Statistics | BS

Statistics, the science of learning from data, has become increasingly important as scientists, businesses, and governments rely more and more on data-driven decision-making. Statisticians work in many areas, including business, economics, medicine, epidemiology, agriculture, environmental sciences, sports, and all aspects of government. With the increasing digitization and networking of society, data have become ever more ubiquitous, further expanding the demand for statisticians and their expertise in the collection and analysis of data.

About this Program

• **College**: Liberal Arts and Sciences
• **Degrees**: Bachelor of Arts | Bachelor of Science
• **Credits for Degree**: 120
• **Additional Information**
  • Contact: Email
  • **Related Statistics Programs**

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

Statistics majors learn how to design studies that effectively address the purpose of a research project and how to properly analyze the data collected in such studies. Core courses cover statistical methods applicable in a wide variety of settings (e.g., regression and design of experiments) as well as the conceptual and mathematical foundations of statistics. Other courses explore specific data types often encountered in practical settings. Statistics majors have the option to minor in actuarial science, a profession involving the statistical and financial practices of insurance.

Students who wish to major in statistics must consult a department advisor early in their programs.

Coursework for the Major

The College of Liberal Arts and Sciences offers the Bachelor of Science (B.S.) and the Bachelor of Arts (B.A.) in statistics. The B.A. is intended for students who wish to pursue a career in the field of statistics or to teach statistics at the secondary-school level, but who do not currently contemplate graduate study in statistics. The B.S. is intended for students who wish to pursue graduate study in statistics or a closely related area, and for other strong students with a deeper interest in the mathematical foundations of statistics.

Students must receive minimum grades of C within two attempts (including withdrawals) in every required core course and in every course counted toward the 12 credit elective requirement, with the exception of MAC 2312 and MAC 2313 where students must receive a minimum grade of B-. Students cannot retake core or statistics elective courses after earning a minimum grade of C, with the exception of MAC 2312 and MAC 2313, in which students must receive a minimum grade of B-. A minimum GPA of 2.0 must be achieved on all attempts of core and major elective courses and 2.67 on MAC 2312 and MAC 2313. The grades from all attempts to satisfy core requirements will be used to compute the minimum GPA. A minimum of 18 credits of major coursework must be taken at UF, including a minimum of 12 credits of core coursework.

Required Coursework for Both Degrees

The B.A. in statistics requires a minimum of 42 credits in statistics and related coursework. The B.S. in statistics requires a minimum of 49 credits in statistics and related coursework. It is important that the prerequisites of each class are met before the class is attempted.

<table>
<thead>
<tr>
<th>Code</th>
<th>Core</th>
<th>Title</th>
<th>Credits</th>
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<td>Select one of the following:</td>
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<tr>
<td>MAC 2311</td>
<td>Analytic Geometry and Calculus 1</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>&amp; MAC 2312</td>
<td>and Analytic Geometry and Calculus 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&amp; MAC 2313</td>
<td>and Analytic Geometry and Calculus 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAC 3472</td>
<td>Honors Calculus 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&amp; MAC 3473</td>
<td>and Honors Calculus 2</td>
<td></td>
<td></td>
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<tr>
<td>&amp; MAC 3474</td>
<td>and Honors Calculus 3</td>
<td></td>
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<tr>
<td>STA 4210</td>
<td>Regression Analysis 1</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>STA 4211</td>
<td>Design of Experiments 1,2</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>STA 4321</td>
<td>Introduction to Probability 1</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>STA 4322</td>
<td>Introduction to Statistics Theory 1,3</td>
<td></td>
<td>3</td>
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<tr>
<td>STA 4504</td>
<td>Categorical Data Analysis</td>
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<td>3</td>
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Statistics Electives

Select two of the following:

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>STA 4222</td>
<td>Sample Survey Design</td>
<td>3</td>
</tr>
<tr>
<td>STA 4502</td>
<td>Nonparametric Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>STA 4702</td>
<td>Multivariate Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>STA 4712</td>
<td>Introduction to Survival Analysis</td>
<td>3</td>
</tr>
<tr>
<td>STA 4821</td>
<td>Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>STA 4853</td>
<td>Introduction to Time Series and Forecasting</td>
<td>3</td>
</tr>
<tr>
<td>STA 4930</td>
<td>Special Topics</td>
<td>3</td>
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</tbody>
</table>

Total Credits: 33

1 The course sequence, STA 4210-STA 4211 and STA 4321-STA 4322 should be completed by the end of the junior year.
2 Prerequisite: STA 4210.
3 Prerequisite: STA 4321.

