

MODULE DESCRIPTION FORM

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

ME930 ENERGY MODELLING AND MONITORING

Module Registrar: Dr D Cóstola daniel.costola@strath.ac.uk	Taught To (Course): Cohorts for whom class is compulsory and Engineering Faculty MSc students.	
Other Lecturers Involved: none	Credit Weighting: 10	Semester: 1
Compulsory RESE MSc / Elective class for MAE	Academic Level: 5	Suitable for Exchange: Y

Required prerequisites

Note: It is the responsibility of ALL students to ensure that they satisfy the prerequisite knowledge for this module BEFORE adding as part of curriculum selection. If unsure, please contact the Module Registrar or discuss with your Programme/Year Adviser of Studies.

None

Module Format and Delivery (HOURS i.e. 1 credit = 10hrs of study):

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	Total
20		30					30	20	100

Educational Aim

This module aims to impart an understanding of the theoretical and operational principles underlying simulation modelling of energy supply and demand systems and their environmental impact. The emphasis is on practical computer lab-based modelling exercises.

Learning Outcomes

On completion of the module the student is expected to be able to:

LO1 Generate and adapt computer models, undertake simulations and analyse predicted performance for a range of passive and active energy technologies.

LO2 Write technical reports that demonstrate an understanding of the main factors that influence energy and environmental performance, and the capabilities of the modelling programs used in the module to predict performance.

Syllabus

The module will teach the following:

1. Heat and mass transfer processes occurring within energy supply and demand systems.
2. Simulation principles: problem representation, treatment of time and space, numerical methods, validation, use in practice.
3. Simulation practice: problem description, modelling methodology, results interpretation, case studies
4. Built environment: energy demand, passive and active energy systems, options for intervention, performance assessment methods.
5. Renewable energy system modelling, focusing on supply-demand matching.
6. Information systems: energy management, monitoring and targeting, classification techniques, trend analysis, smart metering.

Assessment of Learning Outcomes

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:

L01

C1 Submitted technical reports should set out relevant model details and results.

L02

C1 Marks for the submitted technical reports focus on interpretation and discussion of simulation results.
C2 Evidence of good structure, analysis and presentation in the technical reports.

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

Principles of Assessment and Feedback

(within Assessment and Feedback Policy at: <https://www.strath.ac.uk/professionalservices/staff/policies/academic/>)

The technical reports to be submitted by the students should be structured and written as though for a client who has commissioned the study.

Students are encouraged to collaborate in the computer labs in order to modify and run the computer models associated with the current topic. However, it is emphasised that the reports they submit must be entirely their own work – background research plus results they have personally generated and interpreted.

Detailed feedback is given, particularly on the first assignment, to guide the students for their other assignments.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams (*individual weightings*)

Examination				Coursework		Practical		Project	
Number	Month(s)	Duration	Weighting	Number	Weighting	Number	Weighting	Number	Weighting
				2	50% each				
*				*All		*		*	

* **L/Os:** Indicate which Learning Outcomes (L01, L02, etc) are to be assessed by exam/coursework/practical/project as required.

Coursework / Submissions deadlines (*academic weeks*): Week 6 and 10

Resit Assessment Procedures:

Submission of alternate ^coursework prior to commencement of the August exam diet.

^^Students must contact the module Registrar as soon as they know that a resit is required for this class.

PLEASE NOTE:

Students must gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be re-assessed by alternate coursework prior to the August diet. This re-assessment will consist entirely of coursework. No marks from any previous attempts will be transferred to a new resit attempt.

Recommended Reading

***Purchase recommended **Highly recommended reading *For reference (do NOT purchase)

- Clarke J A, 'Energy Simulation in Building Design', Butterworth-Heinemann. *
- McMullan R, 'Environmental Science in Building' 8th edition, Palgrave. *

Additional Student Feedback

(Please specify details of when additional feedback will be provided)

Date	Time	Room No
Announced in class,		Check timetable webpages for details.

Session: 2021/22

Approved:

Course Director Signature: E Henderson

Date of Last Modifications: 01/09/2021

