

Subject Description Form

Subject Code	CSE49400
Subject Title	Advanced Structural Design
Credit Value	3
Level	4
Pre-requisites	CSE310 Design of Concrete Structures or CSE30310 Design of Concrete Structures and CSE311 Design of Steel Structures or CSE30311 Design of Steel Structures
Objectives	(1) To provide fundamental knowledge in the design of steel-concrete composite structures; (2) To further the understanding of various aspects of structural design of prestressed concrete structures; (3) To provide fundamental understanding of seismic behavior of structures and knowledge in earthquake resistant design.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. apply the fundamental knowledge of composite design to formulate solutions to the problems relevant to the design of steel-concrete composite structures; b. apply the fundamental knowledge of structural design to formulate solutions to the problems relevant to the design of prestressed concrete structures; c. apply the fundamental knowledge of earthquake engineering to formulate schematic solutions to problems relevant to earthquake resistant design of structures; d. think critically to provide different viable solutions meeting the global economy; e. develop creative thinking for the built environment; f. communicate and work effectively in a team.
Subject Synopsis/ Indicative Syllabus	➤ <u>Design of Steel-Concrete Composite Structures</u> ○ General design principle ○ Design of composite beams ○ Design of composite columns ➤ <u>Design of Prestressed Concrete Structures</u> ○ Loss of prestress ○ Tendon concordancy ○ Limit state design and prestressed concrete beams ➤ <u>Earthquake Engineering</u> ○ Principle of earthquake resistant design ○ Capacity design and structural system ○ Member ductility and energy absorption

Teaching/Learning Methodology	Throughout the course students will be encouraged to learn through participation in lectures and tutorials. Lectures will be conducted in an interactive manner, requiring prior preparation and class participation of all students. To facilitate this approach, students will be given details of the course in advance.																																												
	Tutorials will also be conducted to reinforce the lectures and to promote critical thinking.																																												
Assessment Methods in Alignment with Intended Learning Outcomes	<table><tr><th rowspan="2">Specific assessment methods/tasks</th><th rowspan="2">% weighting</th><th colspan="6">Intended subject learning outcomes to be assessed</th></tr><tr><th>a</th><th>b</th><th>c</th><th>d</th><th>e</th><th>f</th></tr><tr><td>1. Continuous assessment</td><td>30%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>2. Final examination</td><td>70%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td><td></td></tr><tr><td>Total</td><td>100%</td><td colspan="6"></td></tr></table> Students must pass the final examination and achieve a passing overall score / grade to pass the subject. Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: Students will be assessed with the following components: continuous assessment and an examination to meet the intended learning outcomes.							Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed						a	b	c	d	e	f	1. Continuous assessment	30%	✓	✓	✓	✓	✓	✓	2. Final examination	70%	✓	✓	✓				Total	100%						
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1. Continuous assessment	30%	✓	✓	✓	✓	✓	✓																																						
2. Final examination	70%	✓	✓	✓																																									
Total	100%																																												
Student Study Effort Expected	Class contact:					Average hours per week																																							
	▪ Lectures / Tutorials					3 Hrs.																																							
	Other student study effort:																																												
	▪ Continuous assessment					6 Hrs.																																							
	Total student study effort					9 Hrs.																																							
Reading List and References	References - B. Davison and G.W. Owens, The Steel Designers' Manual, Steel Construction Institute, 7 th edition, 2012. - F.K. Kong and R.H. Evans, Reinforced and Prestressed Concrete, London, Nelson, 1975.																																												