Combined Degree Program

Superior students can earn both the bachelor’s and master’s degrees in a shorter time than typically would be possible by counting up to 12 credits of approved graduate courses toward both degrees. For information and application, contact the undergraduate or graduate coordinator.

Relevant Minors and/or Certificates

Statistics majors may want to consider a minor in actuarial science, which prepares students for careers as actuaries. Required courses cover the material for the beginning examinations and VEE credits leading to an associateship in the major national actuarial societies.

Related Statistics Programs

• Combined Degree
• Statistics minor

Bachelor of Science

The B.S. is intended for students who wish to pursue graduate study in statistics or a closely related area, and for other strong students with a deeper interest in the mathematical foundations of statistics.
Additional Required Coursework for B.S.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td></td>
<td></td>
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<tr>
<td>MAS 4105</td>
<td>Linear Algebra 1</td>
<td>4</td>
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<tr>
<td>MHF 3202</td>
<td>Sets and Logic</td>
<td>3</td>
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<tr>
<td>Programming Elective</td>
<td>Select one of the following:</td>
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<tr>
<td>COP 2800</td>
<td>Computer Programming Using JAVA</td>
<td>3</td>
</tr>
<tr>
<td>COP 3275</td>
<td>Computer Programming Using C</td>
<td></td>
</tr>
<tr>
<td>COP 3502</td>
<td>Programming Fundamentals 1</td>
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</tr>
<tr>
<td>Math and Science Electives</td>
<td>Select two of the following:</td>
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<tr>
<td>MAA 4211</td>
<td>Advanced Calculus 1</td>
<td></td>
</tr>
<tr>
<td>MAA 4212</td>
<td>Advanced Calculus 2</td>
<td></td>
</tr>
<tr>
<td>MAA 4402</td>
<td>Functions of a Complex Variable</td>
<td></td>
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<tr>
<td>MAD 4401</td>
<td>Introduction to Numerical Analysis</td>
<td></td>
</tr>
<tr>
<td>MHF 4102</td>
<td>Elements of Set Theory</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits 16

1 Prerequisite: MHF 3202.

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
• 2.0 UF GPA required

Semester 2
• Complete MAC 1147 or higher-level calculus
• 2.0 UF GPA required

Semester 3
• Complete MAC 2311
• 2.0 UF GPA required

Semester 4
• Complete MAC 2312 with a 2.5 critical-tracking GPA
• 2.0 UF GPA required

Semester 5
• Complete MAC 2313 and a programming elective or any STA course with a 2.5 critical-tracking GPA
• 2.0 UF GPA required

