



Australia's
Global
University

SCHOOL OF CIVIL AND ENVIRONMENTAL

Term 1, 2020

CVEN4309 SUSTAINABLE TIMBER ENGINEERING

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

Email: m.attard@unsw.edu.au CE 604 Phone: +61 2 9385 5075

Associate Lecturer Daniel O'Shea

Email: d.oshea@unsw.edu.au

Online Coordinator Dr. Xiaojun Chen

Email: xiaojun.chen@unsw.edu.au

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:

<http://www.handbook.unsw.edu.au/undergraduate/courses/2020/CVEN4309.html>

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.

Item	Length	Weighting	Learning outcomes assessed	Assessment Criteria	Due date and submission requirements	Marks returned
Online Tutorial						
Online tutorial 1	-	10% for total 9 online tutorials	1,3	Online tutorial questions material will cover week 1	11pm, 01/03/2020	Marks will be returned online immediately after submission
Online tutorial 2			2,3	Online tutorial questions material will cover week 2	11pm, 08/03/2020	
Online tutorial 3			2,3	Online tutorial questions material will cover week 3	11pm, 15/03/2020	
Online tutorial 4			2,3	Online tutorial questions material will cover week 4	11pm, 22/03/2020	
Online tutorial 5			2,3	Online tutorial questions material will cover week 5	11pm, 5/04/2020	

Online tutorial 6			2,3	Online tutorial questions material will cover week 7	11pm, 12/04/2020	
Online tutorial 7			2,3	Online tutorial questions material will cover week 8	11pm, 19/04/2020	
Online tutorial 8			3,4	Online tutorial questions material will cover week 9	11pm, 26/04/2020	
Online Quiz						
Quiz 1	1.5 hours	10%	1, 2, 3, 4	Online Moodle Quiz 1 covers content from Weeks 1-4. Marks are awarded for correct answers.	Tuesday 8pm, 24/03/2020	30/03/2020
Quiz 2	1.5 hours	10%	1, 2, 3, 4	Online Moodle Quiz 2 covers content from Weeks 5-9. Marks are awarded for correct answers.	Tuesday 8pm, 14/04/2020	20/04/2020
Quiz 3	1.5 hours	10%	1, 2, 3, 4	Online Moodle Quiz 3 covers content from Weeks 10. Marks are awarded for correct answers.	Tuesday 8pm, 28/04/2020	4/05/2020
Final Exam						
Final Exam	2 hours	60%*	1, 2, 3, 4	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.		TBD

*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>.

RESOURCES

Reference

AS1720.1 - Timber Structures

SA HB 108 - Timber Design Handbook

EN 1995-1 - Eurocode 5 - Design of Timber Structures

Websites

<https://www.woodsolutions.com.au/>

<http://www.woodworks.org/>

Technology Enabled Learning and Teaching Website and login to Moodle

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

<https://moodle.telt.unsw.edu.au/login/index.php>

UNSW Library Database

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

COURSE PROGRAM

Week	Topic	Online Quiz Moodle
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 <i>Strength of CLT in Bending</i> <i>Capacity of CLT in Tension</i>	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

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