

School of Science, Computing and Engineering
Technologies



Unit Outline

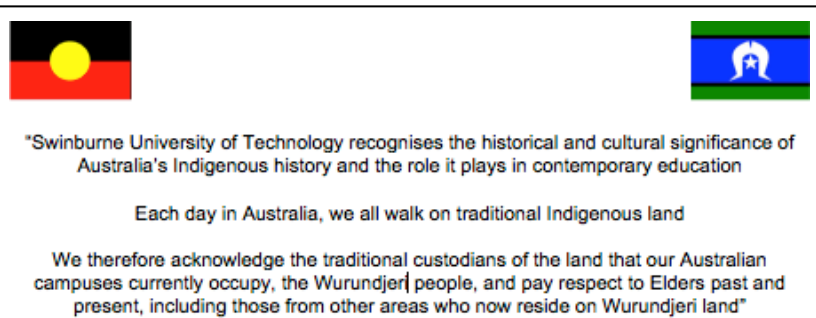
COS30019

Introduction to Artificial Intelligence

Semester January 2026

Please read this Unit Outline carefully. It includes:

- PART A** Unit summary
- PART B** Your Unit in more detail
- PART C** Further information



This content is protected and may not be shared, uploaded, or distributed.

PART A: Unit Summary

| | |
|----------------------------------|--|
| Unit Code(s) | COS30019 |
| Unit Title | Introduction to Artificial Intelligence |
| Duration | One semester |
| Total Contact Hours | 48 hours |
| Requisites: | |
| Pre-requisites | COS20007 Object Oriented Programming OR COS30008 Data Structures and Patterns |
| Co-requisites | Nil |
| Concurrent pre-requisites | Nil |
| Anti-requisites | Nil |
| Assumed knowledge | Object oriented programming at an intermediate level |
| Credit Points | 12.5 credit points |
| Campus/Location | Swinburne Vietnam |
| Mode of Delivery | Blended |
| Assessment Summary | Assignment 1 (Individual) 20% Assignment 2 (Group) 50% Final Assessment Questionnaire (Individual) 30% |

Aims

This unit aims to provide students with an in-depth understanding of algorithmic problem-solving techniques and the sophisticated concepts of artificial intelligence employed to tackle intricate problems. The unit also covers the ethical issues and security risks associated with AI and introduces students to a range of principles and frameworks targeting these issues. It presupposes that students possess proficient programming skills in at least one of the following languages: Python, Java, C#, or C++.

Unit Learning Outcomes

Students who successfully complete this unit can:

Describe and interpret the fundamental concepts of Artificial Intelligence (AI) and generic problem-solving techniques

Identify and explain the ethical principles and frameworks applicable to AI and the security risks associated with AI

Apply advanced algorithms and data structures to solve complex computing problems

Design software that implements AI concepts and algorithms in a project-based context

This content is protected and may not be shared, uploaded, or distributed.

Graduate Attributes

The Swinburne Graduate Attributes describe the capability of our graduates to use knowledge, skills and behaviours to contribute to society meaningfully and positively. They include professional, self-directed learning and future-ready skills.

This unit contributes to the development of the following Swinburne Graduate Attributes:

GA2 Communication - Communicating using different media: Students are required to write reports (for the assignments) to discuss their understanding of the problems as well as their approaches for solving the problems. They are also required to provide comments to explain their code.

GA3 Teamwork - Collaboration and negotiation: Students are required to work within a team for Assignment 2.

GA5 Digital literacies– Information literacy: Students are required to perform research on the Internet to learn about algorithms and how to implement them to fulfil the requirements of the Assignments.

GA6 Digital Literacies– Technical literacy: Students are required to use a programming language (e.g., Python) to implement algorithms learned from this unit and deliver a working software.

Other graduate attributes may be practised in the unit but are not formally taught as part of the unit content, nor incorporated within formal assessment.

GA1 Communication - Verbal communication.

GA4 Teamwork – Teamwork roles and processes.

