

# ES2D3-15 Motor Vehicle Technology

**21/22**

**Department**

School of Engineering

**Level**

Undergraduate Level 2

**Module leader**

Howard Neal

**Credit value**

15

**Module duration**

11 weeks

**Assessment**

100% coursework

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

ES2D3-15 Motor Vehicle Technology

[Module web page](#)

### Module aims

To provide an understanding of the core concepts of motor vehicle technology.

### Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Motor Vehicle evolution

Motor Vehicle layout

Motor Vehicle structure

Motor Vehicle efficiency and dynamics

Introduction to the internal-combustion engine

Exhaust systems, silencers and catalytic converters

Supercharging and turbocharging (forced induction)

Engine management

Vehicle emissions

Introduction to transmission systems

The gearbox and gear ratios

Different types of gears and gearboxes

Drive configuration

Propeller shafts and drive shafts

Final-drive systems

Four-wheel drive systems

Introduction to chassis systems

Directional control and stability

Steering systems

Suspension systems

Springs and dampers

Wheels and tyres

Braking principles

Braking systems

Introduction to vehicle electric, safety and comfort systems

Wiring diagrams

Battery, charging and starting systems

Lighting systems

Heating, ventilation and air conditioning

Passenger safety and restraint systems

Introduction to electric, hybrid and alternative fuels

New and emerging vehicle technology.

## **Learning outcomes**

By the end of the module, students should be able to:

- Demonstrate improved skills of research and information gathering
- Demonstrate presentation and time management skills.
- Evaluate the evolution of the motor vehicle and new and emerging technology.
- Demonstrate and apply knowledge of the fundamental principles of motor vehicle layout and structure.
- Demonstrate and apply knowledge of engines and engine technology, alternative fuels, transmission and chassis systems.
- Demonstrate and apply knowledge of vehicle electric, safety and comfort systems.
- Demonstrate and apply knowledge of the role of ethics in automotive engineering and ISO26262.

## **Indicative reading list**

"Fundamentals of Motor Vehicle Technology Book 1 Sixth Edition"

Authors: Alma Hilier & Nelson Thornes

Publisher: Nelson Thornes; 2 edition (17 Mar 2012)  
ISBN-10: 1408515180 ISBN-13: 978-1408515181

"Fundamentals of Motorsport Engineering",

Author: Josh Smith

Publisher: Nelson Thornes (26 April 2013)

ISBN-10: 1408518082 ISBN-13: 978-1408518083

## **Subject specific skills**

Knowledge and understanding of the need for a high level of professional and ethical conduct in engineering and the use of technical literature, other information sources including appropriate codes of practice and industry standards.

## **Transferable skills**

Be professional in their outlook, be capable of team working, be effective communicators, and be able to exercise responsibility and sound management approaches.

Communicate (written and oral; to technical and non-technical audiences) and work with others

Exercise initiative and personal responsibility, including time management, which may be as a team member or leader

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## **Study**

### **Study time**

<b>Type</b>	<b>Required</b>
Lectures	28 sessions of 1 hour (19%)
Seminars	1 session of 2 hours (1%)
External visits	5 sessions of 1 hour (3%)
Other activity	2 hours (1%)
Private study	113 hours (75%)
Total	150 hours

### **Private study description**

Self-study 113 hrs

### **Other activity description**

2 x 1 hr revision class

## **Costs**

No further costs have been identified for this module.

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## Assessment

You must pass all assessment components to pass the module.

### Assessment group A1

	Weighting	Study time
Group Written Report (15 pages)	30%	
Group Written Report, Including peer assessment		
Group Oral Presentation	10%	
Group Oral Presentation, including peer assessment		
Individual Assignment ASSIGNMENT	60%	

### Feedback on assessment

Formative and summative feedback provided via marksheets for assessed coursework.  
Cohort level exam feedback provided via examiner's report and model solutions to examination papers.

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## Availability

### Courses

This module is Core for:

- Year 2 of UESA-H335 BEng Automotive Engineering
- Year 2 of UESA-H336 MEng Automotive Engineering

This module is Optional for:

- Year 2 of UESA-H315 BEng Mechanical Engineering
- Year 2 of UESA-H605 Undergraduate Electrical and Electronic Engineering

This module is Option list A for:

- Year 2 of UESA-H63W BEng Electronic Engineering
- Year 2 of UESA-H113 BEng Engineering
- Year 2 of UESA-HN15 BEng Engineering Business Management

- Year 2 of UESA-HH75 BEng Manufacturing and Mechanical Engineering
- Year 2 of UESA-HH35 BEng Systems Engineering
- UESA-H112 BSc Engineering
  - Year 2 of H112 Engineering
  - Year 2 of H112 Engineering
- Year 2 of UESA-HN11 BSc Engineering and Business Studies
- Year 2 of UESA-H63X MEng Electronic Engineering
- Year 2 of UESA-H114 MEng Engineering
- Year 2 of UESA-HH76 MEng Manufacturing and Mechanical Engineering
- Year 2 of UESA-H316 MEng Mechanical Engineering
- UESA-HH31 MEng Systems Engineering
  - Year 2 of HH31 Systems Engineering
  - Year 2 of HH35 Systems Engineering
- Year 2 of UESA-H605 Undergraduate Electrical and Electronic Engineering
- Year 2 of UESA-H606 Undergraduate Electrical and Electronic Engineering MEng