<table>
<thead>
<tr>
<th>Subject Code</th>
<th>BRE203</th>
<th>ENVIRONMENTAL SCIENCE</th>
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<tbody>
<tr>
<td>Level</td>
<td>2</td>
<td></td>
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<tr>
<td>Contact Hours</td>
<td>Lect:21 Tut:14 Lab:8</td>
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<tr>
<td>Student Effort</td>
<td>Hours</td>
<td>120</td>
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<tr>
<td>Assessment Method</td>
<td>Coursework 40% Examination 60%</td>
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<tr>
<td>Credit Value</td>
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<tr>
<td>Pre-requisites</td>
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<tr>
<td>Co-requisites</td>
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<tr>
<td>Exclusions</td>
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<tr>
<td>Subject Leader/ Lecturer/Dept.</td>
<td>S.T. Chan (BRE)</td>
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**Subject Aim:**

*This subject is intended to:*

1. Equip students with an holistic understanding of the factors that contribute to the quality and performance of the built environment with respect to the technical knowledge learned in construction technology.

**Learning Outcomes:**

*Students will demonstrate their ability to:-*

1. Understand the means of controlling the internal environment and provide standards of utility and comfort whilst utilizing principles of passive design to minimize the consumption of energy
2. Review the causes of indoor air pollution and the means to provide a healthy environment.
3. Consider the effect of building construction and operation on the environment and appraise the role of sustainable development in minimizing impact on the external environment – use of resources, waste generation, pollution

**Brief Syllabus Content:**

- Man and heat, heat transfer mechanisms, conduction, convection, radiation, thermal comfort.
- Climate and shelter, classification, global mechanisms, climatic data, micro-climatic building design.
- Design variables for energy efficient design and thermal performance of a building.
- Passive and active thermal controls, heating, refrigerators, ventilation and air conditioning.
- Principles of light, electromagnetic radiation, vision, luminance, glare, natural lighting and artificial lighting.
- Principles of sound, noise, noise transfer, insulation, acoustic design.
- Basics of electricity and magnetism, generation and power supply.
- Use of resources, energy efficiency, waste reduction, land use, damage to the environment, sustainable development.
- Environment assessment.
- Indoor air quality.

Teaching activities: Lecture (LT)/Tutorial (TU)/Seminar (SM)/Drawing (DW)/Laboratory or Practical (LB)/Studio (ST)/Workshop (WS)/Project (PJ)/Field Study (FS)/Guided Study (GS)/Visit (VS)
**Experimental work:**

Environmental Science: 2 experiments each of 2 hours duration from the following list:-

1. Lamps – measurement of efficiency.
3. Light fittings - determination of intensity distribution.
4. Daylight – measurement of daylight factor.
5. Absorption - determination of sound absorption coefficient.
6. Oral environment - use of sound level meter to investigate.
7. Reverberation - measurement or reverberation time.
8. Thermal comfort - investigation using thermal comfort meter.
9. ‘U’ values - determination of ‘U’ value of a building element.
10. Thermal radiation - measurement of radiant temperature.

**Learning and Teaching Approach (tasks and activities designed to achieve learning outcomes):**

Teaching periods will adopt a range of methods which could include lectures by staff, small group discussions, student presentations, project based and problem-solving tasks, laboratory and case study work. Where appropriate, the use of computer assisted learning techniques will be employed.

The intention is to create an environment that encourages active learning. Students will be encouraged to reflect on their learning activities to review what they have learned and to plan further action and activity.

**Assessment strategy (assessment of student performance resulting from learning tasks):**

Examination and coursework will constitute the 60% and 40% of the overall work of the subject respectively. The coursework mark will be based on the assessments of assignments projects, presentations, peer-group critiques, tests and examinations. Assessment methods are intended to ensure the students achieve the learning objectives set, and assist learning through constructive feedback.

**Reading List:**


**Supplementary:**