Content

Introduction to Artificial Intelligence and Intelligent Agents

Ethics issues and security risks associated with AI systems

Ethical principles and frameworks applicable to AI systems

Introduction to Logic and Reasoning

Uninformed and Informed Search

Knowledge Representation

Expert Systems

AI Planning

Uncertain Knowledge and Reasoning

Decision Making with Uncertainty

Adaptation and Machine Learning

Philosophical Aspects of AI

This content is protected and may not be shared, uploaded, or distributed.

PART B: Your Unit in more detail

Unit Improvements

Feedback provided by previous students through the Student Survey has resulted in improvements that have been made to this unit. Recent improvements include:

- Mid-semester test has been replaced by Assignment 1 on AI ethics
- New content on AI ethics has been added to the unit
- Content on First-Order Logic has been replaced by Deep Learning

Unit Teaching Staff

| Name | Role | Email / Teams | Consultation Times |
|-------------------------|------------------|-----------------------------|----------------------|
| (HN) Pham, Thi Kim Dung | Lecturer | dtpham@swin.edu.au | By email appointment |
| (HCM) Doan Khai | Lecturer | khaidoan@swin.edu.au | By email appointment |
| (HCM) Quang Chiem | Lecturer | qchiem@swin.edu.au | By email appointment |
| | Unit Coordinator | huynhhoainguyen@swin.edu.au | By email appointment |

Learning and Teaching Structure

| Category | Activity | Total Hours | Hours per Week | Teaching Period Weeks |
|-----------|----------|-------------|----------------|-----------------------|
| In person | Lectures | 24 hours | 2 hours | Weeks 1 to 12 |
| In person | Class | 24 hours | 2 hours | Weeks 1 to 12 |

This content is protected and may not be shared, uploaded, or distributed.

Week by Week Schedule

| Week | Week Beginning | Teaching and Learning Activity | Student Task or Assessment |
|---|----------------|--|--|
| 1 | 05 Jan | Lecture: The foundations of AI & Intelligent Agents Online materials: Introduction & the foundations of AI Tutorial: The foundations of AI | Introduction & the foundations of AI - online discussion Readings <Textbook Chapters 1 & 2> |
| 2 | 12 Jan | Lecture: Ethical and security issues associated with AI systems Online materials: AI Ethics materials | AI ethics Readings AI Ethics materials |
| 3 | 19 Jan | Lecture: Search – Uninformed Online materials: Search - Uninformed Tutorial: Search – Uninformed | Search - Uninformed Readings <Chapter 3 > Weekly check-in – Assignment 1 |
| 4 | 26 Jan | Lecture: Search – Informed Online materials: Search - Informed Tutorial: Search – Informed | Search – Informed Readings <Chapters 3 & 4 > Weekly check-in – Assignment 1 Weekly check-in – Assignment 2A |
| 5 | 02 Feb | Lecture: Adversarial Search Online materials: Adversarial Search Tutorial: Adversarial Search | Adversarial Search Readings <Chapter 5> Weekly check-in – Assignment 1 Weekly check-in – Assignment 2A |
| Lunar New Year Holiday from 08-Feb to 22-Feb inclusively | | | |
| 6 | 23 Feb | Lecture: Machine Learning Online materials: Machine Learning Tutorial: Machine Learning | Machine Learning Readings <Chapter 18> Assignment 1 submission due 1 Mar 2025_23:59 VN Time Assignment 2A submission due 1 Mar 2025_23:59 VN Time |
| 7 | 02 Mar | Lecture: Deep Learning Online materials: Deep Learning Tutorial: Deep Learning | Deep Learning Readings <Poole and Mackworth's Reference Book, Chapter 8> Weekly check-in – Assignment 2B |
| 8 | 09 Mar | Lecture: Logic & Knowledge Representation Online materials: Logic & Knowledge Representation Tutorial: Logic & Knowledge Representation | Logic & Knowledge Representation Readings <Textbook Chapter 7> Weekly check-in – Assignment 2B |
| 9 | 16 Mar | Lecture: Propositional Logic Online materials: Propositional Logic Tutorial: Propositional Logic | Propositional Logic Readings <Chapters 7> Weekly check-in – Assignment 2B |
| 10 | 23 Mar | Lecture: Planning Online materials: Planning Tutorial: Planning | Planning Readings <Chapter 10> Weekly check-in – Assignment 2B |

