Subject Description Form

Subject Code	BRE4393
Subject Title	Temporary Work Design
Credit Value	3
Level	4
Pre-requisite	BRE361 & BRE302
Objectives	Bring students' attention to the vertical integration of the subject areas learned in Level 2 such as Structure, Construction Technology, Engineering Mathematics along with the working experience gained in Industrial Centre to the subject areas of Level 3 Structure II & Construction Technology & Materials II through design project whilst the inter-relation of the horizontal integration between subjects are also important in solving a problem-based project work. Integrate and apply knowledge gained from individual subject areas in technology, management, economics and legal aspects.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) Design falsework and formwork for building construction b) Appraise alternative solutions to falsework and formwork design c) Recognize the inter-relationship and interdependence of various areas in construction related to temporary works, such as cost, time, safety, and quality assurance d) Comprehend the design and construction operations, technology & structure, management, economics and legal impacts of the construction industry both locally and in other countries through guided learning and case study. e) Understand the implications of temporary design and construction in professional and social contexts; develop and improve communications skills and teamwork spirits in term project, and international/comparative study.
Subject Synopsis/ Indicative Syllabus	• Introduction, basic concepts of formwork and falsework. • Bamboo scaffolding: design and safety • Metal scaffolding: components, loads, foundations, and design • shoring design • Formwork materials, formwork types, and quality of finishes • Project handout and briefing • Design of slab forms • Design of wall forms • Design of beam forms • Design of column forms • Selection of horizontal formwork systems • Selection of vertical formwork systems
Teaching/Learning Methodology	Structured lecture/tutorial sessions are carried out at different stages during the progress of project to provide learning support to students in achieving the intended learning outcomes. Lecture/tutorial sessions of 1.0 hours per week are intended for teaching of key concepts, principles, and methods in temporary works design/application. The students are provided with useful resources on Blackboard for self study. A structured design project based on real life situation is to be used for term project and consists of the several components for applied learning:

1. Understand the structural elements of building components,
2. Prepare design of falsework systems to facilitate the construction of the structural elements.
3. Evaluate the different systems of formwork and falsework and to appraise alternation solutions.
4. Propose a suitable structural form for the formwork of various building components, and to prepare the subsequent design drawings, structural calculations and specifications
5. Produce plan and proposal for the falsework/formwork to facilitate building construction
6. Appreciate the multi-objective nature of building construction related to temporary works

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	
Temporary Works Design Report	70% (Group project)	√	√	√	√	√	
Temporary Works Design Report (individual contributions)	20% (Individual part)	√	√	√	√	√	
Quizzes and class attendance	10%	√	√		√		
Total	100 %						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:
The subject is project-based, the students will work in groups to complete the design report, which requires efforts from each team member to demonstrate that the group understands the problem and present the solutions in a professional report. The student in each group will also be individually assessed in contributions, contents, and quality of presentation based on the design report.
The students will take 3-4 quizzes in the form of multiple choice questions to assess their understanding of basic design principles, practice, and knowledge in temporary works, the students are required to attend all the lectures.

<u>Report assessment components:</u>

Report presentation (20%)
1. Report presentation: logical and coherent organization, clarity, citations and appendices, 10%
2. Command of written English: succinct writing, grammar and spelling, 10%

Report contents (80%)
1. Project introduction, 5%

	2. Introduction to temporary works design: materials, types, and selection, 10% 3. Falsework and scaffolding design (including Bamboo scaffolding), 10%* 4. Formwork design: columns (introduction, calculations, sketches and drawings) , 10%* 5. Formwork design: walls (introduction, calculations, sketches and drawings) , 10%* 6. Formwork design: Beams (introduction, calculations, sketches and drawings) , 10%* 7. Formwork design: slabs (introduction, calculations, sketches and drawings) , 10%* 8. Construction management issues in temporary works, sustainability, organization, environment, time, cost, safety, quality, 10% 9. Conclusions, 5% <u>Assessment criteria</u> *Report presentation* A or A+: 1. Excellent design drawings 2. Excellent use of English language in the report 3. Excellent use of tables, charts, figures, sketches in the report. 4. Excellent citation and references 5. The report is organized in logical and professional format B+: 1. Very good design drawings, with occasional errors in details 2. Very good use of English language in the report, with few typos, grammatical errors. 3. Proper use of tables, charts, figures, sketches in the report. 4. Very good citation and references 5. Overall the report is organized in logical and professional format B: 1. Good design drawings, with some errors in design and drawing details 2. Good use of English language in the report, with some typos, grammatical errors. 3. Proper use of tables, charts, figures, sketches in the report. 4. Good citation and references 5. The report is organized in logical and professional format, with some contexts misplaced or not presented clearly. C+: 1. Wholly satisfactory design drawings, with some errors in design and drawing details 2. Proper use of English language in the report, with many typos, grammatical errors. 3. Proper use of tables, charts, figures, sketches, with some formatting errors, in the report, 4. Wholly satisfactory citation and references 5. The report is overall organized in logical and professional format, with some parts of contexts misrepresented. C:

	1. Satisfactory design drawings, with non-critical errors in design and drawing details 2. Satisfactory use of English language in the report, with significant typos, grammatical errors. 3. Use of tables, charts, figures, sketches is marginal, with some formatting and contents errors, in the report, 4. Satisfactory citation and references 5. The report is marginally organized in logical and professional format, with some parts of contexts misrepresented. D+: 1. Barely satisfactory design drawings, with many non-critical errors in design and drawing details 2. Barely satisfactory use of English language in the report, with typos, grammatical errors, which may prevent understanding of some contents. 3. Use of tables, charts, figures, sketches is marginal, with many formatting and contents errors, in the report, 4. Barely satisfactory citation and references 5. The report is barely organized in logical and professional format, with some parts of contexts misrepresented, or difficult to understand. D: 1. Barely adequate design drawings, with many critical errors in design and drawing details 2. poor use of English language in the report, with typos, grammatical errors, which may prevent understanding of the report. 3. Use of tables, charts, figures, sketches is poor, with significant formatting and contents errors, in the report, 4. Barely adequate citation and references 5. The report is not well organized in logical and professional format, with some sections of the report misrepresented, or difficult to understand. F: 1. Inadequate design drawings, difficult to understand the design and drawing details 2. Poor use of English language in the report, with typos, grammatical errors, which prevents clear understanding of the report. 3. Managed to use tables, charts, figures, sketches for presentation in the report, with improper use and format. 4. Inadequate citation and references 5. The report is poorly organized, sometimes misrepresented, and difficult to understand. *Report contents:* A or A+: 1. All the contents and topics required for temporary works design are completed 2. The design for each part of the temporary works is excellent, with proper assumptions, design calculation, design analysis and design drawings. 3. Clear statement of design assumptions 4. No errors in design calculations. B+:

	1. All the contents and topics required for temporary works design are completed, with very few missing contents 2. The design for each part of the temporary works is very good, with proper assumptions, design calculation, design analysis and design drawings. Occasional inconsistence in design and drawings. 3. Very good statement of design assumptions 4. Few noncritical errors in design calculations. B: 1. All the contents and topics required for temporary works design are completed, with some contents partially missing or inadequately presented 2. The design for each part of the temporary works is good, with proper assumptions, design calculation, design analysis and design drawings. some inconsistence in design and drawings. Some noncritical design errors. 3. Good statement of design assumptions 4. Some inaccuracies in design calculations. C+: 1. All the contents and topics required for temporary works design are completed, with some contents missing or inadequately presented 2. The design for each part of the temporary works is wholly satisfactory, with proper assumptions, design calculations, design analysis and design drawings. some errors in design and drawings. Some design errors. 3. Wholly satisfactory statement of design assumptions 4. Some errors in design calculations. C: 1. All the contents and topics required for temporary works design are completed, with some contents missing and inadequately presented 2. The design for each part of the temporary works is satisfactory, with proper assumptions, design calculations, design analysis and design drawings. some errors in design and drawings. design errors are sometimes serious in some items. 3. Satisfactory statement of design assumptions 4. Many errors in design calculations, but not critical and not affecting overall design. D+: 1. All the contents and topics required for temporary works design are completed, with many contents missing or inadequately presented 2. The design for each part of the temporary works is barely satisfactory, with largely proper assumptions, design calculations, design analysis and design drawings. some errors in design and drawings. design errors are often serious in some items. 3. Barely satisfactory statement of design assumptions 4. Many errors in design calculations, may be critical but not affecting overall design. D:

	1. All the contents and topics required for temporary works design are completed, with many contents missing and inadequately presented 2. The design for each part of the temporary works is barely adequate, with marginally proper assumptions, design calculations, design analysis and design drawings. many errors in design and drawings. design errors are often serious in many items. 3. Barely adequate statement of design assumptions 4. Extensive errors in design calculations, may be critical but not affecting overall design. F: 1. Not all the contents and topics required for temporary works design are completed, with many contents or chapters missing and inadequately presented 2. The design for each part of the temporary works is inadequate, with usually inadequate assumptions, design calculations, design analysis and design drawings. Extensive errors in design and drawings. design errors are usually serious. 3. Inadequate statement of design assumptions 4. Extensive errors in design calculations, may be critical and affecting the validity of the overall design. *Quizzes and class attendance* A or A+: Over 90% of the questions are answered correctly B+: 80% - 90% of the questions are answered correctly B: 70% - 80% of the questions are answered correctly C+: 60%- 70% of the questions are answered correctly C: 50%- 60% of the questions are answered correctly D+: 40% - 50% of the questions are answered correctly D: 35% - 40% of the questions are answered correctly F: Under 35% of the questions are answered correctly The grade will be reduced by at least one grade letter if a student was absent from the lecture for up to 3 weeks.

Student Study Effort Expected	Class contact:	
	▪ LEC	26Hrs.
	▪ Tutorial/Project Consultation	13 Hrs.
	Other student study effort:	
	▪ SELF-STUDY/REPORT WRITING	90 Hrs.
	▪	Hrs.
	Total student study effort	129 Hrs.

Reading List and References	**Reading List:** No standard textbook is recommended, since students have to refer to various literatures in order to achieve the requirement of the design project. Reference will be made to current articles in journals, local newspaper, would press, proceedings dealing with topics of current importance.

	Recommended: The Concrete Society (2012), *Formwork A guide to good practice*, 3rd Edition, the Concrete Society, London. Illingworth J.R. (1987). *Temporary Works: Their Role in Construction*, Thomas Telford, London. Labour Department (2014). Code of Practice for Bamboo Scaffolding Safety. Available from: http://www.labour.gov.hk/eng/public/os/B/Bamboo.pdf Buildings Department (2001). Guidelines on the Design and Construction of Bamboo Scaffolds. Available from: http://www.bd.gov.hk/english/documents/code/GDCBS.pdf Wong, Francis K.W. (1998). Bamboo Scaffolding Safety Management for the Building Industry in Hong Kong. Labour Department (2013). *Code of Practice for Metal Scaffolding Safety.* Available from: http://www.labour.gov.hk/eng/public/os/B/mss.pdf Chudley, R. (1999). *Advanced Construction Technology*, 3rd ed. revised by Roger Grano, Longman. Illingworth, J.R. (2000). *Construction Methods and Planning*, 2nd ed., E & FN Spon.