# NM969 Renewable Marine Energy Systems

<table>
<thead>
<tr>
<th>Module Registrar: Prof N Barltrop</th>
<th>Taught To (Course): MSc/PGDip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Lecturers Involved: Dr Li Xu</td>
<td>Credit Weighting: 10</td>
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<tr>
<td>Assumed Prerequisites: Some fluid dynamics</td>
<td>Semester: 2</td>
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<tr>
<td>Compulsory/ optional/ elective class</td>
<td>Academic Level: 5</td>
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## Module Format and Delivery (hours):

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Laboratory</th>
<th>Project</th>
<th>Assignments</th>
<th>Private Study</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>20</td>
<td>10</td>
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<td>30</td>
<td>40</td>
<td>100</td>
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## Educational Aim

This module aims to provide students with an understanding of the ways in which the maritime environment can offer a significant contribution, in a sustainable manner, to global energy demands. To undertake engineering assessments of the design and operation of marine energy generating systems.

## Learning Outcomes

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

- Have an appreciation of the nature of the sea and the statistics of wind, waves and currents
- Be able to assess the relative merits of different marine energy systems based on engineering, environmental, political, social and economic issues
- Be able to understand, modify and use a variety of MathCad mathematical models of tidal, wind and wave energy devices

## Syllabus

The module will teach the following:

- The physical marine environment
- MathCad
- Wave and tidal energy – power generation, equipment and distribution; location; design, installation and operational criteria
- Wind energy
- Ocean thermal energy generation and harnessing
- Case study analyses of existing installations e.g. La Rance Barrage, Wind and tidal stream turbines
- Heave buoys and Pelamis wave-contouring wave energy devices

## Assessment of Learning Outcomes

### Criteria

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

[Note: Criteria break the LO down into ‘teachable’ elements but do not become syllabus orientated i.e. no mention of CAD package names, components etc.]

- LO1 Political economic background
  - C1 Report & Interview
- LO2 Mathematical modelling
  - C1 Report & Interview

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
The opportunity is provided to discuss coursework, especially the computer related coursework, before the final interview.

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

<table>
<thead>
<tr>
<th>L/Outcomes</th>
<th>Examinations</th>
<th>Courseworks</th>
<th>Projects</th>
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<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Duration</td>
<td>Weighting</td>
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<tr>
<td>L01 &amp; L02</td>
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Indicate which learning outcomes (L01, L02 etc) are to be assessed by exam/coursework/project as required.

Coursework / Submissions deadlines:
Week 9

Resit Assessment Procedures:
Viva before August resits

PLEASE NOTE:
Students need to gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be re-examined viva at a mutually agreed time before the August resit exams.

Recommended Reading
Daily Newspapers

Additional Student Feedback
At mutually agreed times, generally in the computer room used for the tutorials.

Approved:
Course Director Signature: Prof N Barltrop
Date of Last Modifications: 19 February 2011

(Updated February 2011)
### MODULE TIMETABLE

**Module Code:** NM9XX  
**Module Title:** Renewable Marine Energy Systems

**Brief Description of Assessment:**
Viva based on submitted coursework

**Assessment Timing:-**
Indicate on the table below the Start/Submission dates for each Assignment/Project and the timing of each Exam/Class Test(s).

<table>
<thead>
<tr>
<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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<table>
<thead>
<tr>
<th>Semester Two</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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CW1 start</td>
<td>CW2 start</td>
<td>CW3 start</td>
<td>CW4 start</td>
<td>CW to be submitted</td>
<td>Viva</td>
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