



College of Natural Sciences and Mathematics

DEPARTMENT OF MATHEMATICS

MATHEMATICS BACHELOR OF ARTS

CLASS OF 2025

CONCENTRATION IN PURE MATHEMATICS

Mathematics B.A.

| TERM 1 | TERM 2 | TERM 3 | TERM 4 | TERM 5 | TERM 6 | TERM 7 | TERM 8 |
|---------------------------------------|--|--|--|-----------------------------------|-------------------------------------|---|---|
| MATH 150A (GE B.4) 4 units | MATH 150B 4 units | MATH 250A 4 units | MATH 250B 4 units | MATH 302 3 units | MATH 350 3 units | MATH 414 3 units | MATH 450 3 units |
| MATH 180 (Cognate I ^a) 4 units | MATH 107 (Cognate II ^a) 4 units | MATH 106 (Cognate III ^a) 4 units | MATH 280 3 units | MATH 307 3 units | MATH 407 3 units | MATH 425 or MATH 471 3 units | MATH 412 3 units |
| MATH 151A 1 unit | MATH 151B 1 unit | MATH 380 (Upper Division Writing) 3 units | MATH 320 (Computer Programming) 3 units | GE C.1 3 units | MATH 430 3 units | GE B.3 1 unit | |
| GE A.1 3 units | GE A.2 3 units | MATH 251A 1 unit | GE C.2 3 units | GE E 3 units | GE D.1 3 units | GE C.1 or C.2 3 units | GE F 3 units |
| GE A.3 CNSM 101 3 units | GE B.2 3 units | GE B.1 3 units | GE D.2 3 units | American Government 3 units | | 3 units of electives to complete 120 units | 2 units of electives to complete 120 units |
| | | | | | Upper Division GE D.3 3 units | Upper Division GE B.5 3 units | Upper Division GE C.3 3 units |
| 15 units | 15 units | 15 units | 16 units | 15 units | 15 units | 16 units | 14 units |

a. Other cognates are also available – see reverse side

| | |
|-----|--------------------------------|
| 37 | GE lower division |
| 9 | GE upper division |
| 51 | Mathematics Required Courses |
| 3 | Mathematics Supporting Courses |
| 12 | Pick 4 of 5 Courses |
| 5 | Electives |
| 3 | University Requirement |
| 120 | TOTAL UNITS |

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 GE Course in B, C, D, or E must double-count as a Z course. 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 EGCE 325 | Dynamics (3) Structural Analysis (3) |

| Computer Science | 10 Units |
|---|---|
| CPSC 131 | Data Structures Concepts (3) |
| CPSC 223H OR CPSC 223J OR CPSC 223N | Visual BASIC Programming (3) Java Programming (3) Visual C# Programming (3) |
| CPSC 240 OR CPSC 332 | Computer System Architecture I (3) 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 ECON 320 OR ECON 440 OR ECON 441 | Intermediate Microeconomics Analysis (3) Intermediate Macroeconomics Analysis (3) Econometrics (3) 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 | 11 Units |
|---------------|----------|
|---------------|----------|

| | |
|----------|--|
| MATH 107 | Intro to Computational Linear Algebra (4) |
| MATH 180 | Strategies of Problem Solving (4) |
| MATH 106 | Integral Calculus and Differential Equations (4) |

| ISDS | 9 Units |
|-------------------------------------|---------|
| Three advisor-approved ISDS courses | |

| 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 – Complete one course in each subarea for a total of 9 units of lower division.

| Subarea | Title |
|---------|------------------------------|
| A1 | Oral Communications |
| A2 | Written Communication |
| A3 | Critical Thinking (CNSM 101) |

- Area B Scientific and Quantitative Reasoning – Complete one course in each subarea; the course in B3 must be associated with the course taken to satisfy B1 or B2. Area B courses must include 9 lower division and 3 upper division units (*).

| Subarea | Title |
|---------|--|
| B1 | Physical Science |
| B2 | Life Science |
| B3 | Laboratory Experience |
| B4 | Mathematics/Quantitative Reasoning |
| B5 (*) | Implications/Explorations in Math and Natural Sciences |

- Area C Arts and Humanities – Complete 3 units from C.1; 3 units from C.2; 3 units from C.3; and 3 units from either C.1 or C.2 for a total of 9 lower division and 3 upper division units (*).

| Subarea | Title |
|---------|-------------------------------------|
| C1 | Introduction to the Arts |
| C2 | Introduction to the Humanities |
| C3 (*) | Explorations in the Arts/Humanities |

- Area D Social Sciences – Complete 9 lower and 3 upper division units (*).

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

- Area E Lifelong Learning and Self Development – Complete 3 units.

- Area F Ethnic Studies – Complete 3 lower division or upper division units.

| Area | Title |
|------|----------------|
| F | Ethnic Studies |

- Area Z Cultural Diversity. (3 units). One GE Course in B, C, D, or E must double-count as a Z course (check TDA or CSUF website for courses that appear in both categories).

- Graduation Requirement – An American Government course is required for students in this catalog year. Please look at your TDA.