

Welcome to the

# Statistics Major

## Data Science Emphasis

in the College of Physical and Mathematical Sciences

### College Advisement Center

Website: <https://science.byu.edu/advisement>  
Email: [science.math.advisement@byu.edu](mailto:science.math.advisement@byu.edu)  
Phone: 801-422-2674  
Office: N-181 ESC

### Statistics Department

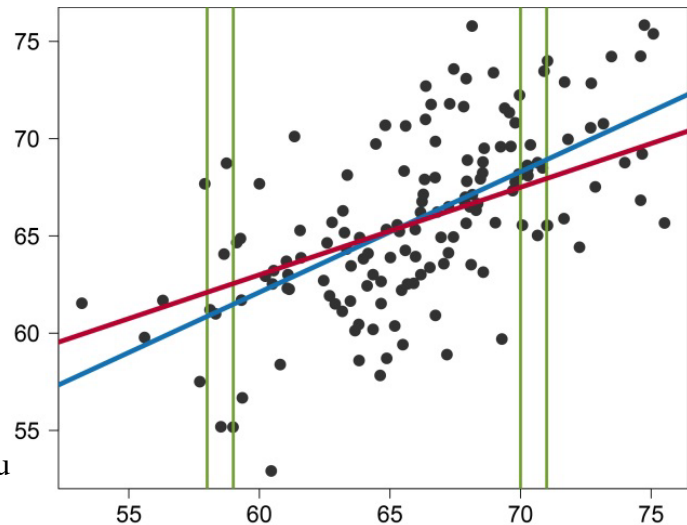
Website: [statistics.byu.edu](http://statistics.byu.edu)  
Email: [statsec@stat.byu.edu](mailto:statsec@stat.byu.edu)  
Phone: 801-422-4505  
Office: WVB 2152

### Faculty Advisor – Del Scott

Email: [scottd@byu.edu](mailto:scottd@byu.edu)  
Phone: 801-422-7054  
Office: WVB 2152B

### Internship Coordinator – Kimri Mansfield

Email: [kmansfield@stat.byu.edu](mailto:kmansfield@stat.byu.edu)  
Phone: 801-422-4506  
Office: WVB 2152D

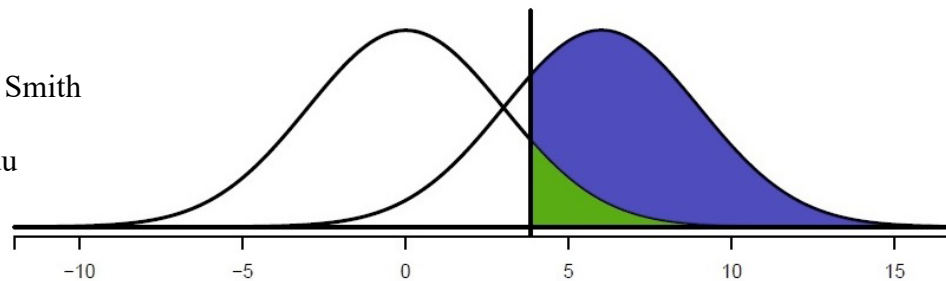


### University Career Services – Lane Muranaka

Website: [careers.byu.edu](http://careers.byu.edu) (Handshake--see flyer in packet)  
Email: [lane\\_muranaka@byu.edu](mailto:lane_muranaka@byu.edu)  
Phone: 801-422-9360, or 801-422-3000 (schedule appointment)  
Office: WVB 2152A

### Department Student Hiring – Brandon Smith

Website: [statistics.byu.edu](http://statistics.byu.edu)  
Email: [bsmith@stat.byu.edu](mailto:bsmith@stat.byu.edu)  
Phone: 801-442-4527  
Office: WVB 2152E



STEM Alliance--Connect with STEM employers, mentors, and clubs: [stem.byu.edu](http://stem.byu.edu)

### Club - Mu Sigma Rho Club, Analytics Club

Contact: Kimri Mansfield  
Contact Information: WVB 2152D, 801-422-4506, [kmansfield@stat.byu.edu](mailto:kmansfield@stat.byu.edu)

# Things to Know

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## Resources for Graduation Planning

- Flow Charts and Major Academic Plans (MAPs) can be found here: <https://science.byu.edu/advisement/explore-majors-and-minors>.
- Academic advisors in N-181 ESC will help you understand course sequencing and help you plan classes to efficiently fill requirements. They can also help you with study skills and initial career exploration as well as connecting you with correct resources.
- Plan and register from your plan on MyMAP. Your academic advisor can help you understand how to best utilize this resource.
- Evaluate your current program. Periodically major programs are updated. An academic advisor would be happy to review the differences between the programs with you to help you determine what would be best for you.
- Consider meeting with a faculty advisor in your department. Contact info is found on the first page of this packet.

