

# DATA SCIENCE (DSCI)

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## **DSCI 500A Essential Calculus for Data Science (1)**

This course introduces the concepts from differential, integral, and multivariate calculus essential for the study of data science. Elements of linear algebra, such as vectors, planes, and matrices, also included. Emphasis on computation and application.

## **DSCI 500B Essential Probability Theory for Data Science (1)**

This course introduces concepts from probability theory essential for the study of data science. Topics include probability spaces, Bayes' Theorem, random variables, discrete and continuous distributions, specifically the normal distribution, and the Central Limit Theorem. Emphasis on computation and application.

## **DSCI 501 Data Mining (3)**

This course is about mining knowledge from data in order to gain useful insights and predictions. From theory to practice, the course investigates all stages of the knowledge discovery process, which includes data preprocessing, exploratory data analysis, prediction and discovery through regression and classification, clustering, association analysis, anomaly detection, and postprocessing.

## **DSCI 502 Data Mining II (3)**

A second semester of data mining introducing tools and techniques necessary for mining large scale data sources. Prerequisite:DSCI 501

## **DSCI 511 Data Preprocess/Visualization (3)**

This course is an introduction to data visualization. It includes data preprocessing and focuses on specific tools and techniques necessary to visualize complex data. Data visualization topics covered include design principles, perception, color, statistical graphs, maps, trees and networks, and other topics as appropriate. Visualization tools may include JavaScript D3 library, Python, and R, and commercially available software such as Tableau, etc. The course introduces the techniques necessary to successfully implement visualization projects using the programming languages studied.

## **DSCI 525 Research Methods (3)**

An introduction to basic scientific and statistical research methods when dealing with measurements of human and corporate activity. Students read and evaluate current research and translate their ideas into viable research projects. Topics include scholarly writing and presentation, descriptive research methods, quasi-experimental and experimental design, ethical issues, and analytical methods.

## **DSCI 595 Thesis (1-3)**

Thesis credit may be earned for significant work toward the writing of a master's thesis. This thesis may be used to fulfill the culminating project requirement.

## **DSCI 599 Practicum (1-6)**

The practicum is an opportunity to directly experience the work of a data scientist or data analytics professional. It consists of project-based learning on a significant and contributory business objective in conjunction with practicing professionals in one of many appropriate industries. May be repeated up to 6 credits.