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.

Covers the practical side of fluid mechanics for the practicing engineer. Bloomer, a product manager, begins with a review of the definitions, equations, and derivations that are useful for the material that follows.Â Practical fluid mcchrnics for â,¬nginâ,¬â,¬ring applications. MECHANICAL ENGINEERING A Series of Textbooks and Reference Books Founding Editor L. L. Faulkner Columbus Division, Battelle Memorial Institute and Department of Mechanical Engineering The Ohio State University Columbus, Ohio 1. Spring Designer's Handbook, Harold Carlson 2. Computer-Aided Graphics and Design, Daniel L. Ryan 3. Lubrication Fundamentals, J. George Wills 4. Solar Engineering for Domestic Buildings, William A. Himmelman 5. Applied. @inproceedings{Daugherty1965FluidMW, title={Fluid Mechanics with Engineering Applications}, author={R. L. Daugherty and Joseph B. Franzini and E. Finnemore}, year={1965} }. R. L. Daugherty, Joseph B. Franzini, E. Finnemore. Published 1965. Mathematics, Engineering. Properties of fluids fluid statics basics of fluid flow energy considerations in steady flow momentum and forces in fluid flow similitude and dimensional analysis steady incomprehensible flow in pressure conduits forces on immersed bodies steady flows in open channels fluid measurements unsteady-flow problems steady flow of compress < Fluid Mechanics for Mechanical Engineers. Jump to navigation Jump to search. Contents.Â One of the greatest advances if fluid mechanics was done by Ludwig Prandtl (1875-1953). Based on his report, only a thin region on the surface of the body is important since the viscous forces are only important in that region called boundary layer, and outside the flow will be the same as if the fluid was inviscid. Fluid mechanics is the branch of physics concerned with the mechanics of fluids (liquids, gases, and plasmas) and the forces on them.:3 It has applications in a wide range of disciplines, including mechanical, civil, chemical and biomedical engineering, geophysics, oceanography, meteorology, astrophysics, and biology. It can be divided into fluid statics, the study of fluids at rest; and fluid dynamics, the study of the effect of forces on fluid motion.:3 It is a branch of continuum mechanics, a