*Bachelor of Arts in Mathematics: Concentration in Mathematics for Advanced Study, Master of Arts in Mathematics Scholars Roadmap*

*San Francisco State University Bulletin 2024-2025*

# BACHELOR OF ARTS IN MATHEMATICS: CONCENTRATION IN MATHEMATICS FOR ADVANCED STUDY, MASTER OF ARTS IN MATHEMATICS SCHOLARS ROADMAP

The San Francisco State Scholars program provides undergraduate students with an accelerated pathway to a graduate degree. Students in this program pursue a bachelor's and master's degree simultaneously. This program allows students to earn graduate credit while in their junior and/or senior year, reducing the number of semesters required for completion of a master's degree.

**This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.**

| Course | Title | Units |
| --- | --- | --- |
| **First Year** | | |
| **Fall Semester** | | |
| ENG 114 | Writing the First Year: Finding Your Voice (A2) [1] | 3 |
| MATH 226 | Calculus I (Major Core, B4) [2] | 4 |
| GE Area A [3] | | 3 |
| GE Area C | | 3 |
| GE Area D | | 3 |
| | **Units** | **16** |
| **Spring Semester** | | |
| MATH 227 | Calculus II (Major Core) | 4 |
| GE Area A | | 3 |
| GE Area D | | 3 |
| GE Area E | | 3 |
| Complementary Studies or SF State Studies or University Elective [4] | | 3 |
| | **Units** | **16** |
| **Second Year** | | |
| **Fall Semester** | | |
| Select One (Major Core): | | 3 |
| MATH 209 | Mathematical Computing | |
| CSC 101 | Introduction to Computing | |
| CSC 309 | Computer Programming | |
| MATH 228 | Calculus III (Major Core) | 4 |
| GE Area B: Physical Science (B1) and Laboratory Science (B3) [5] | | 3-4 |
| GE Area C | | 3 |
| | **Units** | **13-14** |
| **Spring Semester** | | |
| MATH 301GW | Exploration and Proof - GWAR (Major Core) | 3 |
| MATH 440 | Probability and Statistics I (Major Concentration) | 3 |
| Select One: | | 3 |
| CSC 215 | Intermediate Computer Programming (if CSC 101 taken) | |
| Complementary Studies or SF State Studies or University Elective (if MATH 209 or CSC 309 taken) | | |
| GE Area B: Life Science (B2) and Laboratory Science (B3) [5] | | 3-4 |
| GE Area C | | 3 |
| | **Units** | **15-16** |
| **Third Year** | | |
| **Fall Semester** | | |
| MATH 325 | Linear Algebra (Major Core) [6] | 4 |
| MATH 380 | Introduction to Complex Analysis (Major Concentration) | 3 |
| GE Area F | | 3 |
| GE Area UD-B: Upper-Division Physical and/or Life Sciences | | 3 |
| U.S. and California Government (http://bulletin.sfsu.edu/undergraduate-education/american-institutions/#usg) | | 3 |
| | **Units** | **16** |
| **Spring Semester** | | |
| Select One (Major Concentration): | | 3 |
| MATH 310 | Elementary Number Theory | |
| MATH 376 | Ordinary Differential Equations I | |
| MATH 335 | Modern Algebra (Major Core) [6] | 3 |
| Major Elective (6 units) - Take One [7] | | 3 |
| GE Area UD-C: Upper-Division Arts and/or Humanities | | 3 |
| Complementary Studies or SF State Studies or University Elective [4] | | 3 |
| | **Units** | **15** |
| **Fourth Year** | | |
| **Fall Semester** | | |
| MATH 370 | Real Analysis I (Major Core) [6] | 3 |
| MATH 435/735 | Modern Algebra II (Major Concentration and Graduate Core) | 3 |

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| | | |
|---|---|---|
| Major Elective (6 units) - Take One [7] | | 3 |
| GE Area UD-D: Upper-Division Social Sciences | | 3 |
| Complementary Studies or SF State Studies or University Elective [4] | | 3 |
| | **Units** | **15** |
| **Spring Semester** | | |
| MATH 470/770 | Real Analysis II: Several Variables (Major Concentration and Graduate Core) | 3 |
| Complementary Studies or SF State Studies or University Elective - Take Four [4] | | 12 |
| | **Units** | **15** |
| **Fifth Year** | | |
| **Fall Semester** | | |
| Graduate Core - Take Two [8] | | 6 |
| Related Courses - Take One [9] | | 3 |
| | **Units** | **9** |
| **Spring Semester** | | |
| Related Courses - Take Two or Three [9] | | 6-9 |
| Select One (Culminating Experience): | | 0-3 |
| MATH 896EXM | Culminating Experience Examination | |
| MATH 898 | Master's Thesis | |
| | **Units** | **6-12** |
| | **Total Units** | **136-144** |

Select an additional 3 units from unpaired graduate courses other than MATH 898 or MATH 899.

[9] **Upper-Division/Graduate Mathematics or Related Courses (9-12 units)** MATH 730 must be included among these units unless the student had earned a B or higher grade in an undergraduate complex analysis course. No more than 9 units may be selected from approved unpaired undergraduate upper-division courses. Students must complete either a thesis with oral defense (MATH 898) or take the comprehensive examinations and write an expository paper (MATH 896EXM). Students who plan to take MATH 898 must complete 9 units of elective courses. Students who plan to take MATH 896EXM must complete 12 units of elective courses, including at least 3 units of unpaired graduate courses.

[1] ENG 114 can only be taken if you complete Directed Self-Placement (DSP) and select ENG 114; if you select ENG 104/ENG 105 through DSP you will satisfy A2 upon successful completion of ENG 105 in the second semester; multilingual students may be advised into alternative English courses.

[2] To determine the best B4 course option, students should complete the online advising activity at mathadvising.sfsu.edu (https://mathadvising.sfsu.edu/). Questions? Contact Gator Smart Start. (https://gatorsmartstart.sfsu.edu/)

[3] To avoid taking additional units, it is recommended that you meet the **SF State Studies** (AERM, GP, ES, SJ) requirements within your GE or major.

[4] **Complementary Studies**
Students in the B.A. Math program will satisfy the Complementary Studies requirement by taking 12 units of courses in the College of Science and Engineering outside of Math.

[5] Consider taking a class combined with a laboratory or a separate lab to fulfill B3 if not already satisfied.

[6] Can double-count for graduate core, except MATH 735 and MATH 770, for a max of 6 units.

[7] **Major Electives**
Two elective MATH courses numbered 400 or above except MATH 475, MATH 565, MATH 575, MATH 576, and MATH 577.

[8] **Graduate Core**
Select Three:
MATH 710 Measure and Integration (3 units)
MATH 711 Functional Analysis (3 units)
or MATH 730 Theory of Functions of a Complex Variable (3 units)
MATH 725 Advanced Linear Algebra (3 units)
MATH 850 Algebra (3 units)