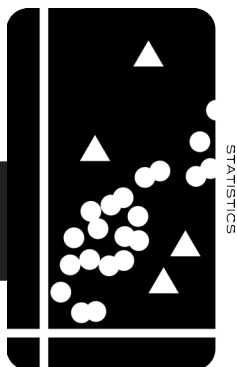


# STAT

## Statistics

<b>WEB LINKS</b>	<a href="http://statistics.rice.edu/undergraduate-program/BA-statistics">http://statistics.rice.edu/undergraduate-program/BA-statistics</a>
<b>FRANK ADVICE</b>	<p>STAT 310 is a calculus-based introduction to the theory of statistics. Students without AP statistics credit should consider STAT 280 or STAT 305 prior to STAT 310 in order to develop background in statistical concepts. These courses are not a prerequisite for STAT 310 but we find that students who have some familiarity with statistics when they enter STAT 310 are able to glean more from the course and perform better. STAT 310 is very different from AP statistics. STAT 310 is a core course for the major and is a very important prerequisite for many STAT courses; learn it well!</p> <p>STAT 410 is a calculus-based introduction to regression and requires STAT 310 or STAT 312 as a hard prerequisite. A background in linear algebra is very helpful for STAT 410.</p> <p>Many courses use the statistical computing package, R, which you learn in STAT 405.</p> <p>Majors should take STAT 310, 405 and 410 as soon as possible.</p>
<b>ADVICE FOR STUDENTS WITH AP CREDIT</b>	<p>AP credits are respected at the level of STAT 280 (introductory statistics course). Engineering students with AP credits should consider taking STAT 310 or STAT 312. STAT 310/312 prerequisites are very important; do not attempt 310/312 until they have all been satisfied. Science and/or pre-med students should consider STAT 305.</p>
<b>ALTERNATIVE CURRICULA</b>	<p>Double majors are welcome to select several “specialization electives” that coordinate with their other majors. Such courses should contain a statistical component in order to earn credit as statistics electives. Talk with an adviser prior to registering for these courses.</p>
<b>BS VERSUS BA</b>	<p>STAT only offers a B.A. degree.</p>
<b>NOT REQUIRED BUT HIGHLY RECOMMENDED COURSES</b>	<p>Students interested in data analytics or data science should consider STAT 405, 410 and 413. Students with biostatistics, bioinformatics or systems biology interests should consider STAT 423 and 453 (contact Profs. Kimmel, <a href="mailto:kimmel@rice.edu">kimmel@rice.edu</a>, Guerra, <a href="mailto:rguerra@rice.edu">rguerra@rice.edu</a> or Vannucci, <a href="mailto:marina@rice.edu">marina@rice.edu</a>). Students with computational finance interests should consider STAT 421, 482 and 486 (contact Prof. Ensor, <a href="mailto:ensor@rice.edu">ensor@rice.edu</a>).</p>



<p><b>RESEARCH</b></p>	<p>Many STAT majors participate in undergraduate research. If there is a professor whose research interests you, ask him or her if you may join his or her research group. Summer research opportunities on and off campus are also possible. Talk with an advisor for more information or visit the department's web page of undergraduate opportunities: <a href="https://statistics.rice.edu/undergraduate-program/opportunities">https://statistics.rice.edu/undergraduate-program/opportunities</a>. Deadlines for summer opportunities may be as early as Nov–Feb.</p>
<p><b>INTERNSHIPS</b></p>	<p>Summer internships are often available. These may or may not be paid. Talk with an advisor for more information or visit the department's undergraduate opportunities page: <a href="https://statistics.rice.edu/undergraduate-program/opportunities">https://statistics.rice.edu/undergraduate-program/opportunities</a>. Deadlines for summer may be as early as Jan-Feb. opportunities/. Deadlines for summer opportunities may be as early as Nov-Feb.</p>
<p><b>PROFESSIONAL ORGANIZATION</b></p>	<p>Houston Area Chapter of American Statistical Association (HACASA) welcomes student participants at their meetings. See <a href="https://community.amstat.org/houston/home/">https://community.amstat.org/houston/home/</a> for details. The Rice Data Science Club: <a href="https://datasci.rice.edu">datasci.rice.edu</a></p>
<p><b>INTERESTING COURSES FOR NON-MAJORS</b></p>	<p><b>General</b>  STAT 312 Probability and Statistics for Engineers  STAT 385 Methods of Data Analysis and System Optimization  STAT 405 R for Data Science  <b>Bio/EnvSci</b>  STAT 313 Uncertainty &amp; Risk in Urban Infrastructures  STAT 423 Probability in Bioinformatics and Genetics  STAT 453 Biostatistics  STAT 485 Environmental Statistics and Decision Making  <b>Financial Statistics</b>  STAT 486 Market Models  STAT 421 Applied Time Series and Forecasting</p>

# B.A. Statistics

**Specializations:** Finance, biostatistics/bioinformatics and environment.

Students interested in an early start to statistics should consider taking STAT 280 or 305 followed by 385 as early as the freshman year. These courses are less mathematical than STAT 310 and 410 but are excellent in developing foundations in statistics and data analysis skills.

