* have successfully completed prerequisites before they may register in the university-level course.

Students pursuing a Biochemistry major should note the following recommended/required high school courses.

UofL course	*High school course*
Biology	
1010	Biology 30, and Chemistry 30 or 0500
1020	*Recommended: Biology 30*
2000	Pure Mathematics 30 or Mathematics 30* or Mathematics 0500 (and Biology 1010)
Chemistry	
1000	Chemistry 30 or 0500, Pure Mathematics 30 or Mathematics 30* or Mathematics 0500 *Recommended: Mathematics 31*
Mathematics	
1560	Pure Mathematics 30 or Mathematics 30* or Mathematics 0500 *Recommended: Mathematics 31 and a blended grade of at least 75% in Mathematics 30 or Pure Mathematics 30*
Physics	
1000	Physics 30, and Pure Mathematics 30 or Mathematics 30* or Mathematics 0500
1050	Pure Mathematics 30 or Mathematics 30* or Mathematics 0500 *Recommended: A course in physical science at the 20 level or above*

**Students may use both Applied Mathematics 30 and a minimum grade of 75% in Athabasca University's Mathematics 101 instead of Mathematics 30 or Pure Mathematics 30.*

Co-operative Education
A Co-op option, requiring three work terms, is available. Students interested in the Co-operative Education/Internship program should contact the Coordinator of Co-operative Education in the Career Resources Centre (B610; tel. 403-382-7154) for further information.

Program Planning Guide

University of Lethbridge

This program guide is designed to help you plan your degree program. The information should help you keep track of your progress in your major, electives and all your degree requirements. Please remember that this is only a guide and not a graduation check. 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.

Current and past Program Planning Guides are available on the UofL website at:
http://www.uleth.ca/reg/ro_quick_links.html

Name: _____ ID: _____ E-Mail: _____

Advisor: _____ Date: _____ *Calendar Year:* 2004-2005

REQUIREMENTS FOR THE BIOCHEMISTRY MAJOR

The Program

The B.Sc. degree with a multidisciplinary major in Biochemistry requires 40 semester courses, including 20 courses in the major.

Transfer Credit

Remember that you may use both University of Lethbridge credit and credit transferred from another college or university to meet degree and major requirements. Transfer credit may be either specified or unspecified. Specified credit is indicated on your transcript by the subject name and the specific number of the course, e.g., Biology 1010, 3200. Unspecified credit (1XXX, 3XXX, etc.) is indicated by the subject name and level of the course in parentheses, e.g., Biology (1000 level), Biology (3000 level), etc.

Unspecified course credit means that the University of Lethbridge does not offer the same course you transferred in, but we recognize it and treat it as a regular course. An unspecified course would count as one of your maximum of 20 from one department, but it could not meet a specific course requirement. For example, if Biology 2000 is required in your program, you could not use Biology (2000 level) to fulfill that requirement.

How do I use the guide?

When you have met one of the requirements, place a check mark beside it. When all the requirements are checked, you should have completed the major.

_____ 1. Biochemistry 3010 - Biochemistry I

_____ 2. Biochemistry 3020 - Biochemistry II

_____ 3. Biochemistry 4200 - Proteins and Nucleic Acids

_____ 4. Biology 1010 - Cellular Basis of Life

_____ 5. Biology 1020 - Diversity of Life

_____ 6. Biology 2000 - Principles of Genetics

_____ 7. Biology 3000 - Molecular Genetics

_____ 8. Biology 3110 - Cell Regulation

_____ 9. Biology 3200 - Principles of Microbiology

_____ 10. Chemistry 1000 - Atoms, Molecules and Chemical Reactions

_____ 11. Chemistry 2000 - Chemical Equilibrium and Electrochemistry

_____ 12. Chemistry 2410 - Introduction to Analytical Chemistry

_____ 13. Chemistry 2500 - Organic Chemistry I

_____ 14. Chemistry 2600 - Organic Chemistry II

_____ 15. Chemistry 2710 - Chemical Kinetics

_____ 16. Chemistry 2720 - Physical Chemistry I

_____ 17. Mathematics 1560 - Calculus I

_____ 18. ONE of the following:

_____ Physics 1000 - Introduction to Physics I (recommended)

_____ Physics 1050 - Introduction to Biophysics

_____ *Engineering 2060 - Engineering Mechanics

_____ 19. Physics 2000 - Introduction to Physics II

_____ 20. ONE of the following:

_____ Biology 4100 - Advances in Agricultural Biotechnology

_____ ** Biology 4110 - Advances in Genetics, Molecular and Cellular Biology

_____ Biology 4170 - Plant Biotechnology

_____ Biology 4560 - Plant Development

Students are required to do a minimum of five additional Science courses for a B.Sc. It is recommended that the additional courses be selected from the following:

_____ Biochemistry 4000 - Studies in Biochemistry

_____ Biology 3310 - Developmental Biology

_____ Biology 3420 - Animal Physiology

_____ Biology 3460 - Plant Physiology

_____ **Chemistry 3410 - Instrumental Methods of Analysis

_____ **Chemistry 3420 - Electroanalytical Chemistry

_____ **Chemistry 3710 - Physical Chemistry II

_____ Mathematics 2560 - Calculus II

_____ Psychology 2600 - Brain and Behaviour

_____ Psychology 3600 - Fundamental Neurobiology

_____ One or more additional selections from the list of advanced molecular biology courses (Biology 4100, 4110, 4170, 4560).

_____ Courses that specifically develop laboratory skills in molecular biology and biochemistry are particularly recommended. Examples include:
Biochemistry 3850/4850 laboratory courses (when offered)
Biology 4200 - Techniques in Molecular Biology
Appropriate Independent Study courses in Biochemistry, Biology or Neuroscience

** Prerequisites required: Engineering 2000 and Mathematics 1560.*
*** These courses are typically offered only on alternate years.*

SAMPLE COURSE SEQUENCING PLAN

B.Sc. - BIOCHEMISTRY

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 semester. 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.

TERMS USED

GLER course: *A course that could count toward the General Liberal Education Requirement. You may use courses in your major towards this 12-course requirement. See the 2004-2005 University of Lethbridge Calendar, Part 4 - Academic Regulations (pp. 77-80) for complete information.*

The Faculty of Arts and Science offers Liberal Education 1001 and 1002, 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 2004-2005 University of Lethbridge Calendar, Part 15 - Courses, p. 347). LBED 1001 and 1002 may be used toward satisfying the GLER.

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 20 courses from any one department).*

	FALL	SPRING
YEAR ONE	Biology 1010 or 1020 Chemistry 1000 Mathematics 1560 Physics 1000 GLER course	Biology 1010 or 1020 Chemistry 2000 Mathematics 2560 (recommended) GLER course GLER course

	FALL	SPRING
YEAR TWO	Biology 2000 Chemistry 2410 Chemistry 2500 GLER course GLER course	Biology 3200 Chemistry 2600 Physics 2000 GLER course GLER course

	FALL	SPRING
YEAR THREE	Biochemistry 3010 Biology 3000 Chemistry 2720 GLER course Elective	Biochemistry 3020 Biology 3110 Chemistry 2710 Science Elective Elective

	FALL	SPRING
YEAR FOUR	Biology 4100, 4110, 4170, or 4560* Science elective 3000/4000 level Science elective 3000/4000 level Elective Elective	Biochemistry 4200 Science elective 3000/4000 level Elective Elective Elective

* *Please check with the Department of Biological Sciences for details regarding 4000-level offerings.*

Note *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.*

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.