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## Tutoring Resources and Research

- Volunteer peer tutors are available through Y Serve if you need help with a class. Also, if you excel in a subject, consider serving your fellow students by becoming a tutor. Find out more here: <https://tutoring.byu.edu/>.
- Many departments provide TA Tutorial Labs and research opportunities. Check your department for details:
  - Chemistry and Biochemistry: C-100 BNSN, 801-422-3667, <https://www.chem.byu.edu/>
  - Computer Science: 3361 TMCB, 801-422-3027, [csoffice@cs.byu.edu](mailto:csoffice@cs.byu.edu)
  - Geological Sciences: S-389 ESC, 801-422-3918, [geology@byu.edu](mailto:geology@byu.edu)
  - Mathematics: 275 TMCB, 801-422-2061, [office@mathematics.byu.edu](mailto:office@mathematics.byu.edu)
  - Mathematics Education: 167 TMCB, 801-422-1735, [office@mathed.byu.edu](mailto:office@mathed.byu.edu)
  - Physics and Astronomy: N-283 ESC, 801-422-4361, [physics\\_office@byu.edu](mailto:physics_office@byu.edu)
  - Statistics: 2152 WVB, 801-422-4505, [statsec@stat.byu.edu](mailto:statsec@stat.byu.edu)

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## Prepare Early for a Career

- Check out Careers & Experiential Learning in 1134 WSC and at <https://ucs.byu.edu/>.
- Consider doing an internship.
  - Attend the STEM and Career Fairs held in fall and winter semesters.
  - Talk to your department about internship opportunities.
  - Use LinkedIn and Handshake (see flyer in this packet) to connect with alumni and apply for jobs/internships. BYU Connect is another great resource for networking ([connect.byu.edu](https://connect.byu.edu)).
  - Talk with the college Career Director who can help you search for internships as well as assist you with many other career related strategies (see first page of this packet).
- Consider taking StDev 317 (Career Strategies) your junior year.
- Consider taking either Chem 502, CS 502, Geol 502, Math 502, PHSCS 502, or STAT 502 (1-credit Job Search Class). Class is held for 1 hour each week.

# BS in Statistics: Data Science (695236) MAP Sheet

Physical and Mathematical Sciences, Statistics

For students entering the degree program during the 2023-2024 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>	<b>JUNIOR YEAR</b>			
<b>Religion Cornerstones</b>				<b>5th Semester</b>			
Teachings and Doctrine of The Book of Mormon	1	2.0	from approved list	1st Semester			
Jesus Christ and the Everlasting Gospel	1	2.0	from approved list	First-year Writing	3.0	STAT 251	3.0
Foundations of the Restoration	1	2.0	REL C 225	MATH 112	4.0	Requirement 4 Elective	3.0
The Eternal Family	1	2.0	from approved list	STAT 121	3.0	STAT 340	3.0
<b>The Individual and Society</b>				STAT 130	0.5	Global and Cultural Awareness	3.0
American Heritage	1-2	3-6.0	from approved list	Arts	3.0	Civilization 1	3.0
Global and Cultural Awareness	1	3.0	from approved list	Religion Cornerstone course	2.0	<b>Total Hours</b>	<b>15.0</b>
<b>Skills</b>				<b>Total Hours</b>	<b>15.5</b>	<b>6th Semester</b>	
First Year Writing	1	3.0	from approved list	2nd Semester		Requirement 7 Elective #1	3.0
Advanced Written and Oral Communications	1	3.0	from approved list	American Heritage	3.0	Requirement 8 Elective #1	3.0
Quantitative Reasoning	1	4.0	MATH 112*	MATH 113	4.0	Adv. Written and Oral Communication	3.0
Languages of Learning (Math or Language)	1	4.0	MATH 112*	STAT 230	3.0	Civilization 2	3.0
<b>Arts, Letters, and Sciences</b>				Physical Science	3.0	Religion elective	2.0
Civilization 1	1	3.0	from approved list	Religion Cornerstone course	2.0	<b>Total Hours</b>	<b>14.0</b>
Civilization 2	1	3.0	from approved list	<b>Total Hours</b>	<b>15.0</b>	<b>SENIOR YEAR</b>	
Arts	1	3.0	from approved list	<b>SOPHOMORE YEAR</b>		<b>7th Semester</b>	
Letters	1	3.0	from approved list	3rd Semester		C S 111	3.0
Biological Science	1	3.0	from approved list	C S 111	3.0	Requirement 5.1	3.0
Physical Science	1	3.0	from approved list	MATH 213	2.0	Requirement 8 Elective #2	3.0
Social Science	1	3.0	from approved list	MATH 215	1.0	Social Science	3.0
<b>Core Enrichment: Electives</b>				STAT 250	3.0	Religion Elective	2.0
Religion Electives	3-4	6.0	from approved list	Global and Cultural Awareness	3.0	Open Electives	5.0
Open Electives	Variable	Variable	personal choice	Religion Cornerstone course	2.0	<b>Total Hours</b>	<b>16.0</b>
*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS				<b>Total Hours</b>	<b>14.0</b>	<b>8th Semester</b>	
				<b>4th Semester</b>		Requirement 5.2	3.0
				C S 235	3.0	Religion Elective	2.0
				STAT 240	3.0	Open Electives	11.5
				STAT 330	3.0	<b>Total Hours</b>	<b>16.50</b>
				Letters	3.0		
				Religion Cornerstone course	2.0		
				<b>Total Hours</b>	<b>14.0</b>		
				<b>Graduation Requirements:</b>			
				Minimum residence hours required			
				Minimum hours needed to graduate			
				30.0			
				120.0			

