COURSE DETAILS

Units of Credit | 6
Course Mode | Moodle Online
Lecture Workshop | Tuesday 6-9pm wks 3,8 (optional)

Course Coordinator | Associate Professor Mario M. Attard
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Online Coordinator | Dr. Xiaojun Chen
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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.

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
• **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 term. 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 multistorey 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 tutorials, 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 tutorials 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.
- Late submission needs prior approval as all assessment is online except for the final examination. There is no penalty if approval has been granted.

Supplementary exam details:

Supplementary Examinations for Term 1 2020 will be held on Monday 25th to Friday 29th May (inclusive) should you be required to sit one. You are required to be available during these dates. Please do not to make any personal or travel arrangements during this period.

<table>
<thead>
<tr>
<th>Item</th>
<th>Length</th>
<th>Weighting</th>
<th>Learning outcomes assessed</th>
<th>Assessment Criteria</th>
<th>Due date and submission requirements</th>
<th>Marks returned</th>
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<tbody>
<tr>
<td>Online Tutorial</td>
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<tr>
<td>Online tutorial 1</td>
<td></td>
<td></td>
<td>1,3</td>
<td>Online tutorial questions material will cover week 1</td>
<td>11pm, 01/03/2020</td>
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<tr>
<td>Online tutorial 2</td>
<td></td>
<td></td>
<td>2,3</td>
<td>Online tutorial questions material will cover week 2</td>
<td>11pm, 08/03/2020</td>
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<tr>
<td>Online tutorial 3</td>
<td></td>
<td></td>
<td>2,3</td>
<td>Online tutorial questions material will cover week 3</td>
<td>11pm, 15/03/2020</td>
<td></td>
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<tr>
<td>Online tutorial 4</td>
<td></td>
<td></td>
<td>2,3</td>
<td>Online tutorial questions material will cover week 4</td>
<td>11pm, 22/03/2020</td>
<td></td>
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<tr>
<td>Online tutorial 5</td>
<td></td>
<td></td>
<td>2,3</td>
<td>Online tutorial questions material will cover week 5</td>
<td>11pm, 05/04/2020</td>
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<tr>
<td>Online tutorial 6</td>
<td>2,3</td>
<td>Online tutorial questions material will cover week 7</td>
<td>11pm, 12/04/2020</td>
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<tr>
<td>Online tutorial 7</td>
<td>2,3</td>
<td>Online tutorial questions material will cover week 8</td>
<td>11pm, 19/04/2020</td>
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<tr>
<td>Online tutorial 8</td>
<td>3,4</td>
<td>Online tutorial questions material will cover week 9</td>
<td>11pm, 26/04/2020</td>
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**Online Quiz**

<table>
<thead>
<tr>
<th>Quiz</th>
<th>Duration</th>
<th>Weight</th>
<th>Topics Covered</th>
<th>Details</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz 1</td>
<td>1.5 hours</td>
<td>10%</td>
<td>1, 2, 3, 4</td>
<td>Online Moodle Quiz 1 covers content from Weeks 1-4. Marks are awarded for correct answers.</td>
<td>Tuesday 8pm, 24/03/2020</td>
</tr>
<tr>
<td>Quiz 2</td>
<td>1.5 hours</td>
<td>10%</td>
<td>1, 2, 3, 4</td>
<td>Online Moodle Quiz 2 covers content from Weeks 5-9. Marks are awarded for correct answers.</td>
<td>Tuesday 8pm, 14/04/2020</td>
</tr>
<tr>
<td>Quiz 3</td>
<td>1.5 hours</td>
<td>10%</td>
<td>1, 2, 3, 4</td>
<td>Online Moodle Quiz 3 covers content from Weeks 10. Marks are awarded for correct answers.</td>
<td>Tuesday 8pm, 28/04/2020</td>
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**Final Exam**

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<thead>
<tr>
<th>Final Exam</th>
<th>Duration</th>
<th>Weight</th>
<th>Topics Covered</th>
<th>Details</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Exam</td>
<td>2 hours</td>
<td>60%*</td>
<td>1, 2, 3, 4</td>
<td>The final exam is a 2hr Open Book examination. The exam covers all the worked covered during the term. Marks are awarded for correct answers and there are marks for getting the method correct.</td>
<td>TBD</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, online tutorials 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. No assessment will be accepted after the due date.

