CERTIFICATE IN DATA STORYTELLING

Certificate Description

This certificate will teach students to code Python and JavaScript and write technical reports for the non-technical audience.

Certificate in Data Storytelling   (12 hours)

Code	Title	Credits
CPSC 507	Computer Programming	3
DSCI 511	Data Preprocess/Visualization	3
MATH 546	Applied Statistics I	3
or CPSC 529	Database Systems	
ENWR 517	Professional & Tech Writing	3
or COMM 503	Communication and Data Science	
Total Credits		**12**

Student Learning Outcomes

Upon the completion of this certificate, the graduate will:

a. have a good understanding of how to preprocess and visualize data.
b. gain experience in Python and JavaScript.
c. learn how to effectively communicate their findings to a non-technical audience, both orally and in writing, and how to write a technical report.

Certificate Courses

COMM 503 Communication and Data Science (3)
Industry experts stress the importance of often-overlooked communication skills in data science. Rachel Hawley, Analytic Solutions Architect at the SAS Institute, states "it is extremely important that potential candidates have effective communication and presentation skills. It's not enough to just have the technical chops, a data scientist must be able to effectively explain how he or she came to a specific conclusion and convince the internal or external customer that their results should be leveraged." This course is designed to explore this intersection between communication and data science. Topics will include assessing and improving communication skills, interpersonal and intercultural communication, teamwork, and leadership. The development of effective presentational skills, particularly oral skills, will be stressed.

CPSC 507 Computer Programming (3)
A problem-solving approach to learning computer programming. Topics include variables, data types, conditional statements, loops, arrays, recursion, principles of software engineering, object-oriented programming, data structures, algorithms, and the use of standard libraries available in a variety of programming languages. The course will use commerically common programming languages and integrated development environments (IDEs).

CPSC 529 Database Systems (3)
Basic concepts of databases. Topics include conceptual data modeling, database design and normalization, and database implementation. Use of SQL for data definition, manipulation, and query processing. While primary emphasis will be on the relational model and traditional RDBMS, discussion will also include a survey of techniques for handling non-relational data models, massive datasets, and unstuctured data, including data warehousing, in-memory databases, NewSQL, NoSQL and Hadoop.

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.

ENWR 517 Professional & Tech Writing (3)
This course teaches skills in written, visual, and verbal communication of particular importance to data science professionals. It engages with foundational concepts of rhetoric, composition, and design that can be applied in any setting while also addressing the forms and conventions of technical writing in a professional setting that students will encounter as practicing researchers and data analysts. The course stresses the seamless continuity between analysis of data and communication about that analysis.

MATH 546 Applied Statistics I (3)
An introduction to the foundations and applications of statistics. Topics include basic concepts of data collection sampling and experimental design, descriptive analysis and graphical displays of data, probability concepts and expectations, normal and binomial distributions, sampling distributions and the Central Limit Theorem, confidence intervals and hypothesis testing, likelihood-based statistics, ANOVA, correlation and simple linear regression.