Data Science (DATA)

Courses

DATA 200AP. Intermediate Probability and Statistical Theory I. 4 Units.
Fundamental probability and distribution theory needed for statistical inference. Topics include axiomatic foundations of probability theory, discrete and continuous distributions, expectation and moment generating functions, multivariate distributions, transformations, sampling distributions, and limit theorems.

Prerequisite: Knowledge of basic statistics and linear algebra; Calculus I-III.

Restriction: Graduate students only. Master of Data Science Degree students only.

DATA 200BP. Intermediate Probability and Statistical Theory II. 4 Units.
Fundamental theory and methods for statistical inference. Topics include data reduction (sufficient, ancillary, and complete statistics), estimation (method of moments, maximum likelihood estimators, Bayes estimators), evaluating methods (mean squared error, best unbiased estimators, asymptotic evaluations), hypothesis testing, and confidence intervals.

Prerequisite: DATA 200AP. DATA 200AP with a grade of B or better.

Restriction: Graduate students only. Master of Data Science Degree students only.

DATA 200P. Data Science Career Seminar.
Covers one or more emerging topics in data science from industry professionals. The course content may vary.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Master of Data Science Degree students only.

DATA 210P. Statistical Methods I. 4 Units.
Statistical methods for analyzing data from multi-variable observational studies and experiments. Topics include model selection and model diagnostics for simple and multiple linear regression and generalized linear models.

Corequisite: DATA 200BP
Prerequisite: DATA 200AP. DATA 200AP with a grade of B- or better. Required: Knowledge of basic statistics and linear algebra.

Restriction: Graduate students only. Master of Data Science Degree students only.

DATA 211P. Statistical Methods II. 4 Units.
Statistical methods for designing experiments, visualizing, and analyzing experimental and observational data using generalized regression models, multivariate analysis, and methods suitable for dependent data.

Prerequisite: DATA 210P. DATA 210P with a grade of B- or better

Restriction: Graduate students only. Master of Data Science Degree students only.

DATA 220P. Databases and Data Management. 4 Units.
Introduction to the design of databases and the use of database management systems (DBMS) for managing and utilizing data. Topics include entity-relationship modeling for design, relational data model, relational algebra, relational schema design, and use of SQL (Structured Query Language).

Restriction: Graduate students only. Master of Data Science Degree students only.

DATA 260P. Fundamentals of Algorithms in Data Science. 4 Units.
Covers fundamental concepts in the design and analysis of algorithms and is geared toward data science applications. Topics include greedy algorithms, deterministic and randomized graph algorithms, models of network flow, fundamental algorithmic techniques, and NP-completeness.

Restriction: Graduate students only. Master of Data Science Degree students only.

DATA 280P. Data Science Career Seminar .
Covers one or more emerging topics in data science from industry professionals. Provides students with the opportunity to learn from experts in the data science industry through guest speaker presentations and Q&A sessions.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Master of Data Science Degree students only.

DATA 294P. Hypothesis and Project Development. 4 Units.
Supervised individual study on data science project development. Under instructor's supervision, students either develop their own projects or undertake projects from industry which have potential to become their capstone projects for DATA 296P or DATA 297P.

Grading Option: In Progress (Letter Grade with S/U).

Restriction: Graduate students only. Master of Science Degree students only.

DATA 295P. Special Topics in Data Science. 4 Units.
Covers one or more emerging topics in data science. Course content may vary.

Repeatability: May be taken for credit 4 times as topics vary.

Restriction: Graduate students only. Master of Data Science Degree students only.

DATA 296P. Capstone Writing and Communication. 4 Units.
Written and oral communication for data science careers. Production of a detailed document describing the design, methods, analytic strategy, interpretation, and conclusions as related to the concurrent capstone design and analysis class and refinement of written documents and oral communications.

Prerequisite: Required: Completion of at least 24 units in the Master of Data Science program.

Restriction: Graduate students only. Master of Data Science Degree students only.

DATA 297P. Capstone Design and Analysis. 4 Units.
Complete implementation of a data science analytic strategy for obtaining empirically-driven solutions to problems from science and industry. Focuses on the problem definition and analysis, data representation, algorithm selection, solution validation, and presentation of results.

Corequisite: DATA 296P

Restriction: Graduate students only. Master of Data Science Degree students only.

DATA 298P. Curricular Practical Training. 2 Units.
Internship in which students work individually at an outside organization to gain experience with the challenges involved in data-related work.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Master of Data Science Degree students only.

DATA 299P. Individual Study. 2 Units.
Supervised individual study in data science.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 4 times.

Restriction: Graduate students only. Master of Data Science Degree students only.