Annexe A: New/Revised Course Content in OBTL+ Format

Course Overview

The sections shown on this interface are based on the templates UG OBTL+ or PG OBTL+
If you are revising/duplicating an existing course and do not see the pre-filled contents you expect in the subsequent sections e.g. Course Aims, Intended Learning Outcomes etc. please refer to Data Transformation Status for more information.

Expected Implementation in Academic Year	
Semester/Trimester/Others (specify approx. Start/End date)	
Course Author * Faculty proposing/revising the course	Lee-Chua Lee Hong
Course Author Email	clhlee@ntu.edu.sg
Course Title	Reinforced Concrete Design
Course Code	CV3011
Academic Units	3
Contact Hours	39
Research Experience Components	Not Applicable

Course Requisites (if applicable)

Pre-requisites	CV2011 Structural Analysis I
Co-requisites	
Pre-requisite to	
Mutually exclusive to	
Replacement course to	
Remarks (if any)	

Course Aims

The objective is to equip the students with basic understanding of the behaviour of reinforced concrete structures and to develop the skill to analyze and design basic concrete members.

Course's Intended Learning Outcomes (ILOs)

Upon the successful completion of this course, you (student) would be able to:

ILO 1	Analyze and design singly and doubly reinforced concrete beams under flexure and shear, including regular (rectangular shaped) and T-beams.
ILO 2	Analyze and design structural concrete beams subjected to shear loading
ILO 3	Conduct a service load analysis to control deflection and cracking of beams
ILO 4	Determine bond length, lap splice and detailing requirements for reinforced concrete members
ILO 5	Analyze and design one way and two way slabs under flexure and shear
ILO 6	Conduct a service load analysis to control deflection and cracking of slabs
ILO 7	Analyze and design reinforced concrete columns and develop moment-axial load interaction curves
ILO 8	Analyze and design isolated and combined footings
ILO 9	Consider the limitations of the design methods used when applying them

Course Content

S/N	Topic	Lecture Hours	Tutorial Hours
1	Basic design concepts: Basic layout of concrete structures, loading, basic material properties of concrete and reinforcing steel, limit state design philosophy.	2	1
2	Analysis of structure: Load combinations and loading arrangements, simplification of framed structures, moment redistribution.	4	2
3	Design and analysis of flexural members: Singly and doubly reinforced rectangular sections, flanged sections, shear, bond and anchorage, serviceability.	8	4
4	Solid slabs: Slab actions, design of one-way spanning slabs, two-way spanning slabs.	5	2
5	Columns: Classification, column behaviour, axially loaded rectangular column, uni-axially bent and bi-axially bent columns, column interaction diagram.	4	2
6	Footing design: Design consideration, design of axially loaded pad footing, eccentrically loaded pad footing, eccentric footing.	3	2
	Total hours	26	13

Reading and References (if applicable)

1. Mosley, W.H., Hulse, R. and Bungey, J.H., "Reinforced Concrete Design to EuroCode 2", 7th edition, Palgrave Macmillan, London, 2012.

2. Toniolo, G. and di Prisco, M., " Reinforced Concrete Design to Eurocode 2", Springer, 2017.

3. Wight, J.K., "Reinforced Concrete: Mechanics and Design", 8th edition, Pearson, 2022.

Planned Schedule

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
1	Basic design concepts	1			Tutorial and lectures
2	Analysis of structure	2			Tutorial and lectures
3	Analysis of structure	2			Tutorial and lectures
4	Design and analysis of flexural members	3			Quiz 1, Tutorial and lectures
5	Design and analysis of flexural members	3			Tutorial and lectures
6	Design and analysis of flexural members	3, 4			Tutorial and lectures
7	Design and analysis of flexural members	4			Tutorial and lectures
8	Solid slabs	5			Tutorial and lectures
9	Solid slabs	6			Tutorial and lectures
10	Columns	7			Quiz 2, Tutorial and lectures
11	Columns	7			Tutorial and lectures
12	Footing design	8, 9			Tutorial and lectures

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
13	Footing design	8, 9			Tutorial and lectures

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Lecture	Weekly lectures to enable students to have the necessary knowledge to achieve the learning outcomes
Tutorial	Weekly tutorials to get students to practice and hone their ability to achieve the learning outcomes

Assessment Structure

Assessment Components (includes both continuous and summative assessment)

No.	Component	ILO	Related PLO or Accreditation	Weightage	Team/Individual	Rubrics	Level of Understanding
1	Summative Assessment (EXAM): Final exam(Final Examination (Restricted Open Book))	1,2,3,4,5,6,7,8,9	CIV SLOs a, b, e	60	Individual	Holistic	Relational
2	Continuous Assessment (CA): Test/Quiz(Continuous Assessment 1 (CA1): Quiz 1)	1,2	CIV SLOs a, b, e	20	Individual	Analytic	Multistructural
3	Continuous Assessment (CA): Test/Quiz(CA2: Quiz 2)	5,6,7	CIV SLOs a, b, e	20	Individual	Analytic	Multistructural

Description of Assessment Components (if applicable)

Formative Feedback

1. Feedback will be through the dissemination of the student's performance in quizzes as well as review of the quiz questions in class.
2. Additional channel will be through individual consultation initiated by students on their particular learning needs.

NTU Graduate Attributes/Competency Mapping

This course intends to develop the following graduate attributes and competencies (maximum 5 most relevant)

Attributes/Competency	Level
Problem Solving	Intermediate
Design Thinking	Intermediate

Course Policy

Policy (Academic Integrity)

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values. As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the academic integrity website for more information. On the use of technological tools (such as Generative AI tools), different courses / assignments have different intended learning outcomes. Students should refer to the specific assignment instructions on their use and requirements and/or consult your instructors on how you can use these tools to help your learning. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Policy (General)

As a student of the course, you are required to abide by both the University Code of Conduct and the Student Code of Conduct. The Codes provide information on the responsibilities of all NTU students, as well as examples of misconduct and details about how students can report suspected misconduct. The university also has the Student Mental Health Policy. The Policy states the University's commitment to providing a supportive environment for the holistic development of students, including the improvement of your mental health and wellbeing. These policies and codes concerning students can be found in the following link.

Policy (Absenteeism)

Policy (Others, if applicable)

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