University of
Lethbridge

Name: _____   **ID:** _____

Program Planning Guide

Current and past Program Planning Guides are available on the
UofL website at www.uleth.ca/ross/ppgs/ppg.html

Calendar Year: 2012/2013

Faculty: Arts & Science

What is Mathematics?

Carl F. Gauss (1777-1855) described his subject: "Mathematics is the Queen of Sciences and Arithmetic the Queen of Mathematics. She often condescends to render service to astronomy and other natural sciences, but under all circumstances the first place is her due." Gauss is rated alongside Newton and Archimedes as one of the greatest mathematicians of all time. The golden age of Mathematics is said to have begun around the end of the 18th Century and continues to this day. The development of Mathematics over the past 200 years has been phenomenal and shows no signs of decline. Now is the golden age of Mathematics.

Applied vs. Pure Mathematics

Mathematics is the study of structure and pattern. Applied mathematicians develop models of structures in the real world, and in this way Mathematics provides a language for many other physical and social sciences. In pure Mathematics the structures studied are more abstract, and the emphasis is on proof of ideas. In all areas of Mathematics, research is very active, with a rapid expansion over the last few decades.

About the Mathematics Major

The Mathematics degree program at the University of Lethbridge offers courses in the three main areas of Mathematics – algebra, analysis, and geometry – as well as Statistics. The department also offers special courses for students in other degree programs. Students will obtain a broad mathematical knowledge coupled with a sound liberal arts education. Often students will combine Mathematics with courses in Physics, Computer Science, Chemistry, Economics, Management, or other areas of interest. Students may complete a B.Sc. in Mathematics, or a combined degrees program with the Faculties of Education or Management.

The Department of Mathematics and Computer Science

The Department of Mathematics and Computer Science consists of full-time Faculty members, academic assistants, and a number of sessional instructors. We want to share our enthusiasm for the subject; we want to get you through whether you are a major or not. We are here to help you with your Mathematics.

Proficiency in English is Essential for the Mathematics Major

Mathematics is about ideas, and ideas are spelled out in words. Many students make a fundamental mistake in thinking that a mastery of English grammar is not essential for Mathematics. Unquestionably, the most important aspect of your university degree is to learn to express, in writing, your ideas so that they can be clearly understood by the intended reader.

Career Opportunities

Most Mathematics majors choose to work in education and for good reason. There appears to be a constant shortage of good Mathematics teachers. Every year the scientific disciplines require more Mathematics from their majors; the demand for mathematical knowledge is accelerating.

Graduate Studies

Members of the Department would be very happy to talk to any students hoping to do graduate studies in Mathematics. Faculty members could advise students on choosing and entering a graduate school and the numerous career possibilities using higher Mathematics. There is a Mathematics Club for students interested in more than just the course work required for a major.

Undergraduate Employment with the Department

While doing their degrees, the best students earn money and valuable experience marking first and second semester assignments, and as proctors (informed supervisors) in the computing laboratories. Some students work privately as tutors for beginning students having difficulties with the subject.

Scholarships and Awards

Students should consult the Calendar for information regarding the many awards available for continuing undergraduate students. NSERC Scholarships are available to top students going on to graduate school. Eligible students should talk to Department members regarding the best strategy for obtaining these awards. A minimum grade point average of 3.5 is a good start.

Texts

The Mathematical Association of America has published a list of 'Library Recommendations for Undergraduate Mathematics' [L. Steen, editor]. This wonderful list - 3,000 texts in 25 categories - allows a beginner to select a three-star classic on any chosen branch of Mathematics. Faculty members have their own lists of classic texts and favourite authors. Majors are strongly encouraged to talk to Department members about extracurricular reading to widen their appreciation of the subject.

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 (AH154 | phone: 403-382-7154) for further information.

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 Mathematics major should note the following recommended/ required high school courses.

UofL Science course		*High School course*
Computer Science	1620	Mathematics 30-1, Mathematics 30-2, or Pure Mathematics 30*
Mathematics	1410	Mathematics 30-1 or Pure Mathematics 30*
	1560	Mathematics 30-1 or Pure Mathematics 30*
		*Recommended: Mathematics 31 and a blended grade of at least 75% in Mathematics 30-1 or Pure Mathematics 30**
Statistics	1770	Mathematics 30-1, Mathematics 30-2, or Pure Mathematics 30*

* Instead of Mathematics 30-1, Mathematics 30-2, or Pure Mathematics 30, students may use UofL's Mathematics 0500.