Model Semester Plan

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>
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</thead>
<tbody>
<tr>
<td>Semester One</td>
<td>Analytic Geometry and Calculus 1 (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 Composition; Writing Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Science laboratory (Gen Ed Biological or Physical Sciences)</td>
<td>1</td>
<td></td>
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<tr>
<td>Gen Ed Social and Behavioral Sciences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Credits</td>
<td>14</td>
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<tr>
<td>Semester Two</td>
<td>What is the Good Life (Gen Ed Humanities)</td>
<td>3</td>
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<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus 2 (Critical Tracking; Gen Ed Mathematics)</td>
<td>4</td>
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<tr>
<td>Gen Ed Biological or Physical Sciences (area not taken in semester one)</td>
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<tr>
<td>State Core Gen Ed Humanities</td>
<td>3</td>
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<td>State Core Gen Ed Social and Behavioral Sciences</td>
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<td>Credits</td>
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<tr>
<td>Semester Three</td>
<td>Analytic Geometry and Calculus 3 (Critical Tracking; Gen Ed Mathematics)</td>
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<td>MAA 4402</td>
<td>Sets and Logic</td>
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<td>Select one:</td>
<td>Introduction to Statistics 1 (Critical Tracking)</td>
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<tr>
<td>STA 2023</td>
<td>Introduction to Statistics Theory</td>
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<tr>
<td>STA 3032</td>
<td>Engineering Statistics (Critical Tracking; Gen Ed Mathematics)</td>
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<tr>
<td>Foreign language</td>
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<tr>
<td>Credits</td>
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<tr>
<td>Semester Four</td>
<td>Linear Algebra 1</td>
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<tr>
<td>Elective (needed if placed out of language with SAT II)</td>
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<td></td>
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<tr>
<td>Foreign language</td>
<td>3-5</td>
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<tr>
<td>Gen Ed Humanities</td>
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<tr>
<td>Programming elective</td>
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<tr>
<td>Credits</td>
<td>16-18</td>
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<tr>
<td>Semester Five</td>
<td>Regression Analysis (Gen Ed Mathematics)</td>
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<tr>
<td>STA 4321</td>
<td>Introduction to Probability (Gen Ed Mathematics)</td>
<td>3</td>
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<tr>
<td>Foreign language if 4-3-3 option</td>
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<tr>
<td>Gen Ed Physical Sciences</td>
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<tr>
<td>Gen Ed Social and Behavioral Sciences</td>
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<tr>
<td>Credits</td>
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<td>Semester Six</td>
<td>Design of Experiments</td>
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<tr>
<td>STA 4211</td>
<td>Introduction to Statistics Theory (Gen Ed Mathematics)</td>
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<tr>
<td>STA 4504</td>
<td>Categorical Data Analysis</td>
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<tr>
<td>Gen Ed Biological Sciences</td>
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</table>
Gen Ed Composition; Writing Requirement 3

Semester Seven
Elective (3000 level or above, not in major) 3
Electives 10
STA elective 3

Credits 15

Semester Eight
Electives 6
Math science electives 6
STA elective 3

Credits 15

Total Credits 120

Academic Learning Compact

The statistics major enables students to achieve proficiency in the fundamentals of statistical reasoning. Through study of both theoretical and applied statistics and through data analysis projects, students will gain knowledge in problem solving, statistical applications and data-based inferences. Emphasis is on developing the ability to approach real world problems and through the use of statistical methods to be able to analyze and to draw valid scientific inferences.

Before Graduating Students Must

• Complete an exam on the fundamentals of statistics, which will be 5% of your grade in STA 4211.
• Complete a data analysis project, which will be 10% of your grade in STA 4211.
• Complete requirements for the baccalaureate degree, as determined by faculty.

Students in the Major Will Learn to

Student Learning Outcomes (SLOs)

Content
1. Identify, define and describe concepts and issues in statistics, including those involved in designing a statistical study, in statistical estimation and in tests of hypotheses.

Critical Thinking
2. Identify sources of variability in a given problem setting and formulate an appropriate statistical analysis.

Communication
3. Clearly and effectively present ideas in speech and in writing concerning statistical issues and analyses of data.

Curriculum Map

I = Introduced; R = Reinforced; A = Assessed

<table>
<thead>
<tr>
<th>Courses</th>
<th>SLO 1</th>
<th>SLO 2</th>
<th>SLO 3</th>
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</thead>
<tbody>
<tr>
<td>STA 4210</td>
<td>I</td>
<td>I</td>
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</tr>
<tr>
<td>STA 4211</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>STA 4222</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>STA 4321</td>
<td>I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STA 4322</td>
<td>I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STA 4502</td>
<td>R</td>
<td>R</td>
<td>R</td>
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<tr>
<td>STA 4504</td>
<td>R</td>
<td>R</td>
<td>R</td>
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<tr>
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<td>R</td>
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<tr>
<td>STA 4712</td>
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<td>R</td>
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<tr>
<td>STA 4853</td>
<td>R</td>
<td>R</td>
<td>R</td>
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</table>

Assessment Types

• Exams
• Projects
• Written and oral presentations