BACHELOR OF ARTS (BA) DEGREE WITH A MAJOR IN STATISTICS

Program Learning Outcomes for the BA Degree with a Major in Statistics

Upon completing the BA degree with a major in Statistics, students will be able to:

1. Apply fundamental theory in probability and statistical inference.
2. Apply and evaluate statistical models.
3. Apply statistical computing for data analysis and data science.
4. Demonstrate competency as a professional statistician.
5. Effectively communicate as a professional statistician.

Requirements for the BA Degree with a Major in Statistics

For general university requirements, see Graduation Requirements (ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements). Students pursuing the BA degree with a major in Statistics must complete:

- A minimum of 16 courses (49-55 credit hours) depending on course selection to satisfy major requirements.
- A minimum of 120 credit hours to satisfy degree requirements.
- A minimum of 60 credit hours outside of major requirements.
- A minimum of 11 courses (34 credit hours) at the 300-level or above.
- A maximum of 3 courses (9 credit hours) from study abroad or transfer credit. For additional departmental guidelines regarding transfer credit, see the Policies tab.

The courses listed below satisfy the requirements for this major. In certain instances, courses not on this official list may be substituted upon approval of the major’s academic advisor, or where applicable, the department’s Director of Undergraduate Studies. (Course substitutions must be formally applied and entered into Degree Works by the major’s Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier).) Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Total Credit Hours Required for the Major in Statistics</td>
<td>49-55</td>
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<tr>
<td></td>
<td>Total Credit Hours Required for the BA Degree with a Major in Statistics</td>
<td>120</td>
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Degree Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td>Core Requirements</td>
<td></td>
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<tr>
<td></td>
<td>Mathematics</td>
<td></td>
</tr>
<tr>
<td>MATH 101</td>
<td>SINGLE VARIABLE CALCULUS I</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 105</td>
<td>AP/OTH CREDIT IN CALCULUS I</td>
<td></td>
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</tbody>
</table>

Select 1 from the following:

- MATH 102 SINGLE VARIABLE CALCULUS II 3
- or MATH 106 AP/OTH CREDIT IN CALCULUS II

Select 1 from the following:

- MATH 212 MULTIVARIABLE CALCULUS
- MATH 221 HONORS CALCULUS III
- & MATH 222 and HONORS CALCULUS IV

Select 1 from the following:

- CAAM 335 MATRIX ANALYSIS
- or MATH 354 HONORS LINEAR ALGEBRA
- or MATH 355 LINEAR ALGEBRA

Computation

- STAT 405 R FOR DATA SCIENCE

Basic Computing

- Select 1 from the following:
  - COMP 100 INTRODUCTION TO COMPUTING AND INFORMATION SYSTEMS
  - COMP 130 ELEMENTS OF ALGORITHMS AND COMPUTATION
  - COMP 140 COMPUTATIONAL THINKING
  - COMP 182 ALGORITHMIC THINKING
  - COMP 200 ELEMENTS OF COMPUTER SCIENCE

Advanced Computing

- Select 1 from the following:
  - COMP 215 INTRODUCTION TO PROGRAM DESIGN
  - COMP 322 / ELEC 323 PRINCIPLES OF PARALLEL PROGRAMMING
  - COMP 330 TOOLS AND MODELS FOR DATA SCIENCE
  - COMP 382 REASONING ABOUT ALGORITHMS
  - CAAM 378 INTRODUCTION TO OPERATIONS RESEARCH AND OPTIMIZATION
  - CAAM 440 APPLIED MATRIX ANALYSIS
  - CAAM 453 NUMERICAL ANALYSIS I
  - CAAM 471 LINEAR AND INTEGER PROGRAMMING
  - CAAM 519 COMPUTATIONAL SCIENCE I

Probability and Statistics

- Select 6 courses from departmental (STAT) course offerings at the 300-level or above, including at least 3 from the following list of methodology/theory courses:

