

# BS in Statistics: Biostatistics (695233) MAP Sheet

Physical and Mathematical Sciences, Statistics

For students entering the degree program during the 2018-2019 curricular year.



University Core and Graduation Requirements				Suggested Sequence of Courses			
<b>University Core Requirements:</b>				<b>FRESHMAN YEAR</b>			
<b>Requirements</b>	<b>#Classes</b>	<b>Hours</b>	<b>Classes</b>	<u>1st Semester</u>		<b>JUNIOR YEAR</b>	
<b>Religion Cornerstones</b>				First Year Writing	3.0	<u>5th Semester</u>	
Teachings and Doctrine of The Book of Mormon	1	2.0	REL A 275	MATH 112* (FWSpSu)	4.0	Requirement 5 elective	3.0
Jesus Christ and the Everlasting Gospel	1	2.0	REL A 250	STAT 121	3.0	STAT 123 or STAT 124	1.5
Foundations of the Restoration	1	2.0	REL C 225	Biological Science	3.0	STAT 223 or STAT 224	1.5
The Eternal Family	1	2.0	REL C 200	Religion Cornerstone course	2.0	STAT 340	3.0
<b>The Individual and Society</b>				General electives	1.0	Advanced Written and Oral Communication	3.0
American Heritage	1-2	3-6.0	from approved list	<b>Total Hours</b>	<b>16.0</b>	Religion elective	2.0
Global and Cultural Awareness	1	3.0	from approved list			General Elective	2.0
<b>Skills</b>				<u>2nd Semester</u>		<b>Total Hours</b>	<b>16.0</b>
First Year Writing	1	3.0	from approved list	American Heritage	3.0	<u>6th Semester</u>	
Advanced Written and Oral Communications	1	3.0	from approved list	MATH 113 (FWSpSu)	4.0	Statistics elective from requirement 5	3.0
Quantitative Reasoning	1	4.0	MATH 112*	STAT 230	3.0	Statistics elective from requirement 6	3.0
Languages of Learning (Math or Language)	1	4.0	MATH 112*	Religion Cornerstone course	2.0	Letters	3.0
<b>Arts, Letters, and Sciences</b>				Physical Science	3.0	Religion elective	2.0
Civilization 1	1	3.0	from approved list	<b>Total Hours</b>	<b>15.0</b>	General electives	4.0
Civilization 2	1	3.0	from approved list	<b>SOPHOMORE YEAR</b>		<b>Total Hours</b>	<b>15.0</b>
Arts	1	3.0	from approved list	<u>3rd Semester</u>		Department recommendation: Internship during Spring/Summer	
Letters	1	3.0	from approved list	MATH 313 (FWSpSu)	3.0	<b>SENIOR YEAR</b>	
Biological Science	1	3.0	PDBIO 120* recommended	STAT 240	3.0	<u>7th Semester</u>	
Physical Science	1-2	3-7.0	from approved list	Global and Cultural Awareness	3.0	Statistics elective from requirement 5	3.0
Social Science	1	3.0	from approved list	Civilization 1	3.0	Statistics elective from requirement 6	3.0
<b>Core Enrichment: Electives</b>				Religion Cornerstone course	2.0	Arts	3.0
Religion Electives	3-4	6.0	from approved list	General electives	1.0	Religion elective	3.0
Open Electives	Variable	Variable	personal choice	<b>Total Hours</b>	<b>15.0</b>	General electives	3.0
*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (9 hours overlap)				<u>4th Semester</u>		<b>Total Hours</b>	<b>15.0</b>
<b>Graduation Requirements:</b>				MATH 314 (FWSpSu)	3.0	<u>8th Semester</u>	
Minimum residence hours required		30.0		STAT 123 or STAT 124	1.5	Social Science	3.0
Minimum hours needed to graduate		120.0		STAT 223 or STAT 224	1.5	General electives	12.0
				STAT 330	3.0	<b>Total Hours</b>	<b>15.0</b>
				Religion Cornerstone course	2.0		
				Civilization 2	3.0		
				<b>Total Hours</b>	<b>14.0</b>		
				Note 1: The sequence of courses suggested may not fit the circumstances of every student. Students should contact their college advisement center for help in outlining an efficient schedule.			
				Note 2: Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.			
				Note 3: Students must have the statistics core completed before their senior year in order to graduate within four years.			

