

CVEN4301 ADVANCED CONCRETE STRUCTURES

COURSE DETAILS

Units of Credit	6
Contact hours	5 hours per week (3 hours lecture + 2 hours demonstration) per week
Class	Tuesday, 13:00 – 16:00 (ONLINE)
Workshop	Wednesday, 12:00 – 14:00 (ONLINE) Wednesday, 14:00 – 16:00 (ONLINE)
Course Coordinator and Lecturer	A./Prof. Hamid Valipour email: H.Valipour@unsw.edu.au office: Civil Engineering Building (H20), Level 7, Room 710 phone 02 9385 6191

INFORMATION ABOUT THE COURSE

Prerequisites: CVEN3301 OR CVEN2303, CVEN3304 OR CVEN3302

This course will continue with and will build on the concepts introduced in Structural Analysis and Modelling (CVEN3301 OR CVEN2303), Concrete Structures (CVEN3304) OR Structural Behaviour and Design (CVEN3302).

HANDBOOK DESCRIPTION

<https://www.handbook.unsw.edu.au/undergraduate/courses/2021/CVEN4301/>

A course on the advanced analysis and design of concrete structures for students looking towards a career in Structural Engineering. The course deals with the design and behaviour of the following fundamental aspects for reinforced and prestressed concrete member design: one-way and two-way concrete slabs (including the direct design, equivalent frame and simplified strip methods); retaining walls, strip, pad and pile footings; and

- x reinforce their understanding of philosophy of design and link design and analysis
- x develop the ability for analytical and independent critical thinking and creative problem solving
- x develop skills related to lifelong learning, such as self-reflection (ability to apply theory to practice in familiar and unfamiliar situations); and
- x acquire the skills for effective collaboration and teamwork

TEACHING STRATEGIES

- | | |
|---------------|---------------------------------------|
| Private Study | xReview lecture material and textbook |
| | xDo set problems and assignments |
| | x |

COURSE PROGRAM

Term 2 2021

Date	Topic	Lecture Content	Demonstration Content
01/06/2021 (Week 1)	Introduction to the course	Introduction to the course	
08/06/2021 (Week 2)	Introduction to the course (Part 1)	Introduction to the course (Part 1)	Introduction to the course (Part 1)
15/06/2021 (Week 3)	Introduction to the course (Part 2)	Introduction to the course (Part 2)	Introduction to the course (Part 2)

ASSESSMENT

As a final year design subject, the focus is on works practiced in industry and the subject assessment is set to match these skills and meet the learning outcomes. This course will be assessed on students' demonstrated knowledge on the topics being taught, including analysis and design of one-way slabs, two-way slabs, flat slabs and footings & retaining walls & prestressed concrete members under short- and long-term service and ultimate strength limit state loading conditions.

Students who perform poorly in the online quizzes and demonstrations are recommended to discuss progress with the course coordinator during the semester.

The Final Examination is worth 60% of the Final Mark if class work is included and 100% if class work is not included. The class work/quizzes are worth 40% of the Final Mark if included. A mark of at least 40% in the final examination is required before the class work (e.g. online tasks and/or quizzes) is included in the final mark. The formal exam scripts will not be returned but students are permitted to view the marked script.

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

Assessment	Rationale and assessment criteria
1. Online Quiz 1	This quiz contains 3 questions on the deemed to comply deflection control and analysis of cracked reinforced concrete (RC) cross section using modular ratio method. The main objective of this assessment is to encourage students to engage with the subject content as soon as possible and develop an understanding about principles of simplified and advanced methods in design of RC structures. Note: each question has several parts.
2. Online Quiz 2	This quiz contains 4 questions. The main objective of this quiz is to provide opportunities for students to reinforce their knowledge and understanding of advanced reinforced concrete design with emphasis on simplified methods for analysis of one-way and two-way slabs under ultimate and service limit state conditions according to AS3600-2018 provisions.
3. Online Quiz 3	This quiz contains 3 questions. The main objective of this quiz is to provide opportunities for students to reinforce their knowledge about design of flat slabs subject to punching shear, design of footings and retaining walls.
4. Final exam	The main objective of this assessment covering the entire subject contents is to provide opportunities for students to demonstrate their knowledge and understanding of advanced reinforced concrete and basic principles in prestressed concrete design and higher skills in using Australian standard AS3600-2018.

Details of each assessment component, the marks assigned to it, the criteria by which marks will be assigned, and the dates of submission are set out below.

Supplementary Examinations for Term 2 2021 will be held on Monday 06th September – Friday 10th September 2021 (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.

PENALTIES

Late submission of assignments will be penalised at the rate of 10% per day after the due time and date have expired. The online quiz portals will expire sharp at the end of the time slot specified for each quiz and no submission will be accepted.

ASSESSMENT OVERVIEW

Item	Length	Weighting	Learning outcomes assessed	Assessment Criteria	Due date and submission requirements	Deadline for absolute fail	Marks returned
1. Quiz-1	70 minutes	15%	Application of systematic design processes and ability for analytical thinking in the context of structural design.	Understanding principles of simplified and advanced methods in design of RC structures with emphasis on deflection control, analysis of cracked section and effective second moment of area	23/06/2021 Quiz portal will be open 6:00-8:00 pm	23/06/2021	24/06/2021
2. Quiz-2	60 minutes	15%	Developing skills for confident use of Australian standards for ultimate and serviceability states	Ability for analytical thinking and understanding of the advanced reinforced concrete design with emphasis on simplified method of analysis of one-way and two-way slabs	14/07/2021 Quiz portal will be open 6:00-8:00 pm	14/07/2021	15/07/2021
3. Quiz-3	70 minutes	10%	An understanding of fundamental and advanced concepts in structural concrete and apply the knowledge of structural design practice	Principles of analysis and design of footing and retaining walls and punching shear capacity of the slabs	04/08/2021 Quiz portal will be open 6:00-8:00 pm	04/08/2021	05/08/2021
4. Final exam	2 hours	60%	Demonstrate an overall understanding of advanced concepts in structural concrete and fluent use of Australian standards for familiar and unfamiliar situations	The entire subject content covered on analysis and design of RC and PC structures under service and ultimate loading conditions are assessed.	Please see final examination timetable		

RELEVANT RESOURCES

Textbooks

- A. Foster, Kilpatrick and Warner, Reinforced Concrete Basics, 3rd Edition, Pearson Prentice Hall, 2021. Available at UNSW Bookstore or Pearson: <http://www.pearson.com.au/>
- B. Warner R.F., Foster S.J., Gravina, R., and Faulkes, K.A., "Prestressed Concrete", 4th Ed., Pearson Australia, 2017, 609 pp., ISBN: 978 1 4860 1897 0.

Additional Reading

AS3600-2018, "Concrete Structure", Standards Australia, 2018. Including *Amendments (2019)*

Access to Australian Standards:

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

Appendix A: Engineers Australia (EA) Competencies