Built Environment

SUSD0007
Integrated Design Studio

Paul Osmond
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>Paul Osmond</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td><a href="mailto:p.osmond@unsw.edu.au">p.osmond@unsw.edu.au</a></td>
</tr>
</tbody>
</table>

2. COURSE DETAILS

Credit Points: 6 UoC

<table>
<thead>
<tr>
<th>Learning Activity</th>
<th>Hours Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>5</td>
</tr>
<tr>
<td>Studio</td>
<td>55</td>
</tr>
</tbody>
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Description
In Australia and globally, the challenge of climate change is driving growing interest in the design and construction of high performance buildings which are climate appropriate, energy efficient and generate energy from renewable sources. This studio course provides the opportunity for BE Masters students to work together in teams with colleagues from the Faculty of Engineering on real world, industry-linked projects focused on the integrated design of sustainable, high performance buildings. The studio will be structured around cross-disciplinary collaboration and integration of low energy, passive design strategies from project conception, and will include opportunities for interaction with experienced industry professionals. Lectures in advanced topics of ESD design and evidence based methods and tools, including evaluation and prediction of building thermal, energy and daylighting performance, will complement and inform students' studio work.

Program Learning Outcomes (PLOs)

1. Advanced disciplinary knowledge and practices - Graduates will have acquired advanced disciplinary knowledge and skills, and an ability to apply these in a range of contexts.
2. Enquiry-based learning - Graduates will have developed an understanding of enquiry-based learning and demonstrate analytical skills
3. Cognitive skills and critical thinking - Graduates will have developed advanced critical thinking and problem solving skills.
4. Communication, adaptive and interactional skills - Graduates will be able to communicate effectively to a range of audiences, and be capable of independent and collaborative enquiry and working effectively with others.
5. Global outlook - Graduates will have an awareness of international issues within their field of study.
### Course Learning Outcomes (CLOs) with Alignment to PLOs and Assessment

<table>
<thead>
<tr>
<th>CLO #</th>
<th>CLO Statement</th>
<th>PLO #</th>
<th>Related Assessment &amp; Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLO 1</td>
<td>Understand and apply the fundamental principles, constraints, technologies and tools of sustainable design to the creation of a new high performance building from concept stage to design development, including consideration of: • triple bottom line and life cycle thinking    • site analysis – climate, context and landscape • passive and active energy efficient design • building materials – long life, loose fit, low impact • human comfort, health and wellbeing • Water and waste cycles</td>
<td>1, 2, 3</td>
<td>Weekly group exercises</td>
</tr>
<tr>
<td>CLO 2</td>
<td>Apply building performance prediction and post-construction performance evaluation techniques to inform the design process and facilitate reflective practice.</td>
<td>1, 2, 3</td>
<td>Final group digital presentation; Individual commentary</td>
</tr>
<tr>
<td>CLO 3</td>
<td>Demonstrate the ability to pursue a sustained, multi-disciplinary integrated design process from concept to developed design.</td>
<td>2, 3, 4</td>
<td>Final group digital presentation; Individual commentary</td>
</tr>
<tr>
<td>CLO 4</td>
<td>Demonstrate the ability to communicate a design concept for a high performance, energy efficient and low environmental impact building.</td>
<td>4, 5</td>
<td>Final group digital presentation</td>
</tr>
</tbody>
</table>

### 3. ASSESSMENT

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Weight</th>
<th>Course Learning Outcomes Assessed</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Weekly group exercises Weeks 1-8, each 2.5%; 6-8 pages using drawings and diagrams, explanatory text where required.</td>
<td>25% (group)</td>
<td>1</td>
<td>Weeks 2-9</td>
</tr>
<tr>
<td>2. Final group digital presentation, design and sustainability ideas; 20 minutes group presentation and 10-20 minutes for crit and Q&amp;A.</td>
<td>25% (group, marks modified by peer review = individual marks)</td>
<td>1, 2, 3, 4</td>
<td>Week 10</td>
</tr>
<tr>
<td>3. Individual commentary; Journal / Diary with commentary on research and design process. Reflection on “journey” + feedback received.</td>
<td>50%</td>
<td>1, 2, 3, 4</td>
<td>Week 12</td>
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## 4. WEEKLY COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Activity</th>
<th>Related CLO</th>
</tr>
</thead>
</table>
| Week 1 | Course requirements, principles and program; Organisation of student groups; People / Place / Purpose – design process | Lecture: Purpose  
Client presentation of brief to groups, discussion in studio                                                                                                                                          | 1           |
| Week 2 | Place: Site and context analysis                                    | Lecture: Place  
Tutorial: Place design principles  
Group work in studio  
Weekly assignment due                                                                                                                                  | 1           |
| Week 3 | Proposition: Design principles                                       | Lecture: Proposition  
Tutorial: Proposition design principles  
Weekly assignment due  
This week also includes intensive Saturday studio: development of design concepts and propositions                                                                                         | 1, 3        |
| Week 4 | Passive design: Orientation, form, massing, solar paths, natural ventilation and daylighting | Lecture: Passive design  
Tutorial: Introduction to Sefaira  
Tutorial: Passive design and form making  
Student submissions: Initial concept design  
Weekly assignment due                                                                                                                                   | 1, 2, 3     |
| Week 5 | Active design: HVAC, lighting, active energy efficiency              | Lecture: Active design  
Tutorial: Active design and form making  
Group work in studio  
Weekly assignment due                                                                                                                                   | 1, 3        |
| Week 6 | Building life cycle: Building ecology, materials, recycling, embodied energy, prefabrication, long life/loose fit/low impact | Lecture: Building life cycle  
Tutorial: Design for construction, buildability, design and tectonics  
Group work in studio  
Weekly assignment due                                                                                                                                   | 1, 2, 3     |
| Week 7 | Blue infrastructure: Water, greywater, blackwater; Waste management | Lecture: Blue infrastructure  
Tutorial:  
Group work in studio  
Weekly assignment due                                                                                                                                   | 1, 3        |
| Week 8 | Green infrastructure: green roofs and walls                          | Lecture: Green infrastructure  
Tutorial: Living architecture  
Group work in studio  
Weekly assignment due                                                                                                                                   | 1, 3        |
| Week 9 | PV systems; Building                                                 | Lecture: PV systems, building rating systems                                                                                                                                                         | 1, 2, 3     |
| performance, prediction and evaluation | Tutorial: Integrating architecture and engineering services  
Group work in studio  
Weekly assignment due |  |
|---|---|---|
| **Week 10**  
Final design presentations | Final group digital presentation and critiques  
Discussion and feedback | 1, 2, 3, 4 |