Note 1: Students should take STAT 130 the semester they declare themselves as a Statistics Major

Note 2: 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 3: Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, including spring and/or summer terms, to reach the 120 credit minimum needed to graduate. Taking fewer credits substantially increases the number of semesters to graduate.

Note 4: Students must have the statistics core completed before their senior year in order to graduate within four years.

Note 5: Open elective credits can be classes of your choosing, classes for a minor, or credits that have already been earned through AP classes, transfer credits, etc.

## Program Requirements

### Requirement 1 —Complete 2 Courses

STAT 121 - Principles of Statistics 3.0

STAT 130 - Intro to Statistics Department 0.5

### Requirement 2 —Complete 6 Courses

#### **Statistics core courses:**

STAT 230 - Analysis of Variance 3.0

STAT 240 - Probability and Inference 1 3.0

STAT 250 - Applied R Programming 3.0

STAT 251 - Introduction to Bayesian Statistics 3.0

STAT 330 - Introduction to Regression 3.0

STAT 340 - Probability and Inference 2 3.0

### Requirement 3 — Complete 4 Courses

#### **Mathematical foundation courses:**

MATH 112 - Calculus 1 4.0

MATH 113 - Calculus 2 4.0

MATH 213 - Elementary Linear Algebra 2.0

MATH 215 - Computational Linear Algebra 1.0

### Requirement 4 —Complete 3 hours

C S 180 - Intro to Data Science 3.0

HLTH 440 - Statistical Computing in Epi 3.0

IS 520 - Spreadsheet Automation 3.0

STAT 286 - Data Science Ecosystems 3.0

### Requirement 5 —Complete 1 of 2 Options

#### **Option 5.1 —Complete 2 Courses**

STAT 482 - Data Science Capstone 1 3.0

STAT 483 - Data Science Capstone 2 3.0

#### **Option 5.2 —Complete 2 Courses**

STAT 386 - Data Science Process 3.0

STAT 486 - Machine Learning 3.0

### Requirement 6 —Complete 2 Courses

C S 111 - Intro to Computer Science 3.0

C S 235 - Data Structures 3.0

### Requirement 7 —Complete 3 hours

**Courses taken in any of the requirements above will not double count here.**

STAT 381 - Statistical Computing 3.0

STAT 435 - Nonparametric Stat Methods 3.0

STAT 437 - Applications in Biostatistics 3.0

STAT 451 - Applied Bayesian Statistics 3.0

STAT 466 - Intro to Reliability 3.0

STAT 469 - Analysis of Correlated Data 3.0

STAT 495R - Special Topics in Statistics - *You may take once 1.0v*

STAT 531 - Experimental Design 3.0

STAT 538 - Survival Analysis 3.0

### Requirement 8 —Complete 6 hours

**Courses taken in any of the requirements above will not double count here. No more than 3.0 hours of any combination of STAT 496R and STAT 497R can be used for this requirement.**

IS 515 - Spreadsheets for Bus Analysis 3.0

IS 520 - Spreadsheet Automation 3.0

MATH 314 - Calculus of Several Variables 3.0

MATH 341 - Theory of Analysis 1 3.0

MATH 342 - Theory of Analysis 2 3.0

STAT 234 - Methods of Survey Sampling 3.0

STAT 274 - Theory of Interest 3.0

STAT 281 - Data Visualization 3.0

STAT 286 - Data Science Ecosystems 3.0

STAT 348 - Predictive Analytics 3.0

STAT 381 - Statistical Computing 3.0

STAT 395R - Special Topics in Applied Stat - *You may take up to 3.0 credit hours 1.0v*

STAT 435 - Nonparametric Stat Methods 3.0

STAT 437 - Applications in Biostatistics 3.0

STAT 451 - Applied Bayesian Statistics 3.0

STAT 466 - Intro to Reliability 3.0

STAT 469 - Analysis of Correlated Data 3.0

STAT 495R - Special Topics in Statistics - *You may take up to 3.0 credit*

*hours 1.0v*

STAT 496R - Academic Internship - *You may take up to 3.0 credit hours 0.5v*

STAT 497R - Intro to Research - *You may take up to 3.0 credit hours 0.5v*

STAT 531 - Experimental Design 3.0

STAT 538 - Survival Analysis 3.0

## THE DISCIPLINE:

Statisticians apply sophisticated methods to increasingly massive data sets to discover insights into important business, government, environmental, 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.

