Module Template for New and Revised Modules

<table>
<thead>
<tr>
<th>Module Code</th>
<th>CEU44A01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module Name</td>
<td>Civil Engineering Materials</td>
</tr>
<tr>
<td>ECTS Weighting²</td>
<td>5 ECTS</td>
</tr>
<tr>
<td>Semester taught</td>
<td>Semester 2</td>
</tr>
<tr>
<td>Module Coordinator/s</td>
<td>Sara Pavia</td>
</tr>
</tbody>
</table>

**Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline**

On successful completion of this module, students should be able to:

- **LO1.** Select quality building material, compatible with existing fabrics and responsible towards the environment.
- **LO2.** Identify, analyse and solve problems relating to the behaviour of building materials in constructions.
- **LO3.** Select the most appropriate materials needed in order to solve a problem or to be employed for a particular use.
- **LO4.** Critically interpret the results of engineering testing and scientific analysis of building materials.
- **LO5.** Differentiate between choices of concrete mix constituents and site process.
- **LO6.** Categorise non-structural cracking and corrosion phenomena in concrete and plan for their minimization or avoidance.
- **LO7.** Develop a regime for investigation of material deterioration.
- **LO8.** Effectively conduct the relevant experiments and analysis needed in order to evaluate the quality and durability of building materials.
- **LO9.** Communicate effectively the results of research and laboratory experimentation.
- **LO10.** Practice high professional standards in relation to the repair and conversation of traditional and historic fabrics.
- **LO11.** Practice high ethical standards concerning the selection of quality materials for building.

---

1. *An Introduction to Module Design* from AISHE provides a great deal of information on designing and re-designing modules.
2. *TEP Glossary*
Graduate Attributes: levels of attainment

To act responsibly - Enhanced
To think independently - Enhanced
To develop continuously - Enhanced
To communicate effectively - Enhanced

Module Content

The module provides the student with essential knowledge on the properties, use, deterioration and repair of some of the most important materials used for building including stone and ceramic brick, insulations Portland cement (PC) concrete, lime and PC mortar, metal and timber.

- Mortar:

- Concrete:

- Sustainable materials and construction:
  Building with earth, hemp-lime concretes, straw bale and other sustainable materials. Thermal and hygric properties. Production and application.

- Insulation materials:
  Lime-based renders, cork and hemp materials, aerogels and CSB. Thermal and hygric properties. Production and application.

- Stone:

- Brick:

- Timber:

- Steel:
  Manufacture. Corrosion and fire protection.

**Teaching and Learning Methods**

Lectures, laboratories and site visits.

The teaching strategy is a mixture of:

- Lectures (27 hours),
- laboratory practical’s and site visits (12 hours),
- research reports.

**Assessment Details**

<table>
<thead>
<tr>
<th>Assessment Component</th>
<th>Assessment Description</th>
<th>LO Addressed</th>
<th>% of total</th>
<th>Week due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination</td>
<td>2 hour written exam</td>
<td>LO1-LO7</td>
<td>80%</td>
<td>In April, as published by the exams office</td>
</tr>
<tr>
<td>Coursework</td>
<td>Four technical reports</td>
<td>LO8-LO11</td>
<td>20%</td>
<td>Before week 10.</td>
</tr>
</tbody>
</table>

**Reassessment Requirements**

2 hour 100% written examination

**Contact Hours and Indicative Student Workload**

Contact hours: lectures 27 hours; laboratories and sites 12 hours.

Independent Study (preparation for course and review of materials): 60 hours

Independent Study (preparation for assessment, incl. completion of assessment): 30 hours

---

3 [TEP Guidelines on Workload and Assessment](#)
### Recommended Reading List

- Download publications on insulation, earth construction, lime-hemp concrete, lime-based materials etc. from: [https://www.tcd.ie/research/profiles/?profile=pavias](https://www.tcd.ie/research/profiles/?profile=pavias)

### Module Pre-requisite

1st / 2nd year modules in Chemistry and Materials.

### Module Co-requisite

None

### Module Website


### Are other Schools/Departments involved in the delivery of this module?

No

### Module Approval Date

January 2020

### Academic Start Year

2019-20