  - STAT 411 ADVANCED STATISTICAL METHODS
  - STAT 413 INTRODUCTION TO STATISTICAL MACHINE LEARNING
  - STAT 418 PROBABILITY
  - STAT 419 STATISTICAL INFERENCE
  - STAT 421 APPLIED TIME SERIES AND FORECASTING
  - STAT 425 INTRODUCTION TO BAYESIAN INFERENCE
  - STAT 453 BIOSTATISTICS
  - STAT 502 / COMP 502 / ELEC 502 NEURAL MACHINE LEARNING I
  - or STAT 310 / ECON 307 PROBABILITY AND STATISTICS 3 or 4
  - or STAT 315 PROBABILITY AND STATISTICS FOR DATA SCIENCE
  - or STAT 410 LINEAR REGRESSION 4

Elective Requirements

Select 18 from the following:

- STAT 411 ADVANCED STATISTICAL METHODS
- STAT 413 INTRODUCTION TO STATISTICAL MACHINE LEARNING
- STAT 418 PROBABILITY
- STAT 419 STATISTICAL INFERENCE
- STAT 421 APPLIED TIME SERIES AND FORECASTING
- STAT 425 INTRODUCTION TO BAYESIAN INFERENCE
- STAT 453 BIOSTATISTICS
- STAT 502 / COMP 502 / ELEC 502 NEURAL MACHINE LEARNING I
Bachelor of Arts (BA) Degree with a Major in Statistics

STAT 541 MULTIVARIATE ANALYSIS
STAT 545 GLM & CATEGORICAL DATA ANALYSIS

Senior Capstone
STAT 435 DATA SCIENCE PROJECTS 3

Total Credit Hours Required for the Major in Statistics 49-55
Additional Credit Hours to Complete BA Degree Requirements 5-11
University Graduation Requirements (ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements) *

Total Credit Hours 120

Footnotes and Additional Information
* Includes coursework completed as distribution credit, FWIS, LPAP, upper-level, residency (hours taken at Rice), 60 hours outside of the major (if applicable), and any additional academic program requirements. The “hours outside of the major” requirement may include all of the above university requirements.

1 With advisor approval, 1 course (3 credit hours) from departments other than Statistics may be used as an elective. The substitution course may not be used as a replacement for 1 of the 3 required methodology/theory courses listed above. STAT 305, STAT 310, STAT 315 and STAT 385 will not count as electives. See below for typically approved coursework.

Approved Electives
With advisor approval, up to 1 course (3-4 credit hours) from the following typically approved coursework outside departmental (STAT) course offerings may be chosen to fulfill Elective Requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>COMP 314 / ELEC 322</td>
<td>APPLIED ALGORITHMS AND DATA STRUCTURES</td>
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<tr>
<td>COMP 322 / ELEC 323</td>
<td>PRINCIPLES OF PARALLEL PROGRAMMING</td>
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<tr>
<td>COMP 330</td>
<td>TOOLS AND MODELS FOR DATA SCIENCE</td>
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<tr>
<td>COMP 370 / EBIO 333</td>
<td>EVOLUTIONARY BIOINFORMATICS</td>
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<tr>
<td>COMP 382</td>
<td>REASONING ABOUT ALGORITHMS</td>
<td></td>
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<tr>
<td>COMP 422</td>
<td>PARALLEL COMPUTING</td>
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<tr>
<td>COMP 430</td>
<td>INTRODUCTION TO DATABASE SYSTEMS</td>
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<tr>
<td>COMP 440 / ELEC 440</td>
<td>ARTIFICIAL INTELLIGENCE</td>
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<tr>
<td>COMP 441</td>
<td>LARGE-SCALE MACHINE LEARNING</td>
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<tr>
<td>COMP 485 / BIOE 485 / ELEC 485</td>
<td>FUNDAMENTALS OF MEDICAL IMAGING</td>
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<tr>
<td>COMP 502 / ELEC 502 / STAT 502</td>
<td>NEURAL MACHINE LEARNING</td>
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<tr>
<td>EBIO 338</td>
<td>DESIGN AND ANALYSIS OF BIOLOGICAL EXPERIMENTS</td>
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<tr>
<td>ECON 209</td>
<td>APPLIED ECONOMETRICS</td>
<td></td>
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<tr>
<td>ECON 300</td>
<td>GAME THEORY AND OTHER MICRO TOPICS FOR ECON MAJORS</td>
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<tr>
<td>ECON 305</td>
<td>GAME THEORY AND OTHER MICRO TOPICS FOR MTEC MAJORS</td>
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<tr>
<td>ECON 308</td>
<td>MATHEMATICAL ECONOMICS</td>
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<tr>
<td>ECON 310 / STAT 376</td>
<td>ECONOMETRICS</td>
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<tr>
<td>ECON 418</td>
<td>ECONOMIC FORECASTING</td>
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<td>ECON 419</td>
<td>ADVANCED TOPICS IN ECONOMETRICS</td>
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<tr>
<td>ECON 449</td>
<td>PRINCIPLES OF FINANCIAL ENGINEERING</td>
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<tr>
<td>PSYC 439</td>
<td>ADVANCED STATISTICAL METHODS FOR PSYCHOLOGY UNDERGRADUATES</td>
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<tr>
<td>SOCI 381</td>
<td>RESEARCH METHODS</td>
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<td>SOCI 406</td>
<td>BASIC DEMOGRAPHIC TECHNIQUES</td>
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<td>SOCI 436</td>
<td>RESEARCH SEMINAR: THE HOUSTON AREA SURVEY</td>
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<td>SOCI 483</td>
<td>DATA ANALYSIS</td>
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<tr>
<td>SMGT 430</td>
<td>INTRODUCTION TO SPORT ANALYTICS</td>
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Policies for the BA Degree with a Major in Statistics
Transfer Credit
For Rice University’s policy regarding transfer credit, see Transfer Credit (ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit). Some departments and programs have additional restrictions on transfer credit. The Office of Academic Advising maintains the university’s official list of transfer credit advisors on their website: https://oaa.rice.edu. Students are encouraged to meet with their academic program’s transfer credit advisor when considering transfer credit possibilities.

