

University of
Lethbridge



Program Planning Guide

Department: Physics and Astronomy

Calendar Year: 2019/2020

Name: _____

ID: _____

Bachelor of Science
Physics

Major in Physics:

www.uleth.ca/artsci/physics-astronomy

Academic Calendar:

www.uleth.ca/ross/academic-calendar

High School Admission Requirements:

www.uleth.ca/ross/admissions/undergrad/high-school

Current and Past Program Planning Guides:

www.uleth.ca/ross/ppgs

Faculty of Arts and Science Advising:

www.uleth.ca/artsci/advising
artsci.advising@uleth.ca
403-329-5106
M2102

Co-operative Education:

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. Physics

Completion of at least 40 courses (120.0 credit hours) with a grade point average of at least 2.00.

Major Requirements (26 courses)

- _____ 1. Chemistry 1000 - General Chemistry I
- _____ 2. Computer Science 1620 - Fundamentals of Programming I
- _____ 3. Mathematics 1410 - Elementary Linear Algebra
- _____ 4. Mathematics 2565 - Accelerated Calculus II
- _____ 5. Mathematics 2570 - Calculus III
- _____ 6. Mathematics 2580 - Calculus IV
- _____ 7. Physics 2000 - Introduction to Physics II
- _____ 8. Physics 2120 - Introduction to Physics III
- _____ 9. Physics 2130 - Waves, Optics and Sound
- _____ 10. Physics 2150 - Quantum Mechanics I
- _____ 11. Physics 2800 - Methods in Mathematical Physics
- _____ 12. Physics 2925 - Introduction to Experimental Physics
- _____ 13. Physics 3150 - Quantum Mechanics II
- _____ 14. Physics 3175 - Electricity and Magnetism
- _____ 15. Physics 3200 - Mechanics
- _____ 16. Physics 3400 - Thermal and Statistical Physics
- _____ 17. Physics 3750 - Contemporary Physics
- _____ 18. Physics 3800 - Methods of Theoretical Physics
- _____ 19. Physics 3925 - Experimental Physics
- _____ 20. Physics 4175 - The Electromagnetic Interaction

_____ 25-26. **Two of:**²

- _____ Physics 3650 - Optics
- _____ Physics 3840 - Introduction to Computational Physics
- _____ Physics 3900 - Intermediate Experimental Physics (Series)
- _____ Physics 4000 - Advanced Studies in Physics (Series)
- _____ Physics 4100 - Nuclear and Particle Physics
- _____ Physics 4250 - Solid State Physics

- _____ 21. **One of:**
 - _____ Mathematics 1560 - Calculus I
 - _____ Mathematics 1565 - Accelerated Calculus I (recommended)

- _____ 22. **One of:**
 - _____ Biology 1010 - Cellular Basis of Life
 - _____ Biology 1020 - Diversity of Life

- _____ 23. **One of:**
 - _____ Physics 1000 - Introduction to Physics I
 - _____ Physics 1050 - Introduction to Biophysics
 - _____ ¹Engineering 2060 - Engineering Mechanics

- _____ 24. **One of:**
 - _____ Physics 4150 - Quantum Mechanics III
 - _____ Physics 4200 - Advanced Mechanics

Other Courses (minimum 14 courses)

- | | |
|----------|-----------|
| 1. _____ | 8. _____ |
| 2. _____ | 9. _____ |
| 3. _____ | 10. _____ |
| 4. _____ | 11. _____ |
| 5. _____ | 12. _____ |
| 6. _____ | 13. _____ |
| 7. _____ | 14. _____ |

Notes

¹Engineering 2000 and Mathematics 1565 are prerequisites for Engineering 2060.

²Offerings in Physics 3850 (Topics) and Physics 4850 (Topics) and either Physics 4150 or Physics 4200 (if not used above) may be used to satisfy this requirement.

Since a number of courses are offered only on alternate years, students are advised to plan carefully to include the desired courses. In all cases, students (especially those planning for advanced studies in Physics) are encouraged to seek advice on their programs from any member of the Department of Physics and Astronomy.

It is recommended that students majoring in Physics include in their program courses in Biology, Chemistry, Computer Science, and Mathematics.

It is strongly recommended that a student attain a grade of 'C' or higher in any course used to satisfy prerequisites for courses in Physics and Mathematics.

See also:

- Bachelor of Science - Remote Sensing
- Bachelor of Science/Bachelor of Education - Physics/Science Education
- Bachelor of Science/Bachelor of Management - Physics

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 Faculty of Education (EDUC), Faculty of Health Sciences (ABHL, ADCS, HLSC, NURS, PUBH, and TREC), and the Dhillon School of Business (MGT) may be counted towards the Lib Ed Requirement.

See the 2019/2020 Calendar, p. 83, 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, Faculty of Fine Arts, or the School of Liberal Education 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 six courses (18.0 credit hours) from disciplines outside the Faculty of Arts and Science, Faculty of Fine Arts, or School of Liberal Education 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 courses (30.0 credit hours) from disciplines offered by the Faculty of Arts and Science, Faculty of Fine Arts, or School of Liberal Education 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 2019/2020 Calendar, p. 277, for more information.

- | | |
|----------|----------|
| 1. _____ | 4. _____ |
| 2. _____ | 5. _____ |
| 3. _____ | 6. _____ |

Concentration: Theoretical Physics (Optional)
See the 2019/2020 Calendar, p. 122, for more information.

- | | |
|----------|----------|
| 1. _____ | 4. _____ |
| 2. _____ | 5. _____ |
| 3. _____ | |

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>Year 1, Fall Mathematics 1410 Mathematics 1565 or Mathematics 1560 Physics 1000 or Physics 1050 Lib Ed Requirement course Lib Ed Requirement course</p>	<p>Year 1, Spring Mathematics 2565 Physics 2000 Physics 2130 Computer Science 1620 Lib Ed Requirement course</p>
<p>Year 2, Fall Chemistry 1000 Mathematics 2570 Physics 2120 Physics 2800 Lib Ed Requirement course</p>	<p>Year 2, Spring Biology 1010 or Biology 1020 Mathematics 2580 Physics 2150 Physics 2925 Lib Ed Requirement course</p>
<p>Year 3, Fall Physics 3150 Physics 3175 Physics 3200 Physics 3925 Lib Ed Requirement course</p>	<p>Year 3, Spring Physics 3400 Physics 3750 Physics 3800 Lib Ed Requirement course Lib Ed Requirement course</p>
<p>Year 4, Fall Physics 3000/4000 level Physics 3000/4000 level Elective 3000/4000 level Elective 3000/4000 level Elective</p>	<p>Year 4, Spring Physics 4150 or Physics 4200 Physics 4175 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 Physics and Astronomy regarding the sequencing of courses.

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 2019/2020 University of Lethbridge Calendar, School of Liberal Education for complete information.

The School of Liberal Education 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 2019/2020 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).

