

Unit of Study: ICT5356 Principles of Artificial Intelligence

Overview:

Principles of Artificial Intelligence provides students with a solid understanding of the fundamental concepts, techniques, and applications of artificial intelligence (AI).

Students will delve into the historical context of artificial intelligence, explore different types of AI, and examine real-world applications. They will gain hands-on experience with machine learning, deep learning, natural language processing, computer vision, and ethical considerations in AI development. Students will explore AI applications in various domains.

By the end of the unit, students will have a strong foundation in AI and be well-prepared to tackle the challenges and opportunities presented by this rapidly evolving field.

Course(s)	Master of Information Technology
Credit Points	8 credit points
Duration	12 weeks (10 teaching weeks; 1 revision week; 1 final assessment week)
Level	Postgraduate Intermediate
Student Workload	Students should expect to spend approximately 13 hours per week over 12 weeks (totalling approximately 156 hours) on learning activities for this unit.
Mode(s) of Delivery	Online
Pre-Requisites	ICT5150 Information Systems
Unit Coordinator	As per current timetable
Contact Information	Consultation: 1 hour scheduled session

Unit Learning Outcomes

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

- ULO1 Analyse the evolution of AI technology and contrast AI and machine learning to traditional programming and software.
- ULO2 Research machine learning techniques and apply appropriate techniques to the development of machine learning models.
- ULO3 Design and interpret deep learning neural networks, including Convolution Neural Networks (CNNs) and Recurrent Neural Networks (RNNs).
- ULO4 Plan, design and create AI applications in various domains, including Natural Language Processing (NLP) and computer vision.
- ULO5 Evaluate the ethical considerations in the development and use of AI technology.
- ULO6 Appraise the future of AI and its impact on our society, industries, and culture.

Weekly Schedule

Detailed information for each week's activities can be found on Unit's Weekly Modules in Canvas.

Week	Topic
Week 1	Introduction to Artificial Intelligence (AI)
Week 2	The basics of Machine Learning and AI Applications
Week 3	Introduction to Deep Learning and Neural Networks
Week 4	Introduction to Natural Language Processing
Week 5	Natural Language Processing and Language Generation Models
Week 6	Introduction to Computer Vision
Week 7	Advanced Computer Vision
Week 8	Ethical Considerations in AI Development
Week 9	AI Applications in Various Domains
Week 10	Future Implications
Week 11	REVISION
Week 12	FINAL ASSESSMENT

Assessments

1. All assessments are compulsory.
2. To pass the unit students must:
 - achieve a total of 50% or more of marks offered; and
 - pass all individual invigilated assessments; and
 - have attempted all assessments.

Where one or more of these requirements are not met, the Board of Examiners will consider a student's overall progress towards meeting the unit learning outcomes and any special circumstances before reaching a decision.

3. The Board of Examiners may grant a supplementary assessment where a student:
 - achieves a total of 45% or more; and
 - has passed all individual invigilated assessments in the unit; and
 - has attempted all assessments; and
 - has a recommendation for supplementary assessment by the Unit Coordinator and the Head of Discipline.

Where one or more of these requirements are not met, the Board of Examiners will consider a student's overall progress towards meeting the unit learning outcomes and any special circumstances before reaching a decision. Attendance and engagement in class will be considered.

4. APIC awards common result grades as set out in the [Award of Grade Policy](#).
5. Detailed information for each assessment can be found on the Unit's Home Page and in the Assessment Brief.

