

**Department of Civil and Environmental Engineering**  
**The Hong Kong University of Science and Technology**  
**Spring Semester, 2023-24**

Rubric	<b>CIVL 2020</b>
Title of course	<b>Industrial and BIM Training</b>
Class time & venue	<b>Two 1.5-hour lectures</b> 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	<b>Dr. Jack C.P. CHENG</b> ( <a href="mailto:cejcheng@ust.hk">cejcheng@ust.hk</a> ; Room 4604) <b>Dr. Thomas HU</b> ( <a href="mailto:thomashu@ust.hk">thomashu@ust.hk</a> ; Room 3585) <b>Ir CK NG</b> ( <a href="mailto:ceckng@ust.hk">ceckng@ust.hk</a> ) ( <a href="mailto:ckng@buildit.com.hk">ckng@buildit.com.hk</a> )
Teaching Assistants	<b><u>BIM and Drawing Module</u></b> <b>GUO, Xiaowen</b> ( <a href="mailto:xguoaw@connect.ust.hk">xguoaw@connect.ust.hk</a> ) <b>HUANG, Cong</b> ( <a href="mailto:chuangax@connect.ust.hk">chuangax@connect.ust.hk</a> ) <b>LIANG, Zhaolun</b> ( <a href="mailto:zliangaq@connect.ust.hk">zliangaq@connect.ust.hk</a> ) <b>LIANG, Zhenyu</b> ( <a href="mailto:zliangav@connect.ust.hk">zliangav@connect.ust.hk</a> ) <b>LIN, Fangzhou</b> ( <a href="mailto:flinan@connect.ust.hk">flinan@connect.ust.hk</a> ) <b>LIU, Wenli</b> ( <a href="mailto:wliucd@connect.ust.hk">wliucd@connect.ust.hk</a> ) <b>WU, Zhaoji</b> ( <a href="mailto:zwubz@connect.ust.hk">zwubz@connect.ust.hk</a> ) <b>XU, Yuqing</b> ( <a href="mailto:yxudv@connect.ust.hk">yxudv@connect.ust.hk</a> )  <b><u>Surveying Module</u></b> <b>CANLAS, Andrea Marcelino</b> ( <a href="mailto:macanlas@connect.ust.hk">macanlas@connect.ust.hk</a> ) <b>HAN, Yingyue</b> ( <a href="mailto:yhanbl@connect.ust.hk">yhanbl@connect.ust.hk</a> ) <b>JIN, Yuhang</b> ( <a href="mailto:yjinbb@connect.ust.hk">yjinbb@connect.ust.hk</a> ) <b>XIAO, Shihao</b> ( <a href="mailto:sxiaoai@connect.ust.hk">sxiaoai@connect.ust.hk</a> ) <b>XU, Weifan</b> ( <a href="mailto:wxubp@connect.ust.hk">wxubp@connect.ust.hk</a> )
Prerequisites	None
Credits	<b>0 credit; Pass or Fail</b>
Course description	CIVL 2020 consists of four modules: <b>(1) BIM and engineering drawing module; (2) surveying module; (3) safety training module; and (4) industrial training module.</b> 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	<p>At the end of this BIM and engineering drawing module, students are expected to be able to:</p> <p>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.</p>
Relationship to the program objectives	<p><i>PEO1: Provide students with professional skills in the design, construction and management of the civil infrastructure, as well as an awareness of environmental sustainability.</i></p> <p>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)</p> <p><i>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.</i></p> <p>This course uses real world examples for illustration and discussions in class and for practices in take-home assignments. (ILO III, VI)</p>
Relationship to program outcomes	<p><i>PO5: 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.</i></p> <p>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)</p> <p><i>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.</i></p> <p>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)</p>
Assessment of outcomes	<p>The grading of the BIM and engineering drawing module will be based on the following assessments:</p> <ol style="list-style-type: none"> <li><b>1. In-class exercises/quizzes and take-home assignments (85%)</b></li> <li><b>2. In-class attendance (15%)</b></li> </ol>
Notes	<ul style="list-style-type: none"> <li>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 <a href="http://tl.ust.hk/conduct/good_learning_experience.pps">http://tl.ust.hk/conduct/good_learning_experience.pps</a> for other proper classroom behaviors so that learning of everyone is fostered.</li> <li>In-class exercises/quizzes should be submitted by the end of the class day.</li> </ul>
Prepared by	Dr. Jack C.P. Cheng, Ir CK Ng, Dr. Thomas Hu
Date	2 February 2024

