Department of Civil and Environmental Engineering The Hong Kong University of Science and Technology Spring Semester, 2022-23

Rubric	CIVL 2020		
Title of course	Industrial and BIM Training		
Class time & venue	 Two 1.5-hour lectures with NO tutorial per week. Lecture 1: Wed Fri 1:30 pm - 2:50 pm Lecture 2: Wed Fri 3:00 pm - 4:20 pm Venue: Room 3207 (CIVL Computer Barn) (22) 		
Instructors	Dr. Jack C.P. CHENG (<u>cejcheng@ust.hk;</u> Room 4604) Dr. Thomas HU (<u>thomashu@ust.hk;</u> Room 3585) Ir CK NG (<u>ceckng@ust.hk</u>) (<u>ckng@buildit.com.hk</u>)		
Teaching Assistants	ts <u>BIM and Drawing Module</u> Mr. CHAN, Chak Fu (<u>cfchanay@connect.ust.hk</u>), Mr. LIANG, Zhaolun (<u>zliangaq@connect.ust.hk</u>), Mr. LIANG, Zhenyu (<u>zliangay@connect.ust.hk</u>), Mr. LIN, Fangzhou (<u>flinan@connect.ust.hk</u>)		
	<u>Surveying Module</u> Mr. LI, Mingkai (<u>mlicj@connect.ust.hk</u>), Mr. ZHANG, Xiao (<u>xzhangfk@connect.ust.hk</u>), Mr. CHEN, Xinyu (<u>xchengl@connect.ust.hk</u>), Mr. FU, Rao (<u>rfuaf@connect.ust.hk</u>)		
Prerequisites	None		
Credits	0 credit; Pass or Fail		
Course description	CIVL 2020 consists of four modules: (1) BIM and engineering drawing module; (2) surveying module; (3) safety training module; and (4) industrial training module. The part offered in Spring semester covers (a) the BIM and engineering drawing module, which includes theoretical and practical training on computer-aided drawing (CAD), building information modeling (BIM), and related topics; and (b) the surveying module, which includes basics of land surveying and operation of construction levels.		
Textbook(s) and/or other materials	None		
Computer usage	Autodesk Revit. Autodesk AutoCAD. Autodesk Civil 3D. Autodesk Dynamo. Autodesk Navisworks.		
Laboratory projects	No lab work required		
Contribution to the professional component	75% engineering topics 25% communication and professional engineer		
Intended Learning Outcomes (ILOs) of this course	At the end of this BIM and engineering drawing module, students are expected to be able to: I. Understand the basics of CAD and BIM. II. Use CAD and BIM software, for both buildings and civil infrastructure. III. Draw BIM models and generate corresponding drawings.		
	IV. Perform basic analyses using 3D BIM models.		

Relationship to the program objectives	 PEO1: Provide students with professional skills in the design, construction and management of the civil infrastructure, as well as an awareness of environmental sustainability. This course provides students with knowledge of construction projects and the industry, feasibility studies, contract documents, cost estimating, and quality and safety management in Construction Engineering and Management. (ILO I, II, III, IV, V, VI) PEO4: Expose students to real world engineering projects as well as cutting edge research to improve their understanding of the profession and technological advancements that can improve current practice. This course uses real world examples for illustration and discussions in 			
	class and for practices in take-home assignments. (ILO III, VI)			
Relationship to program outcomes	<i>PO5:</i> Develop an ability to identify and formulate civil and environmental engineering problems, and propose feasible solutions with an appreciation of their underlying assumptions, uncertainties, constraints, and technical limitations.			
	Students have to identify construction engineering and management problems, and propose feasible solutions through case reviews and discussions in class as well as take-home assignments. (ILO III, VI)			
	PO7: Develop an appreciation of the breadth of civil and environmental engineering, and acquire basic knowledge in several disciplines to enable effective performance within a multidisciplinary work environment.			
	This course provides a wide range of subjects in Construction Engineering and Management, which helps students appreciate the breadth of civil engineering and the complexity of a construction project. (ILO I, II, IV, V)			
Assessment of outcomes	The grading of the BIM and engineering drawing module will be based on the following assessments:			
	1. In-class exercises/quizzes and take-home assignments (85%)			
	2 In class attendance (15%)			
	2. In-class attenuance (1576)			
Notes	• It is our collective responsibility to make each class a stimulating learning experience. I will start and end each class on time. At the same time, I expect you to show up for class on time. Please see http://tl.ust.hk/conduct/good_learning_experience.pps for other proper classroom behaviors so that learning of everyone is fostered.			
	• In-class exercises/quizzes should be submitted by the end of the class day.			
Prepared by	Dr. Jack C.P. Cheng, Ir CK Ng, Dr. Thomas Hu			
Date	3 February 2023			

