

University of  
Lethbridge



## Program Planning Guide

Name: \_\_\_\_\_

ID: \_\_\_\_\_

Calendar Year: 2023/2024

**Major in Physics:**

[www.ulethbridge.ca/artsci/physics-astronomy](http://www.ulethbridge.ca/artsci/physics-astronomy)

**Academic Calendar:**

[www.ulethbridge.ca/ross/academic-calendar](http://www.ulethbridge.ca/ross/academic-calendar)

**High School Admission Requirements:**

[www.ulethbridge.ca/ross/admissions/undergrad/high-school](http://www.ulethbridge.ca/ross/admissions/undergrad/high-school)

**Current and Past Program Planning Guides:**

[www.ulethbridge.ca/ross/ppgs](http://www.ulethbridge.ca/ross/ppgs)

**Co-operative Education:**

[www.ulethbridge.ca/career-bridge/co-operative-education](http://www.ulethbridge.ca/career-bridge/co-operative-education)

**Faculty of Arts and Science Advising:**

[www.ulethbridge.ca/artsci/advising](http://www.ulethbridge.ca/artsci/advising)  
artsci.advising@uleth.ca  
403-329-5106  
M2102

**Bachelor of Science**  
**Physics**

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 ([www.ulethbridge.ca/ross/academic-advising](http://www.ulethbridge.ca/ross/academic-advising)) for advising information.

**Name :** \_\_\_\_\_

**ID :** \_\_\_\_\_

**Program Requirements**

Completion of at least 40 courses (120.0 credit hours) with cumulative and graduation grade point averages of at least 2.00.

**Major Requirements (26 courses)**

- \_\_\_\_\_ Chemistry 1000 - General Chemistry I
- \_\_\_\_\_ Computer Science 1620 - Fundamentals of Programming I
- \_\_\_\_\_ Mathematics 1410 - Elementary Linear Algebra
- \_\_\_\_\_ Physics 2000 - Introduction to Physics II
- \_\_\_\_\_ Physics 2120 - Introduction to Physics III
- \_\_\_\_\_ Physics 2130 - Waves, Optics and Sound
- \_\_\_\_\_ Physics 2150 - Quantum Mechanics I
- \_\_\_\_\_ Physics 2800 - Methods in Mathematical Physics
- \_\_\_\_\_ Physics 2925 - Introduction to Experimental Physics
- \_\_\_\_\_ Physics 3150 - Quantum Mechanics II
- \_\_\_\_\_ Physics 3175 - Electricity and Magnetism
- \_\_\_\_\_ Physics 3200 - Mechanics
- \_\_\_\_\_ Physics 3400 - Thermal and Statistical Physics
- \_\_\_\_\_ Physics 3750 - Contemporary Physics
- \_\_\_\_\_ Physics 3800 - Methods of Theoretical Physics
- \_\_\_\_\_ Physics 3925 - Experimental Physics
- \_\_\_\_\_ Physics 4175 - The Electromagnetic Interaction

**One of:**

- \_\_\_\_\_ Mathematics 1560 - Calculus I
- \_\_\_\_\_ Mathematics 1565 - Accelerated Calculus I (recommended)

**One of:**

- \_\_\_\_\_ Mathematics 2560 - Calculus II
- \_\_\_\_\_ Mathematics 2565 - Accelerated Calculus II (recommended)

**One of the following Streams (a. or b.):**

**a. Standard Stream:**

- \_\_\_\_\_ Mathematics 2570 - Calculus III
- \_\_\_\_\_ Mathematics 2580 - Calculus IV

**b. Accelerated Stream:**

- \_\_\_\_\_ Mathematics 2575 - Accelerated Calculus III (recommended)
- \_\_\_\_\_ <sup>1</sup> One additional course (3.0 credit hours) in Mathematics

**One of:**

- \_\_\_\_\_ Biology 1010 - Cellular Basis of Life
- \_\_\_\_\_ Biology 1020 - Diversity of Life

**One of:**

- \_\_\_\_\_ Physics 1000 - Introduction to Physics I
- \_\_\_\_\_ Physics 1050 - Introduction to Biophysics
- \_\_\_\_\_ <sup>2</sup> Engineering 2060 - Engineering Mechanics

**One of:**

- \_\_\_\_\_ Physics 4150 - Quantum Mechanics III
- \_\_\_\_\_ Physics 4200 - Advanced Mechanics

**Two of:<sup>3</sup>**

- \_\_\_\_\_ 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

**Other Courses (minimum 14 courses)**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
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11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_

**Notes**

<sup>1</sup> *Mathematics 3600 (Differential Equations I) is recommended.*  
<sup>2</sup> *This course has a prerequisite or corequisite that is not required for the major. See the Course Catalogue (p. 351) for more information.*  
<sup>3</sup> *Offerings 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.