This content is protected and may not be shared, uploaded, or distributed

| | | | |
|----|-----------------|--|---|
| 11 | 30 Mar | Lecture: Probabilistic Reasoning and Bayesian Networks Online materials: Probabilistic Reasoning and Bayesian Networks Tutorial: Probabilistic Reasoning and Bayesian Networks | Probabilistic Reasoning and Bayesian Networks Readings <Chapters 13& 14> Assignment 2B submission due 5 April 2025_23:59 VN Time |
| 12 | 06 Apr | Lecture: Summary and Review Online materials: Summary and review Tutorial: Reviews of tutorial material & Practice exam questions | Assignment 2C submission due 12 April 2025_23:59 VN Time |
| | 13 Apr – 18 Apr | Exam Period | Final Assessment Questionnaire (to be announced by the university) |

Assessment

a) Assessment overview

| Tasks and Details | Individual or Group | Weighting | Mapped Unit Learning Outcomes | Mapped Graduate Attributes | Assessment Due Date |
|--------------------------------------|---------------------|-----------|-------------------------------|------------------------------|---|
| 1. Assignment 1 (Research Report) | Individual | 20% | 1, 2 | GA2, GA5 | End of week 6 |
| 2. Project Assignment (Assignment 2) | Group | 50% | 1, 3, 4 | GA1, GA2, GA3, GA4, GA5, GA6 | Part A (End of week 6) Part B (End of week 11) Part C (End of week 12) |
| 3. Final Questionnaire | Individual | 30% | 1, 3 | GA2, GA5, GA6 | Final Assessment Period |

| Assessment Requirements | Details |
|--|--|
| a) Use of generative AI (genAI) in this unit | <p>The valid use of genAI in this unit is as follows:</p> <p>Assessment Task 1 & 2: genAI may be used for brainstorming, creating structures, and generating ideas for improving work. Any use of genAI must be acknowledged, with prompts and outputs included in an appendix.</p> <p>Assessment Task 3: The assessment should be completed entirely without AI assistance.</p> |

This content is protected and may not be shared, uploaded, or distributed.

| | |
|------------------------------------|---|
| b) Hurdle requirements | |
| c) Final assessment period | <p>If the unit you are enrolled in has a final assessment (including invigilated exams), you will be expected to be available for the entire final assessment period including any Special Exam period.</p> <p>Task 3 (Final Questionnaire) will be conducted online and will be an open book test.</p> |
| d) Submission requirements | <p>Assignments and other assessments are generally submitted online through the Canvas assessment submission system which integrates with the Turnitin. Please ensure you keep a copy of all assessments that are submitted.</p> <p>In cases where a hard copy submission is required an Assessment Cover Sheet must be submitted with your assignment. The standard Assessment Cover Sheet is available from the Submitting work webpage or www.swinburne.edu.au/studentforms/.</p> <p>All assessments are to be submitted to Canvas</p> |
| e) Extensions and late submissions | <p>Late Submissions - Unless an extension has been approved, late submissions will result in a penalty. You will be penalised 10% of your achieved mark for each working day the task is late, up to a maximum of 5 working days. After 5 working days, a zero result will be recorded.</p> |
| f) Referencing | <p>To avoid breaching academic integrity, you are required to provide references whenever you include information from other sources in your work and acknowledge when you have used Artificial Intelligence (AI) tools (such as ChatGPT). Further details regarding academic integrity are available in Section C of this document.</p> <p>Referencing conventions required for this unit are:</p> <p>Anderson, J. & Poole, M. (2001). <i>Assignment and thesis writing 4th Edn.</i> Brisbane: John Wiley & Sons</p> <p>Helpful information on referencing can be found at http://www.swinburne.edu.au/library/referencing/</p> |

