Course Outline

2023/2024

COURSE NAME: Predictive Analytics Foundations

COURSE CODE: DATA3320

COURSE DESCRIPTION

By combining design and inferential thinking, data science is redefining how organizations solve challenging problems resulting in efficiency/productivity improvements. This foundational class level class builds on the data preparation and statistics learning outcomes from earlier courses. This course will explore key areas of predictive analytics including question formulation, data collection and statistical inference, predictive modeling, and decision making. Through a strong emphasizes on data mining, quantitative critical thinking, and exploratory data analysis this class covers key principles and techniques of predictive analytics at a foundational level.

Course Credits: 3.00

Pre-requisites: CMIS2250, STAT2201, DATA2210 or DATA2210 and =Year 3

LEARNING OUTCOMES

OUTCOME	Upon successful completion of this course, you will be able to
1	Apply data mining technology to analyze business issues and communicate insights. The following concepts, skills, and issues are used to support this Outcome: • Relate measures collected by information systems to business outcomes • Identify appropriate measures critical to business processes. • Source relevant data for available information systems. • Understand both supervised and unsupervised machine learning concepts and their applications
2	Differentiate and explain data mining processes and predictive analytics techniques. The following concepts, skills, and issues are used to support this Outcome: • Evaluate data to select the analysis needed to achieve the desired business objective. • Compare the features and functionality of data science analytical methods. • Apply feature engineering techniques to improve predictive model accuracy. • Utilize unsupervised learning methods to perform dimensionality reduction prior to other analysis.
3	Develop and optimize predictive analytics models. The following concepts, skills, and issues are used to support this Outcome: • Identify business scenarios where artificial intelligence and machine learning is likely to be beneficial and practical. • Relate statistical concepts such as distribution to their application in predictive modelling. • Create predictive models from datasets of business data.
4	Use programming techniques to implement machine learning concepts. The following concepts, skills, and issues are used to support this Outcome: • Write code, in programming languages such as Python, to perform data manipulation and machine learning tasks. • Apply functionality from external code resource libraries within custom programs. • Perform testing and debugging activities to identify and correct errors. • Utilize industry standard software development tools to create and manage programs.

STUDENT EVALUATION

OUTCOME	ACTIVITY DESCRIPTION	MARK DISTRIBUTION
1	Python Programming Lab Assignments	10%
1, 2 and 3	Machine Leaning Assignments	20%
1, 2 and 3	Data Mining Project	15%
1 and 2	Quiz	10%
1, 2, 3 and 4	Term Exams	40%
1, 2, 3 and 4	Peer Support Forum & Class Engagement	5%
	Total	100%

COURSE COMPLETION REQUIREMENTS

The minimum passing grade for this course is grade point of 1.0 (50% or D). Higher grades may be required to use the course for transfer credit or to satisfy professional designation criteria. Please refer to the Grades Procedure AD 2.2 for more details on your calculation requirements to determine the grading level required to maintain satisfactory academic standing, for progression and graduation.

STUDENT EQUIPMENT AND SUPPLIES

All JR Shaw School of Business students are required to possess a computing device, either a desktop or laptop, that will meet the minimum technology requirements. This will enable you to engage in our digital learning environment and to participate in online assessments. In addition to the minimum technology requirements, your computing device must also support both audio and video streaming technologies and, as a result, must include hardware (either internal or external) such as a microphone and webcam. A broadband (high speed) internet connection is also required.

Your computing device must meet the following minimum technology requirements:

Windows:

- Windows 10

- Processor: Intel i Series 4th Gen or Better or AMD Ryzen Series

- Memory: 4 GB RAM minimum, 8 GB RAM recommended

- Solid State Drive recommended or Hard Drive (minimum free space 15 GB)

- Display resolution: 1366 x 768 minimum, 1920 x 1080 recommended

- Wi-Fi connection: Wireless N, AC or better

- Antivirus Protection: Windows Defender and Windows Firewall are recommended to protect your device and are pre-installed on your Windows computer

Apple:

- Mac Hardware Requirements:

  MacBook (Late 2009 or newer)

  MacBook Pro (Mid 2010 or newer)

  MacBook Air (Late 2010 or newer)

- MacOS High Sierra (10.13) or later

- Memory: 4 GB RAM minimum, 8 GB recommended

- Solid State Drive recommended or Hard Drive (minimum free space 15 GB)

- Antivirus Protection: No additional software is needed. Built-in firewall and security software available in System Preferences

Note: while tablets can support your learning, they are not recommended as a main device.

STUDENT RESPONSIBILITY

It is expected that students will be responsible citizens of the Institute by following the Student Rights and Responsibilities Policy(SR 1.0). As such, each student will assist in the preservation of Institute property, and assume responsibility for their education by staying informed of and abiding by academic requirements and policies; demonstrating respect toward others; and meet expectations concerning attendance, assignments, deadlines, and appointments.

EQUITY AND INCLUSION STATEMENT

NAIT is committed to advancing equity and to actively and intentionally creating learning environments that promote a sense of belonging and dignity that ensure all people are safe, respected and valued. Acknowledging that every member of the NAIT community has a role in and responsibility to this work, NAIT provides the resources and support necessary for programs, departments and individuals to champion equity, diversity and inclusion and address barriers in meaningful ways.

TERRITORIAL ACKNOWLEDGEMENT

At NAIT, we honour and acknowledge that the land on which we learn, work and live is Treaty Six territory. We seek to learn from history and the lessons that have come before us, and to draw on the wisdom of the First Peoples in Canada. Only through learning can we move forward in truth and reconciliation, and to a better future together.