UNIVERSITY OF WARWICK

Proposal Form for New or Revised Modules (MA1 - version 7 - April 2014)

Approval information	
Approval Type	☒ New module ☐ Revised module ☐ Discontinue module
Date of Introduction/Change	October 2018
If new, does this module replace another? If so, enter module code and title:	Yes, it will replace ES2B5, Motor Vehicle Technology.
If revised/discontinued, please outline the rationale for the changes:	
Confirmation that affected departments have been consulted:	Changes have been made in consultations between the School of Engineering and WMG

Module Summary	
1. Module Code (if known)	ES2D3
2. Module Title	Motor Vehicle Technology
3a. Lead department:	WMG
3b. Teaching Split (if known):	WMG 100%
4. Name of module leader	Howard Neal
5. Level	UG: ☐ Level 4 (Certificate) ☒ Level 5 (Intermediate) ☐ Level 6 (Honours) PG: ☐ Level 7 (Masters) ☐ Level 8 (Doctoral) See Guidance Notes for relationship to years of study
6. Credit value(s) (CATS)	15
7. Principal Module Aims	To provide an understanding of the core concepts of motor vehicle technology.
8. Principal Learning Outcomes	By the end of the module the student will be able to • Evaluate the evolution of the motor vehicle and new and emerging technology.

Module Summary	
	• 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. • Demonstrate improved skills of research and information gathering • Demonstrate presentation and time management skills.
9. Timetabled Teaching Activities (summary)	28 x 1 hr lectures 1 x 2 hr seminar 1 site visit (up to 5 hrs) 2 x 1 hr revision classes **Total 37 hrs**
10. Departmental Web-link	http://www2.warwick.ac.uk/fac/sci/eng/eso/modules/year2/
11. Other essential notes	Advice and feedback hours are available for answering questions on the lecture material and past examination questions. Hands-on activities need to be restricted to a maximum of 50 students per set.
12. Assessment methods (summary)	60% examination 30% Group Written Report, including peer assessment – 15 pages 10% Group Oral Presentation, including peer assessment

For use by Strategic Planning and Analytics Office only - Do not fill in this section

Level	JACS3 Code	Teaching Split
		If not provided in 3b above

External Credit Level		Scheme	

Module Context

13. Please list all departments involved in the teaching of this module. If taught by more than one department, please indicate percentage split.

WMG 100%

14. Availability of module

Degree Code	Title	Study Year	C/OC/ A/B/C	Credits
H113	BEng Engineering	2	B	15
H114	MEng Engineering	2	B	15
H315	BEng Mechanical Engineering	2	B	15
H316	MEng Mechanical Engineering	2	B	15
H335	BEng Automotive Engineering	2	A	15
H336	MEng Automotive Engineering	2	A	15
HH35	BEng Systems Engineering	2	Option C	15
HH31	MEng Systems Engineering	2	Option C	15
HH75	BEng Manufacturing and Mechanical Engineering	2	A	15
HH76	MEng Manufacturing and Mechanical Engineering	2	A	15
HN11	BSc Engineering and Business Studies	2	B	15
HN15	BEng Engineering Business Management	2	A	15

15. Minimum number of registered students required for module to run

20 although hands-on activities need to be restricted to a maximum of 50 students per set.

16. Pre- and Post-Requisite Modules

Module Content and Teaching

17. Teaching and Learning Activities *(totals for module – please see guidance)*

Module duration (weeks)	**11**
Lectures	**28 x 1 hr**
Seminars	**1 x 2 hrs**
Tutorials	
Project Supervision	
Demonstration	
Practical Class/Workshops	
Supervised time in studio/workshop	

Module Content and Teaching	
Fieldwork	
External visits	Up to 5 hrs
Work based learning	
Placement	
Year abroad	
Other activity *(please describe): e.g. distance-learning, intensive weekend teaching etc.*	**2 x 1 hr revision class** **Self-study 113 hrs**

18. Assessment Method (Standard)		
Type of assessment	**Length**	**% weighting**
Written Examinations	2 Hours	**60**
Practical Examinations	Hours	
Assessed essays/coursework	Group Oral Presentation, including peer assessment Group written report, including peer assessment – 15 pages	**10** **30**
18a. Final chronological assessment *(please see guidance*)	Examination	

19. Methods for providing 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.

20. Outline Syllabus

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.

