

UNIVERSITY OF WARWICK

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

Approval information	
Approval Type	<input type="checkbox"/> New module <input checked="" type="checkbox"/> Revised module <input type="checkbox"/> Discontinue module
Date of Introduction/Change	October 2017
If new, does this module replace another? If so, enter module code and title:	
If revised/discontinued, please outline the rationale for the changes:	Updated module aims and learning outcomes to reflect goals of research led teaching based on current WMG research.
Confirmation that affected departments have been consulted:	Changes were made in consultation with the School of Engineering and WMG.

Module Summary	
1. Module Code (if known)	ES4A7
2. Module Title	Design for Vehicle Comfort
3a. Lead department:	WMG
3b. Teaching Split (if known):	100% WMG
4. Name of module leader	Dr Stewart Birrell
5. Level	UG: <input type="checkbox"/> Level 4 (Certificate) <input type="checkbox"/> Level 5 (Intermediate) <input type="checkbox"/> Level 6 (Honours) PG: <input checked="" type="checkbox"/> Level 7 (Masters) <input type="checkbox"/> Level 8 (Doctoral) See Guidance Notes for relationship to years of study
6. Credit value(s) (CATS)	15 CATS
7. Principal Module Aims	This key automotive-specific module will introduce the concept of design for vehicle comfort. The module aims to: <ul style="list-style-type: none"> • Promote an understanding of, and an interest in the issues of design for comfort for the occupants of the vehicle. • Critical evaluation of future comfort features, and the engineering principles which underpin these feature.

Module Summary	
	<ul style="list-style-type: none"> Transferable knowledge of comfort assessment methodologies which can be applied to engineering business and practice. <p>This module will draw upon the close links that WMG has with the automotive industry to deliver industry-relevant theory and applied engineering.</p>
8. Principal Learning Outcomes	<p>By the end of the module the student should be able to:</p> <ul style="list-style-type: none"> Evaluate and understand the engineering principles that underpin the design of a vehicle for the comfort of the occupants and other road users. Anticipate the future direction of the design of comfort systems within the vehicle engineering sector. Consider the role and use of comfort systems in vehicle engineering. Demonstrate an in depth knowledge and an advanced understanding of the legislative, social and environmental factors relevant to comfort in vehicles. Appraise and design in-vehicle interfaces aimed to improving comfort and convenience. Communicate in a professional and scientific manner.
9. Timetabled Teaching Activities (summary)	<p>Lectures 30 x 1hr = 30 hours Examples classes 2 x 1hr = 2 hours Laboratory sessions 2 x 3h = 6 hours Total contact hours = 38</p>
10. Departmental Web-link	http://www2.warwick.ac.uk/fac/sci/eng/eso/modules/year4/es4a7
11. Other essential notes	Advice and feedback hours are available for answering questions on the lecture material, theory and lab exercises.
12. Assessment methods (summary)	<p>Examination (3 hours) 70% Assignment (Word limit: 2500) 30% Students must pass the examination and pass the coursework overall.</p>

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

Level	JACS3 Code	Teaching Split
		<i>If not provided in 3b above</i>

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				
14. Availability of module				
Degree Code	Title	Study Year	C/OC/A/B/C	Credits
H331	MEng Automotive Engineering	4	Core	15
H332	MEng Automotive Engineering with Intercalated Year	5	Core	15
H333	MEng Automotive Engineering with a Year in Research	5	Core	15
H33A	MEng Automotive Engineering with Business Management	4	Core	15
H33B	MEng Automotive Engineering with Sustainability	4	Core	15
H33C	MEng Automotive Engineering with Robotics	4	Core	15
H107	MEng Engineering and variants	4	A	15
H109	MEng Engineering with Intercalated Year	5	A	15
H110	MEng Engineering with a Year in Research	5	A	15
15. Minimum number of registered students required for module to run				
1 (core)				
16. Pre- and Post-Requisite Modules				
n/a				

