



## Program Planning Guide

Current and past Program Planning Guides are available on the UofL website at [www.uleth.ca/ross/ppgs/ppg.html](http://www.uleth.ca/ross/ppgs/ppg.html)

Calendar Year: 2011/2012

Faculty: Arts & Science

### About the Multidisciplinary Major in Remote Sensing

The Department of Geography and the Department of Physics offer instruction leading to the Multidisciplinary Major in Remote Sensing. The program is structured to provide a firm theoretical, experimental, and applied background in remote sensing. The Multidisciplinary Major provides a strong basis for further study at the graduate level in related fields, while also providing training in areas of employment opportunity from GIS to astrophysics. Further details on potential career opportunities can be obtained from [www.uleth.ca/fas/phy/careers.html](http://www.uleth.ca/fas/phy/careers.html) and [www.uleth.ca/fas/geo/careers.html](http://www.uleth.ca/fas/geo/careers.html)

### 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 Remote Sensing major should note the following recommended/required high school courses.

UofL Science course	High School course
Computer Science 1620	Mathematics 30-1 or Pure Mathematics 30*
1820	Mathematics 30-1 or Pure Mathematics 30*
Mathematics 1410	Mathematics 30-1 or Pure Mathematics 30*
1560	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	Physics 30, and Mathematics 30-1 or Pure Mathematics 30*
1050	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.

### Program Requirements

The B.Sc. degree with a multidisciplinary major in Remote Sensing requires 40 semester courses, including 21 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., Geography 1000, Physics 2000. Unspecified credit (1XXX, 2XXX, etc.) is indicated by the subject name and level of the course in parentheses, e.g., Geography (1000 level), Physics (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 Geography 2030 is required in your program, you could not use Geography (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**

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**Name :** \_\_\_\_\_ **ID :** \_\_\_\_\_**Seven required Physics courses:**

- \_\_\_ 1. ONE of:
  - \_\_\_ Physics 1000 - Introduction to Physics I
  - \_\_\_ Physics 1050 - Introduction to Biophysics
  - \_\_\_ Engineering 2060 - Engineering Mechanics
- \_\_\_ 2. Physics 2000 - Introduction to Physics II
- \_\_\_ 3. Physics 2120 - Introduction to Physics III
- \_\_\_ 4. Physics 2130 - Waves, Optics and Sound
- \_\_\_ 5. Physics 2900 - Studies in Experimental Physics (Series)
- \_\_\_ 6. Physics 3650 - Optics
- \_\_\_ 7. Physics 4650 - Physics of Remote Sensing

**Eight required Geography courses:**

- \_\_\_ 8. Geography 1000 - Introduction to Physical Geography
- \_\_\_ 9. Geography 2030 - Geomorphology
- \_\_\_ 10. Geography 2300 - Weather and Climate
- \_\_\_ 11. Geography 2700 - Geographical Data and Analysis
- \_\_\_ 12. Geography 2735 - Introduction to Geographical Information Science
- \_\_\_ 13. Geography 3720 - Remote Sensing
- \_\_\_ 14. Geography 4725 - Advanced Remote Sensing
- \_\_\_ 15. ONE of:
  - \_\_\_ Geography 4710 - Remote Sensing Field Techniques
  - \_\_\_ Geography 4751 - Seminar in Spatial Modelling
  - \_\_\_ Geography 4753 - Seminar in Remote Sensing

**Other required courses:**

- \_\_\_ 16. Computer Science 1620 - Fundamentals of Programming I
- \_\_\_ 17. Mathematics 1410 - Elementary Linear Algebra
- \_\_\_ 18. Mathematics 1560 - Calculus I
- \_\_\_ 19. Mathematics 2560 - Calculus II
- \_\_\_ 20. Mathematics 2570 - Calculus III
- \_\_\_ 21. Mathematics 2580 - Calculus IV

**Recommended courses:**

- \_\_\_\_\_ Geography 3300 - Microclimatology
- \_\_\_\_\_ Geography 3710 - Field Techniques in the Earth Sciences
- \_\_\_\_\_ Geography 3740 - Geographical Information Systems
- \_\_\_\_\_ \*Geography 4700 - Advanced Computer Mapping
- \_\_\_\_\_ Geography 4750 - Glacial Processes, Measurements, and Models
- \_\_\_\_\_ Any of Geography 4710, Geography 4751, and Geography 4753 not selected in the major
- \_\_\_\_\_ Physics 2150 - Quantum Mechanics I
- \_\_\_\_\_ Physics 3175 - Electricity and Magnetism
- \_\_\_\_\_ \*\*Physics 3800 - Methods of Theoretical Physics
- \_\_\_\_\_ Physics 3840 - Introduction to Computational Physics
- \_\_\_\_\_ Physics 4175 - The Electromagnetic Interaction
- \_\_\_\_\_ Computer Science 2620 - Fundamentals of Programming II
- \_\_\_\_\_ \*\*\*Computer Science 3620 - Data Structures and Algorithms
- \_\_\_\_\_ Computer Science 3710 - Computer Graphics
- \_\_\_\_\_ \*\*\*\*Statistics 2780 - Statistical Inference

\*Prerequisite required: *Geography 3700*

\*\*Prerequisite required: *Physics 2800*

\*\*\*Prerequisite required: *Computer Science 1820*

\*\*\*\*Prerequisite required: *Statistics 1770*

**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.

<p><b>Year 1, Fall</b>                      Geography 1000                      Mathematics 1410                      Mathematics 1560                      Physics 1000 or Physics 1050                      GLER course</p>	<p><b>Year 1, Spring</b>                      Computer Science 1620                      Geography 2735                      Mathematics 2560                      Physics 2000                      GLER course</p>
<p><b>Year 2, Fall</b>                      Geography 2030                      Mathematics 2570                      Physics 2120                      GLER course                      GLER course</p>	<p><b>Year 2, Spring</b>                      Geography 2300                      Geography 2700                      Mathematics 2580                      Physics 2130                      GLER course</p>
<p><b>Year 3, Fall</b>                      Geography 3720                      GLER course                      GLER course                      Elective 3000/4000 level                      Science Elective</p>	<p><b>Year 3, Spring</b>                      Physics 2900                      Physics 3650<sup>1</sup>                      GLER course                      Elective 3000/4000 level                      Science Elective</p>
<p><b>Year 4, Fall</b>                      Geography 4725                      Physics 4650<sup>1</sup>                      Science Elective                      Elective 3000/4000 level                      Elective</p>	<p><b>Year 4, Spring</b>                      One of: Geography 4710<sup>1</sup>, 4751<sup>1</sup>,                      or 4753<sup>1</sup>                      Science Elective 3000/4000 level                      Elective 3000/4000 level                      Elective                      Elective</p>

<sup>1</sup> 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 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).



**[www.ulethbridge.ca](http://www.ulethbridge.ca)**

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