The Data Science emphasis is designed to help students develop skills that are needed to work on a data science team. These skills include programming, facility with data structures and algorithms, statistical methods, and experience working with real world big data problems. Students with a Data Science emphasis leave BYU with a multi-faceted, disciplined, and flexible approach to data, a rich vocabulary for working with others in data-focused disciplines, and a well-developed capacity for understanding and communicating statistical results.

## CAREER OPPORTUNITIES:

The increase of data science and analytics across disciplines is creating new opportunities for statisticians. The Data Science emphasis prepares students to get entry-level jobs on data science teams in the private and public sectors. A feature of this emphasis is the development of skills and vocabulary in computer science and programming needed to work with massive datasets and to communicate with others on data-science teams.

## INTERNSHIPS:

Undergraduates can seek paid positions in various areas such as (but not limited to) Environment, Business, Health & Medicine, Physical Sciences, and Government. STAT 250, 286, and 330 provide excellent preparation for many internship opportunities. Students are encouraged to meet with their Career Services Director or reach out to the department for the most up-to-date internship opportunities.

## 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 2152 WVB Brigham Young University, Provo, UT 84602 Telephone: (801) 422-4505 BS in Statistics: Data Science (695236)2023-2024 Faculty Advisor: Del T. Scott 2152B WVB Brigham Young University, Provo, UT 84602 Telephone: (801) 422-7054  
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 Provo, UT 84602 Telephone: (801) 422-2674

# BYU Statistics: Data Science Emphasis

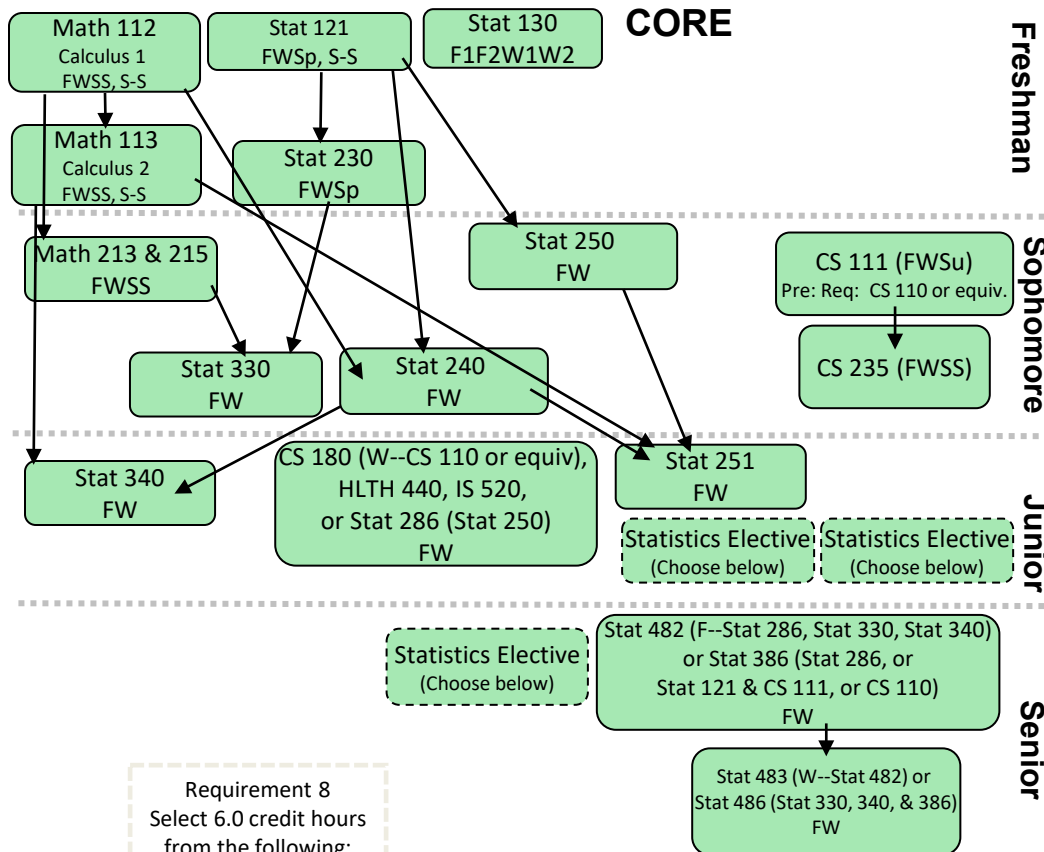
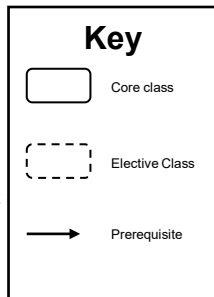
## Requirements / Prerequisites 2023-2024 Academic Year

