

Module Title:	Automotive Systems	Level:	4	Credit Value:	20
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Module code:	ENG492	Is this a new module?	Yes	Code of module being replaced:	ENG480
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Cost Centre:	GAPC	JACS3 code:	H300
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Trimester(s) in which to be offered:	1+2	With effect from:	September 18
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School:	Faculty of Arts, Science and Technology	Module Leader:	O.Durieux
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Scheduled learning and teaching hours	60 hrs
Guided independent study	140 hrs
Placement	0 hrs
Module duration (total hours)	200 hrs

Programme(s) in which to be offered	Core	Option
BEng (Hons) Automotive Engineering	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>

Pre-requisites
None

Office use only

Initial approval February 17

APSC approval of modification Sept 18

Have any derogations received Academic Board approval?

Version 1

Yes No

Module Aims

To develop an applied understanding and an overall basic appreciation of automotive engineering including performance on car, electrical, electronics and control systems which are now integral to modern motor vehicles.

Intended Learning Outcomes

At the end of this module, students will be able to

Key Skills

1	Demonstrate abilities to work in a professional automotive environment, alone or in a team, in line with the HSE procedures, prepare risk assessments.	KS1	KS2
		KS3	KS9
2	Explain and report the role of electrical and electronic systems in a modern motor vehicle; Demonstrate an understanding of sensor technology, signal conditioning and information technology relevant to automotive systems.	KS1	KS3
		KS4	KS6
		KS9	
3	Describe methods of performance data collection and component performance analysis	KS1	KS3
4	Contextualise uncertainty in automotive design using social, ethical, economic and sustainable constraints.	KS1	KS3
		KS9	

Transferable/key skills and other attributes

Self-learning, practical application of theory, solving engineering problems and written communication.

Derogations

A derogation from regulations has been approved for this programme which means that whilst the pass mark is 40% overall, each element of assessment (where there is more than one assessment) requires a minimum mark of 30%.

Assessment:

The assessment is based on a set of practical activities and investigations presented as a single portfolio. The learner is required to detail evidences of the tasks achieved during the completion of the module. The portfolio should cover all learning outcomes.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration (if exam)	Word count (or equivalent if appropriate)
1	1,2,3,4	Learning Log	100%		

Learning and Teaching Strategies:

The module will be presented to students through practical work and demonstrations in our fully equipped automotive laboratory.
Where possible, visits to local industries will be arranged to demonstrate system operations. Relevant videos will also be used to aid the learning process.

Syllabus outline:

Health and Safety in automotive environment. Review of procedures and risk assessments.

Electrical and electronic systems: An applied overview of modern vehicle electrical systems and electronic systems including wiring, protections, relays and connectors.

Management systems: Engine and vehicle management systems.

Sensors and signals: Functional consideration of measurement systems including sensors, signal conditioning and information technology and remote monitoring.

Data acquisition systems: Data collection, collation and analysis, data logging and interpretation.

Environmental legislation: Investigation of current legislation and “green” methods in automotive evaluation, viability of the developments investigated, extrapolate trends to predict future automotive design features from environmental perspective.

Bibliography:

Essential reading

Bosch R, GmbH (Author) (2014); Automotive Handbook, 9th Ed (Bosch Handbooks (Rep)); Professional Engineering Publishing

Denton T (2011); Automobile Mechanical and Electrical Systems, Ed; Butterworth Heinemann Ltd)

Other indicative reading

Ehsani M and Gao Y (2009); Modern Electric Hybrid Electric and Fuel Cell Vehicles: Fundamentals, Theory and Design; CRC Press Inc.

Ribbens W B, Mansour N P (2003); Understanding Automotive Electronics; 6th Ed; Newnes
Martin V D (2000); Automotive Electrical Systems; Butterworth and Heinemann