MATHEMATICS | BS

Studying mathematics develops such skills as critical thinking, oral and written communication, arguing logically and rigorously, thinking abstractly, formulating and solving problems, analyzing data, analyzing mathematical models, quantitative and computer proficiency, and the ability to work in groups. Employers value these skills; consequently, math majors find themselves in demand by employers for careers in a wide spectrum of fields.

About this Program

- **College:** Liberal Arts and Sciences
- **Degrees:** Bachelor of Arts; Bachelor of Science
- **Credits for Degree:** 120
- **Additional Information**
- **Related Mathematics Programs**

To graduate with this major, students must complete all university, college, and major requirements.

The Department of Mathematics offers two undergraduate degree programs in mathematics: The Bachelor of Science (B.S.) is intended for students who wish to pursue graduate study in mathematics as well as for other strong students with a deep interest in mathematics. The Bachelor of Arts (B.A.) is intended for students who wish to pursue a career in a mathematical field or to teach mathematics at the secondary-school level, but who do not currently contemplate graduate study in mathematics.

Coursework for the Major

Students are required to take eight core courses, providing a broad base in mathematics, and four electives chosen from a list of approved courses. All but two of the core courses are the same for both degrees. Students pursuing the B.A. degree have greater flexibility in their choice of electives, facilitating the possibility of a double-major with another scientific discipline.

A minimum of 39 credits of mathematics and mathematics-approved electives is required for each degree. All coursework for the major must be completed with minimum grades of C, with the exception of MAS 4105 for students in the B.S. specialization, which requires a minimum grade of B.

Relevant Minors and/or Certificates

Mathematics majors are encouraged to consider taking a minor in computer science, industrial and systems engineering, physics, or statistics. The Department of Statistics offers a minor in actuarial science.

More Info

UFTeach Program

There is a severe shortage of qualified high school mathematics teachers in Florida and nationwide. Students interested in becoming part of this high-demand profession should see a major advisor about the UFTeach program. UFTeach students complete the UFTeach minor in mathematics teaching with their B.A. or B.S. in mathematics and have the coursework and preparation for professional teacher certification in Florida when they graduate.

More Info

Research

Research and scholarly opportunities are described on the mathematics website under Opportunities for Undergraduates.

More Info

Combined Degree Programs

Mathematics majors who complete the requirements for major by the end of the junior year are eligible for the combined degree program. If admitted to the graduate program, the student will take the graduate sequences MAA 5228 and MAA 5229 and MAS 5311 and MAS 5312 during the senior year. These 12 credits then will apply toward a master’s degree in mathematics as well as toward the undergraduate degree. The student should successfully complete this degree with one additional full-time year of graduate school.

Related Mathematics Programs

- Combined Degree
- Mathematics minor

Bachelor of Science

The Bachelor of Science (B.S.) is intended for students who wish to pursue graduate study in mathematics as well as for other strong students with a deep interest in mathematics.

Coursework

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus 2</td>
<td>4</td>
</tr>
<tr>
<td>MAC 2512</td>
<td>Calculus 2 for Advanced Placement Students</td>
<td></td>
</tr>
<tr>
<td>MAC 3473</td>
<td>Honors Calculus 2</td>
<td></td>
</tr>
<tr>
<td>MAC 2313</td>
<td>Analytic Geometry and Calculus 3</td>
<td>4</td>
</tr>
<tr>
<td>or MAC 3474</td>
<td>Honors Calculus 3</td>
<td></td>
</tr>
<tr>
<td>MAP 2302</td>
<td>Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MHF 3202</td>
<td>Sets and Logic</td>
<td>3</td>
</tr>
<tr>
<td>MAS 4105</td>
<td>Linear Algebra 1</td>
<td>4</td>
</tr>
<tr>
<td>MAS 4301</td>
<td>Abstract Algebra 1</td>
<td>3</td>
</tr>
</tbody>
</table>

**Additional Required Coursework for B.S.**

MAA 4211  Advanced Calculus 1

& MAA 4212  and Advanced Calculus 2  1

Select four electives, 12 credits minimum, from the list below of approved electives; at least three must be a course offered by the Department of Mathematics at the 4000 level or above

| Total Credits | 39 |

1 Students must earn a minimum grade of B in MAS 4105 before taking MAA 4211.

The mathematics major is expected to take the following upper-division core courses at UF: Linear Algebra, Abstract Algebra, Advanced Calculus 1 and 2. These courses are common to all math majors and most clearly define the experience of the mathematics major at UF.

