



UNSW Course Outline

INFS3873 Business Analytics Methods - 2024

Published on the 13 May 2024

General Course Information

Course Code : INFS3873

Year : 2024

Term : Term 2

Teaching Period : T2

Is a multi-term course? : No

Faculty : UNSW Business School

Academic Unit : School of Information Systems and Technology Management

Delivery Mode : In Person

Delivery Format : Standard

Delivery Location : Kensington

Campus : Sydney

Study Level : Undergraduate

Units of Credit : 6

Useful Links

[Handbook Class Timetable](#)

Course Details & Outcomes

Course Description

Today's organisations operate on a global scale and collect huge volumes of data from multiple sources. Management recognises the need to learn how to gather and manage data, transform it into new insights, and translate those insights into effective front-line and strategic actions in

order to have a better understanding of business performance and gain competitive advantage.

This course will provide you with advanced business analytics methods for Predictive Analytics.

The methodologies related to Predictive Analytics are classified into Supervised, Unsupervised, and Reinforcement Learning. While our main focus is on employing supervised and reinforcement learning methods for predictive analytics projects, analysts may also utilize unsupervised learning techniques during a predictive analytics project to gain better understanding of the data and accelerate the predictive modelling process.

You will implement these methodologies using Python, which is widely used thanks to its large toolkit in data processing and analysis. Business case studies will be introduced alongside the technical aspects of Python coding.

Course Aims

This course will provide you with advanced business analytics methods in the framework of "supervised, unsupervised, reinforcement learning". You will learn how to use Python to produce business insights and make data-driven decisions.

Relationship to Other Courses

This course will provide students with advanced business analytics methods to conduct predictive analytics. These methods are categorized into Supervised, Unsupervised, Reinforcement learning.

This course uses "supervised, unsupervised, reinforcement learning" framework, to focus on techniques. This is different from other courses that could use "Descriptive, Predictive and Prescriptive analytics" framework which focuses on the purpose of the analytics problem.

Students will learn how to use Python to implement the techniques in the "supervised, unsupervised, reinforcement learning" framework.

- supervised learning refers to techniques that require a defined response measure. We primarily use supervised learning techniques for predictive analytics projects. However, in the course of a predictive analytics project, analysts may use unsupervised learning techniques to understand the data and to expedite the model building process.

- unsupervised learning refers to techniques that find patterns in unlabeled data, or data that lacks a defined response measure, e.g., text mining, clustering, and dimension reduction.

- reinforcement learning is a branch of machine learning that uses simulated 'rewards' to teach AI systems to achieve desired outcomes in uncertain circumstances through trial and error.

Course Learning Outcomes

Course Learning Outcomes	Program learning outcomes
CLO1 : Apply analytic techniques to solve problems and identify opportunities for growth in the business context.	<ul style="list-style-type: none"> • PLO1 : Business Knowledge • PLO2 : Problem Solving
CLO2 : Predict future outcomes based on historical data through the application of analytics programming language tools.	
CLO3 : Compose a narrative that illustrates and solves a business problem, and present it convincingly with the aid of visual analytics.	
CLO4 : Collaborate with team members to achieve team objectives.	
CLO5 : Examine the ethical implications of data analytics and communication and their impacts on business and society.	<ul style="list-style-type: none"> • PLO5 : Responsible Business Practice

Course Learning Outcomes	Assessment Item
CLO1 : Apply analytic techniques to solve problems and identify opportunities for growth in the business context.	<ul style="list-style-type: none"> • Individual Assignment • Team Assignment • Final Exam
CLO2 : Predict future outcomes based on historical data through the application of analytics programming language tools.	<ul style="list-style-type: none"> • Individual Assignment • Team Assignment • Final Exam
CLO3 : Compose a narrative that illustrates and solves a business problem, and present it convincingly with the aid of visual analytics.	<ul style="list-style-type: none"> • Individual Assignment • Team Assignment • Final Exam
CLO4 : Collaborate with team members to achieve team objectives.	<ul style="list-style-type: none"> • Individual Assignment • Team Assignment • Final Exam
CLO5 : Examine the ethical implications of data analytics and communication and their impacts on business and society.	<ul style="list-style-type: none"> • Individual Assignment • Team Assignment • Final Exam

Learning and Teaching Technologies

Moodle - Learning Management System | Zoom | Anaconda - Jupyter Notebook | EdStem | Echo