### Major (56.5 Hours)

1. Complete the following course: Stat 121 and Stat 130
2. Complete the following courses: Stat 230, Stat 240, Stat 250, Stat 251, Stat 330, Stat 340.
3. Complete the following courses: Math 112, 113, 213, & 215.
4. Complete three hours from the following courses: CS 180, HLTH 440, IS 520, Stat 286.
5. Complete either Stat 482 and 483 or Stat 386 and Stat 486.
6. Complete: CS 111, CS 235.
7. Complete 3.0 elective hours selected from the following courses: Stat 381, Stat 435, Stat 437, Stat 451, Stat 466, Stat 469, Stat 495R, Stat 531, Stat 538.
8. Complete 6.0 Elective hours selected from the following courses: IS 515, IS 520, Math 314, Math 341, Math 342, Stat 234, Stat 274, Stat 281, Stat 286, Stat 348, Stat 381, Stat 395R, Stat 435, Stat 437, Stat 451, Stat 466, Stat 469, Stat 495R, Stat 496R, Stat 497R, Stat 531, Stat 538.

### Minor (19 Hours)

1. Complete one of the following:  
Stat 121, or Stat 201.
2. Complete Math 112, Math 213, Math 215, Stat 230, Stat 240, Stat 330.



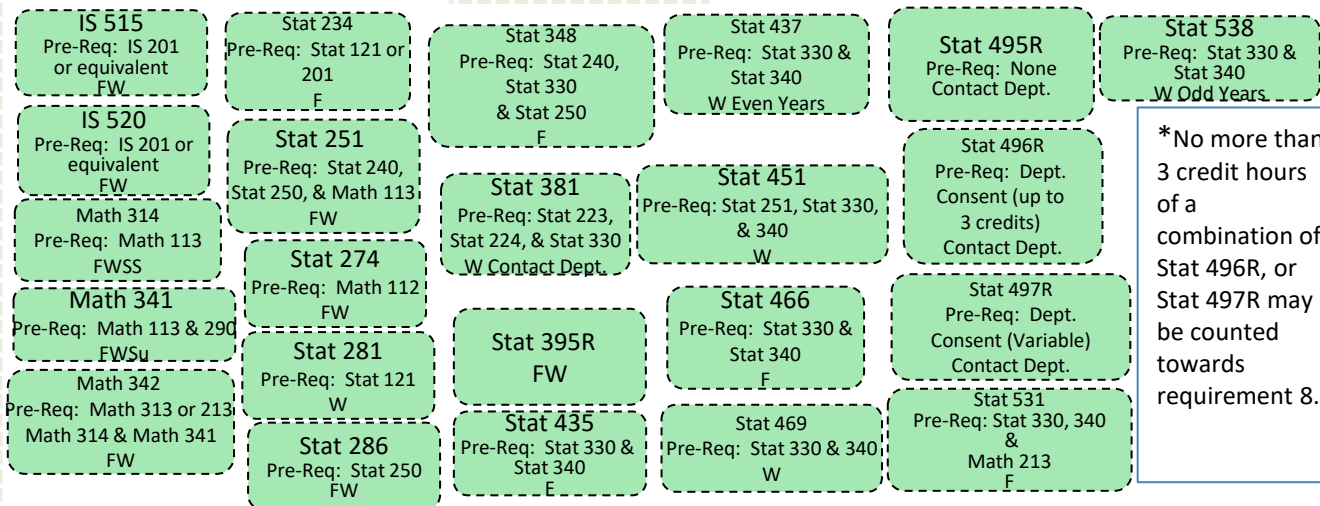
Requirement 7  
Select 3.0 credit hours  
from the following:

All courses listed in  
Requirement 8 except  
IS 515, IS 520, Math 314,  
Math 341, Math 342, Stat 234, Stat 251,  
Stat 274, Stat 281, Stat 286, Stat 348,  
Stat 395R, Stat 496R, and Stat 497R

Note: All  
Courses  
only count  
once  
towards  
the major.

Guide only—please  
consult MyMAP for  
full requirements.  
Please Note: When  
Taught is subject to  
change.

