

Liverpool John Moores University

Title: AEROSPACE TECHNOLOGY
Status: Definitive
Code: **5513ENGIOM** (107414)
Version Start Date: 01-08-2011

Owning School/Faculty: Engineering
Teaching School/Faculty: Isle of Man College

Team	Leader
Gary Colquhoun	Y

Academic Level: FHEQ5
Credit Value: 12.00
Total Delivered Hours: 26.00
Total Learning Hours: 120
Private Study: 94

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	16.000
Practical	4.000
Tutorial	4.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Essay	AS1	Laboratory report(s)	30.0	
Exam	AS2	Examination	70.0	2.00

Aims

To develop the students ability to understand the advanced technologies that the aerospace industry relies on in particular aerodynamics, propulsion and environmental aspects.

Learning Outcomes

After completing the module the student should be able to:

- 1 apply the principles of thermodynamic and fluid mechanics principles to the solution of engineering problems
- 2 apply the theories and procedures associated with the aerodynamics and propulsion of aerospace vehicles.
- 3 recognise the causes and methods for prevention of environmental issues within the aerospace industry

Learning Outcomes of Assessments

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

CW	1	2	
EXAM	1	2	3

Outline Syllabus

Fluid Mechanics – Aerodynamics

Introduction to basic internal/external aerodynamics at various Mach No's.

Evaluation of lift and drag wrt aerospace vehicles and air flow through a jet engine.

Applied Thermodynamics and Heat Transfer

Gas power cycles, gas turbine analysis, 1-d steady flow and jet propulsion.

Advanced forced convection, boundary layer theory, dimensional analysis, radiation.

Propulsion Technology

Appraisal of basic methods of propulsion associated with aerospace including i.c.engines, jet engines, turbomachinery and rockets. Fuels employed. Future developments.

Environmental aspects

Environmental issues. Measurable performance indicators : fuel burn ; emissions of nitrogen oxides (NOx) ; noise. Design optimisation trade-offs ; life cycle assessment.

Learning Activities

Lectures, tutorials and laboratory work.

References

Course Material	Book
Author	Franzini, J.B., Finnemore, E.J.
Publishing Year	2001
Title	Fluid Mechanics with engineering applications
Subtitle	
Edition	10th ed

Publisher	McGraw-Hill
ISBN	

Course Material	Book
Author	Wilson, D.G.,
Publishing Year	1998
Title	The design of high-efficiency turbomachinery and gas turbines
Subtitle	
Edition	
Publisher	Prentice-Hall
ISBN	

Course Material	Book
Author	Rogers G.F.C. and Mayhew Y.R.
Publishing Year	1992
Title	, Engineering Thermodynamics Work and Heat Transfer
Subtitle	
Edition	
Publisher	Longman
ISBN	

Notes

The module introduces the student to the underlying theory and practice of aerospace technology to enable a basic understanding of aerodynamics, propulsion and environmental aspects.