360

Additional Course Information

The tutorial sessions will contain hands-on tasks, which can help students recap the lecture content. You are strongly encouraged to attend the tutorial sessions.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates	Program learning outcomes
Individual Assignment Assessment Format: Individual	15%	Start Date: Week 3 Due Date: Week 5: 24 June - 30 June	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO5 : Responsible Business Practice
Team Assignment Assessment Format: Group	30%	Start Date: Week 6 Due Date: Week 9: 22 July - 28 July	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO4 : Teamwork • PLO6 : Global and Cultural Competence • PLO7 : Leadership Development
Final Exam Assessment Format: Individual	55%		

Assessment Details

Individual Assignment

Assessment Overview

This assignment is designed to test students' ability to think critically in determining the most practical approach to maximise the value gained from an analytics project within a business.

Assesses: PLO1, PLO2, PLO3, PLO5, PLO6, PLO7

BCom Students: myBCom Course points for PLO3

Course Learning Outcomes

- CLO1 : Apply analytic techniques to solve problems and identify opportunities for growth in the business context.
- CLO2 : Predict future outcomes based on historical data through the application of analytics programming language tools.
- CLO3 : Compose a narrative that illustrates and solves a business problem, and present it convincingly with the aid of visual analytics.

- CLO4 : Collaborate with team members to achieve team objectives.
- CLO5 : Examine the ethical implications of data analytics and communication and their impacts on business and society.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Team Assignment

Assessment Overview

Students will have the opportunity to do a group project. Each group will conduct a project involving a data set. A project statement along with a data set will be provided by the instructor. The team is expected to analyse data and derive insights from the analysis to aid decision-making.

Assesses: PLO1, PLO2, PLO3, PLO4, PLO5, PLO6, PLO7

BCom Students: myBCom Course points for PLO2

Course Learning Outcomes

- CLO1 : Apply analytic techniques to solve problems and identify opportunities for growth in the business context.
- CLO2 : Predict future outcomes based on historical data through the application of analytics programming language tools.
- CLO3 : Compose a narrative that illustrates and solves a business problem, and present it convincingly with the aid of visual analytics.
- CLO4 : Collaborate with team members to achieve team objectives.
- CLO5 : Examine the ethical implications of data analytics and communication and their impacts on business and society.

Assignment submission Turnitin type

This is not a Turnitin assignment

Final Exam

Assessment Overview

The final assessment will be held during the University examination period with the date and time determined by the University. It will cover materials covered in lectures. The purpose of the exam is to evaluate your overall learning success in this course in a time-restricted setting. The final exam may cover all material discussed in the course, the lecture notes, the textbooks, and, especially, the assignments. You will be asked to both discuss and apply the concepts explained

in those sources. Your ability to clearly and coherently frame your answers will be part of the evaluation. You must plan on being available for the full examination period to attend the final exam. In addition, you should also ensure that you would be available for a supplementary examination in the event of illness or misadventure. The LIC will provide further advice on the exam during the semester.

Assesses: PLO1, PLO2, PLO3, PLO5, PLO6, PLO7

Course Learning Outcomes

- CLO1 : Apply analytic techniques to solve problems and identify opportunities for growth in the business context.
- CLO2 : Predict future outcomes based on historical data through the application of analytics programming language tools.
- CLO3 : Compose a narrative that illustrates and solves a business problem, and present it convincingly with the aid of visual analytics.
- CLO4 : Collaborate with team members to achieve team objectives.
- CLO5 : Examine the ethical implications of data analytics and communication and their impacts on business and society.

General Assessment Information

Late Submission Penalties

For assessments other than examinations, late submission will incur a penalty of 5% per day or part thereof (including weekends) from the due date and time. An assessment will not be accepted after 5 days (120 hours) of the original deadline unless special consideration has been approved. An assignment is considered late if the requested format, such as hard copy or electronic copy, has not been submitted on time or where the **wrong** assignment has been submitted. For assessments which account for 10% or less of the overall course grade, and where answers are immediately discussed or debriefed, the LIC may stipulate a different penalty. Details of such late penalties will be available on the course Moodle page.

Quality Assurance

The Business School is actively monitoring student learning and quality of the student experience in all its programs. A random selection of completed assessment tasks may be used for quality assurance, such as to determine the extent to which program learning goals are being achieved. The information is required for accreditation purposes, and aggregated findings will be used to inform changes aimed at improving the quality of Business School programs. All material used for such processes will be treated as confidential.