Requirement 8  
Select 6.0 credit hours  
from the following:



\*No more than  
3 credit hours  
of a  
combination of  
Stat 496R, or  
Stat 497R may  
be counted  
towards  
requirement 8.

## handshake

BYU's own job board. Employers who want to hire BYU graduates or offer internships to current students post job openings to this website and students apply. Just like LinkedIn, employers can view student profiles and students can network as they apply for jobs and internships

**Login to [handshake.byu.edu](https://handshake.byu.edu) >>> BYU Net ID**

*\*you do not need to create an account, just sign in with you BYU information*



## HOW TO MAKE THE MOST OUT OF HANDSHAKE:

### 1. COMPLETE YOUR PROFILE

- Upload your resume and it will auto-fill in your profile
- Completed profiles tailor your Handshake experience
- Information from your transcript is already uploaded
- Fill in the Summary/Bio section
- Fill in your past jobs and experiences, including all the bullet points you use on your resume
- Add a professional headshot and background photo

Remember: every word in your profile will be searchable by students and employers

### 4. EXPLORE FELLOW STUDENTS

- “Students” tab
- Search for fellow BYU students to view their profiles and job positions (Facebook stalking... “networking”)

### 5. ATTEND EVENTS

- The “Events” tab will be your key to attending info sessions, interviews, and Career Fairs
- The “Calendar” tab under “Events” will show you what events are coming soon
- Make sure to save events you are interested in or RSVP so you do not forget to attend
- Spread the word to your friends on social media

### 6. DOWNLOAD HANDSHAKE APP

- Search: “Handshake” not “Handshake Career Services”
- Input your BYU e-mail address: [netID@byu.edu](mailto:netID@byu.edu) (it will forward emails to the e-mail you have on file with BYU)
- Handshake will send you a link via e-mail to enable your account in the app
- Navigate the app to perform all the functions of the website that have been previously mentioned

### 7. VISIT THE CAREER STUDIO

- Freshen up your resume, cover letter, or LinkedIn
- Receive networking help
- Practice interviewing with a mock interview
- Meet with a full-time Career Counselor in your field

### 8. GET A JOB, RING THE BELL

- Once you're hired, stop by the Career Studio to ring our Victory Bell and get a picture for the Victory Board



**employers are**  
**5X MORE LIKELY**  
**to view a profile that has**  
**at least one job/skill/organization**

### 2. APPLY FOR JOBS

- Search for job titles, employers, or skills
- Apply for interesting jobs that meet your skill set

### 3. RESEARCH COMPANIES

- Under the “Jobs” Tab there is an “Employers” Tab
- Search for keywords or locations to find companies that are the right fit for you
- Plan to attend their info sessions on BYU Campus, connect with them at Career Fairs, or set up informational interviews to learn more

Remember: when looking at companies or jobs, Handshake will tell you what other BYU students have worked there. Use this resource to network and discover more information!



# Careers in Statistics

## What Do Statisticians Do?

Statisticians look for patterns in data to help make decisions in business, industry, and the biological, physical, psychological, and social sciences. Statisticians help make important advances in scientific research and work in opinion polling, market research, survey management, data analysis, statistical experiments, and education. Statisticians use quantitative abilities, statistical knowledge, and computing and communication skills to collaborate with other scientists to work on challenging problems, including the following:

- Studying the safety and economic viability of nuclear power plants and alternative energy sources
- Evaluating the environmental impact of air, water, and soil pollution
- Designing and analyzing studies to determine the safety and effectiveness of new drugs
- Estimating the unemployment rate in the United States
- Analyzing consumer demand for products and services
- Planning studies for and analyzing data from agricultural experiments

Statisticians apply mathematical and statistical knowledge to social, economic, medical, political, and ecological problems. They work individually, but also as part of interdisciplinary teams on complex problems. Statisticians travel to consult with other professionals or to attend conferences, seminars, and continuing education activities. They communicate and confer with other professionals to understand practical problems and inform others of their solutions. Statisticians use data from well-designed trials and from massive databases to discover results about a particular problem in a variety of fields. They combine their technical training skills with the knowledge of the field within which they are working to produce valuable results.

Statisticians are at times educators, consultants, and theoretical researchers.

## Business and Industry

**Manufacturing** -- Industrial statisticians help build products and deliver services that satisfy customers and increase the company's market share and profit margin. Statisticians help design the best product, guide the transition from design to manufacturing, ensure a consistently excellent product, help manage customer satisfaction, and ensure a financially beneficial bottom line. Industry professionals use statistical methods for quality control and quality assurance in nearly all manufactured goods.



**Marketing** -- Statistics is used to quantify the extent of variation in customers' needs and wants. Statisticians design experiments for new products, conduct focus groups and sample surveys to gather consumer feedback, and perform field experiments in test markets to determine product viability and marketability. Statistics and data mining are also used to analyze sales data and predict future trends.

