

Subject Description Form

Subject Code	BRE462
Subject Title	Advanced Construction Technology
Credit Value	3
Level	4
Pre-requisite	BRE370
Objectives	<ol style="list-style-type: none"> 1. Introduce and discuss selected topics on advanced construction technology in building construction 2. Foster guided learning and critical investigation on the cutting edge technologies in building construction 3. Appreciate the future trends, difficulties and challenges on building construction
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a) grasp the selected construction technologies and conduct analysis on their application scenarios; keep students abreast with the up-to-date technologies in tall buildings construction; b) compare alternative solutions in building construction technologies (contemporary versus conventional; sustainable versus Non-sustainable; automated versus manual); c) further enhance their communication skills through drawings, oral and written presentation in a team environment; d) foster their life-long learning through independent thinking, self-study and critical reviews, in-depth investigations on some construction planning and management issues.
Subject Synopsis/ Indicative Syllabus	<ol style="list-style-type: none"> 1. High performance concrete including high strength concrete, self-compacting concrete and concrete for 3D printing. 2. Demolition: Code of Practice and Building Regulations for demolition works. 3. Advanced Construction Technology, including Very Tall Building Construction, Modular Integrated Construction and construction 3D-printing. 4. Site layout planning: Basic principles in site layout planning, with due consideration to access, storage, accommodations, services, plants, health and safety, and related statutory requirements. 5. Visualization, sensing and tracking applications in construction process monitoring and management control. 6. Alternation and Addition Works (A & A works): Structural & Condition survey / appraisal, conversion, preservation, fulfillment of statutory requirements, project management for A & A works.

Teaching/Learning Methodology	<p>Lectures</p> <p>Lectures are designed to help the students gain basic knowledge and understanding on each selected topic.</p> <p>Case studies: In-class reading and discussions</p> <p>Case studies on each topic are intended to illustrate the theories and regulatory requirements. Reading materials are provided for in-class reading and discussions in the tutorial session. In case study, representative construction technologies used for buildings / projects in Hong Kong and other metropolitan areas will be highlighted. Guest speakers may be invited if appropriate.</p> <p>Group Projects</p> <p>There are three group projects on different focuses;</p> <ul style="list-style-type: none">1) a presentation on topics about project case study or advanced construction technology2) a report on site layout planning study or alternation and addition works3) an essay report on topics about Digital Construction <p>Written Examination</p> <p>Written examination is employed to assess student on problem solving skills individually. Questions for the examination are usually designed as case-based and/or problem-based.</p>																																																						
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 (Please tick as appropriate)</th></tr><tr><th>a</th><th>b</th><th>c</th><th>d</th><th></th><th></th></tr><tr><td>1. Group Project 1 (Tutorial Task & Presentation)</td><td>15%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr><tr><td>2. Group Project 2 (Site Planning)</td><td>15%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr><tr><td>3. Group Project 3 (Essay on Digital Construction)</td><td>20%</td><td>√</td><td>√</td><td></td><td>√</td><td></td><td></td></tr><tr><td>4. Examination</td><td>50%</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> <p>Students must pass both the continuous assessment and the end-of-semester examination in order to pass the subject.</p> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Group projects will require students to have good understandings on related construction technologies. Extensive reading and/or critical review are required. Project report will require the students to demonstrate their collective work as a team with contributions from each team member through effective communications.</p> <p>Students are encouraged to use Artificial Intelligence (AI) tools to assist in the development of the topic areas, identify related contents to be included and to conduct initial evaluation on different options and solutions. Students will be required to document the adoption of AI tools in the coursework as an integral part of the</p>	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)						a	b	c	d			1. Group Project 1 (Tutorial Task & Presentation)	15%	√	√	√	√			2. Group Project 2 (Site Planning)	15%	√	√	√	√			3. Group Project 3 (Essay on Digital Construction)	20%	√	√		√			4. Examination	50%	√	√		√			Total	100%						
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	<p>submission for assessment.</p> <p>Written examination is used to demonstrate students' ability in analyzing issues and problems and to suggest solutions on an individual basis.</p>	
Student Study Effort Required	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Tutorial	13 Hrs.
	Other student study effort:	
	▪ Reading and writing assignments	40 Hrs.
	▪ Group project	40 Hrs.
	Total student study effort	119 Hrs.
Reading List and References	<p>Buildings Department (2016). Code of Practice for Precast Concrete Construction, Buildings Department, Hong Kong SAR Government</p> <p>Buildings Department (2004), Code of Practice for Demolition of Buildings, Buildings Department, Hong Kong SAR Government</p> <p>Caldarone M. (2009). High Strength Concrete: a Practical Guide. Taylor & Francis.</p> <p>Raton B. (2003). The Civil Engineering Handbook, 2nd edition, CRC Press.</p> <p>Chudley R. and Greeno R. (2012). Advanced Construction Technology, 5th edition, Pearson.</p> <p>Chudley R. and Greeno R. (2016). Building Construction Handbook, 11th Edition. Routledge.</p> <p>Chew M. Y. L. (2017). Construction Technology for Tall Buildings, 5th edition, World Scientific.</p> <p>Parker D., Wood A. (2013). The Tall Buildings Reference Book, Routledge (ebook).</p> <p>Cooke, R (2007), Building in the 21st Century, Blackwell.</p> <p>Watt D. (2007), Building Pathology: Principles and Practice, 2nd edition, Blackwell.</p> <p>Macdonald S (ed.) (2003), Concrete: Building Pathology, Blackwell Science.</p> <p>Crotty (2012), The impact of Building Information Modelling: Transforming Practices, Spon.</p> <p>Development Bureau, (2018), Constriction 2.0 – Time to Change, Development Bureau, Hong Kong SAR Government.</p>	