Grading Basis

Standard

Requirements to pass course

In order to pass this course, you must: 1) achieve a composite mark of at least 50 out of 100; 2) meet any additional requirements described in the Assessment Summary section. You are expected to attempt all assessment requirements in the course.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 27 May - 2 June	Lecture	Introduction to Business Analytics Methods
	Tutorial	Introduction to Business Analytics Methods
Week 2 : 3 June - 9 June	Lecture	Clustering and dimension reduction (PCA)
	Tutorial	Clustering and dimension reduction (PCA)
Week 3 : 10 June - 16 June	Lecture	Linear Regression & Logistic Regression
	Tutorial	Linear Regression & Logistic Regression
Week 4 : 17 June - 23 June	Lecture	Regularization & Generic ML methodology
	Tutorial	Regularization & Generic ML methodology
Week 5 : 24 June - 30 June	Lecture	Decision tree
	Tutorial	Decision tree
Week 6 : 1 July - 7 July	Project	No lecture and tutorial classes are scheduled during the flexibility week. In Week 6, students are expected to: <ul style="list-style-type: none">• review learning content from Week 1 to Week 5• work on the team assignment.
Week 7 : 8 July - 14 July	Lecture	Artificial Neural Networks
	Tutorial	Artificial Neural Networks
Week 8 : 15 July - 21 July	Lecture	Ensemble models
	Tutorial	Ensemble models
Week 9 : 22 July - 28 July	Lecture	Multi-armed bandit
	Tutorial	Multi-armed bandit
Week 10 : 29 July - 4 August	Lecture	CNN & Image Processing & Commercial tools
	Tutorial	CNN & Image Processing & Commercial tools

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

Course Resources

Recommended Resources

Textbook (recommended not compulsory):

Introduction to Machine Learning with Python: A Guide for Data Scientists, 1st Edition

ISBN10: 1449369413 | ISBN13: 9781449369415

By Andreas Muller, Sarah Guido

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow 3e: Concepts, Tools, and Techniques to Build Intelligent Systems, 2nd Edition

ISBN-10: 1098125975 ISBN13: 9781098125974

By Aurélien Géron

Additional Costs

NA

Course Evaluation and Development

Feedback is regularly sought from students and continual improvements are made based on this feedback. At the end of this course, you will be asked to complete the [myExperience survey](#), which provides a key source of student evaluative feedback. Your input into this quality enhancement process is extremely valuable in assisting us to meet the needs of our students and provide an effective and enriching learning experience. The results of all surveys are carefully considered and do lead to action towards enhancing educational quality.

You are also encouraged and very welcome to provide feedback and suggestions that you might have about the course directly to the lecturer(s) at any time throughout the term.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Bin Huang		Room 2068, Quadrangle Building		Online	No	Yes

Other Useful Information

Academic Information

COURSE POLICIES AND SUPPORT

The Business School expects that you are familiar with the contents of this course outline and the UNSW and Business School learning expectations, rules, policies and support services as listed below:

- Program Learning Outcomes
- Academic Integrity and Plagiarism
- Student Responsibilities and Conduct
- Special Consideration
- Protocol for Viewing Final Exam Scripts
- Student Learning Support Services

Further information is provided on the [key policies and support](#) page.

Students may not circulate or post online any course materials such as handouts, exams, syllabi or similar resources from their courses without the written permission of their instructor.

STUDENT LEARNING OUTCOMES

The Course Learning Outcomes (CLOs) – under the Outcomes tab – are what you should be able to demonstrate by the end of this course, if you participate fully in learning activities and successfully complete the assessment items.

CLOs also contribute to your achievement of the Program Learning Outcomes (PLOs), which are developed across the duration of a program. PLOs are, in turn, directly linked to [UNSW graduate capabilities](#). More information on Coursework PLOs is available on the [key policies and support](#) page. For PG Research PLOs, including MPDBS, please refer to the [UNSW HDR Learning Outcomes](#).

Academic Honesty and Plagiarism

As a student at UNSW you are expected to display [academic integrity](#) in your work and interactions. Where a student breaches the [UNSW Student Code](#) with respect to academic integrity, the University may take disciplinary action under the Student Misconduct Procedure. To assure academic integrity, you may be required to demonstrate reasoning, research and the process of constructing work submitted for assessment.

To assist you in understanding what academic integrity means, and how to ensure that you do comply with the UNSW Student Code, it is strongly recommended that you complete the [Working with Academic Integrity](#) module before submitting your first assessment task. It is a free, online self-paced Moodle module that should take about one hour to complete.

