



MISSION: To develop a unique business school identity which is distinctive in the marketplace and provides a clear value proposition for students. This will be achieved by embedding the themes of entrepreneurship and innovation, digitalisation and data within our programs and embracing sustainability, work integrated learning and a commitment to social justice.

OVERVIEW

Course Description

Businesses and governments have massive data available to them with which to make systematic strategic decisions. Artificial Intelligence (AI) and machine learning can process and provide fast turnover of these very large amounts of information. This course is designed to provide students with knowledge related to established and emerging developments of AI in organisations using real-world examples. Applications of AI in various areas including finance, fraud detection, customer relationship management, and human resources management will be discussed.

Sustainable Development Goals



Contact Hours

Lecture/Workshop

Face to Face on Campus

A two (2) hour(s) integrated learning session plus one (1) hour workshop per Week, commencing in Week 2

Students are expected to complete four (4) hours of guided learning via online preparation, lectures, interactive workshops, tutorials, discussion groups or self-directed learning and an additional six (6) hours of independent study per week.

Unit Weighting

10

Assumed Knowledge

BUSA1001 Introduction to Business Information Systems/BUSA2001 Big Data Analytics

Workload

Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

Please refer to the course CANVAS site for details of teaching staff for ALL course offerings. The primary contact for courses is the Course Coordinator, whose details are listed on the course CANVAS site.

Student Consultation

A minimum of one (1) hour of consultation per week. Please see course CANVAS site for details of time and location.

Course Learning Outcomes

On successful completion of this course, students will be able to:

1. Demonstrate an understanding of the main concepts of Artificial Intelligence and machine learning;
2. Demonstrate understanding of how to operationalise Artificial Intelligence and machine learning;
3. Identify key areas to apply Artificial Intelligence and machine learning techniques within a business organisation; and
4. Discuss ethical, societal, and organisational issues with and the risk of using Artificial Intelligence and machine learning techniques.

COURSE OUTLINE

ASSESSMENT DETAILS

This course has 3 assessments. Each assessment is described in more detail in the sections below:

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Mid Term Quiz	Week 7 in class	Individual	25%	1, 2, 3
2	Case Study and Report on Artificial Intelligence (AI) in business	Friday of Week 12 by 5:00 pm	Individual	35%	2, 3, 4
3	Final Exam	During formal exam period	Individual	40%	1, 2, 3, 4

Please note: students are advised that all assessments must be submitted in English. Assessment items not submitted in English will receive a mark of zero.

Results of individual assessment items and final results, including those provided via the Learning Management System (LMS) are 'unofficial results' until they are confirmed as finalised by the School Assessment Body and the Head of School or delegate. Finalised results are released directly to students on the Fully Graded Date of the relevant Semester/Trimester.

Time referenced is time in Newcastle NSW

Late Submissions	The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.
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Assessment 1 – Mid Term Quiz

Assessment Type	Quiz
Purpose	The purpose of this class test is to assess student’s learning progression at a primary stage. The test will be based on multiple choice and short answer questions. The questions will be related to students’ understanding of the main concepts of AI and machine learning, how to operationalise AI techniques and tools for enhancing decision support or monitoring aspects within a business organisation. The outcome of the assessment will provide an early immersion of student’s learning and encouragement with opportunity to utilise feedback in improving student learning to achieving their successful comprehension of the course. This test will be an online activity in the classroom.
Description	The mid-term quiz will cover materials of lectures and tutorials from week 1 to 6 and relevant textbook chapters. The coverage areas will be on different types of AI, computational performance vs human performance, cognitive sciences, business decision theory, robotic process of automations, reinforcement learning methods, machine interfaces, knowledge-based reasoning, and AI for problem solving in businesses. There will be a mock-up paper uploaded on CANVAS, prior to the online test, so that student may follow as a guide of practices for preparation. Students are not allowed to use any materials or textbook during the online class test in week 7. As part of this assignment, substantial feedback on each answer of the online class test will be provided to rectify students’ learning in this area of study.
Weighting	25%
Length	50 minutes
Due Date	Week 7 (During the tutorial session)
Submission Method	Online via CANVAS
Assessment Criteria	Each question will have defined details online
Return Method	Online submission
Feedback Provided	Online – All correct answers and total score will be provided immediately after

Assessment 2 - Case Study and Report on Artificial Intelligence (AI) in business

Assessment Type	Case Study / Problem Based Learning
Purpose	The purpose of this assessment is to assess student skills and knowledge on designing a robotic automation process and its potential impacts in any aspects of business operation. The report will also help assess how do students apply knowledge on using different AI techniques to improve practices and processes and justify their arguments through critical analysis on real-world issues in organisations.
Description	While applications of AI are increasingly being recognised in a wide range of business sectors, skills will become of paramount elements for managers and executives to understand how effective AI could be designed, analyse its potential risks and other associated issues in business organisation. The report should describe why a new robotic automation process in a particular operation of business is an essential innovation, with its values to improve managerial practices. The report should relate to your independent investigation on AI functions using data programming language (such as Python) and going through the tutorial case studies, which will be provided on CANVAS. A report template will be uploaded on CANVAS for student to start with the assignment, but it would be a subject to be tailored to adjust the selected case context for the assessment.
Weighting	35%
Length	3000 words
Due Date	Friday of Week 12 by 5:00 pm
Submission Method	Online via - CANVAS
Assessment Criteria	See the assessment rubrics on CANVAS site for further details
Return Method	Online
Feedback Provided	Online – through the rubrics and comments feedback

