MacEwan UNIVERSITY

BACHELOR OF SCIENCE
MATHEMATICAL SCIENCES MAJOR
2016/17 Academic Year

REQUIRED JUNIOR LEVEL COURSES[1,2]	9 CREDITS

- ☐ MATH 114: Elementary Calculus I[3]
- ☐ MATH 115: Elementary Calculus II
- ☐ MATH 120: Basic Linear Algebra I *or* MATH 125: Linear Algebra I
- ☐ CMPT 101: Introduction to Computing I *or* CMPT 103: Introduction to Computing II

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 COURSES[4]

- ☐ CMPT 200: Data Structures and their Algorithms
- ☐ CMPT 201: Programming Methodology
- ☐ CMPT 204: Algorithms I
- ☐ CMPT 220: Unix, Scripting and Other Tools
- ☐ CMPT 229: Computer Organization and Architecture
- ☐ CMPT 230: Introduction to Computer Games
- ☐ CMPT 250: Human-Computer Interaction I
- ☐ CMPT 272: Formal Systems and Logic
- ☐ CMPT 280: Introduction to Computer Security
- ☐ CMPT 291: Introduction to Relational Databases
- ☐ CMPT 305: Object-Oriented Programming
- ☐ CMPT 306: Non-Procedural Programming
- ☐ CMPT 310: Computers and Society
- ☐ CMPT 311: Phenomenon Technology
- ☐ CMPT 315: Web-Centric Computing and eCommerce
- ☐ CMPT 330: Introduction to Real Time Gaming
- ☐ CMPT 340: Numerical Methods
- ☐ CMPT 350: Human-Computer Interaction II
- ☐ CMPT 351: Human-Computer Interaction: Usability
- ☐ CMPT 355: Introduction to Artificial Intelligence
- ☐ CMPT 360: Operating Systems I
- ☐ CMPT 361: Networks I
- ☐ CMPT 370: Introduction to Computer Graphics
- ☐ CMPT 385: Introduction to Database Concepts
- ☐ CMPT 391: Database Management Systems
- ☐ CMPT 395: Introduction to Software Engineering
- ☐ CMPT 399: Topics in Computer Science[5]
- ☐ CMPT 430: 3D Game Development & Artificial Intelligence
- ☐ CMPT 464: Wireless Networks and Embedded Systems
- ☐ CMPT 491: Datamining and Advanced Databases
- ☐ CMPT 496: Individual Project[5]
- ☐ CMPT 498: Team Project[5]
- ☐ CMPT 499: Topics in Computer Science[5]

MATHEMATICS COURSES[4]

- ☐ MATH 200: Fundamental Concepts of Mathematics
- ☐ MATH 214: Intermediate Calculus I
- ☐ MATH 215: Intermediate Calculus II
- ☐ MATH 222: Introduction to Discrete Mathematics
- ☐ MATH 225: Linear Algebra II
- ☐ MATH 228: Algebra: Introduction to Ring Theory
- ☐ MATH 241: Geometry
- ☐ STAT 265: Probability Theory[6]
- ☐ MATH 310: Real Analysis
- ☐ MATH 311: Theory of Functions of a Complex Variable
- ☐ MATH 320: Elementary Number Theory
- ☐ MATH 321: Fields and Modules
- ☐ MATH 330: Ordinary Differential Equations
- ☐ MATH 335: Numerical Methods
- ☐ MATH 341: Axiomatics of Geometry
- ☐ MATH 350: Introduction to Graph Theory
- ☐ MATH 361: History of Mathematics
- ☐ MATH 410: Analysis and Topology
- ☐ MATH 420: Groups and Galois Theory
- ☐ MATH 430: Applied Dynamical Systems
- ☐ MATH 436: Introduction to Partial Differential Equations
- ☐ MATH 495: Special Topics in Mathematics and Statistics[5]

STATISTICS COURSES[4]

- ☐ STAT 252: Applied Statistics II
- ☐ STAT 265: Probability Theory[6]
- ☐ STAT 266: Mathematical Statistics
- ☐ STAT 324: Computational Statistics with R
- ☐ STAT 332: Finite Markov Chains and Applications
- ☐ STAT 350: Sampling Theory and Applications
- ☐ STAT 353: Design & Analysis of Experiments
- ☐ STAT 370: Applied Time Series Analysis
- ☐ STAT 371: Applied Categorical Data Analysis
- ☐ STAT 372: Applied Multivariate Analysis
- ☐ STAT 378: Applied Regression Analysis
- ☐ STAT 412: Stochastic Processes
- ☐ STAT 495: Special Topics in Statistics[5]

➢ **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. Students are required to consult with the MacEwan University Academic Calendar to ensure they meet the prerequisites for all Mathematics, Computer Science and Statistics courses they enrol in.

3. This requirement can also be met with **MATH 113**, which was previously offered at MacEwan University.

4. 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 primary disciplines, 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 primary disciplines, with at least three credits from each primary discipline.

   If a student chooses no minor:
   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 primary disciplines, 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.

5. Students may take any of **CMPT 399**, **CMPT 496**, **CMPT 498**, **CMPT 499**, **MATH 495** and **STAT 495** for credit a maximum of two times, as long as the course topic is different each time they take it.

6. **STAT 265** can only be used once to fulfill *either* a MATH course requirement *or* a STAT course requirement.