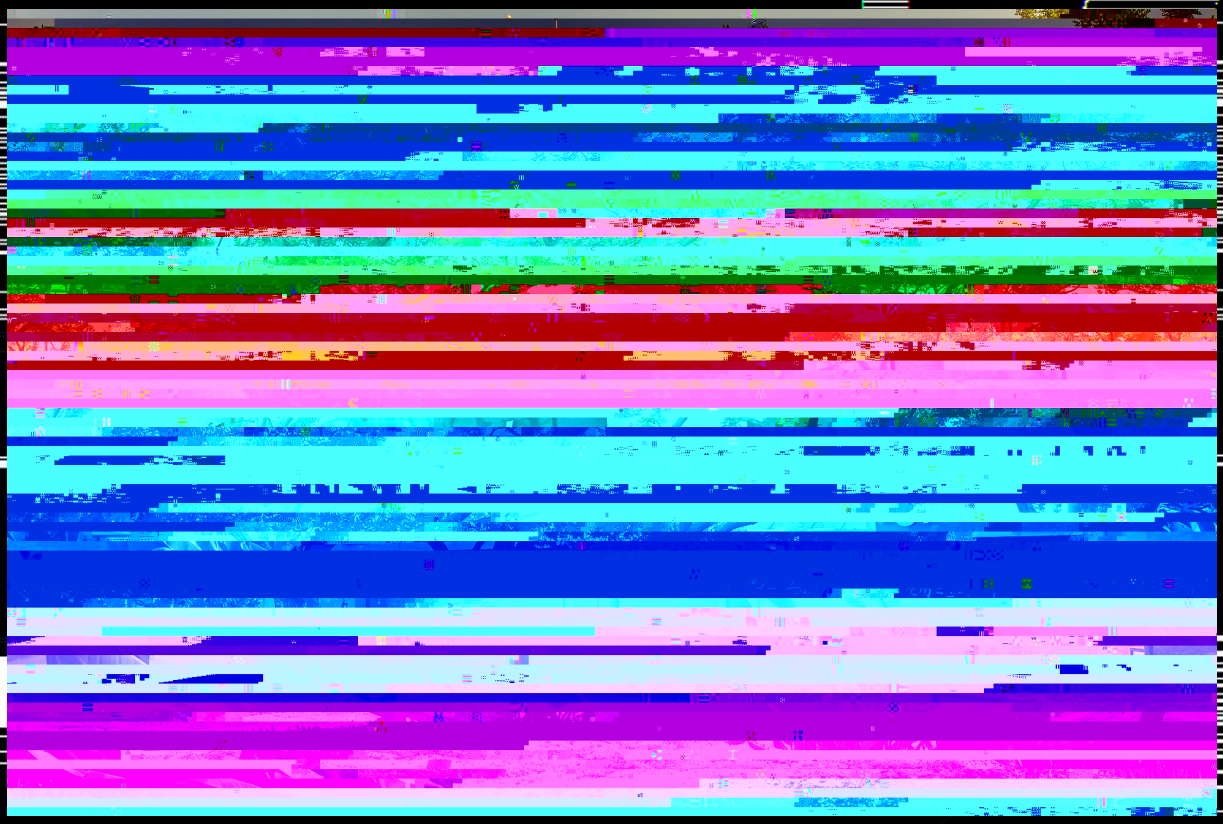
School of Civil and Environmental Engineering

UNSW Engineering

CVEN3303

Steel Structures

Term 1, 2022



Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Scientia Prof Mark Bradford	m.bradford@unsw.edu.au			

Administrators

Name	Email	Availability	Location	Phone
Xinpei Liu	xinpei.liu@unsw.edu.au			

School Contact Information

Engineering Student Support Services – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

Engineering Industrial Training – Industrial training questions

UNSW Study Abroad – study abroad student enquiries (for inbound students)

UNSW Exchange – student exchange enquiries (for inbound students)

UNSW Future Students

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Course Details

Units of Credit 6

Summary of the Course

A course on the design concepts and design of structural elements subject to bending, shear and combined bending and axial compression. Topics include: introduction to limit states design and codes of practice (design objectives; strength and serviceability limit states); loads and load combinations (permanent/dead, imposed/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, laterally unsupported steel beams (lateral-torsional buckling in bending and shear strength); steel beam-columns (in-plane and out-of-plane failure); steel members subjected to biaxial bending; design of steel frames, steel connections and detailing (force and moment connections).

Course Aims

The aim of this course is to introduce students to the design codes that govern structural design and to extend the understanding of structural behaviour by studying new concepts in the context of design of steel structures.

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

- the capacity for analytical and independent critical thinking; and
- 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;

Course Learning Outcomes

After successfully completing this course, you should be able to:

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Assessment

The final grade for this course will normally be based on the sum of the scores from each of the assignments (class work) and the Final Examination. The Final Examination is worth 60% of the final grade if the class work is included and 100% if class work is not included. The class work is worth 40% of the final grade if included. A mark of at least 40% in the Final Examination is required before the class work is included in the final grade. The formal exam scripts will not be returned. Students who perform poorly in the workshops are recommended to discuss progress with the lecturer during the term.