| | |
|-------------------------|--|
| g) Groupwork guidelines | <p>A group assignment is the collective responsibility of the entire group, and if one member is temporarily unable to contribute, the group should be able to reallocate responsibilities to keep to schedule. In the event of longer-term illness or other serious problems involving a member of group, it is the responsibility of the other members to notify immediately the Unit Convenor or relevant tutor.</p> <p>Group submissions must be submitted with an Assignment Cover Sheet, signed by all members of the group. All group members must be satisfied that the work has been correctly submitted. Any penalties for late submission will generally apply to all group members, not just the person who submitted.</p> |
|-------------------------|--|

Required Textbook(s)

The required textbook(s) can be purchased from bookshops and may be available through the Swinburne Library or can be purchased from bookshops.

Course Notes:

Lecture Notes, 2025 (Available from the subject website during the teaching period)

Text Book:

Russell, S.J. and Norvig, P., "Artificial Intelligence: A Modern Approach," 3rd edition, Prentice-Hall, 2010, OR 4th edition, Pearson Education Limited, 2022.

Recommended Reading Materials

Swinburne Library has a large collection of resources. Listed below are some references that will provide valuable supplementary information to this unit. It is also recommended that you explore other sources to broaden your understanding.

- *B. Coppin, "Artificial Intelligence Illuminated" Jones and Bartlett Publishers, 2004*
- *Poole David L. and Mackworth Alan K. 2023. Artificial Intelligence: Foundations of Computational Agents. 3rd Edition, Cambridge University Press, USA.*

PART C: FURTHER INFORMATION



For further information on any of these topics, refer to Swinburne's Student webpage <http://www.swinburne.edu.au/student/>

Student behaviour and wellbeing

All students are expected to: act with integrity, honesty and fairness; be inclusive, ethical and respectful of others; and appropriately use University resources, information, equipment and facilities. All students are expected to contribute to creating a work and study environment that is safe and free from bullying, violence, discrimination, sexual harassment, vilification and other forms of unacceptable behaviour.

The [Student Charter](#) describes what students can reasonably expect from Swinburne in order to enjoy a quality learning experience. The Charter also sets out what is expected of students with regards to your studies and the way you conduct yourself towards other people and property.

You are expected to familiarise yourself with University regulations and policies and are obliged to abide by these, including the [Student Academic Misconduct Regulations](#), [Student General Misconduct Regulations](#) and the [People, Culture and Integrity Policy](#). Any student found to be in breach of these may be subject to disciplinary processes.

Examples of expected behaviours are:

- conducting yourself in teaching areas in a manner that is professional and not disruptive to others
- following specific safety procedures in Swinburne laboratories, such as wearing appropriate footwear and safety equipment, not acting in a manner which is dangerous or disruptive (e.g. playing computer games), and not bringing in food or drink
- following emergency and evacuation procedures and following instructions given by staff/wardens in an emergency response.

Canvas

You should regularly log on to the Swinburne learning management system, Canvas. You can access Canvas via the [Student login](#) webpage or <https://swinburne.instructure.com/> Canvas is updated regularly with important unit information and communications.

Communication

All communication will be via your Swinburne email address. If you access your email through a provider other than Swinburne, then it is your responsibility to ensure that your Swinburne email is redirected to your private email address.

Academic Integrity

Academic integrity is about taking responsibility for your learning and submitting work that is honestly your own. It means acknowledging the ideas, contributions and work of others; referencing your sources and acknowledging the use of generative artificial intelligence; contributing fairly to group work; and completing tasks, tests and exams without cheating. Artificial intelligence tools should only be used where approved by the Unit Convenor.

Swinburne University uses the Turnitin system, which helps to identify inadequate citations, poor paraphrasing and unoriginal work in assignments that are submitted via Canvas. Your Unit Convenor will provide further details.

This content is protected and may not be shared, uploaded, or distributed.

