COMM5601 Interdisciplinary Applications of Analytics Techniques - 2024

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General Course Information

Course Code : COMM5601
Year : 2024
Term : Term 1
Teaching Period : T1
Is a multi-term course? : No
Faculty : UNSW Business School
Academic Unit : UNSW Business School
Delivery Mode : Multimodal
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course provides you with a comprehensive understanding of complex business

interdisciplinary approaches to problem solving with a focus on the practical application of data analytics. You will sharpen your ability to select the most effective methods for diverse business situations, while also learning to critically assess the performance and appropriateness of chosen models in alignment with organisational aspirations.

An integral part of the course is a hands-on project that mirrors real-world, industry-oriented scenarios. This approach ensures that students' learning extends beyond theoretical concepts and is effectively applied across various business domains addressing important areas of such as ethics and sustainability in business practice.

Course Aims

The aims of this course are to provide students with an understanding of the main techniques of predictive analytics and data analytics techniques of particular relevance to business analytics, including:

Regression techniques and classification methods
Model selection and validation methods including cross-validation and dimension reduction
Linear and Non-linear models
Decision Trees and extensions
Supervised and unsupervised learning techniques
Ethics and sustainability implications for data analysis and modelling.

Relationship to Other Courses

The aims of this course are to provide students with an understanding of the main techniques of predictive analytics and data analytics techniques of particular relevance to business analytics, including

- Regression techniques and classification methods

- Model selection and validation methods including cross-validation and dimension reduction

- Linear and Non-linear models

- Decision Trees and extensions

- Supervised and unsupervised learning techniques

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Explain, describe and summarise the key aspects of the theory and practice of data analytics in the context of business applications.
CLO2 : Judge the performance, advantages and shortcomings of models used for predictive analytics in practice.
CLO3 : Use computer software to estimate and apply various statistical learning models for business applications.
CLO4 : Use effective presentation, discussion and report writing skills for explaining data analytics concepts used in business applications.
CLO5 : Collaboratively effectively to communicate business analytics results and insights to a variety of audiences.

Course Learning Outcomes	Assessment Item
CLO1 : Explain, describe and summarise the key aspects of the theory and practice of data analytics in the context of business applications.	• Course Portfolio • Group project • Individual assignment
CLO2 : Judge the performance, advantages and shortcomings of models used for predictive analytics in practice.	• Course Portfolio • Group project • Individual assignment
CLO3 : Use computer software to estimate and apply various statistical learning models for business applications.	• Course Portfolio • Group project • Individual assignment
CLO4 : Use effective presentation, discussion and report writing skills for explaining data analytics concepts used in business applications.	• Course Portfolio • Group project • Individual assignment
CLO5 : Collaboratively effectively to communicate business analytics results and insights to a variety of audiences.	• Group project

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

The approach adopted in this course is a "blended" classroom. This approach integrates student-centred, in-class (live) learning with self-study (home) learning. In this "blended" approach, the first conceptual encounter with the materials happens at home when students study the relevant course material (e.g. video lectures, lecture notes and reading lists). The second conceptual

encounter with the material of a given module happens in class (live online) to deepen the understanding of related topics, spark students' interest with practical case studies, answer students' questions in the self-study process and provide a context for the subsequent modules and lab sessions. In a lecture, the lecturer provides a high-level summary of the key concepts of the module and runs other activities (such as discussions, advanced exercises, guest lectures, real-life applications) that aim to cement students' learning. Finally, the students move on to practicing their knowledge via in-class (live online) tutorials in small groups. Tutorial sessions aim to equip students with the application and implementation skills using software (R, R Studio, R Markdown) by solving real-world problems and provide personalised help on a weekly basis. This course consists of:

Self-study course material available on the course Moodle website (e.g. textbook chapters, video lectures, lecture notes, exercises/questions),

- Weekly lectures,

- Weekly tutorials, and

- Weekly consultation times.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates	Program learning outcomes
Course Portfolio Assessment Format: Individual	30%	Start Date: Weekly Due Date: Weekly	
Group project Assessment Format: Group	30%	Due Date: 05/04/2024 04:00 PM	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO4 : Teamwork • PLO7 : Leadership Development
Individual assignment Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: 26/04/2024 04:00 PM	

Assessment Details
Course Portfolio

Assessment Overview

This multifaceted assessment comprises four distinct parts, emphasizing both the theoretical and applied aspects of the course. By engaging in critical reflection, active participation, in-class exercises, and online discussion, you will intertwine the academic foundation of the subject with real-world application, ensuring a comprehensive grasp of the complexities of data analysis and modelling.

PLO1-PLO3, PLO5 & PLO7

Course Learning Outcomes

- CLO1 : Explain, describe and summarise the key aspects of the theory and practice of data analytics in the context of business applications.
- CLO2 : Judge the performance, advantages and shortcomings of models used for predictive analytics in practice.
- CLO3 : Use computer software to estimate and apply various statistical learning models for business applications.
- CLO4 : Use effective presentation, discussion and report writing skills for explaining data analytics concepts used in business applications.

