UNIVERSITY OF PLYMOUTH MODULE RECORD

Module Code: THER 305	**Credits: 20**	**Level : 3**

Module Title : Thermal and Fluids Engineering

Pre-Requisites :

Co - Requisites :

If Linked, Module linked to :

Short Module Descriptor - (Maximum four lines 9pt print):
Further studies in thermal and fluid engineering relating to specific topics relevant to mechanical engineering.

Elements of Assessment
COURSEWORK 30 % EXAMINATION 70 % EoM TEST %

Module Aims :
To impart further knowledge and problem solving ability in aspects of Applied Thermodynamics and Fluid Mechanics to the discipline of Mechanical Engineering

Skills Elements :

Develops written communication, group working, numeracy, IT, independent learning and practical skills.

Objectives / Learning Outcomes : students should be able to

1. Apply thermodynamic theory to the solution of a range of typical situations including heat transfer problems, combustion, air-conditioning and cooling tower systems.
2. Analyse and predict the performance of modern steam plant.
3. Use knowledge of energy efficiency criteria to minimise energy consumption in a range of situations relating to heating applications.
4. Apply compressible fluid dynamic theory to the solution of a range of typical situations including shock wave formation.
5. Apply basic fluid dynamic principles to the design and selection of turbo-machinery and associated pipe-work for industrial applications.

Indicative Syllabus Content :
Thermal Engineering:
2-D steady and 1-D transient heat conduction; Heat transfer by radiation between finite black and grey surfaces – form factors, radiosity, radiation resistance networks. Combustion and combustion systems; Psychrometry, Air-conditioning and Cooling Towers; Steam plant; Economic use of energy including buildings and heating plant. Brief overview of alternative energy.
Fluids Engineering:
Steady compressible flow in tubes of varying section. Choked flow. Effect of viscosity; isothermal pipe flow. Plain and oblique shock waves. Property ratios in terms of Ma.
Application of turbo-machinery principles to centrifugal and axial flow pumps, hydraulic and wind turbines. Pump selection; cavitation; pump-pipe matching. Pressure transients in pipes; determination of pressure rise and pipe stress.

Please complete the information below

Faculty: Technology	**Dept: DMME**	**Partner Institution: N/A**
Module Leader: M A Bell	**Subject Group: ANA**	**Term: Autumn and Spring**

Registry Use Only

VALIDATION- DATE OF APPROVAL: DATE OF IMPLEMENTATION :
DATES(S) OF APPROVED CHANGES:

ASC:	FEEBAND :	RESOURCE UNITS :