**BS in Statistics: Biostatistics (695233)**  
**2018-2019 Program Requirements (50 Credit Hours)**

<p><b>No more than 3 hours of credit below C- is allowed in major courses.</b></p> <p><b>REQUIREMENT 1</b> Complete 1 course  STAT 121 - Principles of Statistics 3.0</p> <p><b>REQUIREMENT 2</b> Complete 2 courses</p> <p><b>PREPARATION CORE COURSES:</b>  *MATH 112 - Calculus 1 4.0  MATH 113 - Calculus 2 4.0</p> <p><b>REQUIREMENT 3</b> Complete 8 courses</p> <p><b>STATISTICS CORE COURSES:</b>  STAT 123 - Introduction to R Programming 1.5  STAT 124 - SAS Base Programming Skills 1.5  STAT 223 - Applied R Programming 1.5  STAT 224 - Applied SAS Programming 1.5  STAT 230 - Analysis of Variance 3.0  STAT 240 - Probability and Inference 1 3.0  STAT 330 - Introduction to Regression 3.0  STAT 340 - Probability and Inference 2 3.0</p> <p><b>REQUIREMENT 4</b> Complete 2 courses  MATH 313 - Elementary Linear Algebra 3.0  MATH 314 - Calculus of Several Variables 3.0</p> <p><b>REQUIREMENT 5</b> Complete 3.0 hours from the following course(s)  STAT 437 - Applications in Biostatistics 3.0  STAT 538 - Survival Analysis 3.0</p> <p><b>REQUIREMENT 6</b> Complete 6.0 hours from the following course(s)  <b>NOTE: IF TAKEN ABOVE, STAT 437 AND 538 WILL NOT DOUBLE COUNT HERE.</b>  BIO 350 - Ecology 3.0  CHEM 105 - General College Chemistry 1 with Lab (Integrated) 4.0  CHEM 111 - Principles of Chemistry 1 4.0  HLTH 345 - Principles of Epidemiology 3.0  MMBIO 240 - Molecular Biology 3.0  PDBIO 120 - Science of Biology 3.0  PDBIO 305 - Human Physiology 4.0  PWS 340 - Genetics 3.0  STAT 437 - Applications in Biostatistics 3.0  STAT 538 - Survival Analysis 3.0</p> <p><b>REQUIREMENT 7</b> Complete 3.0 hours from the following course(s)  <b>NOTE: COURSES USED ABOVE WILL NOT DOUBLE COUNT HERE. NOTE: NO MORE THAN 3.0 CREDIT HOURS OF STAT 496R MAY BE COUNTED TOWARD THIS REQUIREMENT.</b></p>	<p>STAT 125 - Introduction to Operating Systems, UNIX, and Shell Programn 1.5  STAT 126 - Introduction to Python Programming 1.5  STAT 226 - SQL 1.5  STAT 234 - Methods of Survey Sampling 3.0  STAT 251 - Introduction to Bayesian Statistics 3.0  STAT 274 - Theory of Interest 3.0  STAT 377 - Statistical Models for Financial Economics 3.0  STAT 381 - Statistical Computing 3.0  STAT 420 - Big Data Science 1 3.0  STAT 421 - Big Data Science 2 3.0  STAT 435 - Nonparametric Statistical Methods 3.0  STAT 437 - Applications in Biostatistics 3.0  STAT 451 - Applied Bayesian Statistics 3.0  STAT 466 - Introduction to Reliability 3.0  STAT 469 - Applied Time Series and Forecasting 3.0  STAT 495R - Special Topics in Statistics 3.0v  <i>You may take up to 3 credit hours.</i>  STAT 496R - Academic Internship: Statistics 9.0v  <i>You may take up to 3 credit hours.</i>  STAT 497R - Introduction to Statistical Research 3.0v  <i>You may take up to 3 credit hours.</i>  STAT 531 - Experimental Design 3.0  STAT 538 - Survival Analysis 3.0</p> <p><b>REQUIREMENT 8</b> Complete 3.0 hours from the following course(s)  <b>NOTE: COURSES USED ABOVE WILL NOT DOUBLE COUNT HERE. NOTE: NO MORE THAN 3.0 CREDIT HOURS OF STAT 496R MAY BE COUNTED TOWARD THIS REQUIREMENT. NOTE: IT IS STRONGLY RECOMMENDED THAT STUDENTS INTERESTED IN GRADUATE STUDY IN BIOSTATISTICS COMPLETE MATH 341 AND 342.</b>  C S 142 - Introduction to Computer Programming 3.0  HLTH 345 - Principles of Epidemiology 3.0  IS 515 - Spreadsheets for Business Analysis 3.0  IS 520 - Business Programming and Spreadsheet Automation 3.0  MATH 341 - Theory of Analysis 1 3.0  MATH 342 - Theory of Analysis 2 3.0  STAT 125 - Introduction to Operating Systems, UNIX, and Shell Programn 1.5  STAT 126 - Introduction to Python Programming 1.5  STAT 226 - SQL 1.5  STAT 234 - Methods of Survey Sampling 3.0  STAT 251 - Introduction to Bayesian Statistics 3.0</p>	<p>STAT 274 - Theory of Interest 3.0  STAT 377 - Statistical Models for Financial Economics 3.0  STAT 381 - Statistical Computing 3.0  STAT 420 - Big Data Science 1 3.0  STAT 421 - Big Data Science 2 3.0  STAT 435 - Nonparametric Statistical Methods 3.0  STAT 437 - Applications in Biostatistics 3.0  STAT 451 - Applied Bayesian Statistics 3.0  STAT 466 - Introduction to Reliability 3.0  STAT 469 - Applied Time Series and Forecasting 3.0  STAT 495R - Special Topics in Statistics 3.0v  STAT 496R - Academic Internship: Statistics 9.0v  STAT 497R - Introduction to Statistical Research 3.0v  STAT 531 - Experimental Design 3.0  STAT 538 - Survival Analysis 3.0</p> <p><b>THE DISCIPLINE:</b></p> <p>Statisticians apply sophisticated methods to increasingly massive data sets to discover insights into important business, government, and health policy questions. The curriculum and degrees offered through the Department of Statistics are designed to equip students with decision-making skills for careers as professional statisticians in industrial organizations, government agencies, insurance companies, pharmaceutical companies, universities, and research institutes.</p> <p>The Biostatistics emphasis prepares students to engage in work to advance public health, biology, and medicine. It prepares students for graduate programs in statistics, biostatistics, epidemiology, public health, bioinformatics, and for health sciences professional programs. The Biostatistics emphasis includes the mathematics courses required for graduate study in statistics and biostatistics together with a selection of biology and chemistry courses.</p> <p><b>CAREER OPPORTUNITIES:</b></p> <p>The increase of big data and analytics in personalized medicine, genomics, and bioinformatics is creating new challenges and opportunities for biostatisticians. Students with undergraduate degrees in biostatistics are well-prepared to apply for graduate programs in statistics and biostatistics but they also stand out as applicants to medical and dental schools and residencies. Statistical training prepares these</p>
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2018-2019

