Course Outline (Higher Education)

School:	School of Engineering, Information Technology and Physical Sciences
Course Title:	ARTIFICIAL INTELLIGENCE
Course ID:	ITECH2111
Credit Points:	15.00
Prerequisite(s):	ITECH1100 and (ITECH1400 or ITECH2001)
Co-requisite(s):	Nil
Exclusion(s):	(ITECH7001)
ASCED:	020119

Description of the Course:

This course provides an introduction to the area of study known as artificial intelligence and its relationship to other disciplines. It gives an overview of the major fields of endeavour with an emphasis on knowledge representation, automated reasoning, problem solving and machine learning.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	5	**6**	**7**	**8**	**9**	**10**
Introductory	☐	☐	☐	☐	☐	☐
Intermediate	☐	☐	✔	☐	☐	☐
Advanced	☐	☐	☐	☐	☐	☐

Learning Outcomes:

Knowledge:

K1. Identify and explain a range of Artificial Intelligent algorithms and methodologies for solving complex problems;

K2. Recognize and outline historical and current progress across a range of Artificial Intelligent approaches.

Skills:

S1. Represent knowledge using different techniques to solve complex problems;

S2. Select, set up and apply appropriate algorithmic approaches for solving a variety of complex problems and real world situations;

S3. Apply abstract data models appropriate for a range of Artificial Intelligent solutions;

S4. Interpret, compare and report on algorithm performance in different contexts.

Application of knowledge and skills:

A1. Demonstrate initiative and judgement in adapting algorithms to unique and diverse contexts;

A2. Review and interpret appropriate developments in Artificial Intelligence.

Course Content:

This course introduces students to the fundamental ideas and techniques of artificial intelligence and major directions of its current developments. Starting with a brief historical and philosophical review, at the core of this course is a systematic coverage on symbol processing paradigm of AI, including predicate calculus, state space representation and heuristic search, and knowledge representation and problem solving, reasoning under uncertainty, and case-based learning. In addition, other major paradigms of AI are also introduced, including neural networks, genetic algorithms, reinforcement learning and intelligent agents.

Topics may include:

- History and philosophy behind Artificial Intelligence;
- Logic and search;
- Knowledge representation, reasoning - including reasoning with uncertainty;
- Machine learning;
- Intelligent agents;
- Ethical implications of Artificial Intelligence;
- Applications of Artificial Intelligence (robotics, voice recognition, text processing, image recognition);
- Emerging trends in Artificial Intelligence.

Values:

V1. Appreciate the importance of artificial intelligence for the development of computer science field;

V2. Appreciate the importance of artificial intelligence for the development of human society.

Graduate Attributes

The Federation University FedUni graduate attributes (GA) are entrenched in the [Higher Education Graduate Attributes Policy](#) (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K2, S2, S4, A1, A2	AT1, AT2
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	K2, S2, S3, A1	AT1, AT2
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	K2, A2	AT1, AT2
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	K1, K2, S4, A2	AT1, AT2, AT3
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	S2, S4, A2	AT1, AT2

Learning Task and Assessment:

Assessment for this course will be based on a number of tasks including weekly tasks, written reports, and an end of semester examination covering theoretical aspects of the course.

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1, K2, S1, S2, S3.	Weekly tasks including: on-line quizzes; discussion of ideas in an on-line forum; and recording a journal on how to solve problems using AI techniques.	Journal, forum, quizzes and/or exercises	10% - 30%
S1, S2, S3, S4, A1, A2.	Students will conduct research to select a small set of algorithms, design a suitable knowledge representation and data abstraction, and setup and apply the algorithms on a complex problem. Students will conduct experiments and write a report justifying their choices, as well as interpreting and comparing the algorithms.	Practical works and accompanying written report	30% - 50%
K1, K2, S1, S2, S3.	Questions covering a range of algorithms, methodologies, knowledge representations, appropriate algorithm setups and data abstraction methodologies.	Test(s) or Examination(s)	30% - 40%

Adopted Reference Style:

APA

Refer to the library website for more information

Fed Cite - referencing tool