Liverpool John Moores University

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Title:	ANALYSIS AND DESIGN USING CFD
Status:	Definitive but changes made
Code:	**7024ENG** (105366)
Version Start Date:	01-08-2011
Owning School/Faculty:	Engineering
Teaching School/Faculty:	Engineering

Team	Leader
David Allanson	Y
Andrew Cunningham	
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Academic Level:	FHEQ7	**Credit Value:**	10.00	**Total Delivered Hours:**	84.00
Total Learning Hours:	100	**Private Study:**	16		

Delivery Options
Course typically offered: Semester 2

Component	Contact Hours
Lecture	12.000
Practical	48.000
Tutorial	24.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Essay	AS1	Coursework: Portfolio of CFD solutions	50.0	
Essay	AS2	Coursework: Major individual flow simulation	50.0	

Aims

To provide the student with a fundamental understanding of important techniques in computational fluid dynamics as applied to engineering design. To extend their

experience and skill in engineering analysis with the aid of applications related software.

Learning Outcomes

After completing the module the student should be able to:

1 Use a commercial CFD package to solve real fluid flow problems
2 Appreciate the limitations and use of CFD as part of the design process
3 Evaluate output from a CFD analysis
4 Appreciate the basic theory underpinning commercial CFD computer codes

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Essay	1	2	3	4
Essay	1	2	3	4

Outline Syllabus

Qualitative revision of real fluid flow
Introduction to CFD with industrial examples of usage
Governing equations (Navier-Stokes, Energy, Continuity). Boundary layers.
Turbulence - qualitative understanding. Time averaging. Turbulence modelling.
Discretization methods. Convection-diffusion problems. Upwinding.
Transient calculations. Implementation of boundary conditions.
Use of commercial CFD code to solve engineering problems.

Learning Activities

Lectures and guided computer workshops

References

Course Material	Book
Author	Pulliam,T.H.
Publishing Year	2001
Title	Fundamentals of computational fluid dynamics
Subtitle	
Edition	
Publisher	Springer Verlag
ISBN	3540416072

Notes

This module is intended to provide the student with all the necessary skills to undertake a CFD analysis using a commercial CFD code. It provides the student with knowledge of the basic theory underpinning CFD commercial codes.