21. Illustrative Bibliography

"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

22. Learning outcomes

Successful completion of the module leads to the learning outcomes. The learning outcomes identify the knowledge, skills and attributes developed by the module.

Learning Outcomes should be presented in the format "By the end of the module students should be able to..." using the table at the end of the module approval form:

Resources

23. List any additional requirements and indicate the outcome of any discussions about these.

None

Approval	
24. Module leader's signature	Howard Neal
25. Date of approval	Teaching Policy Committee Chair's Action 4 April 2017
26. Name of Approving Committee (include minute reference if applicable)	School of Engineering and WMG Teaching Policy Committee
27. Chair of Committee's signature	Professor Gill Cooke
28. Head of Department(s) signature	Professor Nigel Stocks

Examination Information		
A1. Name of examiner (if different from module leader)		
A2. Indicate all available methods of assessment in the table below		
% Examined	**% Assessed by other methods**	**Length of examination paper**
60	10% Group Oral Presentation, including peer assessment 30% Group written report, including peer assessment – 15 pages	**2 hrs**
A3. Will this module be examined together with any other module (sectioned paper)? If so, please give details below.		
No		
A4. How many papers will the module be examined by?	☒ 1 paper	☐ 2 papers
A5. When would you wish the exam take place (e.g. Jan, April, Summer)?	**Summer**	
A6. Is reading time required?	☐ Yes	☒ No
A7. Please specify any special exam timetable arrangements.		
A8. Stationery requirements		
No. of Answer books?	**1**	
Graph paper?	**Yes**	
Calculator?	**Yes**	
Any other special stationery requirements (e.g. Data books, tables etc)?	**Engineering Data Book**	
A9. Type of examination paper		
Seen?	☐ Yes	☒ No
Open Book?	☐ Yes	☒ No

Examination Information		
Restricted?	☐ Yes	☒ No
If restricted, please provide a list of permitted texts:		

LEARNING OUTCOMES		
(By the end of the module the student should be able to....)	**Which teaching and learning methods enable students to achieve this learning outcome? (reference activities in section 15)**	**Which summative assessment method(s) will measure the achievement of this learning outcome? (reference activities in section 16)**
Evaluate the evolution of the motor vehicle and new emerging technology.	Lectures, study of literature, site visit, peer group work and discussion. Self-directed learning	Peer assessed written group report and oral presentation. Examination.
Demonstrate and apply knowledge of the fundamental principles of motor vehicle layout and structure.	Lectures, study of literature, site visit, peer group work and discussion. Self-directed learning	Peer assessed group written report and oral presentation. Examination.
Demonstrate and apply knowledge of engines and engine technology, alternative fuels, transmission and chassis systems.	Lectures, study of literature, site visit, peer group work and discussion. Self-directed learning	Peer assessed group written report and oral presentation. Examination.
Demonstrate and apply knowledge of vehicle electric, safety and comfort systems.	Lectures, study of literature, site visit, peer group work and discussion. Self-directed learning	Peer assessed group written report and oral presentation. Examination.
Demonstrate and apply knowledge of the role of ethics in automotive engineering and ISO26262.	Lectures, study of literature, site visit, peer group work and discussion. Self-directed learning	Peer assessed group written report and oral presentation. Examination.
Demonstrate improved skills of research and information gathering	Lectures, group presentation, group report	Group written report and oral presentation. Examination.
Demonstrate presentation and time management skills	Lectures, group presentation, group report	Group written report and oral presentation. Examination.