students to take part in basic and clinical research during medical or dental school and residency.

### **CERTIFICATION:**

**SAS Certified Base Programmer and SAS Certified Advanced Programmer.** Students can take the SAS Certification exams after completing Stat 124 and 224. Information and exam registration is available at [support.sas.com/certify/creds/index.html](https://support.sas.com/certify/creds/index.html).

**SAS/BYU Applied Statistics and Advanced SAS Programming Certificate.** Students who earn a B or higher in the applied and computing core classes (Stat 124, 224, 230, 330, 381) are eligible to receive a certificate jointly issued by SAS and BYU which can be listed on a resume. More information is available at <https://statistics.byu.edu/content/sas-certificate-opportunities>.

### **INTERNSHIPS:**

**Internships.** The National Institutes of Health support a Summer Institute for Training in Biostatistics at nine university biostatistics programs. Program/application information is found at <https://www.nhlbi.nih.gov/node-general/summer-institute-biostatistics>.

### **MAP DISCLAIMER**

While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

### **DEPARTMENT INFORMATION**

**Department of Statistics**  
Brigham Young University  
223 TMCB  
Provo, UT 84602  
Telephone: (801) 422-4505

### **FACULTY ADVISOR:**

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### **ADVISEMENT CENTER INFORMATION**

FOR UNIVERSITY CORE OR PROGRAM QUESTIONS, CONTACT THE ADVISEMENT CENTER.

### **Physical and Mathematical Sciences College Advisement Center**

Brigham Young University  
N-181 ESC  
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