Departmental Transfer Credit Guidelines
Students pursuing the major in Statistics should be aware of the following departmental transfer credit guidelines:

- No more than 3 courses (9 credit hours) of transfer credit from U.S. or international universities of similar standing as Rice may apply towards the major.
- Requests for transfer credit will be considered by the program director (and/or the program’s official transfer credit advisor) on an individual case-by-case basis.

Additional Information
For additional information, please see the Statistics website: https://statistics.rice.edu/.

Opportunities for the BA Degree with a Major in Statistics
Academic Honors
The university recognizes academic excellence achieved over an undergraduate’s academic history at Rice. For information on university honors, please see Latin Honors (ga.rice.edu/undergraduate-students/honors-distinctions/university) (summa cum laude, magna cum laude, and cum laude) and Distinction in Research and Creative Work (ga.rice.edu/undergraduate-students/honors-distinctions/university). Some departments have department-specific Honors awards or designations.
Fifth-Year Master's Degree Option for Rice Undergraduate Students

Rice students have an option to pursue the Master of Statistics (MStat) degree by adding an additional fifth year to their four undergraduate years of science and engineering studies.

Advanced Rice undergraduate students in good academic standing may apply to the MStat degree program during their junior or senior year. Upon acceptance, depending on course load, financial aid status, and other variables, they may then start taking some required courses of the master’s degree program. A plan of study will need to be approved by the student’s undergraduate advisor and the MStat program director.

As part of this option and opportunity, Rice undergraduate students:

- must complete the requirements for a bachelor’s degree and the master’s degree independently of each other (i.e. no course may be counted toward the fulfillment of both degrees).
- should be aware there could be financial aid implications if the conversion of undergraduate coursework to that of graduate level reduces their earned undergraduate credit for any semester below that of full-time status (12 credit hours).
- more information on this Undergraduate - Graduate Concurrent Enrollment opportunity, including specific information on the registration process can be found here [ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment](ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment).

Internship and Research Opportunities

The Department of Statistics encourages its major and minors to participate the practice of statistics through summer internships, employment and research. Information on current opportunities are posted here: [https://statistics.rice.edu/undergraduate-program/opportunities](https://statistics.rice.edu/undergraduate-program/opportunities). Students can also approach individual faculty about research opportunities in their group. An undergraduate advisor can talk with you about these and other possibilities.

Additional Information

For additional information, please see the Statistics website: [https://statistics.rice.edu/](https://statistics.rice.edu/).