ES2D1-15 Manufacturing Engineering Design

20/21

Department
School of Engineering
Level
Undergraduate Level 2
Module leader
Howard Neal
Credit value
15
Module duration
12 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

ES2D1-15 Manufacturing Engineering Design

Module web page

Module aims

This module will develop strategies to identify product requirements, identify design constraints, think creatively, solve problems, identify solutions and foster a holistic approach between design and manufacturing.

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.

- Manufacturing design strategy
- Manufacturing design criteria
- Creative design practices

- Risk reduction
- Cost reduction through manufacture
- Design review
- Management role

Learning outcomes

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

- Use computational tools to aid in decision making processes of design and identify which process parameters influence variation in final product characteristics.
- Identify which design features really matter and how to modify a design to give it greater robustness against variation in the manufacturing process.
- Apply risk reduction techniques at the design stages to reduce manufacturing and assembly problems.
- Appreciate and apply the principles of value analysis for design for manufacture (DFM) and design for assembly (DFA) to identify opportunities for cost reduction.
- Apply software simulation and programming tools in the analysis of functional components.
- Function as part of a team and demonstrate understanding of the importance of personal and shared responsibility, teamwork, and communication e.g. by producing professional quality design documentation.

Indicative reading list

- Product Design for Manufacture and Assembly, 3rd edition 2011, Boothroyd, Dewhurst & Knight, CRC Press
- Shigley's Mechanical Engineering Design, 10th edition 2014, Budynas and Nisbett, McGraw-Hill Higher Education
- Form, structure and Mechanism, M.J.French 2012, Springer
- Engineering Design a systematic approach, Pahl, Beitz, Feldhusen and Grote, 3rd edition 2007, Springer
- Product design, Otto and Wood, 2001, Pearson

View reading list on Talis Aspire

Subject specific skills

Plan and manage the design process, including cost drivers, evaluating outcomes, and working with technical uncertainty.
Ability to apply relevant practical and laboratory skills.

Transferable skills

Communicate (written and oral; to technical and non-technical audiences) and work with others.
Overcome difficulties by employing skills, knowledge and understanding in a flexible manner
Exercise initiative and personal responsibility, including time management, which may be as a team member or leader

Study

Study time

Type	Required
Lectures	5 sessions of 1 hour (3%)
Seminars	10 sessions of 2 hours (13%)
Practical classes	5 sessions of 1 hour (3%)
Supervised practical classes	4 sessions of 4 hours (11%)
Private study	104 hours (69%)
Total	150 hours

Private study description

104 hrs Guided independent learning

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A1

	Weighting	Study time
Group Design Report/Prototype (50 pages) Essay	50%	
Design Application Poster Poster	20%	
Individual Design Proposal (4 pages) Essay	30%	

Feedback on assessment

Written feedback on group design reports.

In session feedback of developing design.
Group feedback on performance tests.

Availability

Courses

This module is Core for:

- Year 2 of UESA-H335 BEng Automotive Engineering
- Year 2 of UESA-HH75 BEng Manufacturing and Mechanical Engineering
- Year 2 of UESA-H336 MEng Automotive Engineering
- Year 2 of UESA-HH76 MEng Manufacturing and Mechanical Engineering

This module is Option list A for:

- Year 2 of UESA-H113 BEng Engineering
- Year 2 of UESA-HN15 BEng Engineering Business Management
- 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-H114 MEng Engineering