

DEPARTMENT OF STATISTICS AND OPERATIONS RESEARCH

Introduction

The major in statistics and analytics (STAN) is an excellent program for students interested in statistical data science, operations research, and actuarial science, as well as in fields such as business, economics, public policy and health, psychology, and biomedicine, where the decision and statistical sciences play an increasingly important role.

Particular areas in which graduates can obtain employment or continue with graduate study include:

Statistics

Students in this area study the mathematical theories of probability and statistics and their application to mathematical models that contain an element of uncertainty or randomness. Opportunities for employment are manifold in businesses and government agencies, and include a broad range of areas from the natural sciences, social sciences, and technology. Concrete examples include pharmacology, genomics, medicine, environmental sciences, social network analysis, and information technology.

Operations Research

In this area, students study mathematical, statistical, and computational techniques related to decision making. Operations research is crucial in business, government, and other management areas where decisions are made by solving large, complex problems (for example, crew scheduling for airlines, and the design of online recommendation systems). In addition to their major courses, students interested in this field are encouraged to take courses in business and economics.

Actuarial Science

Actuaries work primarily in businesses that involve financial risk, including the insurance industry. Students interested in this field take advanced courses in statistics, stochastic processes, and the mathematical theory of risk.

Advising

All majors and minors have a primary academic advisor in Steele Building. Students are strongly encouraged to meet regularly with their advisor and review their Tar Heel Tracker each semester. STAN majors and minors are also encouraged to meet with departmental advisors to discuss course planning before registration each semester. The director of undergraduate studies works with prospective majors and minors by appointment. Additional information on courses, undergraduate research opportunities, the honors program, careers, and graduate schools may be obtained from the department's website (<https://stor.unc.edu/>) or by contacting the director of undergraduate studies.

Courses for Students from Other Departments

The Department of Statistics and Operations Research offers a variety of courses of potential value to students majoring in other disciplines. Introductory courses include STOR 113 and STOR 215, which are foundation courses in decision models, and the basic statistical courses, STOR 120 and STOR 155. At the intermediate level, STOR 305 provides an introduction to business decision models, while STOR 320 is an

introductory course to data science. Substantial coverage of applied statistical methods is provided in STOR 455 and STOR 556. At more advanced mathematical levels, an introduction to probability theory is provided by STOR 435 (or STOR 535), an introduction to proof techniques and discrete mathematics is given in STOR 315, and the basic theory of statistical inference is given by STOR 555. More advanced deterministic and stochastic models of operations research are provided in STOR 415 and STOR 445. Machine learning is covered in STOR 565 and STOR 566.

Graduate School and Career Opportunities

Regardless of the electives chosen, the statistics and analytics degree program provides excellent preparation for graduate study. Graduates with concentrations in operations research or statistics often continue work at the graduate level in those fields or related areas such as industrial engineering, biostatistics, and environmental science, or enter business school to pursue a master's in business administration (M.B.A.) degree.

A five-year B.S.–M.S. degree program in statistics, operations research and data science is also an option. Interested students should consult the director of graduate studies for the operations research program.

Graduates of the statistics and analytics program will find numerous opportunities for well-paid, challenging jobs.

Major

- Data Science Major, B.A. (<https://catalog.unc.edu/undergraduate/programs-study/data-science-major-ba/>)
- Statistics and Analytics Major, B.S. (<https://catalog.unc.edu/undergraduate/programs-study/statistics-analytics-majors-bs/>)

Minor

- Data Science Minor (<https://catalog.unc.edu/undergraduate/programs-study/data-science-minor/>)
- Statistics and Analytics Minor (<https://catalog.unc.edu/undergraduate/programs-study/statistics-and-analytics-minor/>)

Graduate Programs

- M.S. in Statistics, Analytics, and Data Science (STANDS) (<https://catalog.unc.edu/graduate/schools-departments/statistics-operations-research/>)
- Ph.D. in Statistics and Operations Research (<https://catalog.unc.edu/graduate/schools-departments/statistics-operations-research/>)

Courses

- Statistics and Operations Research (STOR) (<https://catalog.unc.edu/courses/stor/>)

Professors

Nilay Argon, Shankar Bhamidi, Amarjit Budhiraja, Jan Hannig, Vidyadhar G. Kulkarni, Yufeng Liu, James Stephen Marron, Andrew Nobel, Mariana Olvera-Cravioto, Gabor Pataki, Vlaslas Pipiras, Richard L. Smith, Kai Zhang, Serhan Ziya.

Associate Professors

Sayan Banerjee, Nicolas Fraiman, Chuanshu Ji, Quoc Tran-Dinh, Zhengwu Zhang.

Assistant Professors

Guanting Chen, Xiangying Huang, Daniel Kessler, Yao Li, Mo Liu, Patrick Lopatto, Ali Mohammad Nezhad, Michael O'Neill, Benjamin Seeger.

Teaching Associate Professors

Mario Giacomazzo, Jeffrey McLean.

Teaching Assistant Professors

Oluremi Abayomi, William Lassiter.

Joint Professors

Joseph Ibrahim, Michael Kosorok, Jayashankar Swaminathan.

Professors Emeriti

George S. Fishman, Douglas G. Kelly, J. Scott Provan, David S. Rubin, Gordon D. Simons, Shaler Stidham Jr., Jon W. Tolle.

Contact Information

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Visit Program Website (<http://www.stor.unc.edu>)

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