Module Details

Module Title	AI Methods and Tools
Module Code	GAV4015-B
Academic Year	2022/3
Credits	20
School	Department of Media Design and Technology
FHEQ Level	FHEQ Level 4

Contact Hours

Type	Hours
Lectures	10
Seminars	14
Laboratories	24
Directed Study	152

Availability

Occurrence	Location / Period
BDA	University of Bradford / Semester 1

Module Aims

* To provide an introduction to the main concepts of AI.
* To introduce fundamental AI techniques and their applications.
* To give an overview of open-source and commercial AI technologies.
* To introduce current programming language.
* To provide practical hands-on experience by implementing basic AI concepts using a current programming language.

Outline Syllabus
A typical syllabus on this module will cover: TOPICS: - Fundamentals of Artificial Intelligence (AI); - History and definitions of AI; - Differences between weak and strong AI; - Capabilities of AI and its applications. CLASSICAL AI APPROACHES AND METHODS: - Introducing fundamentals of classical AI approaches: including rules-based systems, search algorithms including breadth-first, depth-first, and universal cost search. - Statistical methods for AI: Introduction to the foundations and applications of statistical methods in AI, including machine learning, natural language processing, expert systems, robotics and vision. AI TOOLS AND SKILLS: - Overview of open-source AI tools such as Scikit Learn, TensorFlow, Theano, Caffe, Keras, PyTorch, CNTK, Auto ML, and OpenNN, and H2O Platform. - Overview of easy-to-use industry AI tools such as Microsoft Azure AI, Amazon AI web services, and IBM Watson tools. - Learning to code: Introduction to basics of computer coding; data types and operators, control flow, iterations, functions, and classes, using one of the highly adopted languages in the current AI community, for example Python.

Learning Outcomes	
Outcome Number	Description
O1	Understand the primary programming skills needed to deliver AI Solutions.
O2	Identify and describe open-source and commercial AI tools which can be used to build, deploy and operationalise AI solutions.
O3	Demonstrate the basic and necessary underpinning technical skills and knowledge relevant to AI systems.

Learning, Teaching and Assessment Strategy

This module is delivered through formal lectures, computer lab sessions, seminars and independent study, with a focus on providing students with both the theoretical knowledge and practical skills necessary to understand and propose artificial intelligence solutions to given problems.

Lectures and seminars will help students gain the necessary theoretical knowledge on the concepts of artificial intelligence and computer programming.

Guided lab sessions will help students to practise building blocks of code and applying such coding and AI knowledge to small-scale practical problems.

Independent study will take the form of directed reading and completion of questions/topic research individually and in groups for discussion during seminar sessions.

Students will complete formative tasks throughout this module, both individually and in groups, in the form of example questions/case studies and programming tasks. Group/class feedback on these tasks will be given to support student's development of knowledge/skills and their preparation for the summative assessment.

The summative assessment for this module aims to test student's technical knowledge and accuracy relating to AI techniques and their applications. Summative assessment will take the form of two examinations. These exams will assess student's understanding of the fundamental concepts of AI, related technologies, and other concepts covered in the module. The exams will consist of MCQs and short question/answers, including programming syntax. Both exams will assess all the learning outcomes for this module and appropriate feedback will be given for both elements in accordance with the faculty required standards.

Supplementary assessment if required is as original.

Mode of Assessment

Type	Method	Description	Weighting
Summative	Examination - Closed Book	This test assesses students? theoretical understanding of the basic concepts of AI and its core technologies (1 Hr)	50%
Summative	Examination - Closed Book	This test assesses students? theoretical understanding of the basic concepts of AI and its core technologies (1Hr)	50%
Formative	Coursework - Patchwork Assessment	Case studies and programming tasks	N/A

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.