SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING

Semester 2, 2017

CVEN4309 SUSTAINABLE TIMBER ENGINEERING

COURSE DETAILS

Units of Credit: 6
Course Mode: Moodle Online plus Workshops
Lecture Workshop: Thursday 6-9pm  Design Studio 501 H20, wks 2, 7 & 12

Lecturer and Course Convenor: Ms Lisa Thom
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Course Coordinator: Associate Professor Mario M. Attard
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INFORMATION ABOUT THE COURSE

The aim of this course is to introduce you to the fundamental concepts and principles applied by engineers in the design of timber structures of all sorts of sizes and purpose. The course is an online timber design course with three workshops throughout the course to look at current case studies in sustainable design using timber such as International House at Barangaroo, Australia's first engineered timber office block. The workshops will be given by industry partners initially from Wood Solutions and LendLease.

HANDBOOK DESCRIPTION

Structural and Construction Engineers may be responsible for the design and construction of timber structures; from timber frame housing to high rise engineered timber structures. This course provides an introduction to the design of timber structures using a range of timber products and the relevant Australian and European Standards. It further outlines the considerations to design for Durability, Fire, Manufacture and Assembly that play an important role in timber engineering.

Refer to Online Handbook available at:

TEACHING STRATEGIES

This course will be delivered online with recorded lectures and workshop problems delivered through Moodle. There will also be intense campus workshops which could be teleconferenced to those that are not on campus. The workshop will be given by Guest Lectures from industry.

The teaching strategies that will be used include:

- **Recorded Lectures** that will focus on the development and application of timber design. Lectures will also emphasise the relationship of the content to engineering practice and will provide an opportunity for reflection on learning. The lectures will be available on the Moodle course page.
- **Online Problems and Online Quizzes** will supplement the recorded lectures and reading material provided
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- **Moodle Blended Learning Course Page** provides a step by step guide on the course. There is a discussion forum to help provide interaction and help from your peers. Links to video recordings and learning modules to help you learn the solution techniques for many of the subject areas.
- **Industry Workshops** will provide real applications for the content you are learning. Attendance is compulsory.

Suggested approaches to learning in this course include:

- Regular participation in Moodle Forum. *Reflect on class problems and quizzes.*
- Complete all the required tasks in the Moodle course page for this course.
- Weekly reading of notes and recordings of lectures.
- Appropriate preparation for online problem activities.
- Planning your time to achieve all assessment requirements (see assessment).

We encourage you to work with your peers. A good way to learn the material is in small study groups. Such groups work best if members have attempted the problems individually before meeting as a group. A valued and honest collaboration occurs when, for example, you “get stuck” early on in attacking an exercise and go to your classmate with a relevant question. Your classmate then has the opportunity to learn from your question as well as help you. You then bring something to the collaboration. You can learn too from last year’s problem sets and quizzes if used as a check or corrective when you seem to have hit a dead end.

- Students who perform poorly in the quizzes are strongly encouraged to discuss their progress with the lecturer during the semester. Please do not suffer in silence – seek the help at an early stage! We would like you to make most of this learning process and receive a high grade in the course.

**EXPECTED LEARNING OUTCOMES**

After completing this course, the learning outcomes are:

1. Apply their understanding of timber materials properties, timber structural behaviour to the design of timber structural members and connections;
2. Interpret and apply relevant Australian and European Standards to competently design and evaluate the capacity of timber members and connections;
3. Appreciate the range of potential timber structures from houses to multi-storey timber buildings and larger iconic structures;
4. Incorporate practical durability, fire, manufacture and assembly considerations in design

These learning outcomes map to Engineers Australia Stage 1 Competencies 1.1 & 1.2

1.1. Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.
1.2. Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.

**Self-centred and self-directed learning (expectations of the students):**

In addition to the viewing of the recorded videos and online tasks, you are expected to commit **6 - 8 hours per week** to independent learning and general problem solving.

**ASSESSMENT**

Assessment will be based on **completion of online Moodle modules, online quizzes, major assignment** and **a final exam**. These components will address engineering problems consistent with those you are likely to face as a professional Civil/Environmental Engineer.

- The **online Moodle modules** are learning modules to help you learn the solution strategies for the major topics. The assessment is based on completion of the modules.
- The final exam is given because the course learning outcomes include a significant level of technical learning that can be effectively assessed in an exam environment and because exams have high reliability. It is primarily designed to align with UNSW graduate attributes 2 and 3.
- **A mark of at least 40% in the final examination is required before the class work (hand-in quizzes and online tasks) is included in the final mark.** The formal exam scripts will not be returned but you are permitted to view the marked script.

