



[Your Portal](#) [Your Course](#) [Email PM Voyager](#) [Search Help](#) [Logout](#)

[Learning Resources](#) [Support Social News & Info.](#) [Learning & Information Services](#)
[Technical Support](#)

Definitive Module Document (DMD)

[Back](#)

[Module Info](#) > DMD

Module Code: 2AAD0001

Title of Module

Full Title: Computer-Aided Engineering and Structural Mechanics

Short Title: CAE and Structures

MODULE

2AAD0001 (A 05/6)

Computer-Aided Engin...

- [Module Homepage](#)
- [Module News](#)
- [Module Information](#)
- [Teaching Resources](#)
- [Reading List](#)

Search Website

Version: 1

Credit Points: 15

Level / ECTS Level: 2

First Offered: 1/9/2003 00-00-00

6. Home Department:

AAD

7. Departments(s) contributing to teaching:

9. Module Aims:

- * develop an understanding of fluid mechanics
- * gain experience in the use of CAD solid modelling software
- * give an appreciation of the potential of solid modelling as a design tool
- * extend the understanding of engineering and scientific principles appropriate to mechanical engineering
- * provide an understanding of fundamental mechanics concepts and structural behaviour when subjected to combinations of types of loading

10a. Learning Outcomes: Knowledge and Understanding:

- * appreciate the governing equations of fluid mechanics and their formulation in a CFD code
- * show an understanding of the principles of mechanics for bending & torsion

10b. Learning Outcomes: Skills and Attributes:

- * construct solid models of prismatic parts
- * demonstrate an ability to envisage and model a part that satisfies a given brief
- * obtain and analyse results of a CFD simulation for a practical engineering application
- * apply the basic principles of structural analysis in determining the behaviour of simple structures

11. Module Content

11a Module Content:

CAE- This part of the course introduces the students to two CAE systems, CAD solid modelling and Computational Fluid Dynamics (CFD). Each of these comprise 25% of the course. The CAD component gives introductory skills in solid modelling and shows the benefits and potential of 3D models in the design process. The CFD component introduces the concept of discretisation of the governing equations of fluid mechanics and covers setting up simple flow scenarios and geometries. Analysis is carried out with a view to parameters affecting result sensitivity.

MECHANICS- This part of the course includes shear force-bending moment diagrams, beam theory, combined loading conditions, direct stress/strain, shear stress/strain, torsion of shafts, bending stresses in beams with unsymmetrical sections, and power transmission.

11b. Further details on how the learning outcomes of the module will be achieved:

The CAD component entails learning to use a solid modeller to build accurate and robust prismatic parts and simple assembly models. The CFD component of the course covers- an introductory lecture covering the concepts of discretisation, mesh and numerical sensitivity and the rationale of turbulence models; tutorial sessions on a commercial CFD package to familiarise the students with the process of setting up a simulation; a group open-ended assignment to model and analyse results from a choice of simple flow scenarios.

Mechanics-

1. Further studies on shear force and bending moment diagrams, second moment of area, engineers theory of bending, beam theory, combined bending and direct loading.
2. Bending stresses in beams with unsymmetrical sections.
3. Torsion of shafts, power transmission using circular shaft.
4. Thermal stressing.

12. Language of Delivery:

English

13. Language of Assessment:

English

14. Assessment Details (Academic):

Coursework: 50

Exam: 50

Other: Typically, assessment will consist of-

- 1 CAD modelling assignment 20%
- 1 CFD Assignment 20%
- 1 Mechanics laboratory 10%
- 1 Mechanics Examination 50%

Assessment Notes:

Separate passes are required in both the coursework and examination elements of assessment

15. Locations(s):

UH HATFIELD

16. Pre and Co-Requisite:

Pre-Requisite

Co-Req

Prohibited

17. Subject Board of Examiner/s:**18. Comments**

[Disclaimer](#)
[Terms and Conditions](#)

Copyright (C) 2006 University of Hertfordshire.