

REQUIRED JUNIOR LEVEL COURSES^{1,2}

18 CREDITS

- 6 CREDITS** CHEM 101: University Chemistry I
 CHEM 102: University Chemistry II
- 6 CREDITS** EASC 101: Introduction to Physical Earth Science
 EASC 102: Physical Earth Science³
 EASC 103: Historical Geology³ [WINTER]
- 6 CREDITS** PHYS 108: University Physics I *and* PHYS 109: University Physics II
 PHYS 124: Physics for Life Sciences I *and* PHYS 126: Physics for Life Sciences II
 PHYS 144: Mechanics and Waves *and* PHYS 146: Electromagnetism and Radiation

GENERAL SENIOR LEVEL COURSES

42 CREDITS

Please see planning notes on the back of this page for critical information about the structure of this major.

CHEMISTRY COURSES⁴

- | | |
|--|---|
| <input type="checkbox"/> PHSC 200: Physical Science Field Skills ⁵ [SPRING] | <input type="checkbox"/> CHEM 333: Organometallic Chemistry [NOT OFFERED 2015/16] |
| <input type="checkbox"/> CHEM 211: Analytical Chemistry I [FALL] | <input type="checkbox"/> CHEM 353: Advanced Forensic Chemistry [WINTER] |
| <input type="checkbox"/> CHEM 213: Analytical Chemistry II [WINTER] | <input type="checkbox"/> CHEM 362: Advanced Organic Chemistry [EVEN FALL] |
| <input type="checkbox"/> CHEM 232: Inorganic Chemistry [FALL] | <input type="checkbox"/> CHEM 364: Medicinal Chemistry [ODD FALL] |
| <input type="checkbox"/> CHEM 241: Biophysical Chemistry [WINTER] | <input type="checkbox"/> CHEM 370: Advanced Environmental Chemistry [WINTER] |
| <input type="checkbox"/> CHEM 252: Forensic Chemistry [FALL] | <input type="checkbox"/> CHEM 495: Special Topics in Chemistry ⁶ [NOT OFFERED 2015/16] |
| <input type="checkbox"/> CHEM 261: Organic Chemistry I [FALL/WINTER] | <input type="checkbox"/> CHEM 498: Independent Research ⁶ [FALL/WINTER] |
| <input type="checkbox"/> CHEM 263: Organic Chemistry II [FALL/WINTER] | |
| <input type="checkbox"/> CHEM 270: Environmental Chemistry [FALL] | |
| <input type="checkbox"/> CHEM 291: Applied Spectroscopy [WINTER] | |
| <input type="checkbox"/> CHEM 311: Advanced Chemical Analysis [FALL] | |

EARTH AND PLANETARY SCIENCES COURSES⁴

- | | |
|--|---|
| <input type="checkbox"/> PHSC 200: Physical Science Field Skills ⁵ [SPRING] | <input type="checkbox"/> EASC 320: Introduction to Geochemistry [WINTER] |
| <input type="checkbox"/> EASC 206: Geology of the Solar System [FALL] | <input type="checkbox"/> EASC 321: Structure and Tectonics [FALL] |
| <input type="checkbox"/> EASC 208: Introduction to Global Change [Not currently offered] | <input type="checkbox"/> EASC 324: Quaternary Environments [WINTER] |
| <input type="checkbox"/> EASC 209: Geology of Western Canada [WINTER] | <input type="checkbox"/> EASC 334: Planetary Surface Imaging [FALL] |
| <input type="checkbox"/> EASC 219: Mineralogy [ODD FALL] | <input type="checkbox"/> EASC 373: Anthropogenic Climate Change [FALL] |
| <input type="checkbox"/> EASC 221: Introduction to GIS [WINTER] | <input type="checkbox"/> EASC 374: Sustainable Energy Development [Not currently offered] |
| <input type="checkbox"/> EASC 225: Introduction to Geomorphology [FALL] | <input type="checkbox"/> EASC 375: Paleoclimatology [FALL] |
| <input type="checkbox"/> EASC 226: Introduction to Soil Science [ODD FALL] | <input type="checkbox"/> EASC 495: Special Topics in Earth and Planetary Science ⁶ [FALL 2015: Carbon Cycling] |
| <input type="checkbox"/> EASC 230: Invertebrate Paleontology [EVEN FALL] | <input type="checkbox"/> EASC 498: Independent Research ⁶ [FALL/WINTER] |
| <input type="checkbox"/> EASC 238: Geology of Natural Resources [WINTER] | |
| <input type="checkbox"/> EASC 270: The Atmosphere [WINTER] | |
| <input type="checkbox"/> EASC 294: Resources and the Environment [Not currently offered] | |