Assessment Task	Type	Weighting	Length	Due	ULOs Assessed
Assessment 1: Quiz Respond to questions to describe various AI and machine learning approaches.	Individual  Invigilated 	18%	900 words	Weeks 3, 6, 8	ULO2 ULO3
Assessment 2: Supervised Machine Learning Project Implement a machine learning model to solve selected problems using supervised machine learning and related data sets. Write a report outlining steps taken.	Individual 	20%	500 words + model	Week 4	ULO1 ULO2
Assessment 3: Laboratory Practicum Implement machine learning models for given scenarios and corresponding training data. Write a report outlining steps taken.	Individual  Invigilated 	12%	equiv. 1000 words	Weeks 5, 9	ULO1 ULO2 ULO3 ULO4
Assessment 4: NLP / Computer Vision Project Implement a machine learning model to perform natural language processing (text classification) or computer vision (image classification) tasks. Write a report outlining steps taken.	Group 	25%	500 words + model	Week 7	ULO2 ULO3 ULO4
Assessment 5: Report Write a report to discuss emerging AI technologies, guidelines for their development, and their impact on society, industry and other technology.	Individual 	25%	1000 words	Week 12	ULO5 ULO6

equiv. – equivalent word count based on the Assessment Load Equivalence Guide. It means this assessment is equivalent to the normally expected time requirement for a written submission containing the specified number of words.

Course Reserve

Course Reserve includes all required resources and reading material for the unit of study. You can access Course Reserve via [APIC Library](#) or via the Course Reserve link on the unit's homepage.

Recommended Readings:

Arias, C.R., 2022. An introduction to artificial intelligence. AI, Faith, and the Future: An Interdisciplinary Approach, p.15.

Broussard, M., 2019. Artificial Unintelligence, First Edition. MIT Press, USA. IBM, "Supervised Learning", URL: <https://www.ibm.com/topics/supervised-learning>

Taulli, T., 2019. Artificial Intelligence Basics, First Edition. Springer, NY, USA.

Tiwari, R., “AI 101 An Introduction to Artificial Intelligence”, URL: https://www.researchgate.net/publication/367089697_AI_101_An_Introduction_to_Artificial_Intelligence Wooldridge,

M., 2020. A Brief History of Artificial Intelligence, First Edition. Flatiron Books, NY, USA.

Other Resources Requirements:

Unit is completed online via a computer or similar device. Students need access to a computer.

Machine learning projects will be completed using Orange datamining software, which students will download.

Academic integrity

Ethical conduct and academic integrity and honesty are fundamental to the mission of APIC and academic misconduct will not be tolerated by the College. It is the responsibility of every student to make sure that they understand what constitutes academic misconduct and to refrain from engaging in it. Please refer to APIC’s [Academic Integrity Policy](#) for further details.

Other Important Information and Links

<p>Special consideration</p> <p>If your academic work is impacted by significant documented illness, hardship, or other adverse circumstances beyond your control, you may make an application for Special Consideration. Please refer to the Assessment Policy for further details.</p>	<p>Late submission</p> <p>Penalties apply when work is submitted after the due date without approval. Please refer to the Assessment Policy for information about late submission.</p>
<p>Assessment appeals</p> <p>If you are concerned about a mark you have received for an assessment or final grade, you may apply to formally appeal the grade. Please see the Assessment Policy for further details.</p>	<p>Award of grades</p> <p>APIC awards common result grades, set out in the Award of Grade Policy.</p>
<p>Expectations of student conduct</p> <p>Students are expected to conduct themselves in a manner that is consistent with a safe and respectful study environment. More information can be found in the Student Code of Conduct.</p>	<p>Study resources</p> <p>APIC Library and Student Learning Support resources and services can be accessed via the Student Lounge or your Dashboard on the OLS (Canvas).</p>

Student Services

The Student Services team provides administrative support for students and handles enquiries about enrolment, timetables, important dates and submitting forms. More information can be found on the [Student Services page on the OLS \(Canvas\)](#).

Key dates

Key dates through the academic year, including teaching periods, census, payment deadlines and exams can be found on the [Academic Calendar](#) section of the APIC website.

Changes and Updates to the Unit of Study Guide

This Unit of Study Guide may be updated and amended from time to time. Students will be notified of any changes to the unit via the Online Learning System (Canvas) space for the unit.

This Unit of Study Guide was last modified on 5/4/2024.