



## **Module Specification**

### **Essentials and Applications of Artificial Intelligence**

Version: 2024-25, v1.0, 02 Jun 2023

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## Part 1: Information

**Module title:** Essentials and Applications of Artificial Intelligence

**Module code:** UFCE3P-30-3

**Level:** Level 6

**For implementation from:** 2024-25

**UWE credit rating:** 30

**ECTS credit rating:** 15

**Faculty:** Faculty of Environment & Technology

**Department:** FET Dept of Computer Sci & Creative Tech

**Partner institutions:** School for Higher and Professional Education

**Delivery locations:** Not in use for Modules

**Field:** Computer Science and Creative Technologies

**Module type:** Module

**Pre-requisites:** None

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** This module aims to provide an in-depth understanding of Artificial Intelligence (AI) fundamentals, including its history, techniques, and modern applications. This module is an excellent opportunity for students from diverse academic backgrounds to explore this fascinating field. Throughout the course, students will gain hands-on experience in implementing AI solutions using popular programming languages and frameworks while also fostering critical thinking and

ethical considerations in the development and application of AI technologies. By delving into various aspects of AI, such as problem-solving, search algorithms, knowledge representation, machine learning and natural language processing, students will acquire the necessary knowledge and practical skills to contribute effectively to this rapidly evolving domain.

The course also addresses important ethical, social, and governance aspects of AI, encouraging students to consider the broader implications of AI technology.

Overall, this module aims to equip students with a strong foundation in AI principles, techniques, and applications, empowering them to excel in their future careers and contribute to the evolving field of artificial intelligence.

**Features:** Not applicable

**Educational aims:** The educational aims of the new module, Essentials and Applications of Artificial Intelligence, are multifaceted. First, it is designed to foster a foundational understanding of the principles, algorithms, and methodologies used in the field of Artificial Intelligence (AI), and how these can be applied in solving complex real-world problems. Additionally, the module seeks to cultivate critical thinking and analytical skills, equipping students with the ability to assess the societal implications of AI, its ethical considerations, and the potential benefits and risks associated with its use. Practical aspects are not ignored either, with the aim to provide hands-on experience in designing, implementing, and evaluating AI systems using popular machine learning libraries and frameworks. By the end of the course, students should be well-versed in both the theoretical underpinnings of AI and its diverse applications, empowering them to contribute effectively to this continually evolving field.

**Outline syllabus:** Indicative content:

Introduction to Artificial Intelligence: Definition and history of AI, AI paradigms and approaches, Real-world AI applications

Problem-solving and Search Algorithms: Problem representation and state space, Uninformed and informed search

Knowledge Representation and Reasoning: Logical agents, Propositional and first-

order logic, Ontologies and semantic frameworks, Rule-based systems

Machine Learning: Supervised learning, Unsupervised learning, Reinforcement learning, Deep Learning and neural networks

Natural Language Processing: Language models, Text classification and sentiment analysis, Machine translation and summarization

AI Applications across Industries: Example industries to discuss - healthcare, finance, transportation, manufacturing, energy, environment, entertainment, education, retail and cybersecurity

Ethical Considerations and Societal Impact: AI and privacy concerns, Bias, fairness and accountability, Regulation and AI governance

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** The module is delivered through weekly lectures and lab sessions. Each lecture will direct the course and introduce the new ideas and skills required. Then small group lab sessions will enable each student to carry out the practical exercises described in the associated worksheet under the guidance of a Lab Tutor.

Scheduled learning includes lectures, tutorials and practical lab classes.

Independent learning includes time engaged with essential reading and assignment preparation and completion.

**Module Learning outcomes:** On successful completion of this module students will achieve the following learning outcomes.

**MO1** Explain the key concepts, principles and methods of AI and discuss emerging topics and trends in AI.

**MO2** Implement AI-based solutions to real world problems using simple algorithms/models.

**MO3** Evaluate the suitability of AI techniques for solving specific problems.

**MO4** Analyse the benefits, challenges and ethical considerations of implementing AI solutions.

**Hours to be allocated:** 300

**Contact hours:**

Independent study/self-guided study = 228 hours

Computer-based activities = 48 hours

Total = 300

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://rl.talis.com/3/uwe/lists/FF7C0B5A-5ACE-AA0C-7FDE-392C883E4307.html) via the following link <https://rl.talis.com/3/uwe/lists/FF7C0B5A-5ACE-AA0C-7FDE-392C883E4307.html>

## Part 4: Assessment

**Assessment strategy:** The assessment strategy involves a group project and an individual presentation at both sit and resit.

The group project will engage students in teams to develop AI solutions for real-life challenges. Students will propose topics, which will need to be approved by the module instructor. Assessment criteria will include the innovativeness and practicality of their AI solution, team collaboration, project documentation, and the quality of the final deliverable. As an added measure, teams will have to submit a reflective statement, addressing challenges faced and their learnings during the project, to ensure all members participated actively and understand the work carried out.

The individual presentation will cover topics related to AI, including its history, ethical considerations, or societal impact. It will be evaluated based on the quality of research, critical analysis and effective articulation of ideas.

At resit, the reworking of the group project task will be scaled to allow students to work in smaller groups as required.

**Assessment components:****Project (First Sit)**

Description: A group project will require students to develop AI solutions for real-life challenges. Alongside the final deliverable (the project), students will submit project documentation and a reflective statement addressing challenges faced and their learnings during the project. The project will culminate in students showcasing their project results a class presentation.

Weighting: 70 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested: MO2, MO3

**Presentation (First Sit)**

Description: Students are required to submit and deliver an individual presentation (15 mins) that will cover topics related to AI, including its history, ethical considerations, or societal impact. It will be evaluated based on the quality of research, critical analysis and effective articulation of ideas.

Weighting: 30 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO4

**Project (Resit)**

Description: A group project will require students to develop AI solutions for real-life challenges. Alongside the final deliverable (the project), students will submit project documentation and a reflective statement addressing challenges faced and their learnings during the project. The project will culminate in students showcasing their project results a class presentation.

Weighting: 70 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested: MO2, MO3

**Presentation (Resit)**

Description: Students are required to submit and deliver an individual presentation (15 mins) that will cover topics related to AI, including its history, ethical considerations, or societal impact. It will be evaluated based on the quality of research, critical analysis and effective articulation of ideas.

Weighting: 30 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO4

**Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Information Technology {Top-Up} [Frenchay] BSc (Hons) 2024-25

Information Technology {Top-Up} [SHAPE] BSc (Hons) 2024-25