



## MODULE SPECIFICATION

Part 1: Information			
Module Title	Automotive Technology		
Module Code	UFMFC-30-2	Level	Level 5
For implementation from	2018-19		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Contributes towards			
Module type:	Standard		
Pre-requisites	Design, Materials and Manufacturing 2018-19, Energy and Thermodynamics 2018-19, Engineering Mathematics 2018-19, Fluid Dynamics 2018-19, Stress & Dynamics 2018-19		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p><b>Educational Aims:</b> See Learning Outcomes.</p> <p><b>Outline Syllabus:</b> The syllabus includes:</p> <p>Internal Combustion (IC) Engines:            Thermodynamic cycle in power production, IC engine types and applications; IC engine performance calculations, fuelling and ignition systems, combustion in spark ignition (SI) engines, combustion in compression ignition (CI) engines. Chemistry of combustion, reactants, products and pollutants. Engine heat balance, thermal loading engine heat transfer and engine cooling. Numerical modelling of combustion and heat transfer. Alternative Engines, alternative power sources and hybrids. Fundamentals of test, measurement, data acquisition and interpretation.</p>

## STUDENT AND ACADEMIC SERVICES

### Vehicle Powertrains:

Transmission system types, operation, construction and performance characteristics. Clutches and Gear Boxes. Hydrodynamic torque converter. Epicyclical gear trains. Automatic transmission, hydrostatic drives and electric drives. Hybrid drives; series and parallel. Electric drives.

### Vehicle Dynamics:

Vehicle dynamic modelling fundamentals and reference systems. Acceleration performance. Braking performance. Road loads, ride and handling. Steady state cornering; low speed turning and high speed cornering. Automotive suspension. Steering system and tyres.

**Teaching and Learning Methods:** Scheduled learning lectures will introduce the general theoretical concepts and present examples in the use of these techniques. Laboratory sessions will be used to underpin and integrate the key theoretical concepts. Some simulation software may be used to complement and help understand the application concepts with a possible industrial visit or an arranged lecture.

**Independent learning** In addition to the scheduled learning, students are expected to spend time engaged with essential reading, report preparation and studying the concepts and underlying principles.

### Part 3: Assessment

Component A consists of two 2-hour examinations held at the end of each teaching block. These will be designed to assess the student's understanding of the theoretical concepts and the ability to apply them in standard problems.

There is no Component B in this module.

First Sit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	50 %	Examination A (120)
Examination - Component A		50 %	Examination B (120)
Resit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	100 %	Examination (180)

STUDENT AND ACADEMIC SERVICES

<b>Part 4: Teaching and Learning Methods</b>		
Learning Outcomes	On successful completion of this module students will be able to:	
	<b>Module Learning Outcomes</b>	
	MO1	The underlying principles of Internal Combustion
	MO2	The underlying principles of vehicle transmission systems
	MO3	Techniques for solving and analysing problems relating to IC engines, vehicle transmissions and automotive manufacturing systems
	MO4	Modelling and simplifying real problems, applying fundamental principles of mechanical engineering to the analysis of realistic problems and making recommendations based on analysis
	MO5	Interpreting experimental data to assess the validity of solutions and make clear recommendations
	MO6	Modelling situations and providing solutions to problems using engineering principles
	MO7	Problem formulation and decision making, independent learning
	MO8	The underlying principles and practice of vehicle dynamics and vehicle technologies
Contact Hours	<b>Contact Hours</b>	
	<b>Independent Study Hours:</b>	
	Independent study/self-guided study	228
	<b>Total Independent Study Hours:</b>	228
	<b>Scheduled Learning and Teaching Hours:</b>	
	Face-to-face learning	72
	<b>Total Scheduled Learning and Teaching Hours:</b>	72
	<b>Hours to be allocated</b>	300
	<b>Allocated Hours</b>	300
Reading List	<p>The reading list for this module can be accessed via the following link:</p> <p><a href="https://uwe.rl.talis.com/modules/ufmfmc-30-2.html">https://uwe.rl.talis.com/modules/ufmfmc-30-2.html</a></p>	