**COURSE DETAILS**

- **Units of Credit**: 6
- **Contact hours**: 3 hpw Lectures + 2 hpw exercise class/demonstration
- **Lectures**: 
  - Mon 16:00 - 18:00
  - Wed 10:00 - 11:00
  - Central Lecture Block 7 (K-E19-104)

**Demonstration (beginning week 1)**

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>Thu</td>
<td>09:00 - 11:00</td>
<td>Materials Science G10 (K-E8-G10)</td>
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<tr>
<td></td>
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<td>Mathews 113 (K-F23-113)</td>
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<tr>
<td>Fri</td>
<td>13:00 - 15:00</td>
<td>Mathews 231 (K-F23-231)</td>
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**Coordinator/Lecturer:** Dr Hamid Valipour (Structures)
- Email: H.Valipour@unsw.edu.au
- Rm. 710 Civil and Environmental Engineering Building (H20)
- Phone: 9385 6191

**Lecturer**
- A/Prof. Arnaud Castel (Materials)
- Email: A.Castel@unsw.edu.au
- Office: Rm 708 Civil and Environmental Engineering Building (H20)
- Phone: 9385 5043

**INFORMATION ABOUT THE COURSE**

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;
COURSE OVERVIEW

The aim of this course is to provide second year students with a preliminary knowledge of various topics relating to the characteristics of concrete and loading and design of steel structures. The theoretical aspects of the course will build on and reinforce the material and theory covered in the core material science and structural engineering/mechanics subjects.

During this course you will be supported in polishing the core skills, qualities and understandings developed in previous courses and the hone your design skills associated with your role as a future Civil Engineer.

This course will provide you with opportunities to develop the following graduate attributes:

- the capacity for analytical and independent critical thinking;
- skills related to lifelong learning, such as self-reflection (ability to apply theory to practice in familiar and unfamiliar situations); and
- collaborative and teamwork skills.

How does this course relate to other course offerings in the discipline?

At the end of this course you will have the ability to design basic steel structures in practice.

HANDBOOK DESCRIPTION

This course consists of a material and a structural design strand. The structural design strand concerns 70% of the course while the material strand concerns 30% 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; and design of laterally supported steel beams. The Material Strand covers: cement, aggregates and admixtures; fresh concrete properties and hardened concrete properties, durability of concrete.

OBJECTIVES

To introduce students to

- the structural materials including concrete and composites,
- fundamentals of structural design and design steel components under tension, compression and bending members.

TEACHING/LEARNING STRATEGIES

<table>
<thead>
<tr>
<th>Private Study</th>
<th>Lectures</th>
<th>Workshops</th>
<th>Assessments (assignments/quiz/exam)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review lecture material</td>
<td>Listen carefully and ask questions</td>
<td>Work in groups</td>
<td>Demonstrate your understanding of material behaviour</td>
</tr>
<tr>
<td>Do tutorial problems</td>
<td>Try and understand the principles</td>
<td>Preparing for assignments</td>
<td>Demonstrate your understanding of design fundamentals</td>
</tr>
<tr>
<td>Reflect on class and tutorial problems</td>
<td>Follow worked examples</td>
<td>Ask questions</td>
<td>Demonstrate problem solving</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hand-in or Quiz</td>
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</table>
SUGGESTED APPROACHES TO LEARNING IN THE COURSE

Suggested approaches to learning in this course include:

- Regular participation in lectures and exercise classes. *Review lecture and exercise material. Follow worked examples. Reflect on class problems and quizzes.*
- Weekly reading and recording of your learning.
- Appropriate preparation for exercise class 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 demonstrations/quizzes are strongly encouraged to discuss their progress with the lecturers 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, you will be able to:

- understand the behaviour of structural materials.
- assess material suitability for structures in civil engineering.
- 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.
- employ structural design concepts of members such as tension members, compression members and beams in practice.

SELF-CENTRED AND SELF-DIRECTED LEARNING (expectations of the students)

In addition to the lectures and exercise classes, you are expected to commit 7± hours per week to independent learning and general problem solving.

“What I hear, I forget; What I see, I remember; What I do, I UNDERSTAND”

T. A. Angelo

COMMON AND GENERAL INFORMATION

Details of common school information including:

- dates of note
- school contacts
- course requirements
- notes on assessment
- supplementary examinations
- special considerations
- solutions to problems - trouble shooters

are given at http://www.civeng.unsw.edu.au/currentstudents/general/profiles/common_ug/index.html
**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 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.

**TEXTS AND RECOMMENDED READING**

**Structures**


**Materials**

**Recommended Reading:**

**Access to Australian Standards:**
Australian Standards may be accessed through the UNSW Library as follows:

1. Goto the UNSW library home page at: [http://www.library.unsw.edu.au/](http://www.library.unsw.edu.au/)
2. Under “How do I find” Click on the link to “More...”
3. Click on the link “Standards”
4. Click on the link “Standards Subject Guide”
5. Click on “Australian Standards (SAI Global)” and enter the Standard desired into the search field.

**ASSESSMENT**

There will be a formal final 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 60% of the mark and a class mark representing 40% of the mark will be assessed on the quiz/assignments submitted.

**ASSIGNMENTS**

1. Assignment (25%): Structures issue on: 10th of August 2015 due on: 5 pm, 28th of September 2015
2. Quiz (15%): Materials issued & due on: Week 12

The purpose of assignments is to reinforce the lecture material with practice. It will also provide you with the opportunity to develop self-learning and problem solving skills.

*Late submission will be penalised at the rate of 10% per day after the due time and date have expired.*
### COURSE PROGRAMME

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Assessments Due</th>
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<tbody>
<tr>
<td>Structures</td>
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<tr>
<td>1</td>
<td>Introduction, Limit state design principles, Actions and actions effect (HV)</td>
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<tr>
<td>2</td>
<td>Actions and actions effect (Cont’d)/Steel Tension members (HV)</td>
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<tr>
<td>3</td>
<td>Steel Tension members (Cont’d)/Steel compression members (HV)</td>
<td>Assignment will be issued.</td>
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<tr>
<td>4</td>
<td>Steel compression members/In plane effective length &amp; second order effects (HV)</td>
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<tr>
<td>5</td>
<td>In plane effective length &amp; second order effects (Cont’d) (HV)</td>
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<tr>
<td>6</td>
<td>Design of steel flexural members - Part 1 (HV)</td>
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<tr>
<td>7</td>
<td>Design of steel flexural members - Part 2 (HV)</td>
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<tr>
<td>8</td>
<td>Design of steel flexural members - Part 2 (Cont’d) (HV)</td>
<td></td>
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<tr>
<td>Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Introduction, Cements (AC)</td>
<td>Break</td>
</tr>
<tr>
<td>10</td>
<td>Aggregates and Admixtures (5th of October is public holiday, no lecture) (AC)</td>
<td>Assignment will be due on 28th</td>
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<tr>
<td>11</td>
<td>Fresh and Hardened Concrete Properties (AC)</td>
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<tr>
<td>12</td>
<td>Durability of Concrete/Sustainability (AC)</td>
<td>Quiz</td>
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**Notes**

The timetable is indicative only and is subject to changes throughout the semester. Every effort will be made to inform students of variations to the above programme.

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### DATES TO NOTE

Refer to MyUNSW for Important Dates available at:

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

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### 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

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### 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:

http://www.engineering.unsw.edu.au/civil-engineering/resources/academic-advice