ES2H7-15 CAD/CAM and Simulation

25/26

Department
School of Engineering
Level
Undergraduate Level 2
Module leader
Helen Neal
Credit value
15
Module duration
20 weeks
Assessment
100% coursework
Study locations
University of Warwick main campus, Coventry Primary
Distance or Online Delivery

Description

Introductory description

ES3A4-15 CAD/CAM and Simulation

Module web page

Module aims

This module provides an overview of CAD/CAM technologies. Both theoretical concepts and practical applications are covered. The CAM element links into the Manufacturing aims of the module while the CAD element links directly with the engineering aims. It also provides an introduction to discreet part simulation.

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.

CAD

- Introduction

- Geometric modelling, curves surfaces and solids
- Applications, geometric properties, 3D visualization, Design Analysis, Rapid Prototyping and tooling
- Data Exchange: neutral file formats, exchange formats, translators.
- PDM and PLM
  CAM
- Introduction
- Machine tools
- NC Basics, Tool path generation, Machining strategies.
  Simulation
- Basic theory of simulation, Business applications.

Learning outcomes

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

- Design engineering components to meet design constraints. (C5, M5)
- Create Engineering Drawings to fully and clearly define manufacturing and assembly requirements of components. (C5, M5)
- Plan manufacturing operations and create manufacturing instructions for components. (C12, C13, M12, M13)
- Apply knowledge of CAD/CAM tools and technologies to propose strategies to enhance engineering design and manufacture in familiar products. (C3, C13, M3, M13)
- Apply design and manufacturing methods to solve engineering problems. (C3, C12, C13, M3, M12, M13)
- Present solutions to engineering problems in a concise and informative way. (C17, M17)
- Reflect on areas of personal learning across the module. (C18, M18)

Indicative reading list

Chang, K. e-Design: Computer-Aided Engineering Design Academic Press 2016, ISBN: 0128095695.McMahon, C. CADCAM: Principles, Practice and Manufacturing Management (2nd Edition) Addison-Wesley 1998, ISBN: 0201178192
Lee, K. Principles of CAD/CAM/CAE Systems Addison-Wesley 1999, ISBN: 0201380366
Zeid, I. Mastering CAD/CAM McGraw Hill 2004, ISBN: 0072868457.

View reading list on Talis Aspire

Subject specific skills

- Ability to conceive, make and realise a component, product, system or process
- 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

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
- Appreciation of the global dimensions of engineering, 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.

Study

Study time

Type	Required
Lectures	6 sessions of 1 hour (4%)
Demonstrations	2 sessions of 1 hour (1%)
Supervised practical classes	10 sessions of 2 hours (14%)
Online learning (independent)	10 sessions of 1 hour (7%)
Private study	108 hours (74%)
Total	146 hours

Private study description

Guided independent and group learning: 108 hours

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A

	Weighting	Study time	Eligible for self-certification
Individual Portfolio	100%		Yes (extension)
1,000 words plus portfolio - total max 20 pages			

Feedback on assessment

Verbal and/or written feedback for over the course of the group project (formative)
Written feedback for individual portfolio (summative)

Availability

Pre-requisites

Courses

This module is Core for:

- Year 1 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 Optional for:

- Year 2 of UESA-HN15 BEng Engineering Business Management