



Module Specification

Automotive Technology

Version: 2023-24, v4.0, 07 Jun 2023

Contents

Module Specification	1
Part 1: Information	2
Part 2: Description	2
Part 3: Teaching and learning methods	3
Part 4: Assessment.....	4
Part 5: Contributes towards	6

Part 1: Information

Module title: Automotive Technology

Module code: UFMFMC-30-2

Level: Level 5

For implementation from: 2023-24

UWE credit rating: 30

ECTS credit rating: 15

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Field: Engineering, Design and Mathematics

Module type: Module

Pre-requisites: Engineering Mathematics 2023-24

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Not applicable

Features: Not applicable

Educational aims: See Learning Outcomes.

Outline syllabus: The syllabus includes:

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.

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.

Part 3: Teaching and learning methods

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.

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

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

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Total = 300

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ufmfmc-30-2.html) via the following link <https://uwe.rl.talis.com/modules/ufmfmc-30-2.html>

Part 4: Assessment

Assessment strategy: The first task requires the submission of an individual report.

The second task will require the students to individual present heir findings in relation to their practical work.

The third assessment task consists of a single summative examination held at the end the teaching block. This exam will be designed to assess the student's understanding of the theoretical concepts and the ability to apply them in standard problems.

The resit follows the first sit assessment.

Assessment tasks:

Report (First Sit)

Description: Students to submit a 1000 word (max) report in relation to their practical work

Weighting: 20 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO4, MO5, MO7

Presentation (First Sit)

Description: Presentation of practical work, 10 mins.

Weighting: 10 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO4, MO5, MO6

Examination (First Sit)

Description: Examination, 2 hours.

Weighting: 70 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO2, MO3, MO7, MO8

Report (Resit)

Description: 1000 word (max) report with findings in relation of practical work

Weighting: 20 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO4, MO5, MO7

Presentation (Resit)

Description: Presentation of practical work, 10 mins.

Weighting: 10 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO4, MO5, MO6

Examination (Resit)

Description: Examination, 2 hours.

Weighting: 70 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO2, MO3, MO7, MO8

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mechanical Engineering and Technology (Vehicle Technology) {Foundation}
[Feb][FT][GCET][4yrs] BEng (Hons) 2021-22

Mechanical Engineering and Technology (Vehicle Technology) {Foundation}
[Oct][FT][GCET][4yrs] BEng (Hons) 2021-22

Mechanical Engineering and Vehicle Technology {Foundation}

[Feb][FT][GCET][4yrs] - Withdrawn BEng (Hons) 2021-22

Mechanical Engineering and Vehicle Technology {Foundation} [Oct][FT][GCET][4yrs]

- Withdrawn BEng (Hons) 2021-22