Assessment 3 - Final Examination

Assessment Type	Formal Examination
Purpose	The examination will assess the overall learning outcomes from the course and reflections based on the other assignments of the course.
Description	The final examination will consist of short answer and problem-solving questions relevant to the entire coverage of the course from week 1 to 13. For preparation, there will be a mock-up exam paper uploaded on CANVAS site, a week prior to the final exam. This course has a RESTRICTED OPEN BOOK examination. A memory aid is permitted. The memory aid is a single double sided A4 sheet of handwritten or typed notes for use during the examination. Note: memory aids must be left on the examination table and cannot be removed from the examination venue.
Weighting	40%
Length	120 minutes
Due Date	Formal Exam Period
Submission Method	Formal Examination
Assessment Criteria	Please refer to rubric on CANVAS site for further details.
Return Method	Not Returned
Feedback Provided	No Feedback. Examination scripts will not be returned to students. Final examination scripts will be made available for review by students, upon request, in a controlled and monitored setting. Students are required to make requests, directly to the relevant course coordinator. Completed examination scripts are kept by the Newcastle Business School for a period of six (6) months only, from the relevant fully graded date. Requests made after the six (6) month period cannot be considered.

SYLLABUS

Course Content

Topics in the course include but are not limited to the following:

1. Introduction to artificial intelligence (AI)
2. Business applications of machine learning and personalisation
3. AI-driven business and government transformation
4. AI in the organisational knowledge, reasoning and planning
5. Benefits and risks of using AI for communicating, perceiving and decision making

Course Materials

Required Text:

Russell, S. and Norvig, P. (2022). *Artificial Intelligence: A Modern Approach*, 4th Edition, Publisher: Pearson Education

ISBN: 978-0-13-461099-3

An additional Readings list will be provided on the course CANVAS site.

SCHEDULE

Week	Topic	Class Preparation	Assessment
1	Introduction to Artificial intelligence (AI) in Business (type of AI, foundations of AI in business, computational performance vs human performance, and cognitive sciences for business)	Chapter 1 (textbook)	No tutorial class
2	Introduction to decision theory, game theory, probability theory, and operations research (e.g. reinforcement learning methods)	Chapter 2 (textbook)	Overview of current trends and applications of AI (e.g. Oxford AI Program; application of computer vision and cyber physical systems)
3	Robotic automations in business	Resources on CANVAS	Basic theory of probability and decision theories
4	Human brain and machine interfaces	Resources on CANVAS	Capacities of different AI and computing platforms and Moore's Law
5	AI for problem solving in businesses	Chapter 3 (textbook)	Intro to <i>Natural Language Processing (NLP)</i> programming for AI in Business (See resources on CANVA)
6	Knowledge based agents for reasoning and planning	Resources on CANVAS	Working with numbers and operators
7	Applications of Computer Visions in operational decision making	Resources on CANVAS	Assessment 1 due: In-Class Quiz
8	Expert systems for businesses	Chapter 7 (textbook) and online resources	Solving Queries in NLP
9	Applications of machine learning and deep learning methods in business decision making	Chapter 19 (textbook)	Problem based learning in NLP
10	Natural Language Processing applications for businesses	Chapter 24 (textbook)	Natural Language Processing exercises
11	Ethical, societal and legal aspects of AI and cyber security and cybernetics	Resources on CANVAS	Case study on sentiment analysis
12	Quantum computing and AI	Resources on CANVAS	Case study on quantum computing for AI solutions Assessment 2 due: Friday of week 12 by 5:00 pm
13	Review lecture	Resources on CANVAS	Revision tasks

If a lecture/class is scheduled on a public holiday, a make-up lecture may be announced by the course coordinator on the course CANVAS site.

CONTACTS

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PSB Academy Enquiries

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ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

*Skills are those identified for the purposes of assessment task(s).

Communication Methods	Communication methods used in this course include: <ul style="list-style-type: none"> - CANVAS Course Site: Students will receive communications via the posting of content or announcements on the CANVAS course site. - Email: Students will receive communications via their student email account. - Face to Face: Communication will be provided via face to face meetings or supervision.
Course Evaluation	Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.
Oral Interviews (Vivas)	As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the Oral Examination (viva) Procedure . In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the Student Conduct Rule .
Academic Misconduct	All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to https://policies.newcastle.edu.au/document/view-current.php?id=35 .
Adverse Circumstances	The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where: <ol style="list-style-type: none"> 1. the assessment item is a major assessment item; or 2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system; 3. you are requesting a change of placement; or 4. the course has a compulsory attendance requirement. Before applying you must refer to the Adverse Circumstances Affecting Assessment Items Procedure available at: https://policies.newcastle.edu.au/document/view-current.php?id=236
Important Policy Information	The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at https://www.newcastle.edu.au/current-students/no-room-for/policies-and-procedures that support a safe and respectful environment at the University.

This course outline was approved by the Head of School. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.

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