

# ES4A7-15 Design for Vehicle Comfort

**20/21**

**Department**

School of Engineering

**Level**

Undergraduate Level 4

**Module leader**

**Credit value**

15

**Module duration**

10 weeks

**Assessment**

100% coursework

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

ES4A7-15 Design for Vehicle Comfort

[Module web page](#)

### Module aims

This key automotive-specific module will introduce the concept of design for vehicle comfort. The module aims to:

- 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 features.
  - Transferable knowledge of comfort assessment methodologies which can be applied to engineering business and practice.
- This module will draw upon the close links that WMG has with the automotive industry to deliver industry-relevant theory and applied engineering.

### 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.

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)

## **Learning outcomes**

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

- 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.

## **Indicative reading list**

"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

## **Subject specific skills**

Ability to conceive and make a valid argument to support an engineering decision

Ability to develop solutions using published and validated literature

Ability to be pragmatic, taking a systematic approach and the logical and practical steps necessary

for, often complex, concepts to become reality

Ability to seek to achieve sustainable solutions to problems and have strategies for being creative and innovative

Ability to be risk, cost and value-conscious, and aware of their ethical, social, cultural, environmental, health and safety, and wider professional engineering responsibilities

Ability to communicate across engineering disciplines in a constructive way to progress a project

## **Transferable skills**

Apply problem solving skills, information retrieval, and the effective use of general IT facilities

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

Plan self-learning and improve performance, as the foundation for lifelong learning/CPD

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

Awareness of the nature of engineering business and enterprise in the creation of economic and social value

Overcome difficulties by employing skills, knowledge and understanding in a flexible manner

Ability to formulate and operate within appropriate codes of conduct, when faced with an ethical issue

Appreciation of the global dimensions of engineering, customers, commerce and communication

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

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## **Study**

### **Study time**

<b>Type</b>	<b>Required</b>
Lectures	30 sessions of 1 hour (20%)
Practical classes	2 sessions of 3 hours (4%)
Other activity	2 hours (1%)
Private study	112 hours (75%)
Total	150 hours

### **Private study description**

112 hours guided independent learning

## Other activity description

2 x 1 hours examples classes

## 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.

Students can register for this module without taking any assessment.

### Assessment group A

	Weighting	Study time
Assignment 1	30%	
Word Limit 2500		
Assignment 2	70%	
Assignment - as per assessment policy		

## Feedback on assessment

Written comments and electronically marked-up assignment  
Cohort level feedback on examinations

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## Availability

## Courses

This module is Core for:

- Year 4 of UESA-H336 MEng Automotive Engineering

This module is Option list A for:

- Year 4 of UESA-H163 MEng Biomedical Systems Engineering
- Year 4 of UESA-H114 MEng Engineering
- Year 4 of UESA-H311 MEng Mechanical Engineering

This module is Option list B for:

- Year 4 of UESA-HH31 MEng Systems Engineering