

Automotive Engineering

Module Code:	MAE5009-B
Academic Year:	2018-19
Credit Rating:	20
School:	Department of Mechanical and Energy Systems Engineering
Subject Area:	Mechanical and Automotive Engineering
FHEQ Level:	FHEQ Level 5
Module Leader:	Dr David Bryant

Additional Tutors:

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	48
Tutorials	6
Laboratory	18
Directed Study	128

Availability Periods

Occurrence	Location/Period
BDA	University of Bradford / Academic Year (Sept - May)

Module Aims

To develop knowledge and understanding of automotive design engineering and technology to understand the motor vehicle as a system,

To apply the theory associated with the design and operation of the component parts of the vehicle engine, drivetrain, suspension, and body systems.

To introduce the basic legislative and environmental context of vehicle design and operation.

Outline Syllabus

The module will introduce automotive technology taking a detailed look at components, their function and basic principles. Design calculations will be introduced with a focus on longitudinal vehicle motion in the context of acceleration and braking forces. Basic engine systems will be introduced and gradeability and traction limited acceleration will also be considered. Legislation and current and future technologies will be discussed.

Typical topics include but are not limited to:

- ' Braking systems
- ' Steering systems
- ' Suspension systems
- ' Power train
- ' Prime movers
- ' Tyres & tyre slip
- ' Brake force coefficient
- ' Adhesion utilisation & braking distribution
- ' Load transfer
- ' Vehicle performance & acceleration
- ' Legislative requirements

Module Learning Outcomes

On successful completion of this module, students will be able to...

- 1 1.1 Describe the design and operation of the motor vehicle and its major components.
 1.2 Analyse the automotive industry and market.
 1.3 Evaluate the design and operation of motor vehicle components and systems.
 1.4 Apply physical principles and design calculation methods in vehicle component design.
- 2 2.1 Identify the constituent parts of a motor vehicle and explain their purpose and function.
 2.2 Make measurements and analyse how vehicle systems work.
 2.3 Undertake simple design calculations relating to component parts of a motor vehicle.
 2.4 Use data in performance calculations.
- 3 3.1 Better manage, present and interpret data using improved IT skills.
 3.2 Solve problems systematically.
 3.3 Exhibit better communication and personal management skills.

Learning, Teaching and Assessment Strategy

The basic subject matter is introduced by lectures, using hardware examples and seminars from practitioners. Topics cover the science, technology and principles of automotive engineering in the context of the major mechanical systems (learning outcomes 1.1, 1.2, 1.3, 1.4, 2.1, 2.3, 2.4, 3.2). Technical knowledge is consolidated by hands-on project work with the completion of a programme of assessed laboratory work (Learning outcomes 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, and 3.3). Directed study takes the form of background reading to deepen the understanding of the material with final assessment being a closed book examination (Learning outcomes 1.1, 1.2, 1.3, 1.4, 2.3, 2.4, 3.2). Supplementary

assessment is to repair deficiency in original submission.

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Summative	Examination - closed book	Examination - closed book	1.5 hours	50%	Yes
Summative	Coursework	A programme of laboratory work relating to vehicle data logging and analysis - 2 x 2000 word reports		50%	No

Legacy Code (if applicable)

ENG2316L

Reading List

To view Reading List, please go to [rebus:list](#).