Program Requirements

The B.Sc. degree with a major in Mathematics requires 40 semester courses, including a minimum of 18 courses (16 Mathematics and Statistics courses plus two cognates) in the Mathematics major. A maximum of 20 courses in Mathematics (including Statistics) is allowed. Arts and Science regulations allow Mathematics and Computer Science to be treated as separate Departments; consequently, Computer Science courses are not counted toward the 20-course maximum.

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., Mathematics 1410, Statistics 2780, etc. Unspecified credit (1XXX, 2XXX, etc.) is indicated by the subject name and level of the course in parentheses, e.g., Mathematics (1000 level), Statistics (2000 level), etc.

Unspecified Course Credit

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 Mathematics 2560 is required in your program, you could not use Mathematics (2000 level) to fulfill that requirement. Students with unspecified transfer credit need to consult an Academic Advisor to establish how the transfer credit fits in the degree program. This should be done as soon as possible after transfer credit is awarded.

Program Worksheet

N a m e : _____   **I D :** _____

Required courses:

_____   1.   Mathematics 1410 - Elementary Linear Algebra

_____   2.   Mathematics 1560 - Calculus I

_____   3.   Mathematics 2000 - Mathematical Concepts

_____   4.   Mathematics 2560 - Calculus II

_____   5.   Mathematics 2570 - Calculus III

_____   6.   Mathematics 2580 - Calculus IV

_____   7.   Mathematics 3400 - Group and Ring Theory

_____   8.   Mathematics 3410 - Linear Algebra

_____   9.   Mathematics 3500 - Analysis I

_____   10.   Statistics 1770 - Introduction to Probability and Statistics

_____   11.   Statistics 3500 - Mathematical Probability

_____ 12-16.   Five additional 3000/4000-level Mathematics or Statistics courses offered by the Department of Mathematics and Computer Science (see Note below), at least two of which must be regularly offered 4000-level courses (excluding Mathematics 4980 or Statistics 4980 - Applied Studies and Mathematics 4990 or Statistics 4990 - Independent Study):

     1. _____

     2. _____

     3. _____

     4. _____ (4000 level)

     5. _____ (4000 level)

Note: One of the additional 3000-level courses above may be replaced by one of the following:
Computer Science 3630 - Theoretical Foundations of Computing
*Physics 3200 - Mechanics
*Has prerequisite not included in major.

Required cognates:

_____   17.   Computer Science 1620 - Fundamentals of Programming I

_____   18.   Computer Science 2620 - Fundamentals of Programming II

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 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.

Year 1, Fall	Year 1, Spring
Mathematics 1410	Mathematics 2000
Mathematics 1560	Mathematics 2560
GLER course	GLER course
GLER course	GLER course
GLER course	GLER course

Year 2, Fall	Year 2, Spring
Computer Science 1620 *(required cognate)*	Computer Science 2620 *(required cognate)*
Mathematics 2570	Mathematics 2580
Statistics 1770	GLER course
GLER course	Elective
Elective	Elective

Year 3, Fall	Year 3, Spring
Mathematics 3400	Mathematics 3410
Mathematics 3500	Statistics 3500[1]
Science elective	Mathematics or Statistics 3000/ 4000 level
Science elective	Science elective
Elective	Science elective

Year 4, Fall	Year 4, Spring
Mathematics 4000 level	Mathematics 4000 level
Mathematics or Statistics 3000/ 4000 level	Mathematics or Statistics 3000/ 4000 level
Elective 3000/4000 level	Science elective
Science elective	Science elective
Elective	Elective

[1] *Semester of offering may vary.*

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 2012/2013 University of Lethbridge Calendar, Part 4 - Academic Regulations (p. 90) 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 2012/2013 University of Lethbridge Calendar, Part 14 - Courses, p. 327). LBED 1000 and 2000 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).

Cognate: A course from a related discipline deemed to complement the chosen area of study and to encompass knowledge and skills essential to that area.