Tentative Class Schedule for CIVL 2020 for Spring 2023 (*Note: The actual topics covered in each lecture may vary depending on the class pace.*)

Week	Class	Date	Lecture Topic	Instructor			
1	1	3 February 2023 (Fri)	Introduction of BIM	Jack Cheng			
			Revit (basic operations, solar study)				
2	2	8 February 2023 (Wed)	Revit (drawing generation, rendering)	Jack Cheng			
			Assignment: BIM Revit Rendering				
	3	10 February 2023 (Fri)	Revit (schedule of quantities, room, IFC)	Jack Cheng			
			Assignment: BIM Floor Plan (HKUST Sports Hall)	X 1 61			
3	4	15 February 2023 (Wed)	Revit (walkthrough, model creation) Assignment: BIM Walkthrough	Jack Cheng			
	5	17 February 2023 (Fri)	Basic AutoCAD. Civil 3D (point, surface)	CK Ng			
4	6	22 February 2023 (Wed)	Civil 3D (pipe/drainage network, profile)	CK Ng			
	7	24 February 2023 (Fri)	In-class Assignment: Civil 3D (drainage network)	CK Ng			
5	8	1 March 2023 (Wed)	Revit (rebar)	CK Ng			
	9	3 March 2023 (Fri)	Revit (rebar) with Assignment	CK Ng			
6	10	8 March 2023 (Wed)	Revit Structure	CK Ng			
	11	10 March 2023 (Fri)	Revit Structure, with Assignment	CK Ng			
7	12	15 March 2023 (Wed)	BIM, CDE, ISO, Digital Construction	CK Ng			
			Construction Reviews				
	13	17 March 2023 (Fri)	Civil 3D (road, bridge, tunnel)	CK Ng			
8	14	22 March 2023 (Wed)	Civil 3D (road, bridge, tunnel) with Assignment	CK Ng			
	15	24 March 2023 (Fri)	Navisworks (clash detection, search sets)	Jack Cheng			
			Assignment: Clash Report				
9	16	29 March 2023 (Wed)	Navisworks (4D modeling)	Jack Cheng			
	17	31 March 2023 (Fri)	Introduction of BIM Standards Assignment: CIC BIM Viewer	Jack Cheng			
10		5 April 2023 (Wed)	Midterm Break				
		7 April 2023 (Fri)	Easter Holiday				
11	18	12 April 2023 (Wed)	Revit Dynamo (Examples 1 and 2)	Jack Cheng			
	19	14 April 2023 (Fri)	Revit Dynamo (Example 3)	Jack Cheng			
			Assignment: BIM Dynamo				
12	20	19 April 2023 (Wed)	Discussion on BIM and Construction Digitalization	Jack Cheng			
	21	21 April 2023 (Fri)	Survey Lecture (on campus LT)	Thomas Hu			
13	22	26 April 2023 (Wed)	Survey Fieldwork (on campus) (~40 students)	Thomas Hu			
	23	28 April 2023 (Fri)	Survey Fieldwork (on campus) (~40 students)	Thomas Hu			
14	24	3 May 2023 (Wed)	Survey Fieldwork (on campus) (~40 students)	Thomas Hu			
	25	5 May 2023 (Fri)	Survey Exam	Thomas Hu			
* Midterm Break from 5 April 2023 to 11 April 2023							
* Last day of classes in Spring 2023 semester – 9 May 2023							