Plagiarism, collusion, contract cheating, unauthorised file sharing, falsification, fabrication, manipulation or misrepresentation of information, reuse of previous work and non-compliance with instructions in an invigilated or non-invigilated assessment item are all breaches of academic integrity and treated as academic misconduct. Examples of breaches of academic integrity include, but are not limited to:

- submitting work as your own for assessment that has been fully or partially completed by a third party, either paid or unpaid
- using output from artificial intelligence tools (e.g. ChatGPT) in whole or part without acknowledgement and/or without the approval of the Unit Convenor
- using another person's work or ideas as though it is your own work, without appropriate attribution
- working closely with another student or group of students (either past or current), to submit for assessment, some or all of the other student or students' work as your own work
- sharing without permission of the Unit Convenor, Swinburne resources or other material related to assessment to an entity or document repository site
- creating, intentionally modifying or inventing information that is intended to be submitted as part of an assessment item
- using the whole or part of a computer program written by another person as your own without appropriate acknowledgement
- poorly paraphrasing somebody else's work
- using a musical composition or audio, visual, graphic and photographic work created by another person without acknowledgment
- enabling others to cheat, including letting another student copy your work or by giving access to a draft or completed assignment
- letting someone or something else impersonate you, or you impersonate someone else in an invigilated or non-invigilated assessment item
- accessing, obtaining and/or providing to others unauthorised materials relating to an invigilated or non-invigilated assessment item.

The penalties for academic misconduct can be severe, ranging from a zero grade for an assessment task through to exclusion from Swinburne. For further details, see <https://www.swinburne.edu.au/student-login/academic-integrity/>
Student support

Swinburne offers a range of services and resources to help you complete your studies successfully. Your Unit Convenor or studentHQ can provide information about the study support and other services available for Swinburne students. For further information, see the [Current students](#) web page.

Special consideration

If your studies have been adversely affected due to serious and unavoidable circumstances outside of your control (e.g. severe illness or unavoidable obligation), you may be able to apply for special consideration (SPC).

Applications for Special Consideration are submitted via the SPC online tool normally no later than 5.00pm on the third working day after the submission/sitting date for the relevant assessment component. See <https://www.swinburne.edu.au/life-at-swinburne/student-support-services/special-consideration-assistance/>

Note: Submitting fraudulent (fake or altered) medical certificates is considered misconduct and can lead to serious penalties from Swinburne. In addition, your doctor may report fraudulent medical certificates as a prosecutable offence under the Victorian Crimes Act.

AccessAbility Services

If you are a student with a disability, medical or mental health condition or you have significant carer responsibilities, you may require reasonable adjustments to fully access and participate in education. Swinburne's AccessAbility Services can develop an Education Access Plan (EAP) that includes the services and reasonable adjustments that you need.

This content is protected and may not be shared, uploaded, or distributed.

It is recommended that you register with AccessAbility Services when you first commence your course but you can contact the service at any time during your studies to find out about reasonable adjustments. Contact [Accessibility Services](#) to discuss further.

Review of marks

An independent marker reviews all fail grades for major assessment tasks. In addition, a review of assessment is undertaken if your final result is between 45 and 49 or within 2 marks of any grade threshold.

You can ask the Unit Convenor to check the result for an assessment item or your final result. Your request must be made in writing within 10 working days of receiving the result. The Unit Convenor can discuss the marking criteria with you and check the aggregate marks of assessment components to identify if an error has been made. This is known as local resolution. If you are dissatisfied with the outcome of the local resolution, you can lodge a formal complaint.

Feedback, complaints and suggestions

In the first instance, discuss any issues with your Unit Convenor. If your concerns are not resolved or you would prefer not to deal with your Unit Convenor, then you can complete a feedback form. See <https://www.swinburne.edu.au/corporate/feedback/>

Advocacy

If you require assistance with any academic issues, University statutes, regulations, policies and procedures, you are advised to seek advice from an Independent Advocacy Officer at the Swinburne Student Association. Talking to an Advocacy Officer is free, independent and confidential. For more information and booking an appointment, please see <https://www.swinburne.edu.au/current-students/student-services-support/advocacy/>