

Module Details	
Module Title	Vehicle Design Analysis
Module Code	MAE6017-B
Academic Year	2020/1
Credits	20
School	Department of Mechanical and Energy Systems Engineering
Subject Area	Mechanical and Automotive Engineering
FHEQ Level	FHEQ Level 6
Pre-requisites	N/A
Co-requisites	N/A

Contact Hours	
Type	Hours
Lectures	36
Laboratories	6
Directed Study	158

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2

Module Aims
To develop a systematic knowledge and understanding of key principles related to automotive design, engineering and technology to understand the motor vehicle as a system. To apply the theory, methods and techniques necessary to solve problems associated with the design and operation of the component parts of the vehicle engine, drivetrain, suspension, and body systems. To introduce the legislative and environmental context of vehicle design and operation.

Outline Syllabus	
1. Automotive Engineering overview 2. Road Loads 3. Acceleration behaviour 4. Brakes & braking 5. Tyres & cornering 6. Prime movers 7. Clutches 8. Gearboxes & gearing 9. Power cycles 10. Suspension 11. Vehicle roll 12. Steering	

Learning Outcomes	
Outcome Number	Description
01	Apply the underpinning scientific and physical principles relating to the design and analysis of the motor vehicle and its major components
02	Describe and evaluate developing technologies related to automotive engineering.
03	Use the results from engineering analysis to solve vehicle engineering problems and to recommend appropriate action.
04	Perform measurements, evaluate data and apply engineering analysis techniques to the solution of unfamiliar problems.
05	Manage, present and interpret data using improved IT skills.

Learning, Teaching and Assessment Strategy
The basic subject matter is introduced by lectures and seminars using hardware examples and lectures from practitioners. Topics cover the science, technology and principles of automotive engineering in the context of the major mechanical systems. Directed study takes the form of background reading to deepen the understanding of the material Technical knowledge is consolidated by project work with the completion of a programme of assessed laboratory work (Learning outcomes LO1-5). Final assessment is a piece of written coursework (Learning outcomes LO1-5). Supplementary assessment is to repair deficiency in original submission. Formative assessment is enabled via an online assessment with immediate solutions enabling self-evaluation and identification of areas for support. This module satisfies the below Learning Outcomes as specified by the Accreditation of Higher Education Programmes: Third Edition (AHEP3) as published by The Engineering Council in-line with the UK Standard for Professional Engineering Competence (UK-SPEC). These outcomes specify six key areas of learning: Science and Mathematics (SM), Engineering Analysis (EA), Design (D), Economic, Legal, Social, Ethical and Environmental Context (EL), Engineering Practice (P) and Additional General Skills (G). SM1b, EA1b, EA2, D1, D2, D3b, D4, EL2, EL4, EL5, EL6b, P2, P3, P5, G1, SM4m, EA4m. Further details of these learning outcomes can be found at https://www.engc.org.uk/.

Mode of Assessment				
Type	Method	Description	Length	Weighting
Summative	Coursework	Coursework on vehicle design (2500 words)	N/A	50%
Summative	Coursework	Programme of laboratory work (2500 words)	N/A	50%
Formative	Examination - MCQ	Tests the formal knowledge and understanding with immediate solutions for self evaluation.	N/A	N/A

Reading List
To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

© University of Bradford 2020

<https://bradford.ac.uk>