MATHEMATICS – MAJOR (SCIENCE) – BACHELOR OF SCIENCE (HONOURS)

MATH-M-BSH
Subject: Administered by the Department of Mathematics and Statistics.
Plan: Consists of 60.0 units as described below.
Program: The Plan, alone, or in combination with a Minor in another subject, and with sufficient electives to total 120.0 units, will lead to a Bachelor of Science (Honours) Degree.

Requirements for this program have been modified. Please consult the 2020-2021 Calendar for the previous requirements.

Code	Title	Units
1. Core		
A. Complete the following:		
MATH 110	Linear Algebra	6.00
MATH 120	Differential and Integral Calculus	6.00
B. Complete the following:		
MATH 210	Rings and Fields	3.00
MATH 231	Differential Equations	3.00
MATH 280	Advanced Calculus	3.00
MATH 281	Introduction to Real Analysis	3.00
C. Complete the following:		
STAT 268	Statistics and Probability I	3.00
STAT 269	Statistics and Probability II	3.00
2. Option		
A. Select 24.00 units from the following:		24.00
MATH at the 300 level or above		
STAT at the 300 level or above		
BIOM at the 300 level or above		
B. Select 6.00 units from the following:		6.00
MATH at the 400 level or above		
STAT at the 400 level or above		
BIOM at the 400 level or above		
Electives		
Elective Courses		60.00
Total Units		**120.00**

3. Notes

A. In planning their program, students should keep in mind that some of the 300- and 400-level courses listed are not offered every year and that many 400-level courses may be taken in third year.

B. Graduate courses at the 800-level are available to fourth-year students with an excellent record who obtain permission of the Department and of the School of Graduate Studies and Research.

C. Students should select some of their 300-level and 400-level courses to be focused in one area of mathematics or statistics. The following is a list of suggested areas and some of the courses that belong to those areas:

1. Actuarial Focus *(p. 1)*
   MATH 272 Applications of Numerical Methods, MATH 337 Stochastic Models in Operations Research, MATH 384 Mathematical Theory of Interest, MATH 385 Life Contingencies, MATH 434 Optimization Theory with Applications to Machine Learning, STAT 353 Probability II, STAT 361 Applied Methods in Statistics I, STAT 455 Stochastic Processes and Applications, STAT 462 Statistical Learning I, STAT 463 Fundamentals of Statistical Inference, STAT 464 Discrete Time Series Analysis, STAT 465 Quality Management.COMM 211 Financial Accounting, COMM 221 Introduction To Finance, ECON 110 Principles of Economics, ECON 111 Introductory Microeconomics, ECON 112 Introductory Macroeconomics, ECON 212 Microeconomic Theory I
2. *Biomathematics Focus*
   BIOM 300 Modeling Techniques in Biology, MATH 337 Stochastic Models in Operations Research, MATH 339 Evolutionary Game Theory, MATH 427 Introduction to Deterministic Dynamical Systems, MATH 434 Optimization Theory with Applications to Machine Learning, STAT 455 Stochastic Processes and Applications
3. *Business Focus*
   MATH 337 Stochastic Models in Operations Research, MATH 384 Mathematical Theory of Interest, MATH 401 Graph Theory, MATH 434 Optimization Theory with Applications to Machine Learning, STAT 353 Probability II, STAT 361 Applied Methods in Statistics I, STAT 455 Stochastic Processes and Applications, STAT 463 Fundamentals of Statistical Inference, STAT 464 Discrete Time Series Analysis, STAT 465 Quality Management
4. *Communications Focus*
   MATH 328 Real Analysis, MATH 406 Introduction to Coding Theory, MATH 418 Number Theory and Cryptography, MATH 474 Information Theory, MATH 477 Data Compression and Source Coding, STAT 455 Stochastic Processes and Applications
5. *Discrete Mathematics and Optimization Focus*

MATH 401 Graph Theory, MATH 402 Enumerative Combinatorics, MATH 406 Introduction to Coding Theory, MATH 434 Optimization Theory with Applications to Machine Learning, STAT 353 Probability II

6. *Dynamic Processes Focus*
   MATH 326 Functions of a Complex Variable, MATH 328 Real Analysis, MATH 427 Introduction to Deterministic Dynamical Systems, STAT 353 Probability II
7. *Probability Focus*
   MATH 328 Real Analysis, MATH 474 Information Theory, STAT 353 Probability II, STAT 455 Stochastic Processes and Applications, STAT 463 Fundamentals of Statistical Inference
8. *Pure Mathematics Focus*
   MATH 310 Group Theory, MATH 326 Functions of a Complex Variable, MATH 328 Real Analysis, MATH 341 Differential Geometry, MATH 401 Graph Theory, MATH 413 Introduction to Algebraic Geometry, MATH 414 Introduction to Galois Theory, MATH 421 Fourier Analysis
9. *Statistics Focus*
   STAT 361 Applied Methods in Statistics I, STAT 456 Bayesian Analysis, STAT 457 Statistical Learning II, STAT 462 Statistical Learning I, STAT 463 Fundamentals of Statistical Inference, STAT 464 Discrete Time Series Analysis, STAT 465 Quality Management, STAT 471 Sampling and Experimental Design, STAT 473 Generalized Linear Models, STAT 486 Survival Analysis, STAT 466 Statistical Programming with SAS and Applications
10. *Teaching Focus*
    MATH 311 Elementary Number Theory, MATH 381 Mathematics with a Historical Perspective, MATH 382 Mathematical Explorations, MATH 386 Our Number System - an Advanced Perspective, MATH 387 Elementary Geometry - an Advanced Perspective

D. A maximum of 6.0 units from courses offered by other Faculties and Schools may be counted toward the program and/or Plan Requirements. This includes courses in BMED, COMM, GLPH, LAW, NURS and courses in the Faculty of Engineering and Applied Science.