## Tentative Class Schedule for CIVL 2020 for Spring 2024

(Note: The actual topics covered in each lecture may vary depending on the class pace.)

Week	Class	Date	Lecture Topic	Instructor
1		31 January 2024 (Wed)	Hardware/software Setup	
	1	2 February 2024 (Fri)	Introduction of BIM Revit (basic operations, solar study)	Jack Cheng
2	2	7 February 2024 (Wed)	Revit (drawing generation, rendering) Assignment: BIM Revit Rendering	Jack Cheng
	3	9 February 2024 (Fri)	Revit (schedule of quantities, room, IFC) Assignment: BIM Floor Plan (HKUST Sports Hall)	Jack Cheng
3	4	14 February 2024 (Wed)	Revit (walkthrough, model creation) Assignment: BIM Walkthrough	Jack Cheng
	5	16 February 2024 (Fri)	Basic AutoCAD. Civil 3D (point, surface)	CK Ng
4	6	21 February 2024 (Wed)	Civil 3D (pipe/drainage network, profile)	CK Ng
	7	23 February 2024 (Fri)	In-class Assignment: Civil 3D (drainage network)	CK Ng
5	8	28 February 2024 (Wed)	Revit (rebar)	CK Ng
	9	1 March 2024 (Fri)	Navisworks (clash detection, search sets) Assignment: Clash Report	Jack Cheng
6	10	6 March 2024 (Wed)	Navisworks (4D modeling)	Jack Cheng
	11	8 March 2024 (Fri)	Introduction of BIM Standards Assignment: CIC BIM Viewer	Jack Cheng
7	12	13 March 2024 (Wed)	Revit Dynamo (Examples 1 and 2)	Jack Cheng
	13	15 March 2024 (Fri)	Revit Dynamo (Example 3) Assignment: BIM Dynamo	Jack Cheng
8	14	20 March 2024 (Wed)	Discussion on BIM and Construction Digitalization	Jack Cheng
	15	22 March 2024 (Fri)	Revit (rebar) with Assignment	CK Ng
9	16	27 March 2024 (Wed)	Revit Structure	CK Ng
		29 March 2024 (Fri)	Easter Holiday	
10		3 April 2024 (Wed)	Midterm Break	
	17	5 April 2024 (Fri)	Revit Structure, with Assignment	CK Ng
11	18	10 April 2024 (Wed)	BIM, CDE, ISO, Digital Construction Construction Reviews	CK Ng
	19	12 April 2024 (Fri)	Civil 3D (road, bridge, tunnel)	CK Ng
12	20	17 April 2024 (Wed)	Civil 3D (road, bridge, tunnel) with Assignment	CK Ng
	21	19 April 2024 (Fri)	Survey Lecture (on campus LT)	Thomas Hu
13	22	24 April 2024 (Wed)	Survey Fieldwork (on campus) (~40 students)	Thomas Hu
	23	26 April 2024 (Fri)	Survey Fieldwork (on campus) (~40 students)	Thomas Hu
14		1 May 2024 (Wed)	Labor Day Holiday	
	24	3 May 2024 (Fri)	Survey Fieldwork (on campus) (~40 students)	Thomas Hu
15	25	8 May 2024 (Wed)	Survey Fieldwork (on campus) (~40 students)	Thomas Hu
	26	10 May 2024 (Fri)	Survey Exam	Thomas Hu

**\* Midterm Break from 28 March 2024 to 4 April 2024**  
**\* Last day of classes in Spring 2024 semester – 10 May 2024**