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

All students are expected to sit their final examination on Kensington campus (Sydney). If you reside farther than 40 km from the Kensington campus, and you wish to sit your exam externally (by distance), you must register for an external exam by the UNIVERSITY CENSUS DATE. More information can be found here: [https://www.engineering.unsw.edu.au/civil-engineering/student-resources/policies-procedures-and-forms/exam](https://www.engineering.unsw.edu.au/civil-engineering/student-resources/policies-procedures-and-forms/exam).
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/

Technology Enabled Learning and Teaching Website and login to Moodle

http://telt.unsw.edu.au/

UNSW Library Database

Access Engineering – platform of e-books, videos and interactive tables and graphs.

COURSE PROGRAM

<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 |                             |
| 2    | Serviceability of Bending Elements  
Capacity of Bending Elements | Revision Quiz 1              |
| 3    | Workshop 1 – Lightweight Timber; Introduction to Course  
Capacity of Tension Members  
Capacity of Compression Members  
AS1694 Residential Tables | Revision Quiz 2         |
| 4    | Capacity of Connections  
Durability | Revision Quiz 3 |
| 5    | CLT Material Properties  
Design of CLT with Eurocode 5  
Gamma Method | Revision Quiz 4 |
| 6    | Non-Teaching Week | Online Moodle Quiz 1  
24/03/2020 |
| 7    | Serviceability of Bending Elements  
Strength of CLT in Bending  
Capacity of CLT in Tension | Revision Quiz 5 |
| 8    | Workshop 2 – Engineered Timber | Revision Quiz 6 |
| 9    | Distribution of Concentrated Loads in CLT  
Capacity of CLT Connections | Online Moodle Quiz 2  
14/04/2020  
Revision Quiz 7 |
| 10   | Introduction to Fire Engineering  
Fire Design of CLT | Revision Quiz 8 |
| 11   | | Online Moodle Quiz 3  
28/04/2020 |
DATES TO NOTE
Refer to MyUNSW for Important Dates available at:

https://student.unsw.edu.au/dates

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:

https://student.unsw.edu.au/plagiarism

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
- CEVSOC.

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
### Appendix A: Engineers Australia (EA) Competencies

#### Stage 1 Competencies for Professional Engineers

<table>
<thead>
<tr>
<th>Program Intended Learning Outcomes</th>
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<tbody>
<tr>
<td><strong>PE1: Knowledge and Skill Base</strong></td>
</tr>
<tr>
<td>PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals</td>
</tr>
<tr>
<td>PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing</td>
</tr>
<tr>
<td>PE1.3 In-depth understanding of specialist bodies of knowledge</td>
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<td>PE1.4 Discernment of knowledge development and research directions</td>
</tr>
<tr>
<td>PE1.5 Knowledge of engineering design practice</td>
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<tr>
<td>PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice</td>
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<tr>
<td><strong>PE2: Engineering Application Ability</strong></td>
</tr>
<tr>
<td>PE2.1 Application of established engineering methods to complex problem solving</td>
</tr>
<tr>
<td>PE2.2 Fluent application of engineering techniques, tools and resources</td>
</tr>
<tr>
<td>PE2.3 Application of systematic engineering synthesis and design processes</td>
</tr>
<tr>
<td>PE2.4 Application of systematic approaches to the conduct and management of engineering projects</td>
</tr>
<tr>
<td><strong>PE3: Professional and Personal Attributes</strong></td>
</tr>
<tr>
<td>PE3.1 Ethical conduct and professional accountability</td>
</tr>
<tr>
<td>PE3.2 Effective oral and written communication (professional and lay domains)</td>
</tr>
<tr>
<td>PE3.3 Creative, innovative and pro-active demeanour</td>
</tr>
<tr>
<td>PE3.4 Professional use and management of information</td>
</tr>
<tr>
<td>PE3.5 Orderly management of self, and professional conduct</td>
</tr>
<tr>
<td>PE3.6 Effective team membership and team leadership</td>
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