

Subject Description Form

Subject Code	CSE2702/IC2702
Subject Title	Information Modelling and Construction Applications
Credit Value	3 Training Credits
Level	2
Pre-requisite/	CSE2700/IC2700 Construction Practices and Safety CSE2701/IC2701 Construction Drawing and Modelling
Objectives	This subject aims to equip students with the techniques to administer construction projects by adopting industry's latest technologies, techniques, methods and practices. This subject also aims to provide students an opportunity in applying the techniques in real-life situation. It is aimed for students, upon completion of this subject and IC2701, to attain professional competence equivalent to CIC-accredited BIM Coordinator (CCBC).
Intended Learning Outcomes	Upon completion of the subject, students will be able to: <ul style="list-style-type: none"> a. Administer the operations of building information modelling systems in construction projects; b. Be aware of the industry's latest design and construction practices and their implication on BIM; c. Apply quality control measures in construction projects; and d. Suggest advanced construction practices for construction projects.
Subject Synopsis/ Indicative Syllabus	<p><u>Advanced Building Information Modelling (BIM)</u></p> <ul style="list-style-type: none"> • Digital information management, collaboration and integration; and • Commercial and contractual issues of BIM projects. <p><u>Modular Construction Practices</u></p> <ul style="list-style-type: none"> • Introduction to the concept of design for manufacture and assembly (DfMA) and the development from in-situ to modular integrated construction (MiC); • Use of advanced technology such as VR/AR, AI, RFID, BIM, high performance materials, 3D printing etc. in MiC; and • Advantages and technical challenges of MiC. <p><u>Inspection for Quality Control</u></p> <ul style="list-style-type: none"> • Introduction to the common inspection practice for selected piling and building works; • Use of non-destructive test (NDT) method such as carbonization test, half-cell potential test, sonic echo test, ultrasonic test, etc.; and • Advantages and technical challenges of NDT. <p><u>Mini Project</u></p> <ul style="list-style-type: none"> • Design for and produce by traditional and advanced methods such as in-situ casting and modular construction using 3D printing; • Technical and economical characteristics of traditional and advanced production methods; and • Advantages and technical challenges of traditional and advanced production methods.

Learning Methodology	The subject will be delivered through the following learning methods: <div><div>a.</div><div>Mini-lectures – Lectures and demonstrations are used to introduce and explain key concept, definition and application of BIM and industry’s latest practices. Multi-media illustrations are used for students to appreciate the good practices of the practices, as well as case studies and small group discussions are used to relate these knowledges with real-life practices;</div><div>b.</div><div>Hands-on workshop - Students are organized to perform hands-on works in small groups under supervision of IC training staff in workshops. A wide range of practices are demonstrated. Hands-on sessions are arranged, if appropriate, for students to practice the industry standards and techniques;</div><div>c.</div><div>Assignments - Individual assignments are arranged to deepen students’ knowledge and sharpen their skills on BIM operation and industry’s latest practices;</div><div>d.</div><div>Mini-project – Students are organized in groups to carry out design, production and post-project evaluation to apply their training experiences and appreciate the challenges of the construction practices in real-life applications; and</div><div>e.</div><div>Self-learning - Independent on-line learning materials are provided for students to broaden their horizon of industry development.</div></div>					
Assessment Methods in Alignment with Intended Learning Outcomes	Assessment Method	Weighting (%)	Intended Subject Learning Outcomes Assessed			
			a	b	c	d
	Assignments	30	✓	✓	✓	✓
	Reports	40	✓	✓	✓	✓
	Tests	30	✓	✓	✓	✓
	Assignments - Students’ performance are assessed continuously by assignments in the form of worksheets. Students’ performance in the context of project work will also be monitored and assessed accordingly by IC training staff.					
	Reports - Students’ reflection on their learning outcomes are captured by their training report.					
Tests - Multiple-choices and short-question type on-line tests are used to assess students on their declarative knowledge and their analytical thinking.						
Student Study Effort Required	Class Contact					
	Mini lecture and demonstration		22 Hrs			
	Hands-on practice, tests and project work		68 Hrs			
	Other Study Effort					
	Assignment and report		9 Hrs			
	Self-learning		6 Hrs			
	Total Study Effort:		105 Hrs			

Reading List and References	<p>Reading Materials:</p> <ul style="list-style-type: none"> • Construction Industry Council DfMA Alliance Learning Resources (http://www.cic.hk/eng/main/dfma_alliance/knowledge_sharing/) • Construction Industry Council BIM Publications (https://www.bim.cic.hk/en/resources/publications) <p>References:</p> <ul style="list-style-type: none"> • Code of Practice for Foundations 2017 published by Buildings Department of the HKSAR • Code of Practice for Site Supervision 2009 published by Buildings Department of the HKSAR • Maierhofer, Reinhardt, Dobmann, Maierhofer, Christiane, Reinhardt, Hans-Wolf, and Dobmann, Gerd. Non-destructive Evaluation of Reinforced Concrete Structures. Cambridge : Boca Raton: Woodhead ; CRC, 2010. • Sanjayan, Nazari, Nematollahi, Sanjayan, Jay G., Nazari, Ali, and Nematollahi, Behzad. 3D Concrete Printing Technology : Construction and Building Applications. Oxford, England ; Cambridge, Massachusetts: Butterworth-Heinemann, 2019.
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