

**SCHOOL OF CIVIL AND ENVIRONMENTAL
ENGINEERING**

THE UNIVERSITY OF
NEW SOUTH WALES

Semester 2 – 2013



CVEN 2302 MATERIALS AND STRUCTURES

COURSE DETAILS

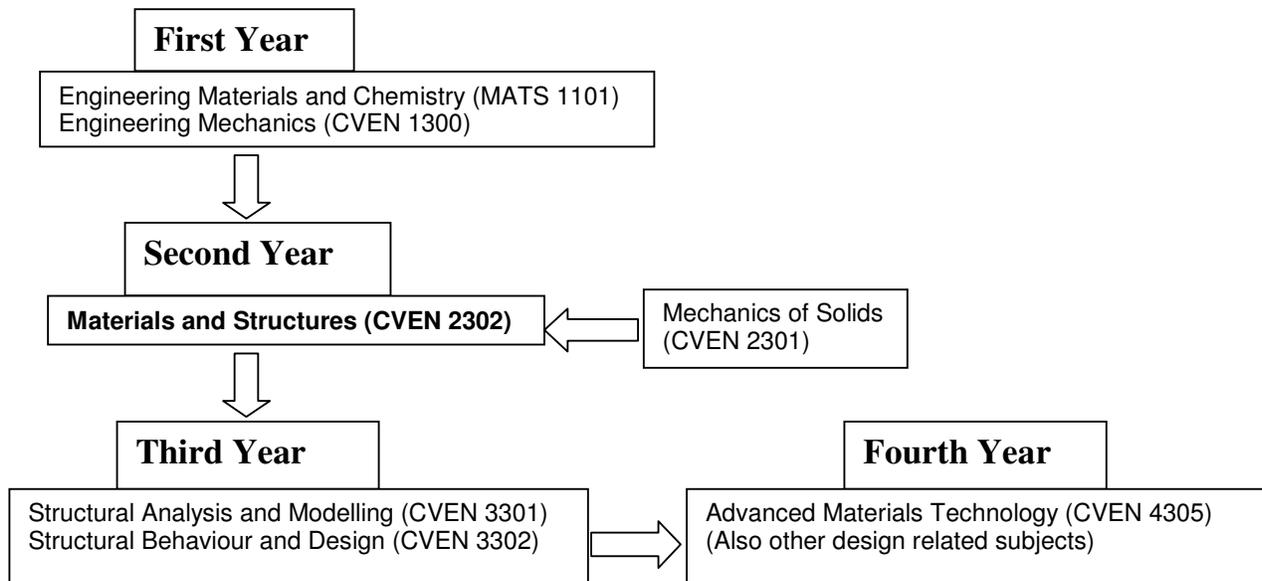
Units of Credit	6		
Contact hours	5 hours per week		
Class	Monday	9.00 – 11.00	Central Lecture Block 7
	Thursday	15.00 – 16.00	Central Lecture Block 7
Tutorial	Thursday	16.00 – 18.00	

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INFORMATION ABOUT THE COURSE

Materials and Structures is a new course introduced in 2007 in the Second Year, as a continuation of Engineering Materials and Chemistry (MATS 1101) in the First Year. In *Materials and Structures* (CVEN 2302), topics on Concrete and Composites will be introduced in the 'materials strand'. Areas such as mechanical properties, durability and applications will be covered. In 'structures area', considerations such as loading types, fundamentals of design of tension and compression members will be dealt with. The relationship between this subject and the subjects in previous and forthcoming years is shown below:



HANDBOOK DESCRIPTION

This course consists of a material and a structural design strand. The structural design strand concerns 75% of the course while the material strand concerns 25% of the course. The Structural Design Strand covers: Introduction to limit states design and codes of practice (design objectives; strength and serviceability limit states); loads and load combinations (dead, live and wind loads); design of structural steel tension members; Euler column buckling; design of stocky and slender compression members; design of laterally supported steel beams and simple steel connections. The Material Strand covers: cement, aggregates and admixtures; fresh concrete properties and hardened concrete properties, durability of concrete.

OBJECTIVES

To introduce students to (i) the structural materials including concrete and composites, (ii) fundamentals of design of tension, compression and bending members.

TEACHING STRATEGIES

Private Study	<ul style="list-style-type: none">• Review lecture material• Do tutorial problems• Reflect on class and tutorial problems
Lectures	<ul style="list-style-type: none">• Listen carefully and ask questions• Try and understand the principles• Follow worked examples
Tutorials	<ul style="list-style-type: none">• Work in groups• Preparing for assignments• Ask questions• Hand-in or Quiz
Assessments (quiz/exam)	<ul style="list-style-type: none">• Demonstrate your understanding of material behaviour• Demonstrate your understanding of design fundamentals• Demonstrate problem solving

EXPECTED LEARNING OUTCOMES

- To be able to understand the behaviour of structural materials.
- To be able to assess material suitability for structures in civil engineering.
- To be able to apply the fundamentals learnt in this course to real engineering problems in large scale concrete, composite or steel structures such as tall buildings and bridges.
- Familiarise you with fundamental structural design concepts of members such as tension members, compression members and beams.

For each hour of contact it is expected that a student will put in at least 1.5 hours of private study.

ASSESSMENT

There will be a formal examination taking place in the UNSW examination week. The final examination will have two parts: Section A – Structures and Section B – Materials. This examination will represent 70% of the mark and a class mark representing 30% of the mark will be assessed on the quiz/assignments submitted.

COURSE PROGRAM

The following topics will be covered.

Structures Strand

Week	Topic	Assessment
1	Introduction, Limit state design	
2	Permanent actions (dead loads), Imposed actions (live loads)	
3	Wind actions	
4	Introduction to steel structures, Design of tension members	
5	Design of tension members (cont.), Buckling of columns	Hand in 1 due
6	Design of compression members	
7	Design of flexural members	
8	Simple steel connections	Hand in 2 due

Materials Strand

Week	Topic	Assessment
9	Introduction, Cements	
10	Aggregates and Admixtures	
11	Fresh and Hardened Concrete Properties	
12	Durability of Concrete/Sustainability	Quiz 1

(The week of the scheduled lectures is indicative ONLY and may vary from time to time.)

RELEVANT RESOURCES

Text Books:

Structures

HB2.2-2003, "Australian Standards for Civil Engineering Students - Part 2: Structural Engineering", Standards Australia International, 2003.

Materials

Neville, A.M., and Brooks, J.J., "Concrete Technology", 2001. Prentice Hall, Second Edition 2010.

Recommended Reading:

1. Trahair, N.S. and Bradford, M.A. "The Behaviour and Design of Steel Structures to AS4100", 3rd Australian edn., E&FN Spon, London, 1998.
2. Bradford, M.A., Bridge, R.Q., and Trahair, N.S., "Worked Examples for Steel Structures", 3rd edn, AISC, Sydney, 1997.
3. Neville, A.M., "Properties of Concrete", Wiley Publishers, 1996.
4. Jackson, N. and Dhir, R.K., "Civil Engineering Materials", 5th Edition, MacMillan Press Ltd, 1996.
5. Mindess, S., Young, J.F. and Darwin, D., "Concrete", Prentice Hall, 2003.

COMMON SCHOOL INFORMATION

PLEASE VISIT: <http://www.civeng.unsw.edu.au/info-about/our-school/policies-procedures-guidelines/academic-advice>

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 CATEI process, your student assessments 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.

NOTES ON ASSESSMENT

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: <http://www.lc.unsw.edu.au/onlib/plag.html>