



MODULE SPECIFICATION

Part 1: Information			
Module Title	Advanced AI, Computer Vision and Cyber Security		
Module Code	UFCFFV-15-M	Level	Level 7
For implementation from	2021-22		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Computer Science and Creative Technologies
Department	FET Dept of Computer Sci & Creative Tech		
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 is an opportunity to learn state-of-the-art machine learning, including deep learning with application to big data and image analysis. With these advanced tools students will have the opportunity to design algorithms based on clinical studies that address the key chronic diseases such as neurodegeneration, cancer and metabolic disorders, to better diagnose patients, prescribe the right treatments and monitor the evolution of disease. The second part of the module will detail advances in cyber security with a particular focus on General Data Protection Regulation (GDPR). 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 utilise state-of-art techniques, such as deep learning to extract useful information from complex and noisy data and to facilitate healthcare applications by, for example, solving localisation and classification problems.</p> <p>Educational Aims: The aim of this module will be to build on the data analytics introduced in the compulsory module, “AI, Computer Vision and Robotics, Applications in Healthcare”, which will allow advanced analysis of data from a qualitative and quantitative perspective.</p>

STUDENT AND ACADEMIC SERVICES

Outline Syllabus: • Advanced coding, programming and data analytics. This element will build on the basic programming and image data analytics developed in the AI, Computer Vision and Robotics Applications in Healthcare module.

- Deep Learning: AI and Deep Machine learning in real world projects.
- Image data processing, data fusion, pattern analysis. Use data from single or multiple sources and extract useful features from these data.
- Cyber Security: This aspect of the module will detail advanced concepts of cyber security with a particular focus on GDPR.

Teaching and Learning Methods: Lectures: This module will be delivered in integrated topic sections, where each section will provide the tools that can be later applied to design algorithms and strategies in a case study approach.

Tutorials: As part of the lecture series, tutorials will be embedded in each time slot and are open to covering support material from research-based material to case studies.

Practical classes: Several classes will be included that are linked to the lecture series offering the students an applied understanding of each topic section.

Part 3: Assessment

There are two pieces of assessment: an exam (Component A) and a portfolio (Component B).

COMPONENT A: The exam (2 hours) will test learned knowledge of core concepts delivered during lectures and tutorial classes.

COMPONENT B: The portfolio is designed to develop their understanding of how data fusion can be applied to improve Healthcare Technology, a key focus of the programme. The portfolio is a collection of works that students develop both individually and in small groups (Sprint working) as they learn. The questions/tasks are set to be research informed and problem based. This portfolio will be able to showcase their ability to present their innovative approaches to real world issues as part of formative activities allowing student feedback. Elements including coding, modelling and data analysis will be assessed in this piece of assessment. Within this assessment the students will develop a portfolio of work (1500 words). Throughout the development of the portfolio students will benefit from formative feedback, supported through tutorials. The nature of the portfolio will require engagement with original work.

First Sit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	50 %	Examination (2 hours)
Portfolio - Component B		50 %	The students will develop a portfolio of work (1500 words).
Resit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	50 %	Examination (2 hours)
Portfolio - Component B		50 %	The students will develop a portfolio of work (1500 words).

Part 4: Teaching and Learning Methods

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Learning Outcomes	On successful completion of this module students will achieve the following learning outcomes:	
	Module Learning Outcomes	Reference
	Design innovative algorithms based on clinical studies that address the key chronic disease (Component B)	MO1
	Apply data fusion analysis to address key challenges in the Health Technology sector (Component B and A).	MO2
	Critically appraise the application of technology in the area of Advanced AI, Computer Vision and Cyber Security (Component A).	MO3
Contact Hours	Independent Study Hours:	
	Independent study/self-guided study	114
	Total Independent Study Hours:	114
	Scheduled Learning and Teaching Hours:	
	Face-to-face learning	36
	Total Scheduled Learning and Teaching Hours:	36
	Hours to be allocated	150
	Allocated Hours	150
Reading List	<i>The reading list for this module can be accessed via the following link:</i>	
	https://rl.talis.com/3/uwe/lists/7F503814-85BB-B65E-8B53-23A92E2302D2.html?lang=en-GB&login=1	

Part 5: Contributes Towards	
This module contributes towards the following programmes of study:	
Health Technology [Sep][PT][Frenchay][2yrs] MSc 2020-21	