## Sample Degree Plan

*THIS IS ONE EXAMPLE OF MANY POSSIBLE SCHEDULES. CONSULT A DIVISIONAL OR DEPARTMENTAL ADVISER TO CUSTOMIZE YOUR DEGREE PLAN. THIS EXAMPLE ASSUMES A FRESHMAN WITHOUT CALCULUS I (MATH 101) AND WITHOUT AN INTRODUCTORY STATISTICS COURSE, INCLUDING AP STATISTICS. SOME FRESHMEN MATRICULATE WITH CREDIT FOR MATH 101 AND 102 AND AN INTRODUCTORY STATISTICS COURSE OR AP STATISTICS. IN THIS CASE, CONSULT A STATISTICS DEPARTMENT UNDERGRADUATE ADVISER.*

FALL				SPRING			
<b>FRESHMAN</b>		17 credits		<b>FRESHMAN</b>		16 credits	
MATH 101	Single Variable Calculus I	3		MATH 102	Single Variable Calculus II	3	
STAT 280	Elementary Applied Statistics	4*		COMP 130	Elements of Algorithmic Comp	4	
FWIS	Freshman Writing	3			OR 100/140/182/200		
OPEN	Open elective	3		DIST	Distribution elective	3	
OPEN	Open elective	3		OPEN	Open elective	3	
LPAP	Lifetime Phys Activity elective	1		OPEN	Open elective	3	
<b>SOPHOMORE</b>		15 credits		<b>SOPHOMORE</b>		16 credits	
MATH 212	Multivariable Calculus	3		STAT 405	Stat Computing and Graphics	3	
STAT 310	Probability and Statistics	3		STAT 410	Linear Regression	4*	
DIST	Distribution elective	3		DIST	Distribution elective	3	
OPEN	Open elective	3		OPEN	Open elective	3	
OPEN	Open elective	3		OPEN	Open elective	3	
<b>JUNIOR</b>		15 credits		<b>JUNIOR</b>		15 credits	
SPEC	Special Elective	3		SPEC	Specialization elective	3**	
MATH 355	Linear Algebra	3		SPEC	Specialization elective	3	
DIST	Distribution elective	3		SPEC	Specialization elective	3	
COMP 330	Tools and Models–Data Science	3		DIST	Distribution elective	3	
	or 215/322/382 CAAM 378/440/453/471/519			OPEN	Open elective	3	
OPEN	Open elective	3					
<b>SENIOR</b>		15 credits		<b>SENIOR</b>		15 credits	
SPEC	Specialization elective	3		STAT 450	Senior Capstone Project	3	
SPEC	Specialization elective	3		OPEN	Open elective	3	
DIST	Distribution elective	3		OPEN	Open elective	3	
OPEN	Open elective	3		OPEN	Open elective	3	
OPEN	Open elective	3		OPEN	Open elective	3	

\* In addition to class hours, these courses have a regularly scheduled lab and/or discussion session that must fit into your schedule.

\*\* STAT 305, 339, and 385 may not count as electives for the statistics major. Students may request approval for up to two statistics-related courses from other departments to count toward the specialization electives.

BASIC REQUIREMENTS	General math & science courses	12
	Core courses in major	20-21
ELECTIVE REQUIREMENTS	Specialization electives	18
	Open electives and LPAP	48-49
	FWIS and distribution courses	21
Minimum credit required for the B.A.		120

Of the 120 total degree credits, the B.A. in Statistics requires 50–51 credits in general math and science, core, and specialization area courses.

## Major Requirements

NUMBER	CREDIT	TITLE
MATH 101	3	Single Variable Calculus I
MATH 102	3	Single Variable Calculus II
MATH 212	3	Multivariable Calculus
MATH 355/CAAM 335/336	3	Linear Algebra /Matrix Analysis/ Differential Equations for Science and Engineering
STAT 310	3	Probability and Statistics **
STAT 410	4	Linear Regression
STAT 405	3	Statistical Computing & Graphics
STAT 450	3	Senior Capstone Project
COMP 130/ 140/180/182	4	Elements of Algorithms and Computation/Computational Thinking/Principles of Computing/ Algorithmic Thinking
COMP 215/322/330/382 OR CAAM 378/440/453/471/519	3-4	Introduction to Programming /Fundamentals of Parallel Programming/ Tools and Models-Data Science/Reasoning About Algorithms or Intro to Operations Research and Optimization/ Applied Matrix Analysis/ Numerical Analysis/ Numerical Analysis I/ Linear and Integer Programming/Computational Science I
SPEC	3	Specialization elective
SPEC	3	Specialization elective
SPEC	3	Specialization elective
SPEC	3	Specialization elective
SPEC	3	Specialization elective
SPEC	3	Specialization elective
<p><i>At least three electives must be chosen from the following list of courses.</i></p> <ul style="list-style-type: none"> <li>• STAT 411 Advanced Statistical Methods</li> <li>• STAT 413 Introduction to Statistical Machine Learning</li> <li>• STAT 418 Probability</li> <li>• STAT 419 Statistical Inference</li> <li>• STAT 421 Time Series</li> <li>• STAT 425 Introduction to Bayesian Inference</li> <li>• STAT 453 Biostatistics</li> <li>• STAT 502 Neural Machine Learning I</li> <li>• STAT 541 Multivariate Statistics</li> <li>• STAT 545 Generalized Linear Models</li> </ul> <p><i>STAT 305 and 385 may not count as electives. One statistics-related course from other departments may qualify as electives, with advisor approval.</i></p>		