

# MATHEMATICS LIBERAL PROGRAM - CORE SCIENCE COMPONENT (B.SC.) (45 CREDITS)

**Offered by:** Mathematics and Statistics (Faculty of Science)  
**Degree:** Bachelor of Science  
**Program credit weight:** 45

## Program Description

The B.Sc.; Liberal Program – Core Science Component in Mathematics provides a general overview of Mathematics, including a rigorous foundation and exploration of the different branches of Mathematics,

### Degree Requirements – B.Sc.

*This program is offered as part of a Bachelor of Science (B.Sc.) degree.*

To graduate, students must satisfy both their program requirements and their degree requirements.

- The program requirements (i.e., the specific courses that make up this program) are listed under the Course Tab (above).
- The degree requirements—including the mandatory Foundation program, appropriate degree structure, and any additional components—are outlined on the Degree Requirements page.

Students are responsible for ensuring that this program fits within the overall structure of their degree and that all degree requirements are met. Consult the Degree Planning Guide on the SOUSA website for additional guidance.

**Note:** For information about Fall 2025 and Winter 2026 course offerings, please check back on May 8, 2025. Until then, the "Terms offered" field will appear blank for most courses while the class schedule is being finalized.

## Program Prerequisites

Students entering the Core Science Component in Mathematics are normally expected to have completed the courses below or their equivalents. Otherwise, they will be required to make up any deficiencies in these courses over and above the 45 credits required for the program.

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| Course   | Title                        | Credits |
|----------|------------------------------|---------|
| MATH 133 | Linear Algebra and Geometry. | 3       |
| MATH 140 | Calculus 1.                  | 3       |
| MATH 141 | Calculus 2.                  | 4       |

## Guidelines for Selection of Courses

The following informal guidelines should be discussed with the student's adviser. Where appropriate, Honours courses may be

substituted for equivalent Major courses. Students planning to pursue graduate studies are encouraged to make such substitutions.

Students interested in computer science are advised to choose courses from the following and to complete the Computer Science Minor:

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| Course   | Title                           | Credits |
|----------|---------------------------------|---------|
| MATH 317 | Numerical Analysis.             | 3       |
| MATH 318 | Mathematical Logic.             | 3       |
| MATH 327 | Matrix Numerical Analysis.      | 3       |
| MATH 328 |                                 | 3       |
| MATH 335 | Groups, Tilings and Algorithms. | 3       |
| MATH 340 | Discrete Mathematics.           | 3       |
| MATH 417 | Linear Optimization.            | 3       |

Students interested in probability and statistics are advised to take

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| Course   | Title                                 | Credits |
|----------|---------------------------------------|---------|
| MATH 204 | Principles of Statistics 2.           | 3       |
| MATH 324 | Statistics.                           | 3       |
| MATH 423 | Applied Regression.                   | 3       |
| MATH 447 | Introduction to Stochastic Processes. | 3       |
| MATH 523 | Generalized Linear Models.            | 4       |
| MATH 525 | Sampling Theory and Applications.     | 4       |

Students interested in applied mathematics should take

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| Course   | Title                            | Credits |
|----------|----------------------------------|---------|
| MATH 317 | Numerical Analysis.              | 3       |
| MATH 319 | Partial Differential Equations . | 3       |
| MATH 324 | Statistics.                      | 3       |
| MATH 326 | Nonlinear Dynamics and Chaos.    | 3       |
| MATH 327 | Matrix Numerical Analysis.       | 3       |
| MATH 417 | Linear Optimization.             | 3       |

Students considering a career in secondary school teaching are advised to take

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| Course   | Title                                  | Credits |
|----------|----------------------------------------|---------|
| MATH 318 | Mathematical Logic.                    | 3       |
| MATH 328 |                                        | 3       |
| MATH 338 | History and Philosophy of Mathematics. | 3       |
| MATH 346 | Number Theory.                         | 3       |
| MATH 348 | Euclidean Geometry.                    | 3       |

Students interested in careers in business, industry or government are advised to select courses from the following list:

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| Course   | Title                                 | Credits |
|----------|---------------------------------------|---------|
| MATH 317 | Numerical Analysis.                   | 3       |
| MATH 319 | Partial Differential Equations .      | 3       |
| MATH 327 | Matrix Numerical Analysis.            | 3       |
| MATH 329 | Theory of Interest.                   | 3       |
| MATH 417 | Linear Optimization.                  | 3       |
| MATH 423 | Applied Regression.                   | 3       |
| MATH 430 | Mathematical Finance.                 | 3       |
| MATH 447 | Introduction to Stochastic Processes. | 3       |
| MATH 523 | Generalized Linear Models.            | 4       |
| MATH 525 | Sampling Theory and Applications.     | 4       |

Required Courses (27 credits)

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| Course   | Title                                   | Credits |
|----------|-----------------------------------------|---------|
| MATH 222 | Calculus 3. <sup>1</sup>                | 3       |
| MATH 235 | Algebra 1.                              | 3       |
| MATH 236 | Algebra 2.                              | 3       |
| MATH 242 | Analysis 1.                             | 3       |
| MATH 243 | Analysis 2.                             | 3       |
| MATH 249 | Honours Complex Variables. <sup>2</sup> | 3       |
| MATH 314 | Advanced Calculus.                      | 3       |
| MATH 315 | Ordinary Differential Equations.        | 3       |
| MATH 316 | Complex Variables. <sup>2</sup>         | 3       |
| MATH 323 | Probability.                            | 3       |

<sup>1</sup> Students who have successfully completed a course equivalent to MATH 222 Calculus 3. with a grade of C or better may omit MATH 222 Calculus 3., but must replace it with 3 credits of complementary courses.

<sup>2</sup> Students may select either MATH 249 Honours Complex Variables. or MATH 316 Complex Variables. but not both.

Complementary Courses (18 credits)

6 credits selected from:

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| Course   | Title                           | Credits |
|----------|---------------------------------|---------|
| MATH 317 | Numerical Analysis.             | 3       |
| MATH 324 | Statistics.                     | 3       |
| MATH 335 | Groups, Tilings and Algorithms. | 3       |
| MATH 340 | Discrete Mathematics.           | 3       |

12 credits selected from:

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| Course   | Title                                  | Credits |
|----------|----------------------------------------|---------|
| MATH 204 | Principles of Statistics 2.            | 3       |
| MATH 208 | Introduction to Statistical Computing. | 3       |

|          |                                        |   |
|----------|----------------------------------------|---|
| MATH 308 | Fundamentals of Statistical Learning.  | 3 |
| MATH 318 | Mathematical Logic.                    | 3 |
| MATH 319 | Partial Differential Equations .       | 3 |
| MATH 326 | Nonlinear Dynamics and Chaos.          | 3 |
| MATH 327 | Matrix Numerical Analysis.             | 3 |
| MATH 329 | Theory of Interest.                    | 3 |
| MATH 338 | History and Philosophy of Mathematics. | 3 |
| MATH 346 | Number Theory.                         | 3 |
| MATH 348 | Euclidean Geometry.                    | 3 |
| MATH 352 | Problem Seminar.                       | 1 |
| MATH 378 | Nonlinear Optimization .               | 3 |
| MATH 410 | Majors Project.                        | 3 |
| MATH 417 | Linear Optimization.                   | 3 |
| MATH 423 | Applied Regression.                    | 3 |
| MATH 430 | Mathematical Finance.                  | 3 |
| MATH 447 | Introduction to Stochastic Processes.  | 3 |
| MATH 451 | Introduction to General Topology.      | 3 |
| MATH 462 | Machine Learning .                     | 3 |
| MATH 463 | Convex Optimization.                   | 3 |
| MATH 510 | Quantitative Risk Management.          | 4 |
| MATH 523 | Generalized Linear Models.             | 4 |
| MATH 524 | Nonparametric Statistics.              | 4 |
| MATH 525 | Sampling Theory and Applications.      | 4 |
| MATH 545 | Introduction to Time Series Analysis.  | 4 |