



# MATHEMATICS BACHELOR OF ARTS

## CLASS OF 2022

### CONCENTRATION IN PURE MATHEMATICS



| TERM 1                                | TERM 2                                 | TERM 3   | TERM 4   | TERM 5              | TERM 6                              | TERM 7                             | TERM 8                                |
|---------------------------------------|--|--|--|---------------------|-------------------------------------|------------------------------------|---------------------------------------|
| MATH 150A<br>(GE B.4)<br>4 units      | MATH 150B<br>4 units                   | MATH 250A<br>4 units                                   | MATH 250B<br>4 units                             | MATH 302<br>3 units | MATH 350<br>3 units                 | MATH 414<br>3 units                | MATH 450<br>3 units                   |
| CNSM 101<br>(Cognate I ^a)<br>3 units | MATH 107<br>(Cognate II ^b)<br>4 units | MATH 180 or<br>Math 210<br>(Cognate III ^b)<br>3 units | MATH 280<br>3 units                              | MATH 307<br>3 units | MATH 407 or<br>MATH 430<br>3 units  | MATH 425 or<br>MATH 471<br>3 units | MATH 412 or<br>MATH 430<br>3 units    |
| MATH 151A<br>1 unit                   | MATH 151B<br>1 unit                    | MATH 380<br>(Upper Division<br>Writing)<br>3 units     | Math 320<br>(Computer<br>Programming)<br>3 units | GE C.1<br>3 units   | GE D.1<br>3 units                   | GE B.3<br>1 units                  |                                       |
| GE A.1<br>3 units                     | GE A.2<br>3 units                      | MATH 251A<br>1 unit                                    | GE C.2<br>3 units                                | GE B.5<br>3 units   |                                     | GE D.4<br>3 units                  |                                       |
| GE A.3<br>3 units                     | GE B.2<br>3 units                      | GE B.1<br>3 units                                      | HISTORY 110B<br>GE D.2<br>3 units                | GE D.3<br>3 units   |                                     |                                    | Electives<br>to complete<br>120 units |
|                                       |  | HISTORY 110A<br>GE C.4<br>3 units                      |  |                     | Upper Division<br>GE D.5<br>3 units | Upper Division<br>GE E<br>3 units  | Upper Division<br>GE C.3<br>3 units   |
| 14 units                              | 15 units                               | 17 units   | 16 units   | 15 units            | 12-15 units                         | 13 units                           | 15-18 units                           |

- a. CNSM 101 may be used as a “wild card” replacement course for any cognate  
 b. Other cognates are also available – see reverse side

|            |                                |
|------------|--------------------------------|
| 40         | GE lower division              |
| 9          | GE upper division              |
| 50         | Mathematics Required Courses   |
| 3          | Mathematics Supporting Courses |
| 12         | Pick 4 of 5 Courses            |
| 6          | Electives                      |
| <b>120</b> | <b>TOTAL UNITS</b>             |

### INSTRUCTIONS FOR COMPLETING THE MATHEMATICS BACHELOR OF ARTS

1. Meet with your assigned faculty advisor each semester to plan and review your academic progress.
2. Visit your College of Natural Sciences and Mathematics Student Success Team in MH 488 to review GE and graduation requirements.
3. Complete GE courses in areas A1, A2, and A3 with a C- or higher. Complete a total of 12 units in GE Area B. One course from GE Area Z can also fulfill a requirement in categories D1, C4, or D4. Check your Titan Degree Audit for courses that appear in both categories.
4. **All** Mathematics courses must be completed with a grade of C or higher.
5. Apply for Graduation through your Student Center at the start of Term 7.

**MATHEMATICS BACHELOR OF ARTS  
PURE MATHEMATICS Concentration**

The Math Major is for students who are preparing to (1) enter a graduate study in mathematics, (2) seek math-related careers in business, industry or government, or (3) pursue a career in teaching.

**MATHEMATICS CORE AND SUPPORTING COURSES**

- Complete the courses listed below:

| Course    | Course Title                                       |
|-----------|--|
| MATH 150A | Calculus I   |
| MATH 151A | Calculus I Workshop                                |
| MATH 150B | Calculus II  |
| MATH 151B | Calculus II Workshop                               |
| MATH 250A | Calculus III                                       |
| MATH 251A | Calculus III Workshop                              |
| MATH 250B | Intro to Linear Algebra and Differential Equations |
| MATH 280  | Strategies of Proof                                |
| MATH 307  | Linear Algebra                                     |
| MATH 350  | Advanced Calculus I                                |

- Pure Mathematics Concentration Requirements (21 units total)

*Pure Mathematics Required Courses (9 units)*

|          |                          |
|----------|--------------------------|
| MATH 302 | Modern Algebra (3)       |
| MATH 414 | Topology (3)             |
| MATH 450 | Advanced Calculus II (3) |

*Pure Mathematics Elective Courses (12 units)*

|          |                           |
|----------|---------------------------|
| MATH 407 | Abstract Algebra (3)      |
| MATH 412 | Complex Analysis (3)      |
| MATH 425 | Differential Geometry (3) |
| MATH 430 | Number Theory (3)         |
| MATH 471 | Combinatorics (3)         |