**Engineering** -- Engineers work in electronics, chemicals, aerospace, pollution control, construction, and other industries. They may be responsible for leading large projects with significant costs, technical complexity, and responsibility. Statistical methods allow engineers to make a consistent product, detect problems, minimize chemical waste, and predict product life.

**Statistical Computing** -- Reliable and accurate statistical software is arguably the most important tool available to statisticians in every field. Developing code that is both user friendly and sufficiently complex is a challenging task, as is exploiting the rapidly occurring improvements in hardware platforms,

graphics, and algorithms. Opportunities in this field include software design and development, software testing, quality assurance, technical support, education, documentation, marketing, and sales.



## **Health and Medicine**

**Epidemiology** -- Epidemiological statisticians work on projects such as calculating cancer incidence rates or the rates of chronic and infectious diseases, monitoring and reporting on disease outbreaks, and monitoring changes in health-related behaviors such as smoking and physical activity. Fields of practice include nutritional, environmental, genetic, and social epidemiology, as well as pharmacoepidemiology.

**Public Health** -- Public health statisticians work on preventing disease, prolonging life, and promoting health through organized community efforts. These include sanitation, control of contagious infections, hygiene education, early diagnosis and preventive treatment, and adequate living standards. This requires understanding of epidemiology, nutrition, antiseptic practices, and social science. In the United States, public health is studied and coordinated on a national level by the Centers for Disease Control and Prevention; internationally, the World Health Organization plays an equivalent role.

**Pharmaceutical Science** -- Statisticians in pharmacology work in pharmaceuticals, animal health, and government research. They are key to all aspects of drug discovery, development, approval, and marketing. They work in pre-clinical research, clinical trials, epidemiology, health economics, and market research. Statisticians are essential in the drug development process because they ensure the validity and accuracy of findings at all stages of the process.

**Statistical Genetics** -- Statistics has been used in human genetics to create automated methods of labeling possible indicators of genetic abnormalities, such as birth defects and early aging. Statistics has also been used in animal and plant genetics to breed desirable characteristics in offspring. Using complex statistical models, statisticians aid in formulating sound decisions by distinguishing between environmental and genetic effects.

## **Learning**

**Education** -- Education is one of the country's biggest industries and the tasks that the educational statistician can choose to undertake are diverse. Statisticians teach students from kindergarten through doctoral programs. They may help assess teacher effectiveness, analyze a large database to understand a particular issue, or develop better statistical models to represent the amount of learning attained by one student or by all students in a school district, state, or nation.

**Science Writing and Journalism** -- Science writers are employed by the mass media, universities, and corporations to produce news briefs, articles, news releases, and other reports. Writers with scientific backgrounds are especially in demand because of their ability to explain complicated statistical or scientific data in easy-to-understand articles for non-statisticians and the general public.

## **Research**

**Government** -- Statistical methods are used in government regulation on topics such as stock trading rules, air purity standards, and new drug approvals. Statistics are cited in court proceedings, congressional hearings, and lobbying arguments. Politics involves statistics in the form of approval rating surveys, voter registration, campaigning, and election predictions. Statisticians participate in government agencies such as the Food and Drug Administration, the Census Bureau, the Bureau of Labor Statistics, the Office of Management and Budget, the Bureau of Transportation Statistics, the National Institutes of Health, and the Department of Agriculture. Federal agencies provide data that are used in making federal, state, and



local government policies.

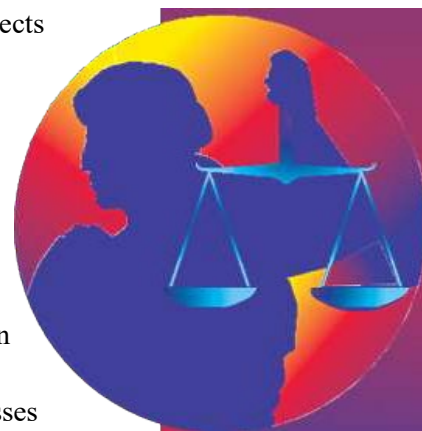
**Survey Methods** -- Statisticians work on surveys in government, the social sciences, education, law, forestry, agriculture, biology, medicine, business, and e-commerce. Survey statisticians might study efficient survey design, experimental methods for increasing response rates, accounting for nonresponse and under-coverage, or how to release data to the public while maintaining the confidentiality of respondents. Other important issues include question wording and design and deciding where and how to take samples that will include traditionally underrepresented groups.

**Research and Development** -- Whether in developing new computing technology or designing a better consumer product, statisticians work in all sectors of industry to identify sources of variability and increase the reliability of products and technology using experimental design, statistical analysis, and continuous improvement tools.

