STUDENT AND ACADEMIC SERVICES

UWE Bristol | University of the West of England

MODULE SPECIFICATION

Part 1: Information			
Module Title	Emerging Automotive Technology 1		
Module Code	UFMFWS-15-3	Level	Level 6
For implementation from	2022-23		
UWE Credit Rating	15	ECTS Credit Rating	7.5
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
Overview: This module builds on thermofluid and electrical knowledge. The module introduces the students to the theory, operation and simulation of vehicle powertrains. The aim is to develop the students' understanding of fundamental concepts and apply them to the development of a vehicle powertrain. In the first part of the module the students will learn about conventional and unconventional automotive powertrains, based on the outlined syllabus below. The students will learn how the drive to making automotive technology more sustainable and environmentally friendly is being achieved. The students will also learn how to integrate different powertrains. In the second part of the module the students will learn how to simulate a conventional Internal Combustion Engine (ICE). The students will use commercial software to develop an engine simulation and analyse it's performance. On successful completion of this module, students will be in a position to integrate knowledge from different engineering disciplines and apply methods of engineering analysis and simulation to problems that occur in the design of powertrain systems including the need for technologies that are environmentally sustainable.

Educational Aims: The aim of this module is to allow students to research and evaluate new and emerging technologies that will impact on the performance, safety and sustainability of automotive vehicles.

Outline Syllabus: Components
Forced induction
Measuring Engine Performance
Natural ICE Wave model
Sizing of electric PT components
Control of electrical components
Integration of Hybrid systems
Environment and sustainability

Teaching and Learning Methods: The module makes use of collaborative learning spaces to facilitate small group discussion. The module delivery is based on a lectorial model whereby lecture content and tutorial work and discussion are integrated and carefully managed in each session.

The delivery therefore ensures that engineering theory and principles can be readily assimilated and applied within the engineering context so that the components and interactions that make up the design of a powertrain system are fully understood.

The delivery model will therefore be in the form of lectorials to assist the learning in groups and also involve interactive quizzes to promote active engagement and regular formative feedback.

Part 3: Assessment

The assessment strategy is designed to assess both the core engineering related to emerging automotive technologies and the use of simulation to study emerging technologies.

The module will be assessed in two components

Component A will be a written examination that will assess core engineering skills including electrical powertrain components and forced induction.

Component B will assess the ability to simulate engines in order to investigate and evaluate emerging automotive technologies. The students will create a virtual engine simulation of a naturally aspirated and forced induction ICE using experimental data to validate their model.

The resit assessment will follow the same format as the first sit.

First Sit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	25 %	Exam (2 hours)
Written Assignment - Component B		75 %	Written report (2000 words)
Resit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	25 %	Exam (2 hours)
Written Assignment - Component B		75 %	Written report (2000 words)

Part 4: Teaching and Learning Methods	
Learning Outcomes	On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	Reference
Apply an integrated or systems approach to solving complex Automotive engineering problems (EA4m)	MO1
Demonstrate use of fundamental scientific knowledge and principles to investigate new and emerging automotive technologies (EA5m)	MO2
Integrate knowledge and understanding of other engineering disciplines to critically evaluate emerging automotive technologies (SM3m)	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	*The reading list for this module can be accessed via the following link:* https://rl.talis.com/3/uwe/lists/9F79CA37-DC70-8FB4-F7C6-F646F33BDE38.html?lang=en-US&login=1

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Mechanical Engineering MEng 2020-21