

# STATISTICS, CERTIFICATE

The Statistics certificate is a great fit for students who wish to use statistical principles to solve data problems with a mathematical approach. Students will develop knowledge and skills in analytics and statistics, such as understanding how to work with data and applying their analysis within their given major or domain area. Statistics continues to be one of the fastest growing employment sectors in the nation and in Wisconsin and the Statistics certificate will allow a broader range of students to gain these highly desired skills.

Students in the certificate will gain “scientific, professional and technological expertise, and a sense of purpose.”

## HOW TO GET IN

Students must have credit for the following to declare the certificate:

Code	Title	Credits
<b>Complete one introductory statistics course</b>		
STAT 240	Data Science Modeling I	
STAT 301	Introduction to Statistical Methods	
STAT 302	Accelerated Introduction to Statistical Methods	
STAT 324	Introductory Applied Statistics for Engineers	
STAT 371	Introductory Applied Statistics for the Life Sciences	
<b>Complete one calculus course</b>		
MATH 221	Calculus and Analytic Geometry I	
MATH 171 & MATH 217	Calculus with Algebra and Trigonometry I and Calculus with Algebra and Trigonometry II	

Declaration of the certificate occurs via an online form, but students are encouraged to schedule a meeting with a Statistics advisor if they have questions.

Students declared in the Statistics major or Data Science major are not eligible to declare this certificate.

## REQUIREMENTS

### REQUIREMENTS FOR THE CERTIFICATE IN STATISTICS

The certificate requires a minimum of 13 credits.

Code	Title	Credits
<b>Introductory Statistics, complete one option</b>		<b>3-4</b>
STAT 240	Data Science Modeling I	
STAT 301	Introduction to Statistical Methods	
STAT 302	Accelerated Introduction to Statistical Methods	

STAT 324	Introductory Applied Statistics for Engineers	
STAT 371	Introductory Applied Statistics for the Life Sciences	
<b>Statistical Language</b>		<b>1</b>
STAT 303	R for Statistics I	
<b>Regression Analysis, complete one option</b>		<b>3-4</b>
STAT 333	Applied Regression Analysis	
STAT 340	Data Science Modeling II	
<b>Probability, complete one option</b>		<b>3</b>
STAT/MATH 309	Introduction to Probability and Mathematical Statistics I	
STAT 311	Introduction to Theory and Methods of Mathematical Statistics I	
MATH 331	Introductory Probability	
STAT/MATH 431	Introduction to the Theory of Probability	
MATH 531	Probability Theory	
<b>Elective, complete one option</b>		<b>3</b>
STAT/MATH 310	Introduction to Probability and Mathematical Statistics II	
STAT 312	Introduction to Theory and Methods of Mathematical Statistics II	
STAT 349	Introduction to Time Series	
STAT 351	Introductory Nonparametric Statistics	
STAT 405	Data Science Computing Project	
STAT 411	An Introduction to Sample Survey Theory and Methods	
STAT 421	Applied Categorical Data Analysis	
STAT/M E 424	Statistical Experimental Design	
STAT 433	Data Science with R	
STAT 436	Statistical Data Visualization	
STAT 443	Classification and Regression Trees	
STAT 451	Introduction to Machine Learning and Statistical Pattern Classification	
STAT 453	Introduction to Deep Learning and Generative Models	
STAT 456	Applied Multivariate Analysis	
STAT 461	Financial Statistics	
STAT/COMP SCI 471	Introduction to Computational Statistics	
STAT 479	Special Topics in Statistics	
STAT 575	Statistical Methods for Spatial Data	
STAT/B M I 641	Statistical Methods for Clinical Trials	
STAT/B M I 642	Statistical Methods for Epidemiology	

**Total Credits 13**

### RESIDENCE AND QUALITY OF WORK

- At least 7 certificate credits must be completed in residence
- Minimum 2.000 GPA on all certificate courses

## CERTIFICATE COMPLETION REQUIREMENT

This undergraduate certificate must be completed concurrently with the student's undergraduate degree. Students cannot delay degree completion to complete the certificate.

