Module Specification

Module Summary Information

<table>
<thead>
<tr>
<th></th>
<th>Module Title</th>
<th>Structures 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Module Credits</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Module Level</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Module Code</td>
<td>BNV6135</td>
</tr>
</tbody>
</table>

5 | Module Overview |
---|-----------------|
In accordance with the programme philosophy and aims, this module has been designed to enable students to use problem-based learning to understand the Structural Design process and relate it to information previously learned in Structures 1 and Civil Engineering Materials.

The module covers both analytical and numerical modelling of structures in order to provide the background for the students to produce the structural design of a small building. The effect of loading combinations is addressed utilising the approach specified in British Standards and European Norms. Aspects of analytical modelling are considered for structural design to the Eurocodes, utilising the UK National Annexes, for the common structural materials. Numerical aspects are covered via the Finite Element Method (FEM) and related software.

Learning activities incorporate formative assessment including problem solving, in-class tasks, and seminar work. The assessment outline section below details assessment for this module by way of coursework.

Practical work within this module includes use of ICT as a visual tool, problem-based scenarios and group work. Students are encouraged to plan their own work schedules, manage their time and extend their presentational skills.

6 | Indicative Content |
---|-------------------|
1. Assess design actions on structures according to Eurocodes 0 & 1.  
   - Basis for design according to Eurocode 0  
   - Loading models and combinations according to Eurocode 1

2. Design structural members to the Eurocodes.  
   - Structural design of timber to Eurocode 5  
   - Structural design of steel to Eurocode 3  
   - Structural design of concrete to Eurocode 2  
   - Structural design of masonry to Eurocode 6

3. Assess structures considering the effects of stiffness, mass, and damping in the design process.  
   - Matrix methods for structural analysis
4. Appraise structures utilising Finite Element Analysis (FEA)
   - Upper- and lower-bound FEA
   - Non-linear analysis
   - The ANSYS software

7 | Module Learning Outcomes
---|---
**On successful completion of the module, students will be able to:**
1. Assess design actions on structures according to Eurocodes 0 & 1.
2. Design structural members to the Eurocodes.
3. Assess structures considering the effects of stiffness, mass, and damping in the design process.
4. Appraise structures utilising Finite Element Analysis (FEA).

8 | Module Assessment
---|---
| Learning Outcome |
| Coursework | Exam | In-Person |
| 1-4 | X | |

9 | Breakdown Learning and Teaching Activities
---|---
| Learning Activities | Hours |
| Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable | 48 |
| Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE | 56 |
| Private Study (PS) includes preparation for exams | 96 |
| **Total Study Hours:** | **200** |