**COGNATE OPTIONS**

Each student is required to select one of the following cognates:

| Chemistry | 10 Units              |
|-----------|-----------------------|
| CHEM 120A | General Chemistry (5) |
| CHEM 120B | General Chemistry (5) |

| Civil Engineering       | 9 Units                                 |
|-------------------------|---|
| EGCE 201                | Statics (3)                             |
| EGCE 301                | Mechanics of Materials (3)              |
| EGCE 302 OR<br>EGCE 325 | Dynamics (3)<br>Structural Analysis (3) |

| Computer Science                          | 10 Units  |
|---|---|
| CPSC 131                                  | Data Structures Concepts (3)  |
| CPSC 223H OR<br>CPSC 223J OR<br>CPSC 223N | Visual BASIC Programming (3)<br>Java Programming (3)<br>Visual C# Programming (3) |
| CPSC 240 OR<br>CPSC 332                   | Computer System Architecture I (3)<br>File Structures and Database Systems (3)    |
| CPSC 253U                                 | Operating System Workshop in Unix (1)   |

| Economics   | 9 Units  |
|---|--|
| ECON 201  | Principles of Microeconomics (3)   |
| ECON 202  | Principles of Macroeconomics (3)   |
| ECON 310 OR<br>ECON 320 OR<br>ECON 440 OR<br>ECON 441 | Intermediate Microeconomics Analysis (3)<br>Intermediate Macroeconomics Analysis (3)<br>Econometrics (3)<br>Mathematical Economics (3) |

| Finance                                    | 9 Units                          |
|--|----------------------------------|
| FIN 320                                    | Financial Management (3)         |
| Two of the following three course options: |                                  |
| FIN 340                                    | Introduction to Investments (3)  |
| FIN 360                                    | Principles of Insurance (3)      |
| ISDS 473                                   | Applied Business Forecasting (3) |

| Intro to Math | 10 Units                |
|---------------|-------------------------|
| CNSM 101      | Think Like Einstein (3) |

|                         |   |
|-------------------------|---|
| MATH 107                | Intro to Computational Linear Algebra (4)   |
| MATH 180 OR<br>MATH 210 | Strategies of Problem Solving (3)<br>Intro to Laplace Transforms and Fourier Series (3) |

| ISDS                                   | 9 Units  |
|--|--|
| Three of the following course options: |  |
| ISDS 422                               | Surveys and Sampling Design and Applications (3) |
| ISDS 465                               | Linear Programming in Management Science (3)     |
| ISDS 467                               | Statistical Quality Control (3)                  |
| ISDS 472                               | Design of Experiments (3)                        |
| ISDS 474                               | Data Mining (3)                                  |
| ISDS 475                               | Multivariate Analysis (3)                        |

| Physics   | 11 Units  |
|-----------|---|
| PHYS 225  | Mechanics (3)   |
| PHYS 225L | Fundamental Physics: Laboratory (1)                       |
| PHYS 226  | Fundamental Physics: Electricity Magnetism (3)            |
| PHYS 226L | Fundamental Physics: Laboratory (1)                       |
| PHYS 227  | Fundamental Physics: Waves, Optics and Modern Physics (3) |

| Mathematics  | 9 Units |
|--|---------|
| Three upper-division Mathematics courses from one of four Mathematics major concentrations other than student's concentration. |         |

| Research | 9 Units                      |
|----------|------------------------------|
| MATH 491 | Research Seminar (1)         |
| MATH 497 | Undergraduate Research (3,3) |
| MATH 498 | Senior Thesis (2)            |

\*The research cognate is intended for students that would benefit more from research and a thesis than a standard cognate. Student should begin this cognate no later than their junior year.

**UNIVERSITY & GE REQUIREMENTS**

- Upper Division Writing Requirement

To meet the upper-division baccalaureate writing requirement, students must pass with a "C" (2.0) or better MATH 380.

- Computer Programming Requirement

To meet the elementary computer programming requirement, students must pass with a "C" (2.0) or better MATH 320, CPSC 120 or CPSC 121.

**GENERAL EDUCATION REQUIREMENTS**

- Area A Core Competencies – 9 units

| Subarea | Title                 |
|---------|-----------------------|
| A1      | Oral Communication    |
| A2      | Written Communication |
| A3      | Critical Thinking     |

- Area B Scientific and Quantitative Reasoning – 12 units

| Subarea | Title                                       |
|---------|---|
| B1      | Physical Science                            |
| B2      | Life Science                                |
| B3      | Laboratory Experience                       |
| B4      | Mathematics/Quantitative Reasoning          |
| B5      | Implications & Explorations NSM (upper div) |

- Area C Arts and Humanities – 12 units

| Subarea | Title   |
|---------|---|
| C1      | Introduction to the Arts                            |
| C2      | Introduction to the Humanities                      |
| C3      | Origins of World Civilizations                      |
| C4      | Explorations in the Arts and Humanities (upper div) |

- Area D Social Sciences – 15 units

| Area | Title   |
|------|---|
| D1   | Introduction to the Social Sciences             |
| D2   | American History, Institutions, and Values      |
| D3   | American Government                             |
| D4   | Explorations in the Social Sciences (upper div) |

- Area E Lifelong Learning and Self Development – 3 units of your choosing

• Area Z Cultural Diversity. Area Z should be completed with a course that will fulfill Area C4 and Area Z OR Area D1 and Area Z OR Area D4 and Area Z.