Submission of Assessment Tasks

SPECIAL CONSIDERATION

You can apply for special consideration when illness or other circumstances beyond your control interfere with your performance in a specific assessment task or tasks, including online exams. Students studying remotely who have exams scheduled between 10pm and 7am local time, are also able to apply for special consideration to sit a supplementary exam at a time outside of these hours.

Special consideration is primarily intended to provide you with an extra opportunity to demonstrate the level of performance of which you are capable. To apply, and for further information, see Special Consideration on the UNSW [Current Students](#) page.

Special consideration applications will be assessed centrally by the Case Review Team, who will update the online application with the outcome and add any relevant comments. The change to the status of the application immediately sends an email to the student and to the assessor with the outcome of the application.

Please note the following:

1. Applications can only be made through Online Services in myUNSW (see the UNSW [Current Students](#) page). Applications will not be accepted by teaching staff. The lecturer-in-charge/course coordinator will be automatically notified when your application is processed.
2. Applying for special consideration does not automatically mean that you will be granted a supplementary exam or other concession.
3. If you experience illness or misadventure in the lead up to an exam or assessment, you must submit an application for special consideration, either prior to the examination taking place, or prior to the assessment submission deadline, except where illness or misadventure prevent you from doing so.
4. If your circumstances stop you from applying before your exam or assessment due date, you must apply within 3 working days of the assessment or the period covered by your supporting documentation.
5. Under the UNSW Fit To Sit/Submit rule, if you sit the exam/submit an assignment, you are declaring yourself well enough to do so and are cannot subsequently apply for special consideration.
6. If you become unwell on the day of – or during – an exam, you must stop working on your exam, advise your course coordinator or tutor and provide a medical certificate dated within 24 hours of the exam, with your special consideration application. For online exams, you must contact your course coordinator or tutor immediately via email, Moodle or chat and advise

them you are unwell and submit screenshots of your conversation along with your medical certificate and application.

7. Special consideration requests do not allow the awarding of additional marks to students.

Further information on Business School policy and procedure can be found under “Special Consideration” on the [key policies and support](#) page.

LATE SUBMISSION PENALTIES

For assessments other than examinations, late submission will incur a penalty of 5% per day or part thereof (including weekends) from the due date and time. An assessment will not be accepted after 5 days (120 hours) of the original deadline unless special consideration has been approved. An assignment is considered late if the requested format, such as hard copy or electronic copy, has not been submitted on time or where the ‘wrong’ assignment has been submitted.

For assessments which account for 10% or less of the overall course grade, and where answers are immediately discussed or debriefed, the LIC may stipulate a different penalty. Details of such late penalties will be available on the course Moodle page.

FEEDBACK ON YOUR ASSESSMENT TASK PERFORMANCE

Feedback on student performance from formative and summative assessment tasks will be provided to students in a timely manner. Assessment tasks completed within the teaching period of a course, other than a final assessment, will be assessed and students provided with feedback, with or without a provisional result, within 10 working days of submission, under normal circumstances. Feedback on continuous assessment tasks (e.g. laboratory and studio-based, workplace-based, weekly quizzes) will be provided prior to the midpoint of the course.

Faculty-specific Information

PROTOCOL FOR VIEWING FINAL EXAM SCRIPTS

UNSW students have the right to view their final exam scripts, subject to a small number of very specific exemptions. The UNSW Business School has set a [protocol](#) under which students may view their final exam script. Individual schools within the Faculty may also set up additional local processes for viewing final exam scripts, so it is important that you check with your School.

If you are completing courses from the following schools, please note the additional school-

specific information:

- Students in the **School of Accounting, Auditing & Taxation** who wish to view their final examination script should also refer to [this page](#).
- Students in the **School of Banking & Finance** should also refer to [this page](#).
- Students in the **School of Information Systems & Technology Management** should also refer to [this page](#).

COURSE EVALUATION AND DEVELOPMENT

Feedback is regularly sought from students and continual improvements are made based on this feedback. At the end of this course, you will be asked to complete the [myExperience survey](#), which provides a key source of student evaluative feedback. Your input into this quality enhancement process is extremely valuable in assisting us to meet the needs of our students and provide an effective and enriching learning experience. The results of all surveys are carefully considered and do lead to action towards enhancing educational quality.

QUALITY ASSURANCE

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TEACHING TIMES AND LOCATIONS

Please note that teaching times and locations are subject to change. Students are strongly advised to refer to the [Class Timetable website](#) for the most up-to-date teaching times and locations.