### LEARNING OUTCOMES

1. Frame a scientific question with the appropriate mode of data analysis, analyze such data correctly, and summarize and interpret the results in a useful manner
2. Apply a number of key statistical techniques, including significance testing, goodness-of-fit testing, and regression analysis
3. Use tools from mathematical statistics and probability to assess the quality of point estimators, confidence intervals, and hypothesis tests
4. Apply a statistical language to manipulate data and perform exploratory data analysis using basic statistical methods

### ADVISING AND CAREERS

Students who are interested in statistics academic advising should check out the advising information on our website (<https://stat.wisc.edu/statistics-certificate/>) or send an email to [statcert@stat.wisc.edu](mailto:statcert@stat.wisc.edu).

Please note that students will need at least Calculus 2 to finish the Statistics certificate requirements.

## L&S CAREER RESOURCES

Every L&S major opens a world of possibilities. SuccessWorks (<https://successworks.wisc.edu/>) at the College of Letters & Science helps students turn the academic skills learned in their major, certificates, and other coursework into fulfilling lives after graduation, whether that means jobs, public service, graduate school or other career pursuits.

In addition to providing basic support like resume reviews and interview practice, SuccessWorks offers ways to explore interests and build career skills from their very first semester/term at UW all the way through graduation and beyond.

Students can explore careers in one-on-one advising, try out different career paths, complete internships, prepare for the job search and/or graduate school applications, and connect with supportive alumni and even employers in the fields that inspire them.

- SuccessWorks (<https://careers.ls.wisc.edu/>)
- Set up a career advising appointment (<https://successworks.wisc.edu/make-an-appointment/>)
- Enroll in a Career Course (<https://successworks.wisc.edu/career-courses/>)- a great idea for first- and second-year students:
  - INTER-LS 210 (<https://guide.wisc.edu/search/?P=INTER-LS%20210>) L&S Career Development: Taking Initiative (1 credit)
  - INTER-LS 215 (<https://guide.wisc.edu/search/?P=INTER-LS%20215>) Communicating About Careers (3 credits, fulfills Comm B General Education Requirement)
- Learn about internships and internship funding (<https://successworks.wisc.edu/finding-a-job-or-internship/>)

- Activate your Handshake account (<https://successworks.wisc.edu/handshake/>) to apply for jobs and internships from 200,000+ employers recruiting UW-Madison students
- Learn about the impact SuccessWorks has on students' lives (<https://successworks.wisc.edu/about/mission/>)

### PEOPLE

A full listing of the Statistics faculty, including affiliated faculty and links to webpages, can be found on the departmental website (<https://stat.wisc.edu/people-main-faculty/>).

Faculty:

- Cecile Ane, Professor Statistics and Botany
- Joshua Cape, Assistant Professor, Statistics
- Peter Chien, Professor Statistics
- Jessi Cisewski-Kehe, Assistant Professor, Statistics
- Sameer Deshpande, Assistant Professor, Statistics
- Nicolas Garcia Trillos, Assistant Professor, Statistics
- Yinqiu He, Assistant Professor, Statistics
- Hyunseung Kang, Assistant Professor, Statistics
- Sunduz Keles, Professor, Statistics & Biostatistics and Medical Informatics
- Bret Larget, Professor Statistics
- Keith Levin, Assistant Professor, Statistics
- Wi-Yin Loh, Professor, Statistics
- Michael Newton, Professor, Statistics & Biostatistics and Medical Informatics
- Vivak Patel, Assistant Professor, Statistics
- Alejandra Quintos, Assistant Professor, Statistics
- Sebastian Raschka, Assistant Professor, Statistics
- Garvesh Raskutti, Associate Professor, Statistics
- Karl Rohe, Professor, Statistics
- Kris Sankaran, Assistant Professor, Statistics
- Jun Shao, Professor, Statistics
- Miaoyan Wang, Assistant Professor, Statistics
- Yazhen Wang, Chair and Professor, Statistics
- Brian Yandell, Professor, Statistics
- Chunming Zhang, Professor, Statistics
- Zhengjun Zhang, Professor, Statistics
- Yiqiao Zhong, Assistant Professor, Statistics
- Jun Zhu, Professor, Statistics