



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: 2011/2012

Faculty: Arts & Science

About Computer Science

Every year computers become smaller in physical size but larger in capacity; they become faster and cheaper. The progress in Computer Science since World War II has been absolutely astonishing. There seems to be no slowdown in sight. Computer Science is undeniably one of the most exciting subjects of all time; it has revolutionized the industrial world completely. Almost certainly computers will continue to change our lives as we become more and more dependent upon their awesome power.

About 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. Half are specialists in Computer Science. We want to share our enthusiasm for the subject; we want to get you through whether you are a major or not.

Proficiency in English is Essential for the Computer Science Major

Computing, like 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 Computing and 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 Computer Science majors pursue careers programming in industry. There has been a constant shortage of computer scientists; steady employment has not been a problem. Despite the popularity of the subject, the shortage of Computer Science graduates continues.

Graduate Studies

Members of the Department are always happy to talk to any students hoping to do graduate studies in Computing. Faculty members would be pleased to advise students on choosing and entering a graduate school and the numerous career possibilities using computer science.

Computer Science Club

There is an active Computer Science 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 for the Department, 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.

Bachelor of Science Computer Science

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

<i>UofL Science course</i>		<i>High School course</i>
Computer Science	1620 1820	Mathematics 30-1 or Pure Mathematics 30* Mathematics 30-1 or Pure Mathematics 30*
Mathematics	1410 1510 1560	Mathematics 30-1 or Pure Mathematics 30* Mathematics 30-1 or Pure Mathematics 30* Mathematics 30-1 or Pure Mathematics 30*
		<i>Recommended: Mathematics 31 and a blended grade of at least 75% in Mathematics 30-1 or Pure Mathematics 30*</i>
Physics	1000 1050	Physics 30, and Mathematics 30-1 or Pure Mathematics 30* Mathematics 30-1 or Pure Mathematics 30*
		<i>Recommended: One course in the physical sciences at the 20 level or above</i>
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, or both Applied Mathematics 30 and a minimum grade of 75% in Athabasca University's Mathematics 101.*

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.

Program Requirements

The B.Sc. degree with a major in Computer Science requires 40 semester courses, including a minimum of 17 courses in the major (15 courses in Computer Science plus two cognates). A maximum of 20 courses in Computer Science is allowed. Arts and Science regulations allow Computer Science and Mathematics to be treated as separate Departments; consequently Mathematics and Statistics courses are considered separate from this limit of 20 Computer Science courses.

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., Computer Science 1620, Mathematics 2000, etc. Unspecified credit (1XXX, 2XXX, etc.) is indicated by the subject name and level of the course in parentheses, e.g., Computer Science (1000 level), Mathematics (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 Computer Science 2620 is required in your program, you could not use Computer Science (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

Name : _____ ID : _____

Required courses:

- _____ 1. Computer Science 1620 - Fundamentals of Programming I
- _____ 2. Computer Science 1820 - Discrete Structures
- _____ 3. Computer Science 2610 - Introduction to Digital Systems
- _____ 4. Computer Science 2620 - Fundamentals of Programming II
- _____ 5. Computer Science 2720 - Practical Software Development
- _____ 6. Computer Science 3615 - Computer Architecture
- _____ 7. Computer Science 3620 - Data Structures and Algorithms
- _____ 8. Computer Science 3740 - Programming Languages
- _____ 9-15. Seven additional 3000/4000-level Computer Science courses offered by the Department of Mathematics and Computer Science, at least one of which must be a regularly offered 4000-level course (excluding Computer Science 4850 - Topics in Computer Science, Computer Science 4980 - Applied Studies, and Computer Science 4990 - Independent Study):

Note: *One of the additional 3000-level courses may be replaced by a course from the following list:
 Physics 3900 - Intermediate Experimental Physics (Series) (Digital Electronics)
 Any 3000/4000-level Mathematics course*

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____ (4000 level)

Required cognates:

- _____ 16. Mathematics 2000 - Mathematical Concepts
- _____ 17. One of:
 - _____ Mathematics 1410 - Elementary Linear Algebra
 - _____ Mathematics 1510 - Calculus for Management and Social Sciences
 - _____ Mathematics 1560 - Calculus I
 - _____ Statistics 1770 - Introduction to Probability and Statistics

It is strongly recommended that Computer Science majors include additional Mathematics courses in their program. Students intending to take Computer Science 3670 or Physics 3900 should plan carefully to include the appropriate Mathematics or Physics prerequisites in their programs.

Note: *Computer Science 1000 may NOT be included among the required courses for a Computer Science major.*

Some senior courses are scheduled for alternate years. Since these courses are frequently sequential and dependent upon adequate preparation, students are urged to seek advice before the end of their third semester in planning a major and selecting courses.

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

Computer Science 1620
Computer Science 1820
GLER course
GLER course
GLER course

Year 2, Fall

Computer Science 2610
Computer Science 2720
GLER course
GLER course
Science elective (*Mathematics or Statistics recommended*)

Year 3, Fall

Computer Science 3740
Computer Science 3000/4000 level
Science elective
Elective
Elective

Year 4, Fall

Computer Science 3000/4000 level
Computer Science 3000/4000 level
Science elective
Science elective
Elective

Year 1, Spring

Computer Science 2620
Mathematics 2000 (*required cognate*)
Mathematics or Statistics cognate
GLER course
GLER course

Year 2, Spring

Computer Science 3615
Computer Science 3620
Computer Science 3000/4000 level
GLER course
Elective

Year 3, Spring

Computer Science 3000/4000 level
Computer Science 3000/4000 level
Science elective
Science elective
Elective

Year 4, Spring

Computer Science 4000 level
Science elective
Science elective
Elective
Elective

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 2011/2012 University of Lethbridge Calendar, Part 4 - Academic Regulations (p. 85) 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 2011/2012 University of Lethbridge Calendar, Part 14 - Courses, p. 306). 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.