Liverpool John Moores University

Title:	Fluid Dynamics and Heat Transfer
Status:	Definitive
Code:	**6156ENG** (120025)
Version Start Date:	01-08-2019
Owning School/Faculty:	Maritime and Mechanical Engineering
Teaching School/Faculty:	Maritime and Mechanical Engineering

Team	Leader
David Allanson	Y
Geraint Phylip-Jones	

Academic Level:	FHEQ6	**Credit Value:**	10	**Total Delivered Hours:**	44
Total Learning Hours:	100	**Private Study:**	56		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24
Practical	6
Tutorial	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS2	Examination	70	2
Portfolio	AS1	Portfolio	30	

Aims

To further develop the essential principles of Fluid Dynamics and Heat Transfer

Learning Outcomes

After completing the module the student should be able to:

1 Solve practical fluid flow problems
2 Predict lift and drag forces associated with external flows
3 Analyse heat transfer phenomena
4 Evaluate heat exchanger performance using standard techniques

Learning Outcomes of Assessments

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

Exam	1	2	3	4
Portfolio	1	2	3	4

Outline Syllabus

Governing equations of viscous flow. Navier –Stokes and Continuity Equations. Prantl boundary layer equation, Blausis solution and simplified working relationships. VonKarman momentum integral and turbulent boundary layers structure.

Streamline and bluff bodies, lift and drag coefficients, boundary layer separation and wake, wind tunnel testing.

Analytical and numerical methods applied to multi-mode heat transfer problems including radiation, conduction and convection.

Heat Exchanger analysis including Log means temperature difference (LMTD), Heat exchanger effectiveness method (NTU).

Learning Activities

A combination of lectures, tutorials and practical sessions

Notes

This module takes an in-depth look into the governing equation and theory of the complex area of fluid flow and heat transfer. The underpinning ideas are delivered by lectures and tutorials which requires the student to have a fundamental understanding of the principles and how to apply them to practical situations.