Built Environment

SUSD0003
Course Name: Energy and the Built Environment

Convener Name: Dr Sarath Mataraarachchi
Disclaimer
This abbreviated course outline is indicative of the outcomes, delivery and assessment. While Course Learning Outcomes will remain constant, other details may be subject to change. The full and most accurate course outline will be available in Moodle.

1. COURSE STAFF

<table>
<thead>
<tr>
<th>Course Convenor</th>
<th>Dr Sarath Mataraarachchi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td><a href="mailto:s.mataraarachchi@unsw.edu.au">s.mataraarachchi@unsw.edu.au</a></td>
</tr>
</tbody>
</table>

2. COURSE DETAILS

Credit Points:  6 UoC

<table>
<thead>
<tr>
<th>Learning Activity</th>
<th>Total Hours</th>
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<tbody>
<tr>
<td>Lecture</td>
<td>16</td>
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<tr>
<td>Tutorial</td>
<td>5</td>
</tr>
<tr>
<td>Studio</td>
<td>0</td>
</tr>
<tr>
<td>Computer Lab</td>
<td>7</td>
</tr>
<tr>
<td>Online learning activity</td>
<td>8</td>
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Description
This course provides an overview of energy related issues in the built environment - demand and supply solutions, technologies and infrastructure, greenhouse emissions, transportation - and energy related interactions with other aspects of sustainable development. Various systems and tools for assessing and rating the performance of the built environment are introduced and explored. The course also discusses related policy, planning, design, management and technological strategies as applied at different scales in the built environment, drawing on best practice 'real world' case studies. The course is constructed around a series of lectures, readings and research assignments; assessment is based on both individual and group work.

Program Learning Outcomes (PLOs)
The Program Learning Outcomes from Architectural Studies addressed in this course are:

1. Appraise the discipline of Architecture in its environmental, cultural, historical and interdisciplinary context and the ability to apply architectural knowledge and skills through architectural design to local, national and international contexts.
2. Demonstrate independent architectural enquiry through rigorous analysis, critique and reflection.
3. Capacity to be ethical architectural practitioners and lifelong learners.
4. Capacity to be effective communicators versed in architectural literacy and in a collaborative teamwork environment.
5. The ability to be enterprising, innovative and creative in architecture and design-based fields and industries.
6. Ability to act in the architectural profession with environmental responsibility and be culturally aware and capable of respecting diversity and acting in socially responsible ways.
### Alignment of Course Learning Outcomes (CLOs), Program Learning Outcomes (PLOs), and Assessment

<table>
<thead>
<tr>
<th>CLO #</th>
<th>CLO Statement</th>
<th>PLO #</th>
<th>Related Assessment &amp; Activities</th>
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</table>
| CLO 1 | Demonstrate critical thinking and evaluation of issues around energy, greenhouse gas/carbon emissions and related environmental aspects, impacts and opportunities associated with buildings and precincts; demonstrate reflective thinking and communication of these in their own personal and professional contexts. | 1, 5       | Assignment 1  
Assignment 2  
Assignment 3  
Assignment 4 |
| CLO 2 | Demonstrate a fundamental understanding and application of metrics, indicators and rating systems, and develop arguments and present a case for a holistic sustainability building rating framework, including major compliance criteria and mechanisms. | 1, 2, 3, 5 | Assignment 1  
Assignment 4 |
| CLO 3 | Investigate and critically assess an office building or other equivalent built environment in terms of its performance on energy, emissions and other sustainability indicators. | 2, 3, 5    | Assignment 2 |
| CLO 4 | Independently and as part of a multidisciplinary team, develop, discuss and demonstrate application of appropriate policy, planning, design and/or management initiatives to achieve greater sustainability in the built environment throughout its life cycle. | 3, 4       | Assignment 1  
Assignment 2  
Assignment 4 |

### 3. ASSESSMENT

<table>
<thead>
<tr>
<th>Assessment task</th>
<th>Weight</th>
<th>Course Learning Outcomes assessed</th>
<th>Due date</th>
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<tbody>
<tr>
<td>1. Assignment 1</td>
<td>5%</td>
<td>1</td>
<td>11/10/2019</td>
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<tr>
<td>2. Assignment 2</td>
<td>35%</td>
<td>1, 2, 3, 4</td>
<td>20/11/2019</td>
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<td>3. Assignment 3</td>
<td>25%</td>
<td>3, 4</td>
<td>13/11/2019</td>
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<td>4. Assignment 4</td>
<td>35%</td>
<td>1, 2, 3, 4</td>
<td>20/11/2019</td>
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*The assessment design procedure (Section 1.2) states that courses should include an early assessment task prior to the census date or one-third into the course.  

**2019 UNSW 3+ Census dates**  
Term 1- March 17  
Term 2- June 30  
Term 3- October 13
## 4. WEEKLY COURSE SCHEDULE

|------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------|
| 1    | • Introduction to the course, Course design, L&T strategies and expectations, Assignments, Groups, and house-keeping matters  
      • Sustainable Design and Construction Rating and Assessment Tools (Introduction of the group assignment) | • Lectures and tutorials  
      • Small group discussion                                                                 | 1, 2, 3,     |
| 2    | • Energy: fundamentals and application                                                            | • Short video lecture  
      • Q&A session on Video  
      • Relevant Youtube videos  
      • Reading  
      • Quizzes                                                                 | 2            |
| 3    | • Energy and associated issues in the built environment: emerging directions                     | • Short video lectures  
      • Lessons in Slide format  
      • Q&A session on Video  
      • Relevant Youtube videos  
      • Reading  
      • Quizzes                                                                 | 3, 4         |
| 4    | • Energy Regulation Compliances and Case Studies in Australia                                    | • Short video lectures  
      • Lessons in Slide format  
      • Q&A session on Video  
      • Relevant Youtube videos  
      • Reading  
      • Quizzes                                                                 | 4            |
| 5    | • Climate Data for Design and Decision-making                                                     | • Short video lectures  
      • Lessons in Slide format  
      • Q&A session on Video  
      • Relevant Youtube videos                                                                 | 1, 2, 3, 4   |
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Learning Activities</th>
<th>Assignments</th>
</tr>
</thead>
</table>
| 6    | Passive House                              | • Short video lectures  
• Lessons in Slide format  
• Q&A session on Video  
• Relevant Youtube videos  
• Reading  
• Quizzes                                                                 | 1, 2, 3, 4        |
| 7    | Design Practice and Sustainability         | • Short video lectures  
• Lessons in Slide format  
• Q&A session on Video  
• Relevant Youtube videos  
• Reading  
• Quizzes                                                                 | 1, 4              |
| 8    | CRC Low Carbon Living: Research and Innovation | • Short video lectures  
• Lessons in Slide format  
• Q&A session on Video  
• Relevant Youtube videos  
• Reading  
• Quizzes                                                                 | 1, 2, 3, 4        |
| 9    | Green Star Foundation Course               | • Short video lectures  
• Lessons in Slide format  
• Q&A session on Video  
• Relevant Youtube videos  
• Reading  
• Quizzes                                                                 | 1, 2, 3, 4        |
| 10   | In class group project presentations and discussions | • Presentations by students for examination                                                                 | 1, 2, 3, 4        |