

BACHELOR OF SCIENCE MATHEMATICAL SCIENCES MAJOR

2013/14 Academic Year

REQUIRED JUNIOR LEVEL COURSES¹

18 CREDITS

- MATH 114: Elementary Calculus I²
- MATH 115: Elementary Calculus II
- MATH 120: Basic Linear Algebra I or MATH 125: Linear Algebra I

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.

COMPUTER SCIENCE COURSES³

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| <input type="checkbox"/> CMPT 200: Data Structures and their Algorithms | <input type="checkbox"/> CMPT 350: Human-Computer Interaction II |
| <input type="checkbox"/> CMPT 201: Programming Methodology | <input type="checkbox"/> CMPT 351: Human-Computer Interaction: Usability |
| <input type="checkbox"/> CMPT 204: Algorithms I | <input type="checkbox"/> CMPT 355: Introduction to Artificial Intelligence |
| <input type="checkbox"/> CMPT 220: Unix, Scripting and Other Tools | <input type="checkbox"/> CMPT 360: Operating Systems and Net Centric Computing I |
| <input type="checkbox"/> CMPT 229: Computer Organization and Architecture | <input type="checkbox"/> CMPT 362: Operating Systems II |
| <input type="checkbox"/> CMPT 230: Introduction to Computer Games | <input type="checkbox"/> CMPT 364: Net Centric Computing II |
| <input type="checkbox"/> CMPT 250: Human-Computer Interaction I | <input type="checkbox"/> CMPT 370: Introduction to Computer Graphics |
| <input type="checkbox"/> CMPT 272: Formal Systems and Logic | <input type="checkbox"/> CMPT 385: Introduction to Database Concepts |
| <input type="checkbox"/> CMPT 291: Introduction to Relational Databases | <input type="checkbox"/> CMPT 391: Database Management Systems |
| <input type="checkbox"/> CMPT 305: Object-Oriented Programming | <input type="checkbox"/> CMPT 395: Introduction to Software Engineering |
| <input type="checkbox"/> CMPT 306: Non-Procedural Programming | <input type="checkbox"/> CMPT 399: Topics in Computer Science ⁴ |
| <input type="checkbox"/> CMPT 310: Computers and Society | <input type="checkbox"/> CMPT 430: 3D Game Development & Artificial Intelligence |
| <input type="checkbox"/> CMPT 311: Phenomenon Technology | <input type="checkbox"/> CMPT 491: Datamining and Advanced Databases |
| <input type="checkbox"/> CMPT 315: Web-Centric Computing and eCommerce | <input type="checkbox"/> CMPT 496: Individual Project ⁴ |
| <input type="checkbox"/> CMPT 330: Introduction to Real Time Gaming | <input type="checkbox"/> CMPT 498: Team Project ⁴ |
| <input type="checkbox"/> CMPT 340: Numerical Methods | <input type="checkbox"/> CMPT 499: Topics in Computer Science ⁴ |

MATHEMATICS COURSES³

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| <input type="checkbox"/> MATH 200: Fundamental Concepts of Mathematics | <input type="checkbox"/> MATH 321: Fields and Modules |
| <input type="checkbox"/> MATH 214: Intermediate Calculus I | <input type="checkbox"/> MATH 330: Ordinary Differential Equations |
| <input type="checkbox"/> MATH 215: Intermediate Calculus II | <input type="checkbox"/> MATH 341: Axiomatics of Geometry |
| <input type="checkbox"/> MATH 222: Introduction to Discrete Mathematics | <input type="checkbox"/> MATH 350: Introduction to Graph Theory |
| <input type="checkbox"/> MATH 225: Linear Algebra II | <input type="checkbox"/> MATH 361: History of Mathematics |
| <input type="checkbox"/> MATH 228: Algebra: Introduction to Ring Theory | <input type="checkbox"/> MATH 410: Analysis and Topology |
| <input type="checkbox"/> MATH 241: Geometry | <input type="checkbox"/> MATH 420: Groups and Galois Theory |
| <input type="checkbox"/> MATH 310: Real Analysis | <input type="checkbox"/> MATH 430: Applied Dynamical Systems |
| <input type="checkbox"/> MATH 311: Theory of Functions of a Complex Variable | <input type="checkbox"/> MATH 436: Introduction to Partial Differential Equations |
| <input type="checkbox"/> MATH 320: Elementary Number Theory | <input type="checkbox"/> MATH 495: Special Topics in Mathematics and Statistics ^{4,5} |

STATISTICS COURSES³

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| <input type="checkbox"/> STAT 252: Applied Statistics II | <input type="checkbox"/> STAT 370: Applied Time Series Analysis |
| <input type="checkbox"/> STAT 265: Probability and Statistics Theory | <input type="checkbox"/> STAT 371: Applied Categorical Data Analysis |
| <input type="checkbox"/> STAT 314: Mathematical Statistics | <input type="checkbox"/> STAT 372: Applied Multivariate Analysis |
| <input type="checkbox"/> STAT 350: Sampling Theory and Applications | <input type="checkbox"/> STAT 378: Applied Regression Analysis |
| <input type="checkbox"/> STAT 353: Design & Analysis of Experiments | <input type="checkbox"/> STAT 412: Stochastic Processes |

➤ Important! Please see the back of this page for planning notes. ◀

IMPORTANT PLANNING NOTES

1. **MATH 114**, **MATH 115**, and **MATH 120/125** can be used toward the core requirements of a Bachelor of Science degree. Students with a major in Mathematical Science will be required to take additional junior level prerequisite courses, which will be determined by the student's primary disciplines. Additional credits will be placed in a student's options.
 - a. The Mathematical Sciences major requires students to take a high number of junior level credits. Mathematical 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.
2. This requirement can also be met with **MATH 113**, which was previously offered at MacEwan University.
3. The structure of the Mathematical Sciences major is as follows:

If a student chooses a Mathematical Sciences minor:

 - a. Students must choose two primary disciplines from Computer Science, Mathematics, and Statistics, and may choose the third discipline as their minor.
 - b. All senior credits in the third discipline will count only toward the minor.
 - c. Student must take a minimum of 18 senior level credits from both of their primary disciplines to complete the major's requirements, with an additional six senior level credits taken in either of the primary disciplines.
 - d. 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 Mathematical Sciences:

 - a. Students must choose two primary disciplines from Computer Science, Mathematics, and Statistics.
 - b. Student must take a minimum of 18 senior level credits from both of their primary disciplines to complete the major's requirements, with an additional six senior level credits taken in any of the three disciplines.
 - c. 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:

 - a. Students must choose two primary disciplines from Chemistry, Earth and Planetary Sciences, and Physics.
 - b. Student must take a minimum of 18 senior level credits from both of their primary disciplines to complete the major's requirements, with an additional six senior level credits taken in any of the three disciplines.
 - c. 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.
 - d. 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.
 - e. Students must plan their options very carefully, as they can use a maximum of six credits in any Mathematical Sciences discipline within their options. Students also cannot exceed the 48 credit junior level maximum, and they must complete 72 credits of Science courses.
4. Students may take any of **CMPT 399**, **CMPT 496**, **CMPT 498**, **CMPT 499**, and **MATH 495** for credit a maximum of two times, as long as the course topic is different each time they take it.
5. **MATH 495** is not listed in the MacEwan University Academic Calendar, but it is scheduled for the 2013/14 academic year.