MODULE DESCRIPTION FORM

16390 Energy systems 2

Module Registrar: Mr C M Johnstone
cameron.johnstone@strath.ac.uk

Taught To (Course): Cohorts for whom class is elective

Other Lecturers Involved: Dr J M Kim

Credit Weighting: 10 (ECTS 5)

Semester: 1 and 2

Assumed Prerequisites: 16294 Energy Systems I

Elective class

Academic Level: 3

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

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Laboratory</th>
<th>Groupwork</th>
<th>External</th>
<th>Online</th>
<th>Project</th>
<th>Assignments</th>
<th>Private Study</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>24</td>
<td>12</td>
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Educational Aim

This class builds on the students’ understanding of the various systems which are employed within the built environment to satisfy our energy demands and the environmental conditions created. This module aims to impart a deeper understanding of the limitations in the operational characteristics of these systems and the conflicts that occur when embedded within the building fabric.

Learning Outcomes

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

- LO1 identify technical and economic effects of simultaneous systems operation (electrical and thermal).
- LO2 assess performance of energy efficient technologies (measures) used in servicing the environment.
- LO3 demonstrate awareness of effective system/network operational issues in an analytical manner.
- LO4 describe issues associated with implementing “new and renewable technology” systems within an infrastructure designed for more traditional ‘engineering’ approaches.

Syllabus

The module will teach the operations of the various systems, which are used/deployed to service the built environment. This will specifically cover the following thematic areas:

- Requirements of and demands placed on building energy systems
- Building integrated renewable technologies
- Passive solar systems adopted within building design.
- Active solar and photovoltaic integration
- Micro-generation and network
- Energy management: mechanisms and techniques
- Supply side energy management
- New methodologies in demand side energy management

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 LO2, LO4
C1 Fail: invalid or little explanation with poor presentation
C2 Second: fair description with brief diagram; valid methods.
C3 First: concise and clear descriptions with appropriate supporting materials (e.g. schematic diagrams, examples etc); valid methods with good presentation.
LO3
C1 Fail: invalid calculation process and no explanation.
C2 Second: valid calculation process with little explanation.
C3 First: valid calculation process, good scientific presentation (e.g. unit) and correct results with clear explanation.

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

12 Principles of Assessment and Feedback
(on Learning & Teaching web pages: www.strath.ac.uk/learnteach/teaching/staff/assessfeedback/12principles/)

Formal, summative feedback will be provided by the return of examination marks to students after assessment (note: exam scripts will not be returned to students and no individual or collective discussion of exam performance will be facilitated.

Informal feedback will be provided at regular tutorial sessions primarily through verbal discussion with individuals or groups on tutorial exercises attempted in advance by students (note: to receive this feedback students should participate in these tutorials but attendance is not mandatory.)

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

<table>
<thead>
<tr>
<th>Examinations</th>
<th>Courseworks</th>
<th>Projects</th>
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<tbody>
<tr>
<td>Number</td>
<td>Month(s)</td>
<td>Duration</td>
</tr>
<tr>
<td>2</td>
<td>Jan &amp; May/June</td>
<td>1 hour each</td>
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Indicate which learning outcomes (LO1, LO2 etc) are to be assessed by exam/coursework/project as required.

Coursework / Submissions deadlines: End of March

Resit Assessment Procedures: 2 hour examination in August

PLEASE NOTE:
Students need to gain a summative mark of 40% to pass the module. Students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of exam.

Recommended Reading

****Purchase essential; ***Purchase recommended; **Highly recommended reading;
*Simply for reference (do NOT purchase)


*http://www.cogen.org/projects/educogen.htm

* http://www.energymanagertraining.com/new_index.php

** Software program for feasibility test of new/renewable energy systems, ‘MERIT’,
http://www.esru.strath.ac.uk/Programs/Merit.htm

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

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<th>Room No</th>
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Session: 2014/15

Approved:

Course Director Signature: [Signature]

Date of Last Modifications: 04 September 2014
**Module Code:** 16390  
**Module Title:** Energy systems 2

**Brief Description of Assessment:**

Students have an open book exam for an hour each semester. Students have to demonstrate their ability to describe technical issues related to energy systems they learn from lectures. Two assignments are given at each semester respectively. The assignment for the second semester is associated with the computer lab tutorial session.

**Assessment Timing:**

Indicate on the table below the start/submission dates for each assignment/project and the timing of each exam/assessment(s).

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<th>Semester One</th>
<th>WK1</th>
<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
<th>WK5</th>
<th>WK6</th>
<th>WK7</th>
<th>WK8</th>
<th>WK9</th>
<th>WK10</th>
<th>WK11</th>
<th>WK12</th>
<th>Exam Period</th>
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<td>Start of assignment</td>
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<td>Jan open book exam</td>
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<th>Semester Two</th>
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<th>WK10</th>
<th>WK11</th>
<th>WK12</th>
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<td>Start of assignment</td>
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<td>May/June open book exam</td>
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