The relative value of each of the assessable tasks is as follows:

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<table>
<thead>
<tr>
<th>Item</th>
<th>Marks</th>
<th>Due Date</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Revision Problems</td>
<td>10%</td>
<td>Weekly, 5pm Friday</td>
<td>Each week revision problems will be required to be completed.</td>
</tr>
<tr>
<td>Online Moodle Quiz 1</td>
<td>10%</td>
<td>5pm Friday 25th August</td>
<td>Online Moodle Quiz 1 covers content from Weeks 1-4. Marks are awarded for correct answers.</td>
</tr>
<tr>
<td>Online Moodle Quiz 2</td>
<td>10%</td>
<td>5pm Friday 22nd September</td>
<td>Online Moodle Quiz 2 covers content from Weeks 5-8. Marks are awarded for correct answers.</td>
</tr>
<tr>
<td>Online Moodle Quiz 3</td>
<td>10%</td>
<td>5pm Friday 13th October</td>
<td>Online Moodle Quiz 3 covers content from Weeks 9-11. Marks are awarded for correct answers.</td>
</tr>
<tr>
<td>Final Examination</td>
<td>60%*</td>
<td>Final Examination Period</td>
<td>The final exam is a 2hr Open Book examination. The exam covers all the worked covered during the semester. Marks are awarded for correct answers and there are marks for getting the method correct.</td>
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</table>

*Note: A mark of at least 40% in the final examination is required before the class work is included.

The examination, assignment and online quizzes show evidence of application of theoretical concepts to solving problems. There are no exemptions from any part of this assessment. If you are repeating the course you must complete all components this year.

**Note:** The course coordinator reserves the right to adjust the final scores by scaling if agreed to by the Head of School.

**RESOURCES**

**Reference**

- AS1720.1 - Timber Structures
- SA HB 108 - Timber Design Handbook
- EN 1995-1 - Eurocode 5 - Design of Timber Structures

**Websites**

- [http://www.woodworks.org/](http://www.woodworks.org/)

**Technology Enabled Learning and Teaching Website and login to Moodle**

- [http://telt.unsw.edu.au/](http://telt.unsw.edu.au/)

**UNSW Library Database**

Access Engineering – platform of e-books, videos and interactive tables and graphs.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Online Moodle Quiz</th>
</tr>
</thead>
</table>
| 1    | Introduction to Timber  
       Understanding Timber  
       Engineering Properties of Timber  
       Timber Products  
       AS1700.1 Timber Structures | Revision Quiz      |
| 2    | Workshop 1 – Lightweight Timber; Introduction to Course               |                    |
| 3    | Serviceability of Bending Elements  
       Capacity of Bending Elements | Revision Quiz      |
| 4    | Capacity of Tension Members  
       Capacity of Compression Members  
       AS1694 Residential Tables    | Revision Quiz      |
| 5    | Capacity of Connections  
       Durability                 |                    |
| 6    | CLT Material Properties  
       Design of CLT with Eurocode 5  
       Gamma Method               | Revision Quiz      |
| 7    | Workshop 2 – Engineered Timber                                       |                    |
| 8    | Serviceability of Bending Elements  
       Strength of CLT in Bending  
       Capacity of CLT in Tension | Revision Quiz      |
| 9    | Field Trip Week – no lecture material                                 | Online Moodle Quiz 2 |
| 10   | Distribution of Concentrated Loads in CLT  
       Capacity of CLT Connections | Revision Quiz      |
| 11   | Introduction to DfMA and LEAN  
       Manufacturing Considerations  
       Logistics Considerations  
       Installation Considerations | Revision Quiz  
       Online Moodle Quiz 3      |
| 12   | Introduction to Fire Engineering  
       Fire Design of CLT          | Revision Quiz      |
| 13   | Workshop 3 – Revision Workshop                                        |                    |

**DATES TO NOTE**

Refer to MyUNSW for Important Dates available at:

[https://my.unsw.edu.au/student/dates.html](https://my.unsw.edu.au/student/dates.html)

**PLAGIARISM**

Beware! An assignment that includes plagiarised material will receive a 0% Fail, and students who plagiarise may fail the course. Students who plagiarise are also liable to disciplinary action, including exclusion from enrolment.

Plagiarism is the use of another person’s work or ideas as if they were your own. When it is necessary or desirable to use other people’s material you should adequately acknowledge whose words or ideas they are and where you found them (giving the complete reference details, including page number(s)). The Learning Centre provides further information on what constitutes Plagiarism at:
COURSE EVALUATION AND DEVELOPMENT

The School of Civil and Environmental Engineering evaluates each course each time it is run through (i) the UNSW Course and Teaching Evaluation and Improvement (CATEI) process, and (ii) Focus Group Meetings.

As part of the MyExperience process, your student evaluations on various aspects of the course are graded; the Course Coordinator prepares a summary report for the Head of School. Any problem areas are identified for remedial action, and ideas for making improvements to the course are noted for action the next time that the course is run.

Focus Group Meetings are conducted by the four Year Managers (academic staff) for any students who wish to attend, in each year of the civil and/or environmental engineering programs. Student comments on each course are collected and disseminated to the Lecturers concerned, noting any points which can help improve the course.

ACADEMIC ADVICE

For information about:

- Notes on assessments and plagiarism,
- School policy on Supplementary exams,
- Special Considerations,
- Solutions to Problems,
- Year Managers and Grievance Officer of Teaching and Learning Committee, and
- CEVSOE.

Refer to Academic Advice on the School website available at:

https://www.engineering.unsw.edu.au/civil-engineering/student-resources/policies-procedures-and-forms/academic-advice