**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 (ACCT, AGEM, FINC, HRLR, IGBM, IMGT, MGT, and MKTG) may be counted towards the Lib Ed Requirement.

See the 2023/2024 Calendar, p. 83, for more information.

\_\_\_\_\_ Four Fine Arts and Humanities courses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

\_\_\_\_\_ Four Social Science courses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

\_\_\_\_\_ Four Science courses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
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.

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7. \_\_\_\_\_
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11. \_\_\_\_\_
12. \_\_\_\_\_

\_\_\_\_\_ **Minor (Optional):** \_\_\_\_\_

See the 2023/2024 Calendar, p. 331, for more information.

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5. \_\_\_\_\_
6. \_\_\_\_\_

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, ACCT, ADCS, AGEM, CDEV, CRED, EDUC, FINC, HLSC, HRLR, IGBM, IMGT, MGT, MKTG, NURS, PUBH, and TREC) will not meet this requirement.

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15. \_\_\_\_\_

\_\_\_\_\_ 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.

\_\_\_\_\_ 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, ACCT, ADCS, AGEM, CDEV, CRED, EDUC, FINC, HLSC, HRLR, IGBM, IMGT, MGT, MKTG, 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.

*\*Disciplines are identified by a specific course label (e.g. KNES, ASTR, and HIST are separate disciplines).*

\_\_\_\_\_ **Concentration: Theoretical Physics (Optional)**

See the 2023/2024 Calendar, p. 128, for more information.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**Sample Sequencing Plan**

Shown below is a sample sequence of courses for your degree. Consult timetables for course offerings, prerequisites, and corequisites before registering each 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><b>Year 1, Fall</b>  <b>Mathematics 1410</b>  <b>Mathematics 1560 or Mathematics 1565</b>  <b>Physics 1000 or Physics 1050</b>                      Lib Ed Requirement course                      Lib Ed Requirement course</p>	<p><b>Year 1, Spring</b>  <b>Mathematics 2560 or Mathematics 2565</b>  <b>Physics 2000</b>  <b>Physics 2130</b>                      Computer Science 1620                      Lib Ed Requirement course</p>
<p><b>Year 2, Fall</b>                      Chemistry 1000  <b>Mathematics 2570 or Mathematics 2575</b>  <b>Physics 2120</b>  <b>Physics 2800</b>                      Lib Ed Requirement course</p>	<p><b>Year 2, Spring</b>                      Biology 1010 or Biology 1020  <b>Mathematics 2580 or an additional course in MATH</b>  <b>Physics 2150</b>  <b>Physics 2925</b>                      Lib Ed Requirement course</p>
<p><b>Year 3, Fall</b><sup>1</sup>                      Physics 3000/4000 level                      Physics 3000/4000 level                      Physics 3000/4000 level                      Physics 3000/4000 level                      Lib Ed Requirement course</p>	<p><b>Year 3, Spring</b><sup>1</sup>                      Physics 3000/4000 level                      Physics 3000/4000 level                      Physics 3000/4000 level                      Lib Ed Requirement course                      Lib Ed Requirement course</p>
<p><b>Year 4, Fall</b><sup>1</sup>                      Physics 3000/4000 level                      Physics 3000/4000 level                      Elective 3000/4000 level                      Elective 3000/4000 level                      Elective</p>	<p><b>Year 4, Spring</b><sup>1</sup>                      Physics 3000/4000 level                      Physics 3000/4000 level                      Elective 3000/4000 level                      Elective 3000/4000 level                      Elective</p>

<sup>1</sup> The term of offering for all senior Physics courses may vary. Students are strongly advised to consult with the Department of Physics and Astronomy regarding the sequencing of courses.

**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 elective courses within the major and plan accordingly.