Independent Concentration

Although Brown offers nearly 80 concentrations, a small number of students have academic interests that fall beyond the scope of these offerings. Brown allows these students to design their own concentrations through the Independent Concentration (IC) program. The IC program is for exceptionally dedicated students who are willing to spend extra time and effort creating a "new" concentration, representing a coherent field of study that Brown does not offer. Such fields may include emerging topics, such as "sustainable technology," or broader interdisciplinary areas, such as "Deaf and Disability Studies." Students interested in pursuing an Independent Concentration are strongly encouraged to review the IC website (http://brown.edu/academics/college/advising/curricular-resource-center/independent-concentrations/independent-concentrations), speak with the Curricular Resource Center (http://brown.edu/Administration/Dean_of_the_College/crc)'s IC Coordinator and with the IC Dean (Dean Chang (margaret_chang@brown.edu)) and to review previous proposals in the CRC’s library.

Independent concentration proposals are reviewed and approved by the College Curriculum Council. The Statistics Track below is a pre-approved IC program.

Statistics Track

Statistics has a theoretical core surrounded by a large number of domains of application in diverse fields, including economics, psychology, biology and medicine, sociology, population sciences, government, anthropology, astronomy, physics, chemistry, geology, engineering, and computer science. At Brown, graduate training in Biostatistics is available in the Department of Biostatistics and in Mathematical Statistics in the Division of Applied Mathematics, and students may choose from a wide variety of introductory and advanced courses in statistical methodology, including the Departments of Economics, Sociology, Cognitive, Linguistic and Psychological Sciences, Political Science and Computer Science.

The Undergraduate program in Statistics, established in 1997, is an interdepartmental program, administered by the Department of Biostatistics and leading to the Sc.B. degree. The program is constructed on several premises: that statistics is a scientific discipline in its own right, with its characteristic methodology and body of knowledge; that it is essentially concerned with the art and science of the analysis of data; and that it is best taught in conjunction with specific, substantive applications. To this end, the concentration is designed to provide a foundation of basic concepts and methodology, requiring students to take core courses in the discipline itself, and to expose students to a cross-section of statistical applications, through courses of their own selection and subject to approval) in the social, biological, and natural sciences.

In a senior honors thesis, each student will be required to carry out a major project of statistical data analysis in one of these disciplines. The program prepares students for careers in industry and government, for graduate study in statistics or biostatistics and other sciences, as well as for professional study in law, medicine, business, or public administration.

Requirements in addition to Senior Thesis:
The program begins with a foundation in mathematics and computing, combined with an introductory introduction to statistical thinking and practice. A set of three core courses builds on this foundation by providing a comprehensive account of the fundamentals of statistical theory and data analysis. At this point, the students in the concentration are ready to delve into more advanced material covering important areas of statistical methodology. In addition to formal coursework, students will have opportunities to acquire practical experience in study design, data management, and statistical analysis by working as undergraduate research assistants in projects in one of the participating academic departments or research centers at Brown.

The program requires twelve one-semester courses and participation in the senior seminar. The required courses are as follows:

Foundations courses:
Mathematics
Three courses, including courses in multivariate calculus and linear algebra
Computing
APMA 0160 Introduction to Scientific Computing
Introduction to statistical thinking and practice
Select one of the following:
SOC 1100 Introductory Statistics for Social Research
ECON 1620 Introduction to Econometrics
APMA 0650 Essential Statistics
Core Courses in Theory and Data Analysis
PHP 2510 Principles of Biostatistics and Data Analysis
Choose one of the following series:
APMA 1650 Statistical Inference I
& APMA 1660 and Statistical Inference II
MATH 1610 Probability
& MATH 1620 and Mathematical Statistics
Advanced Courses in Statistical Methods
APMA 1690 Computational Probability and Statistics
PHP 2511 Applied Regression Analysis
Two electives from the following courses:
Social Sciences:
ECON 1630 Econometrics I
ECON 2030 Introduction to Econometrics I
ECON 2040 Econometric Methods
ECON 2630 Econometric Theory
ECON 2640 Microeconomics
SOC 2010 Multivariate Statistical Methods I
SOC 2220 Advanced Quantitative Methods of Sociology Analysis
SOC 2230 Techniques of Demographic Analysis
SOC 2960G Spatial Data Analysis Techniques in the Social Sciences
Biostatistics:
APMA 1710 Information Theory
APMA 2810R Computational Biology Methods for Gene/Protein Networks and Structural Proteomics
B IOL 1420 Experimental Design in Ecology
PHP 2620 Statistical Methods in Bioinformatics, I
PHP 2200 Intermediate Methods in Epidemiologic Research
PHP 2520 Statistical Inference I
PHP 2030 Clinical Trials Methodology
PHP 2603 Analysis of Longitudinal Data
PHP 2530 Bayesian Statistical Methods

Total Credits
Prospective students will be able to obtain Advanced Placement credit for the requirements in mathematics, computing, and introductory statistics. Students who have already completed an introductory course in statistics will be granted permission to proceed to Level II core courses if they meet the prerequisites in mathematics and computing.

Honors: Honors work in the Independent Concentration, Statistics track requires the completion of a senior thesis and a superior record in the program.

The program is administered by the Department of Biostatistics, located at 121 South Main Street, 7th floor.

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