

Subject Description Form

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| 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 | <ol style="list-style-type: none"> (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 | <p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. To apply the fundamental knowledge of composite design to formulate solutions to the problems relevant to the design of steel-concrete composite structures; b. To apply the fundamental knowledge of structural design to formulate solutions to the problems relevant to the design of prestressed concrete structures; c. To apply the fundamental knowledge of earthquake engineering to formulate schematic solutions to problems relevant to earthquake resistant design of structures; d. Able to think critically to provide different viable solutions meeting the global economy; e. Able to develop creative thinking for the built environment; f. Able to communicate and work effectively in a team. |
| Subject Synopsis/ Indicative Syllabus | <ul style="list-style-type: none"> ➤ <u>Design of Steel-Concrete Composite Structures</u> <ul style="list-style-type: none"> ○ General design principle ○ Design of composite beams ○ Design of composite columns ➤ <u>Design of Prestressed Concrete Structures</u> <ul style="list-style-type: none"> ○ Loss of prestress ○ Tendon concordancy ○ Limit state design and prestressed concrete beams ➤ <u>Earthquake Engineering</u> <ul style="list-style-type: none"> ○ 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. |

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| | Tutorials will also be conducted to reinforce the lectures and to promote critical thinking. | | | | | | | |
| Assessment Methods in Alignment with Intended Learning Outcomes | Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | |
| | | | a | b | c | d | e | f |
| | 1. Continuous assessment | 30 | √ | √ | √ | √ | √ | √ |
| | 2. Final examination | 70 | √ | √ | √ | | | |
| | Total | 100 % | | | | | | |
| <p>Students must attain at least grade D in both continuous assessment and final examination (whenever applicable) in order to attain a passing grade in the overall result.</p> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Students will be assessed with the following components: continuous assessment and an examination to meet the intended learning outcomes.</p> | | | | | | | | |
| 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 | <p>References</p> <ul style="list-style-type: none"> - B. Davison and G.W. Owens, The Steel Designers' Manual, Steel Construction Institute, 7th edition, 2012. - F.K. Kong and R.H. Evans, Reinforced and Prestressed Concrete, London, Nelson, 1975. | | | | | | | |