



School of Civil and Environmental Engineering

Term 2, 2021

# CVEN3304 CONCRETE STRUCTURES

## COURSE DETAILS

<b>Units of Credit</b>	6	
<b>Contact hours</b>	6 hours per week	
<b>Lecture</b>	Monday, 16:00 – 18:00	Online
	Thursday, 09:00 – 11:00	Online
<b>Workshop</b>		Check timetable for location
	Thursday, 14:00 – 16:00	Face-to-Face/Online
	Thursday, 16:00 – 18:00	Face-to-Face/Online
	Friday, 10:00 – 12:00	Face-to-Face/Online
	Friday, 12:00 – 14:00	Face-to-Face/Online

**Course Coordinator and Lecturer** Dr Taehwan Kim (Coordinator and Lecturer)  
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**Lecturer** Dr Sascha Eisenträger  
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## INFORMATION ABOUT THE COURSE

This course introduces students to concrete materials (CM) and the design of reinforced concrete (RC) structural elements subject to bending, shear and combined bending and axial compression. These include concrete materials (cements, aggregates and admixtures and hardened concrete properties), concrete mechanical properties, reinforcement types and properties, durability requirements, behaviour of reinforced concrete cross-sections in bending at both service and ultimate loads, ultimate strength analysis and design of cross-sections in flexure (singly and doubly reinforced, ductility), serviceability analysis and design of beams (cracked section analysis, deflection and crack control), ultimate strength in shear, bond anchorage and curtailment (simple and continuous beams and one-way slabs), short and slender concrete columns (interaction diagrams).

## HANDBOOK DESCRIPTION

See link to virtual handbook -

<https://www.handbook.unsw.edu.au/undergraduate/courses/2021/CVEN3304/>

<b>OBJECTIVES</b>
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The objectives of this course are to:

- x Introduce you to concrete components, basics of hydration reaction occurred in concrete, and effects of concrete components on characteristics and performance of concrete. This objective contributes to the achievement of learning outcomes 1 and 2.
- x Introduce you to the fundamentals of reinforced concrete (RC) design under bes— ce y de you t

4.	<i>Explain the design principles and concepts for ultimate strength design, and serviceability design</i>	<i>PE1.2, PE1.5, PE1.6, PE2.2</i>
5.	<i>Conduct structural analysis to understand the behaviour of structural members</i>	<i>PE1.2, PE1.3, PE1.6, PE2.1, PE2.2, PE3.4</i>
6.	<i>Design structural members for given conditions (bending moment, shear force, and axial force) in compliance with Australian Standards.</i>	<i>PE1.2, PE1.3, PE1.6, PE2.1, PE2.2, PE3.4</i>

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

## COURSE PROGRAM

### Term 2 2021

Date	Topic	Lecture Content	Demonstration Content
31/05/2021 (Week 1) Dr Kim	Concrete Materials	Introduction of Concrete and Cement Hydration	Concrete and cement production
07/06/2021 (Week 2) Dr Kim	Concrete Materials	Concrete Components Fresh concrete properties	Concrete Components Fresh concrete properties
14/06/2021 (Week 3) Kim	RC Introduction RC design No class on Monday 14 <sup>th</sup> June	Public holiday Monday 14 <sup>th</sup> June RC Introduction RC Design	Hardened Concrete Properties
21/06/2021 (Week 4)	RC Design RC Beam – Bending	RC Design Flexural Behaviour I	RC Introduction RC Design
28/06/2021 (Week 5) Dr Kim	RC Beam – Bending	Flexural Behaviour of Beam II and III Flexural Beam Design	Flexural Behaviour of Beam I and II
05/07/2021 (Week 6)		Flexibility week for all courses (non -teaching)	
12/07/2021 (Week 7) Dr Eisenträger	RC Beam – Shear	Shear Behaviour of Beam Shear Design of Beam	Flexural Behaviour of Beam III and Flexural Design Shear Behaviour of Beam
19/07/2021 (Week 8) Dr Eisenträger	RC Beam – Serviceability	RC Design Flexural Behaviour I	RC Introduction RC Design



<b>ASSESSMENT OVERVIEW</b>
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<b>Item</b>	<b>Length</b>	<b>Weighting</b>	<b>Learning outcomes assessed</b>	<b>Assessment Criteria</b> <i>(this needs to explicitly describe what students are expected to demonstrate in the task)</i>	<b>Due date and submission requirements</b>	<b>Deadline for absolute fail</b>	<b>Marks returned</b>
<b>1. Assignments</b>							
Online Assignments	7 to 10 days/each	Total 40 %	1, 2, 3, 4, 5, 6	Six Online Assignments	Will be announced in Moodle	Will be announced in Moodle	



**Appendix A: Engineers Australia (EA) Competencies**

*Stage 1 Competencies for Professional Engineers (EA) - 1a.3 (10n Tw 25.108 Td(s)5.8 A)-.u)-12.1 28 Td[20]-13 (2)]0 Tc 0 Tw oel&i*