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 MAE MSc students.**		
Other Lecturers Involved: none	**Credit Weighting: 10**	**Semester: 1**	
Assumed Prerequisites: none	**Compulsory/ elective class for MAE**	**Academic Level: 5**	**Suitable for Exchange: Y**

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					20	30	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

Criteria

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

LO1

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

LO2

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

The technical reports to be submitted by the students should be structured and written as though for a client who has commissioned the study. An example will be given of a technical report to show what is required in terms of assessment of "good" performance.

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

Examination				**Coursework**		**Practical**		**Project**	
Number	Month(s)	Duration	***Weighting***	Number	***Weighting***	Number	***Weighting***	Number	***Weighting***
				2	100%				
				*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 7 and 10
Two technical reports to be submitted - see Module Timetable page.

Resit Assessment Procedures:
Submission of further technical reports prior to commencement of the August exam diet.
As soon as a student knows that they require a resit assessment for this class they should contact the class registrar to confirm these resit requirements and deadlines 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 during the August diet. This re-assessment will consist entirely of further coursework to be set by the registrar. No marks from any previous attempts will be transferred to a new resit attempt.

Recommended Reading

*****Purchase recommended **Highly recommended reading *For reference**

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

Additional Student Feedback

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

Session: 2019/20

Approved:

Course Director Signature: ***E Henderson***

Date of Last Modifications: **09/09/2019**

(Updated July 2019)

MODULE TIMETABLE

Module Code:	**ME930**	**Module Title:**	**Energy Modelling and Monitoring**

Brief Description of Assessment:

2 technical reports on a range of energy and environmental topics that are investigated through computer simulation.

Assessment Timing

Please note: Timings can and will change, this should only be used as a guide.

Semester One	W&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Course work Set	Course work Submit	Choose an item. Choose an item.	Choose an item. Choose an item.	Course work Set	Course work Submit	Choose an item. Choose an item.	Choose an item. Choose an item.

Semester Two	C&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period