Liverpool John Moores University

Title:	COMPUTATIONAL FLUID DYNAMICS FOR DESIGN
Status:	Definitive
Code:	**6082ENG** (115897)
Version Start Date:	01-08-2018
Owning School/Faculty:	Maritime and Mechanical Engineering
Teaching School/Faculty:	Maritime and Mechanical Engineering

Team	Leader
David Allanson	Y

Academic Level:	FHEQ6	**Credit Value:**	10	**Total Delivered Hours:**	33
Total Learning Hours:	100	**Private Study:**	67		

Delivery Options
Course typically offered: Semester 2

Component	Contact Hours
Lecture	11
Practical	22

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	AS1	Invigilated Blackboard test	40	
Test	AS2	Invigilated Blackboard test with prior seen project element	60	

Aims

To provide the student with a fundamental understanding of important techniques in computational fluid dynamics and to extend their experience and skill with the aid of applications related software.

Learning Outcomes

After completing the module the student should be able to:

1 Set up and validate CFD model to solve a real fluid flow problem.
2 Discuss the limitations and use of CFD as part of the design process.
3 Evaluate output from a CFD analysis
4 Explain the basic theory underpinning commercial CFD codes.

Learning Outcomes of Assessments

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

Blackboard test	1	3	4	
test of seen project	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.
Pressure-velocity coupling.
Transient calculations. Implementation of boundary conditions.
Use of commercial CFD code to solve engineering problem.

Learning Activities

Lectures and guided computer workshops

Notes

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