PHYSICS COURSES⁴

- | | |
|---|--|
| <input type="checkbox"/> PHSC 200: Physical Science Field Skills ⁵ [SPRING] | <input type="checkbox"/> PHYS 308: An Introduction to Semiconductors and Superconductors [EVEN FALL] |
| <input type="checkbox"/> PHYS 200: Introduction to Relativity [FALL] | <input type="checkbox"/> PHYS 320: The Origin of Elements [ODD FALL] |
| <input type="checkbox"/> PHYS 208: Quantum Aspects of Physics [FALL] | <input type="checkbox"/> PHYS 324: Origins of Planetary Systems [EVEN FALL] |
| <input type="checkbox"/> PHYS 212: Revolutions in Physics: The Structure of the Universe [WINTER] | <input type="checkbox"/> PHYS 332: Computational Physics [ODD FALL] |
| <input type="checkbox"/> PHYS 224: Fluids and Heat [WINTER] | <input type="checkbox"/> PHYS 372: Quantum Mechanics [EVEN WINTER] |
| <input type="checkbox"/> PHYS 244: Mechanics [WINTER] | <input type="checkbox"/> PHYS 390: Advanced Physics Laboratory [FALL] |
| <input type="checkbox"/> PHYS 250: Introduction to Biophysics [FALL] | <input type="checkbox"/> PHYS 495: Special Topics in Physics and Astrophysics ⁶ [NOT OFFERED 2015/16] |
| <input type="checkbox"/> PHYS 261: Physics of Energy [WINTER] | <input type="checkbox"/> PHYS 498: Independent Research ⁶ [FALL/WINTER] |
| <input type="checkbox"/> PHYS 301: Nuclear Physics [ODD FALL] | |
| <input type="checkbox"/> PHYS 302: Particle Physics [EVEN FALL] | |

IMPORTANT PLANNING NOTES

- Twelve credits from the prerequisite junior level courses can be used toward a student's core requirements. Additional credits will be placed in a student's options.
 - The Physical Sciences major requires students to take a high number of junior level credits. Physical Sciences majors must plan their options carefully to ensure that they do not exceed 48 junior level credits, which is the maximum number of junior level credits permitted in a Bachelor of Science degree.
- Students are required to consult with the MacEwan University Academic Calendar to ensure they meet the prerequisites for all Chemistry, Earth and Planetary Sciences, and Physics courses they enrol in.
- Students who choose Earth and Planetary Sciences as one of their primary disciplines, and wish to pursue weather and climate studies should take **EASC 102**. Students who wish to pursue geology or planetary studies should take **EASC 103**.
- The structure of the Physical Sciences major is as follows:
 - If a student chooses a minor in one of the Physical Sciences disciplines:**
 - Students must choose two primary disciplines from Chemistry, Earth and Planetary Sciences, and Physics, and may choose the third discipline as their minor.
 - All senior credits in the third discipline will count only toward the minor.
 - Student must use only courses from their primary disciplines to complete the major's requirements, with a minimum of 18 senior level credits taken in each discipline.
 - Students must have 12 credits at the 300- or 400-level in their major, with at least three credits from each primary discipline.
 - If a student chooses a minor other than in one of the Physical Sciences disciplines:**
 - Students must choose two primary disciplines from Chemistry, Earth and Planetary Sciences, and Physics.
 - Student must take 18 senior level credits in both of their primary disciplines to complete the major's requirements. An additional six senior level credits must be taken in the third discipline.
 - Students must have 12 credits in their primary disciplines at the 300- or 400-level in their major, with at least three credits from each primary discipline.
 - If a student chooses no minor:**
 - Students must choose two primary disciplines from Chemistry, Earth and Planetary Sciences, and Physics.
 - Student must take 18 senior level credits in both of their primary disciplines to complete the major's requirements. An additional six senior level credits must be taken in the third discipline.
 - Students must have 12 credits in their primary disciplines at the 300- or 400-level in their major, with at least three credits from each primary discipline.
 - The 18 credits normally assigned to a minor will be considered options. Therefore, a student must complete 39 credits of options to be eligible for graduation.
 - Students must plan their options very carefully, as they can use a maximum of six credits in any Physical Sciences discipline within their options. Students also cannot exceed the 48 credit junior level maximum, and they must complete 72 credits of Science courses.
- PHSC 200** is a Physical Sciences course that covers material relevant to Chemistry, Earth and Planetary Sciences, and Physics. It can be used toward a student's Chemistry, Earth and Planetary Sciences, or Physics requirements, but while it may be applied to any of these requirements, students can only receive credit for the course one time.
 - Because the Physical Sciences major is not a discipline-specific major, **PHSC 200** can count toward a student's major. If it is taken outside the student's major, it will count toward that student's maximum of six major/minor credits in their options.
- Students may take any of **CHEM 495**, **CHEM 498**, **EASC 495**, **EASC 498**, **PHYS 495** and **PHYS 498** for credit a maximum of two times each, as long as the course topic is different each time they take it.

*This planning sheet should be used only as a **guide** for course planning and it should be used in conjunction with the Bachelor of Science Degree Planner. Remember: not all courses listed are offered each year and course offerings are subject to change. In the event of a discrepancy between the information presented on this sheet and that available on myStudentSystem, the information on myStudentSystem will be considered accurate.*