Detailed Assessment Description

For detailed information on assessment requirements and marking rubrics, please refer to the relevant sections in Moodle.

Assignment submission Turnitin type

This is not a Turnitin assignment

Group project

Assessment Overview

The group project provides a comprehensive learning experience by allowing you to tackle real industry challenges in the field of business analytics, supported by peers, academics, and industry practitioners. You will have an opportunity to solve a real-world problem. This hands-on, cross-disciplinary project not only aids in developing vital skills such as teamwork, communication, problem-solving and ethical and sustainable business practices but also promotes collaboration when tackling complex issues in the real world.

PLO1-PLO5, PLO7

Course Learning Outcomes

- CLO1 : Explain, describe and summarise the key aspects of the theory and practice of data analytics in the context of business applications.
- CLO2 : Judge the performance, advantages and shortcomings of models used for predictive analytics in practice.
- CLO3 : Use computer software to estimate and apply various statistical learning models for business applications.
- CLO4 : Use effective presentation, discussion and report writing skills for explaining data analytics concepts used in business applications.
- CLO5 : Collaboratively effectively to communicate business analytics results and insights to a variety of audiences.

Detailed Assessment Description

The group project provides a comprehensive learning experience by allowing you to tackle real industry challenges in the field of business analytics, supported by peers, academics, and industry practitioners. This hands-on, cross-disciplinary project not only aids in developing vital skills such as teamwork, communication, and problem-solving but also promotes collaboration when tackling complex issues in the real world.

Assignment submission Turnitin type

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

Individual assignment

Assessment Overview

In this assessment, you will analyse a dataset with an emphasis on practical business analytics and develop authentic outputs. The task aims to enhance your problem-solving skills in real-world scenarios. It is also intended to develop your skills in research, critical thinking and problem solving, your data analysis and programming skills, and your ability to communicate your ideas and solutions concisely and coherently.

PLO1-PLO3

Course Learning Outcomes

- CLO1 : Explain, describe and summarise the key aspects of the theory and practice of data analytics in the context of business applications.
- CLO2 : Judge the performance, advantages and shortcomings of models used for predictive analytics in practice.
- CLO3 : Use computer software to estimate and apply various statistical learning models for business applications.

- CLO4 : Use effective presentation, discussion and report writing skills for explaining data analytics concepts used in business applications.

Detailed Assessment Description

For detailed information on assessment requirements and marking rubrics, please refer to the relevant sections in Moodle.

Assignment submission Turnitin type

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

General Assessment Information

Grading Basis

Standard

Requirements to pass course

In order to pass this course students must:

- Achieve a composite mark of at least 50 out of 100
- Engage actively in course learning activities and attempt all assessment requirements
- Meet any additional requirements specified in the assessment details
- Meet the specified attendance requirements of the course

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 12 February - 18 February	Lecture	Course Introduction Regression Chapter 7, 8
Week 2 : 19 February - 25 February	Lecture	Logistic Regression Chapter 9
Week 3 : 26 February - 3 March	Lecture	Forecasting with Time Series Data Chapter 10
Week 4 : 4 March - 10 March	Lecture	Supervised Data Mining: k-Nearest Neighbors and Naive Bayes Chapter 11, 12
Week 5 : 11 March - 17 March	Lecture	Supervised Data Mining: Decision Trees Chapter 13
Week 6 : 18 March - 24 March	Module	Flexibility Week
Week 7 : 25 March - 31 March	Lecture	Unsupervised Data Mining Chapter 14
Week 8 : 1 April - 7 April	Lecture	Imbalanced Class Supplementary
Week 9 : 8 April - 14 April	Lecture	Deep Learning Supplementary
Week 10 : 15 April - 21 April	Lecture	Risk Analysis and Simulation Chapter 16

Attendance Requirements

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

General Schedule Information

Note: for more information on the UNSW academic calendar and key dates including study period, exam, supplementary exam and result release, please visit: https://student.unsw.edu.au/new-calendar-dates

Course Resources

Prescribed Resources

The website for this course is on Moodle. The course will use various digital resources, but they all will be linked from Moodle.

To access the Moodle online support site for students, follow the links from that website to UNSW Moodle Support/Support for Students. Additional technical support can be obtained from itservicecentre@unsw.edu.au (02 9385 1333).

All course contents will be available from the course website. It is essential that you visit the site regularly to see any notices posted there by the course coordinator, as it will be assumed that they are known to you within a reasonable time.

Textbooks

There are many books of relevance to the course topics. The following book will be the main text references for a substantial part of the course:

Jaggia, Sanjiv, Alison Kelly, Kevin Lertwachara and Leida Chen. Business Analytics: Communicating with Numbers 2/e. McGraw-Hill Education, 2022

Additional readings from the professional actuarial literature will also be used to provided additional context, details, and examples. This will be communicated in the course website.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Lecturer	Xiao Xu					Yes	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 Plagarism

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

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.

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.