

Module Details	
Module Title	Artificial Intelligence
Module Code	COS5028-B
Academic Year	2024/5
Credits	20
School	School of Computer Science, AI and Electronics
FHEQ Level	FHEQ Level 5

Contact Hours	
Type	Hours
Lectures	24
Laboratories	22
Directed Study	154

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1

Module Aims
<p>To provide an introduction to the foundations of Artificial Intelligence (AI).</p> <p>To introduce important AI concepts and some application areas of AI, and thereby to equip students with the basic methods and techniques of AI.</p> <p>To provide some practical hand-on experience by implementing basic AI concepts using some programming languages, such as Python.</p>

## Outline Syllabus

1. Concepts of Artificial Intelligence and Applications
2. Intelligent Agents: Different types of agents will be considered.
3. Quantifying Uncertainty. Concepts related to quantifying uncertainty in artificial intelligence, e.g. probability, joint distributions and the Bayes rule, will be discussed with examples from real world scenarios.
4. Solving Problems by Searching. Different search techniques will be introduced with examples and algorithms.
5. Concepts of Fuzzy Logic and applications
6. Introduction to Machine Learning. Different approaches to learning will be discussed: supervised and unsupervised learning. Some learning algorithms, including decision trees, regression models, perceptions and artificial neural networks, will be introduced.

## Learning Outcomes

Outcome Number	Description
01	Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its concepts
02	Apply basic principles of AI in solutions that require problem solving, inference, planning and search, and learning.
03	Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, search and path planning algorithms, artificial neural networks and other machine learning models.
04	Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications associated with ethical aspects of Data sharing, AI deployment, AI accountability and explainability

## Learning, Teaching and Assessment Strategy

The course will consist of lectures, computer lab sessions, independent study, and directed reading to provide the opportunity to gain theoretical knowledge and practical knowledge of Artificial Intelligence. Formal lectures will outline the theoretical principles of Artificial Intelligence. Lab sessions will provide students with the necessary software skills to develop their own Artificial Intelligence systems. The coursework will involve students in the practical development of Artificial Intelligence models on real-life data sets and problems. Students will be assessed through two courseworks.

Utilising recent developments and current research in Artificial Intelligence, the students will participate in lectures, Labs and independent study to explore concepts and solve real-world problems. This module will use recent developments, case studies, practical demonstrations, and significant opportunities for students to design their own solutions. In addition to the modules, academic skills workshops will be organised during the year to provide further support in self-regulation, persistence, and the development of essential skills such as digital literacy.

To support accessibility, clarity and comprehension all teaching material is provided online wherever possible in advance of the teaching sessions. Throughout the programme, lots of opportunities are provided for students to design their own solutions and to express their own ideas, choosing from a variety of Artificial Intelligence frameworks, tools, and services.

To prepare the students for employment in the real-world, assessments are designed to measure industry needed skills such as data processing, multidisciplinary skills, software development, report writing skills and team-work skills (using group coursework to strengthened students? ability to work effectively in teams). Throughout the module, students will be provided with variety of practical problems, which will help develop confidence in tackling data analysis problems and in the use of the software tools that will support them. The timely constructive feedback during practical lab exercises and online support using TEL tools will support student learning throughout the module.

Assessment is in the form of two coursework exercise that require students to select and solve problems in the fields of Artificial Intelligence using both the knowledge gained in the module as well as independent research conducted during the completion of the coursework. Communication of research outcomes and key findings are tested in written report and software codes

### Mode of Assessment

Type	Method	Description	Weighting
Summative	Coursework - Written	Practical case study analysis on the use of AI in real-life problems . 1500 words.	50%
Summative	Coursework - Written	Case study analysis using computer programming. 1500 words.	50%

### Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>

#### *Please note:*

*This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.*