## **Social Sciences**

**Consulting** -- Independent statistical consultants work on many of the same projects as other statisticians, but they usually are hired on a temporary basis to solve a specific problem that requires statistical expertise not available within the hiring company. Since the field of statistics is so broad, many statistical consultants specialize in some area, such as quality improvement or pharmaceuticals. Consultants may be hired with grant money to work on short-term projects in medicine, agriculture, engineering, or business.

**Law** -- Statistics are becoming more and more important as court cases address increasingly complex problems. Sometimes the statistician analyzes data that can help the jury or judge decide whether someone is guilty of a crime or must pay damages for causing injuries. Other times, statisticians are hired as expert witnesses during trials. Court cases involving statistical analyses include DNA testing, salary discrepancies, consumer surveys, and disease clusters.

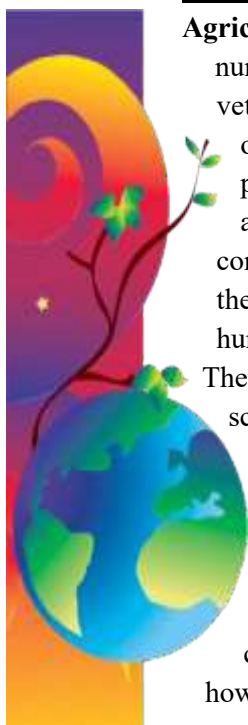


## **Natural Resources**

**Agriculture** -- Statisticians have teamed up with experts in agriculture in order to study a number of challenging questions, including chemical pesticides, hydrogeology, veterinary sciences, genetics, and crop management. Precision agriculture is the practice of using statistical models to optimize agricultural inputs such as fertilizer or pesticides, to maximize yield and minimize negative ecological impact. Statisticians are involved in studies ranging from small laboratory experiments to large projects conducted over many hundreds or thousands of square miles. They work on data from the smallest scale of organisms, like viruses and bacteria, to plants, insects, animals, and humans.

They work with scientists from fields such as bacteriology, genetics, biochemistry, dairy science, environmental studies, entomology, plant sciences, rural sociology, veterinary medicine, wildlife, and ecology.

**Ecology** -- Statisticians play a major role in addressing questions about the earth's natural environment, including animal populations, agricultural protections, fertilizer, and pesticide safety. Most states employ wildlife statisticians. Statisticians are employed by state and federal environmental agencies as well as companies that collect environmental data. Increasingly, companies need statisticians to help assess how a new product or plant will affect the surrounding environment. Scientific researchers also work with statisticians, often at universities, to design experiments that will answer basic questions about the environment.



## **Resources**

### **Weekly Emails**

Sign up for weekly emails advertising available internship opportunities at [career.placement@stat.byu.edu](mailto:career.placement@stat.byu.edu).

### **Handshake**

<http://handshake.byu.edu/>

### **American Statistical Association**

<https://www.amstat.org/>

### **Jobs in Statistics**

<http://jobs.amstat.org/>

### **Salary Reports**

<https://www.amstat.org/ASA/Your-Career/Salary-Information.aspx>

### **“Careers in Statistics: Possibilities and Opportunities”**

–animated PowerPoint slide show that provides an overview of the field of statistics and highlights the opportunities available to those who become statisticians (<https://www.worldofstatistics.org/statistics-as-a-career/careers-in-statistics/>)

**Careers in Statistics issue of *Amstat News*** –annual September issue including biographies of famous statisticians, career advice, and “Day in the Life” articles of current practicing statisticians

**“Career Corner”** articles in *Amstat News* –monthly articles highlighting a topic of importance to students of statistics and young statisticians

## **How to Become a Statistician?**

### **Education and Training**

Statisticians typically study statistics, mathematics, and/or some related field of statistical application. More and more opportunities are available for statisticians with bachelor’s degrees. Many jobs, however, require either a master’s degree or doctorate. Continuing education is available through the American Statistical Association at events like the Joint Statistical Meetings and traveling “LearnSTAT” courses. Employers often encourage, or even require, their employees to earn continuing education credits.

### **Skills**

Statisticians often develop skills in a particular field of study, such as medicine, public policy, economics, biology, psychology, or agriculture. Language and communication skills are important because statisticians must convey the results of their investigations in oral and/or written reports. The ability to explain findings clearly and concisely is essential and requires knowledge of grammar and comprehensive writing skills.

### **Employment Prospects**

The demand for statisticians is currently high and is growing. According to the Occupational Outlook Handbook, published by the Bureau of Labor Statistics, the overall employment of mathematicians and statisticians is expected to grow 33% from 2016 to 2026, much faster than the average for all occupations. Furthermore, colleges and universities will be hiring more and more faculty members in statistical fields. Salaries and opportunities for advancement are competitive and reflect the current demand.