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

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Assignments	40%	Not Applicable	1, 2, 3, 4, 5
2. Examination	60%	Not Applicable	1, 2, 3, 4, 5

Assessment 1: Assignments

Assignment work

Additional details

Assignment 1: Design/Tension Members - issued end Week 1, due 5pm end Week 3

(Worth 30% of Assignment (Assessment 1)

Assignment 2: Compression Members - issued end Week 3, due 5pm end Week 6

(Worth 25% of Assignment (Assessment 1)

Assignment 3: Flexural Members - issued end Week 5, due 5pm end Week 8

(Worth 30% of Assignment (Assessment 1)

Assignment 4: Connections - issued start Week 8, due 5pm end week 8

(Worth 15% of Assignment (Assessment 1)

Assessment 2: Examination

Examination

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

Course Schedule

View class timetable

Timetable

Date	Type	Content
O-Week: 7 February - 11 February		
Week 1: 14 February - 18 February	Lecture	TOPIC: Introduction to structural design LECTURE CONTENT: Introduction, Limit States Design principles, Actions and effects of actions. DEMONSTRATION CONTENT: Introduction, Limit States Design principles, Actions and effects of actions.
Week 2: 21 February - 25 February	Topic	TOPIC: Axially loaded members LECTURE CONTENT: Steel tension members DEMONSTRATION CONTENT: Steel tension members
Week 3: 28 February - 4 March	Topic	TOPIC: Axially loaded members LECTURE CONTENT: Steel compression members DEMONSTRATION CONTENT: Steel compression members
Week 4: 7 March - 11 March	Topic	TOPIC: Axially loaded members, Flexurally loaded members LECTURE CONTENT: In-plane effective length and second-order effects In-plane effective length and second-order effects.

Resources

Prescribed Resources

?Q2/..+0.0. Qrccj Qrpsarspcq. Standards Australia, Sydney, 2016*?Q2/..* Supp 1-1999 *Qrccj Qrpsarspcq* ش *Amkkclr_pw*. Standards Australia, Sydney, 2020.

?Q-LXQ //5.,.+0..0 Qrpsarsp_j Bcqgel ?argmlq8 N_pr . Eclcp_j Npglagnjcq, SA Sydney / SNZ Wellington, 2016.*?Q-LXQ //5.,/+0..0 Qrpsarsp_j Bcqgel ?argmlq8 N_pr / Ncpk_lclr**Gknmqcb_lb *Mrfcp ?argmlq,* SA Sydney / SNZ Wellington, 2016.

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

1. Go to the library homepage at www.library.unsw.edu.au
2. Select “Data Bases”
3. Locate “Australian Standards”
4. Click on “Australian Standards (SAI Global) and enter the relevant standard into the search field.

A very useful link is that to the Australian Steel Institute: www.steel.org.au

Recommended Resources

N.S. Trahair and M.A. Bradford. *Rfc @cf_tgmsp_lb Bcqgel md Qrccj Qrpsarspcq rm ?Q2/...* 3rd Australian Edition, E&FN Spon, London, 2017.

M.A. Bradford, R.Q. Bridge and N.S. Trahair. *Umpicb Cv_knjcq dmp Qrccj Qrpsarspcq*. 4th Edition, Australian Steel Institute, Sydney, 2013.

S.T. Woolcock, S. Kitipornchai, M.A. Bradford and G.A. Haddad. *Bcqgel md Nmpr_j Dp_kc @sgjbgleq,* 4th Edition, Australian Steel Institute, Sydney, 2011.

Submission of Assessment Tasks

Please refer to the Moodle page of the course for further guidance on assessment submission.

UNSW has a standard late submission penalty of:

- 5% per day, for all assessments where a penalty applies, capped at five days (120 hours), after which a student cannot submit an assessment, and no permitted variation.

Academic Honesty and 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

Academic Information

Final Examinations:

Final exams in T1 2022 will be held online between 29th April - 12th May inclusive, and supplementary exams between 23rd - 27th May inclusive. You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

ACADEMIC ADVICE

- Key Staff to Contact for Academic Advice (log in with your zID and password): https://intranet.civeng.unsw.edu.au/key-staff-to-contact-during-your-studies-at-unsw
- Key UNSW Dates - eg. Census Date, exam dates, last day to drop a course without academic/financial liability etc.
- CVEN Student Intranet (log in with your zID and password): https://intranet.civeng.unsw.edu.au/student-intranet
- Student Life at CVEN, including Student Societies: https://www.unsw.edu.au/engineering/civil-and-environmental-engineering/student-life
- Special Consideration: https://student.unsw.edu.au/special-consideration