### Requirements for the Major in Mathematics

#### Prerequisites (State Mandated Common Prerequisites)

Students wishing to transfer to USF from a Florida Community College should complete the A.A. degree at the community college. Some courses required for the major may also meet General Education Requirements thereby transferring maximum hours to the university. A student who transfers without an A.A. degree and has fewer than 60 semester hours of acceptable credit must meet the university’s entering freshman requirements including ACT or SAT test scores, GPA, and course requirements. The transfer student should also be aware of the immunization, foreign language, and continuous enrollment policies of the university.

Students should complete the following prerequisite courses listed below at the lower level prior to entering the university. If these courses are not taken at the community college, they must be completed before the degree is granted. Unless stated otherwise, a grade of “C” is the minimum acceptable grade.

- **COPXXX** Computer Language Course
  - (Pascal, FORTRAN, C, C++, or C++)
- **MACX311** Calculus I
- **MACX312** Calculus II
- **MACX313** Calculus III

Students must also complete two laboratory-based science courses, 4 - 8 semester hours total, from the respective science majors: Biology, Chemistry, Geology, or Physics.

### MAJOR IN MATHEMATICS

The courses taken to satisfy the requirements below will constitute the major program referred to in the general graduation requirements of the College of Arts and Sciences.

Majors are encouraged to consult the department’s Undergraduate Advisor before every semester. The Undergraduate Advisor will recommend electives which are appropriate for the student's interests and goals.

Majors are encouraged to consider the Honors Program and the Accelerated BA/MA Program, which are outlined below.

#### 1. Mathematics Requirements (Min. 45 cr. hrs.)

- **Core Requirement.** Majors must complete the following five courses (20 cr. hrs.):
  - **MAC 2311** Calculus I (4)
  - **MAC 2312** Calculus II (4)
  - **MAC 2313** Calculus III (4)
  - **MGF 3301** Bridge to Abstract Mathematics (4)
  - **MAS 3105** Linear Algebra (4)

- **Analysis Requirement.** Majors must complete one of the following two courses (4 cr. hrs.):
  - **MAA 4211** Intermediate Analysis I (4)
  - **MAS 4156** Vector Calculus (4)

Majors who complete both **MAA 4211** and **MAS 4156** may count one of these towards the Elective Requirement below.

- **Elective Requirement.** Majors must complete seven courses from the following electives (Min. 21 cr. hrs.):
  - **CGS 3414** Problem Solving Using Pascal or C (3)
  - **COP 4313** Symbolic Computations in Mathematics (3)
  - **MAA 4211** Intermediate Analysis I (4)
  - **MAA 4212** Intermediate Analysis II (4)
  - **MAA 4401** Numerical Analysis (3)
  - **MAA 4402** Complex Variables (3)
  - **MAA 4404** Theory of Computation (3)
  - **MAP 5305** Introduction to Graph Theory (3)
  - **MAP 2302** Differential Equations (3)
  - **MAP 5345** Applied Partial Differential Equations (3)
  - **MAP 5407** Methods of Applied Mathematics (3)
  - **MAS 4124** Numerical Linear Algebra (3)
  - **MAS 4156** Vector Calculus (4)
  - **MAS 5215** Number Theory (3)
  - **MAS 4301** Elementary Abstract Algebra (3)
  - **MAT 4970** Mathematics Senior Thesis (3)
  - **MAT 5405** History of Modern Mathematics (3)
  - **MTG 4214** Modern Geometry (3)
  - **MTG 4302** Introduction to Topology (3)
  - **STA 4321** Essentials of Statistics (3)
  - **STA 4442** Introduction to Probability (3)

Special Notes.

- **MAT 4930,** Selected Topics in Mathematics, or 5000-level mathematics courses may be taken as electives, with the approval of the Undergraduate Advisor.

One or two courses from another department which are of high mathematical content may also be taken as electives, with the approval of the Undergraduate Advisor and the Chairman.

Majors wishing to take a course in statistics should first take **STA 4442** and then **STA 4321**.

Majors wishing to continue towards a graduate degree in mathematics should take **MAS 4301** and **MAA 4211**. (See also the sections on the Honors Program and the Accelerated BA/MA Program below.)

#### 2. Mathematics-related Courses (Min. 6 cr. hrs.)

Majors must take two courses in science or engineering which are required courses for the majors within those departments. The two courses need not be in the same department. Science courses must include laboratories and be offered by the Departments of Biology, Chemistry, Geology, or Physics.

### HONORS PROGRAM IN MATHEMATICS

The program is designed for superior students having a solid background in high school mathematics and the ability to handle a fast paced, challenging program leading to a BA degree. Successful completion of the program will be prominently displayed on the student's diploma and will be recorded on the official U.S.F. transcript of the student's work.

Students are eligible for admission to the program when they

- 1. have completed **MAS 4301,** Elementary Abstract Algebra,
- 2. have at least a 3.0 average for all college courses, and
- 3. have at least a 3.5 average for mathematics courses.

Applications are submitted to the Undergraduate Committee of the Department of Mathematics.

The requirements for a B.A. degree in mathematics with honors are as follows:

1. completion of the requirements of the major in mathematics,
2. completion of **MAA 4211,** Intermediate Analysis I,
3. completion of **MAT 4970,** Mathematics Senior Thesis,
4. completion of eight mathematics courses at or above the 4000-level,
5. at least a 3.0 average for all college courses, and
6. at least a 3.5 average for mathematics courses.

### ACCELERATED BA/MA PROGRAM

This program is designed for superior students having a solid background in high school mathematics and the ability to handle a fast paced, challenging program leading to a BA and MA degree in mathematics in four to five years.

The program meets all the requirements for the BA degree, but requires the student to take those graduate level courses required for the MA degree during the last two years in the program. Up to 20 hours of graduate courses may be counted towards the MA degree as well as the BA degree, but not towards the undergraduate major (that is, as free electives).

For admission to the program, a student must

1. have completed at least 30 hours of college credit includ-
Requirements for the Minor in Mathematics

The minor in mathematics is open to all students. Students with majors in the sciences, engineering, business, and the social sciences are particularly encouraged to pursue the minor. A student wishing to receive a minor in mathematics must meet the following course requirements (minimum of 26 cr. hrs.):

1. Required Courses (20 cr. hrs.)
   
   Either
   
   MAC 2311 Calculus I (4)
   MAC 2312 Calculus II (4)
   MAC 2313 Calculus III (4)
   
   Or
   
   MAC 2281 Engineering Calculus I (4)
   MAC 2282 Engineering Calculus II (4)
   MAC 2283 Engineering Calculus III (4)
   
   Also, both of the following:
   
   MGF 3301 Bridge to Abstract Mathematics (4)
   MAS 3105 Linear Algebra (4)

2. Elective Courses (Min. 6 cr. hrs.)
   
   Any 2 mathematics courses which are required or elective for the major in mathematics.

TEACHER EDUCATION PROGRAMS

For information concerning the degree programs for secondary school teachers, see the description given in the Mathematics Education section of this catalog.