Module Content and Teaching	
17. Teaching and Learning Activities (<i>totals for module – please see guidance</i>)	
Module duration (weeks)	10
Lectures	30
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Class/Workshops	2 x 3 hours
Supervised time in studio/workshop	

Module Content and Teaching		
Fieldwork		
External visits		
Work based learning		
Placement		
Year abroad		
Other activity <i>(please describe): e.g. distance-learning, intensive weekend teaching etc.</i>	2 x 1 hours examples classes 112 hours guided independent learning	
18. Assessment Method (Standard)		
Type of assessment	Length	% weighting
Written Examinations	3 Hours	70%
Practical Examinations		
Assessed essays/coursework	Assignment (Word limit: 2500)	30%
18a. Final chronological assessment <i>(please see guidance)</i>	Examination	

19. Methods for providing feedback on assessment.
Written comments and electronically marked-up assignment Cohort level feedback on examinations
20. Outline Syllabus
Embedded Systems (automotive electronics and sensors) Interior cabin comfort systems, including seating, lighting, thermal comfort Vehicle ergonomics and human factors Human Machine Interface (HMI) Automotive sound quality and NVH Perceived quality Smart driving technologies Connected and Autonomous Vehicles (CAV)
21. Illustrative Bibliography
"Automotive Handbook", Bosch, 2011, "Advanced Automotive Fault Diagnosis", Denton, T, 2006, "Bodyspace : Anthropometry, Ergonomics and the Design of Work ", Pheasant, S, 2005, "Handbook of the psychology of aging", Birren, J. E, 2011, "Comfort and Design: Principles and Good Practice", Vink, P (ed), 2004, "Designing Interactive Systems : A Comprehensive Guide To HCI And Interaction Design", Benyon, D, 2010, "The Design of Future Things", Norman, D.A, 2007,

"Driver Distraction and Inattention: Advances in Research and Countermeasures, Volume 1", Regan, Lee and Victor, 2013.

"Vehicle Refinement: Controlling Noise and Vibration in Road Vehicles", Harrison, M, 2004,

"Connected and Autonomous Vehicle – The UK Economic Opportunity", KPMG/SMMT Report, March 2015:
<http://www.smmmt.co.uk/wp-content/uploads/sites/2/CRT036586F-Connected-and-Autonomous-Vehicles-%E2%80%93-The-UK-Economic-Opportu...1.pdf>

"Driverless: Intelligent Cars and the Road Ahead", Lipson and Kurman, 2016

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:

See table at the end of this form.

Resources

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

Approval

24. Module leader's signature	Stewart Birrell
25. Date of approval	Teaching Policy Committee Chair's Action 5 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
70%	30% Assignment (Word limit: 2500)	3 Hours
A3. Will this module be examined together with any other module (sectioned paper)? If so, please give details below.		
n/a		
A4. How many papers will the module be examined by?	<input checked="" type="checkbox"/> 1 paper <input type="checkbox"/> 2 papers	
A5. When would you wish the exam take place (e.g. Jan, April, Summer)?	Summer	
A6. Is reading time required?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 databook	
A9. Type of examination paper		
Seen?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Open Book?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Restricted?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 and understand the engineering principles that underpin the design of a vehicle for the comfort of the occupants and other road users.	Lectures, directed reading, examples papers and private study.	Unseen examination.
Anticipate the future direction of the design of comfort systems within the vehicle engineering sector.	Lectures, directed reading, examples papers, private study and assignment.	Unseen examination. Assessment of assignment.
Consider the role and use of comfort systems in vehicle engineering.	Lectures, directed reading, private study and assignment.	Assessment of assignment.
Demonstrate an in depth knowledge and an advanced understanding of the legislative, social and environmental factors relevant to comfort in vehicles.	Lectures, directed reading, examples papers, private study and assignment.	Unseen examination. Assessment of assignment.
Appraise and design in-vehicle interfaces aimed to improving comfort and convenience	Lectures, lab sessions and group discussions.	Unseen examination. Assessment of assignment.
Communicate in a professional and scientific manner.	Group discussions and assignment.	Assessment of assignment.