Recommended Coursework for Both Degrees

All math majors are encouraged to meet the college distribution requirement in the physical sciences with the sequence PHY 2048/PHY 2049 or the sequence PHY 2060/PHY 2061. Math majors should also take no mathematics course at the 3000 level or below that is
not on the lists of core courses or approved electives, except with advisor approval. Students who want to pursue careers in applied mathematics are urged to take STA 4321/STA 4322 and learn a scientific programming language.

**Recommended Coursework for B.S.**
Students who want to pursue graduate study in a Ph.D. program in mathematics should complete MAS 4301 and MAA 4211/MAA 4212 by the end of their junior year. They should include MAS 5311 and MAA 4226 among their electives, and they are encouraged to take more than four electives.

Graduate tuition fees will apply for MAS 5311.

**Critical Tracking**
Critical Tracking records each student's progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

For degree requirements outside of the major, refer to CLAS Degree Requirements: Structure of a CLAS Degree.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites may be used for transfer students.

**Semester 1**
- Complete MAC 2311
- 2.0 UF GPA required

**Semester 2**
- Complete MAC 2312
- 2.0 UF GPA required

**Semester 3**
- Complete MAC 2313
- 2.0 UF GPA required

**Semester 4**
- Complete MHF 3202 (or MAS 3300 for UTeach students) with a 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

**Semester 5**
- Complete MAS 4105 with a minimum grade of B and a 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

**Model Semester Plan**
*Model semesters 1-4 are the same for both degrees.*

The semester plans below are sample programs; they may be adjusted to reflect background and goals. Students should consult a department advisor in 358 Little Hall early to plan their programs.

Students are expected to complete the writing requirement while in the process of taking the courses below. Students are also expected to complete the general education international (GE-N) and diversity (GE-D) requirements concurrently with another general education requirement (typically, GE-C, H or S).

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STA 4321</td>
<td>Analytic Geometry and Calculus 1 (Critical Tracking; State Core Gen Ed Mathematics)</td>
<td>4</td>
</tr>
<tr>
<td>STA 4322</td>
<td>Analytic Geometry and Calculus 2 (Critical Tracking; State Core Gen Ed Mathematics)</td>
<td>4</td>
</tr>
<tr>
<td>State Core Gen Ed Biological or Physical Sciences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>State Core Gen Ed Social and Behavioral Sciences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>MAA 4211</td>
<td>Advanced Calculus 1</td>
<td>3</td>
</tr>
<tr>
<td>MAA 5311</td>
<td>Intro Algebra 1 (or another math elective)</td>
<td>3</td>
</tr>
<tr>
<td>Elective (3000 level or higher, not in major)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Foreign language</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td>Mathematics elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>15-18</td>
</tr>
</tbody>
</table>

Semester One
- Complete MAC 2311
- 2.0 UF GPA required

Semester Two
- Complete MAC 2312
- 2.0 UF GPA required

Semester Three
- Complete MAC 2313
- 2.0 UF GPA required

Semester Four
- Complete MAA 4211
- 2.0 UF GPA required

Semester Five
- Complete MAA 4212
- 2.0 UF GPA required

Semester Six
- Complete MAS 4301
- 2.0 UF GPA required

Semester Seven
- Complete MAA 4226
- 2.0 UF GPA required
Academic Learning Compact

The major in mathematics enables students to develop proficiency in calculus, differential equations, advanced calculus, linear algebra, and abstract algebra, and expose them to several other mathematical areas beyond these core fields. Students will learn to read and to construct mathematical proofs, to reason in abstract mathematical systems and to use mathematical models. Students will also acquire the ability to read new mathematics and to formulate mathematical models and arguments.

Before Graduating Students Must

- Be evaluated on your responses to certain examination questions in upper-division courses that are required for your degree.
- Complete requirements for the baccalaureate degree, as determined by faculty.

Students in the Major Will Learn to

Student Learning Outcomes (SLOs)

Content
   Bachelor of Science: Explain conceptual and computational competency in core mathematics: calculus, differential equations, advanced calculus, linear algebra, and abstract algebra.

Critical Thinking
2. Identify correct mathematical arguments in abstract mathematical systems.

3. Develop and analyze mathematical models of scientific problems.

Communication
4. Develop and write correct mathematical arguments.

Curriculum Map

<table>
<thead>
<tr>
<th>I = Introduced; R = Reinforced; A = Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courses</td>
</tr>
<tr>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Bachelor of Arts</td>
</tr>
<tr>
<td>Bachelor of Science</td>
</tr>
</tbody>
</table>

Assessment Types

- Exams