



MODULE SPECIFICATION

Part 1: Information			
Module Title	AI and Computer Vision, Application in Healthcare		
Module Code	UFMFEV-30-M	Level	Level 7
For implementation from	2020-21		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engineering Design & Mathematics		
Module Type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co-requisites	None		
Module Entry Requirements	None		
PSRB Requirements	None		

Part 2: Description
<p>Overview: This module will be delivered over two semesters where the students will be introduced to medical imaging, artificial intelligence (AI), and cyber security with a particular focus on the application of this technology. This will be delivered through a series of lecture, tutorials and interactive practical classes. By the end of the module the students will be able to complete basic programming, recognise the different types of health and healthcare data and apply imaging processing and machine learning approaches to better utilise this data.</p> <p>Educational Aims: This module aims to provide the platform to introduce data analytics and programming that will enable the student to understand simple machine learning and informatics, as well as the broad applications and implications of AI and computer vision in healthcare.</p> <p>Outline Syllabus:</p> <ul style="list-style-type: none"> • Introduction to AI, Data Analytics and their Application to Healthcare • Mathematics and Computer Programming Fundamentals for Data Science • Simple Computer Vision and Machine Learning • Health Informatics and Big Data Frameworks

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- Medical Imaging
- The Future of Computer Vision and Machine Learning in Healthcare
- Defining Cyber Security

Teaching and Learning Methods: The module content will be delivered through a combination of lectures (with embedded interactive sessions as appropriate) and computer lab sessions. In the latter, students will have the opportunity to work through a set of practical individual and group exercises modelled on Agile 'sprints' with on-the-spot support and formative assessment from the module team.

Part 3: Assessment

There are three pieces of assessment: an exam (Component A) and two written reports (Component B, a literature review and a data analysis report).

COMPONENT A: The exam (2 hours) will focus on knowledge and understanding developed during the lectures and reinforced by the practical sessions.

COMPONENT B1: For the Literature Review (1500 words) students will critically analyse a relevant case study, with reference to appropriate academic and industry-related sources, demonstrating their ability to apply their knowledge and understanding to specific healthcare contexts.

COMPONENT B2: In the Data Analysis Report (1500), students will summarise the practical work carried in one of the 'sprints', reporting to a hypothetical product owner and reflecting on the process for the sake of continuous improvement within their hypothetical organisation. In doing so, they will demonstrate their ability to apply informatics and AI techniques, and to evaluate and communicate the implications of their decisions.

First Sit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	50 %	Examination (2 hours).
Written Assignment - Component B		25 %	Literature Review (1,500 words).
Written Assignment - Component B		25 %	Data analysis (1500 words).
Resit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	50 %	Examination (2 hours).
Written Assignment - Component B		25 %	Literature review (1500 words)
Written Assignment - Component B		25 %	Data analysis (1500 words)

Part 4: Teaching and Learning Methods

On successful completion of this module students will achieve the following learning outcomes:

Learning Outcomes	Module Learning Outcomes	Reference
	Critically discriminate between key concepts in the fields of AI, computer vision, autonomous systems, big data, and informatics. (components A, B2)	MO1
	Appraise common informatics tools and approaches, in general and for specific healthcare applications. (components A, B1, B2)	MO2

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	Apply informatics, AI and computer vision methods, and critically explain common pitfalls. (components A, B1, B2)	MO3
	Critically evaluate existing implementations of AI, computer vision and informatics. (components A, B1, B2)	MO4
	Demonstrate ethical and professional values with respect to the development of innovative technologies in Health Tech. (components A, B2)	MO5
	Evaluate data-security and privacy vulnerabilities in autonomous systems and informatics applications. (components A, B2)	MO6
Contact Hours	Independent Study Hours:	
	Independent study/self-guided study	228
	Total Independent Study Hours:	228
	Scheduled Learning and Teaching Hours:	
	Face-to-face learning	72
	Total Scheduled Learning and Teaching Hours:	72
	Hours to be allocated	300
	Allocated Hours	300
Reading List	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p>https://rl.talis.com/3/uwe/lists/54D845E9-E859-5EF4-DE35-2F3647346405.html?lang=en-GB&login=1</p>	

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Health Technology [Sep][FT][Frenchay][1yr] MSc 2020-21

Health Technology [Sep][PT][Frenchay][2yrs] MSc 2020-21