

University of Macau
Undergraduate Civil Engineering Programme

Coordinating Unit:	Department of Civil and Environmental Engineering, Faculty of Science and Technology		
Supporting Unit(s):	Nil		
Course Code:	CIVL1002	Year of Study:	1
Course Title:	Civil Engineering Drawing		
Compulsory/Elective:	Compulsory		
Course Prerequisites:	Nil		
Prerequisite Knowledge:	Nil		
Duration:	One semester	Credit Units:	2
Class/Laboratory Schedule:	3 hours of lecture per week.		
Laboratory/Software Usage:	Computer laboratory/AutoCAD		
Course Description:	This course is designed to provide civil engineering undergraduates with basic understanding of the theory and practice of engineering drawings and computer-aided design for civil engineering applications. Students will learn to read and construct blueprints and working drawings by means of lectures, discussion of drawing examples related to existing buildings or projects, CAD practice. Topics will include basic fundamentals of graphics and drafting principles, Auto-Cad fundamentals, architectural drawings, structural floor plan of building, detailing for typical reinforced concrete structural and steel members.		
Course Objectives:	<ol style="list-style-type: none"> 1. To present fundamentals of graphics and drafting appropriate for developing functional skill in computer aided drafting. 2. To provide students with adequate knowledge and experience in preparing engineering drawings using AutoCAD. 3. To teach students to read, construct and understand basic Civil engineering drawings. 4. To help students acquire the skills pertinent to the production of properly detailed, formatted and dimensioned Civil Engineering drawings. 		
Learning Outcomes (LO):	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> 1. produce geometric construction, multiview, sectional view, dimensioning and detail drawings of typical 2-D engineered objects. [POs: a,e]; 2. understand and complete architectural floor plan. [POs: a,e]; 3. understand and complete structural framing plan. [POs: a,e]; 4. understand and complete typical reinforced concrete structural and steel members detailing. [POs: a,e] 5. understand and know how to apply computer software to prepare civil engineering drawing [POs: a,e,l] 		
Texts & References: <i>(* recommended textbook(s))</i>	<ol style="list-style-type: none"> 1. AutoCAD 2015 Beginning and Intermediate, by Munir M. Hamad, ISBN:9781937585365 2. AutoCAD 2015 and AutoCAD LT 2015: No Experience Required, by Donnie Gladfelter, ISBN:9781118862292 3. Steel Detailers' Manual by Alan Hayward and Frank Weare, Blackwell Scientific Publications, ISBN 0-632-03523-4 4. Handout provided by instructor 		

Student Assessment:	<ul style="list-style-type: none"> • Computer laboratory exercises: 15%; • Drawings exercises: 15%; • Midterm Examinations: 40% • Final Examination: 30% 																
Learning Outcome Assessment:	<ul style="list-style-type: none"> • Class work & Homework. • Examination • Course evaluation 																
Pedagogical Methods:	<table border="0"> <tr> <td><input checked="" type="checkbox"/> Lecture</td> <td><input type="checkbox"/> Service learning</td> </tr> <tr> <td><input type="checkbox"/> Guest speakers</td> <td><input type="checkbox"/> Internship</td> </tr> <tr> <td><input type="checkbox"/> Case study</td> <td><input type="checkbox"/> Field study</td> </tr> <tr> <td><input type="checkbox"/> Role playing</td> <td><input type="checkbox"/> Company visits</td> </tr> <tr> <td><input type="checkbox"/> Student presentation</td> <td><input type="checkbox"/> e-learning</td> </tr> <tr> <td><input type="checkbox"/> Project</td> <td><input checked="" type="checkbox"/> Independent study</td> </tr> <tr> <td><input type="checkbox"/> Simulation game</td> <td><input checked="" type="checkbox"/> Others: <u>Computer software</u></td> </tr> <tr> <td><input checked="" type="checkbox"/> Exercises and problems</td> <td></td> </tr> </table>	<input checked="" type="checkbox"/> Lecture	<input type="checkbox"/> Service learning	<input type="checkbox"/> Guest speakers	<input type="checkbox"/> Internship	<input type="checkbox"/> Case study	<input type="checkbox"/> Field study	<input type="checkbox"/> Role playing	<input type="checkbox"/> Company visits	<input type="checkbox"/> Student presentation	<input type="checkbox"/> e-learning	<input type="checkbox"/> Project	<input checked="" type="checkbox"/> Independent study	<input type="checkbox"/> Simulation game	<input checked="" type="checkbox"/> Others: <u>Computer software</u>	<input checked="" type="checkbox"/> Exercises and problems	
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Major Assessment Methods:	Case Study	Role Playing	Student Presentation	Individual project/paper	Group project/paper	Simulation Game	Exercises & problems	Service learning	Internship	Field Study	Company visits	Written examination	Oral examination	Others (Written/Drawing examinations)
Class Participation/ Discussion														
Computer laboratory exercises							✓							
Drawing Exercises							✓							
Test(s)														✓
Examination														✓
Others														
Course Web: (if any)	UMMoodle													

Course Content: (topic outline)	Week no.	Topics	LO no.
	1	Introduction to Civil Engineering Drawings Isometric drawing, orthographic or multi-view drawing, dimensioning, sectioning, different drawing tools and software	1
	2	Architectural Drawing Typical architectural drawing of a building: (site plan, building elevations, floor plan of each floor, basement plan and roof plan); house emergency floor plan; electrical floor plan ; air conditioning duct floor plan ; plumbing floor plan ; foundation floor plan (footing); foundation floor plan (pile);	2
	3,4	Structural Drawing (Reinforced concrete structures) Introduction to reinforced concrete structures Structural detailing drawings (RC members and connections) Structural framing plan; Beams; Columns and Foundations; Staircase; Slabs	3, 4
	5	Structural Drawing (Steel structures) Introduction to steel structures Structural detailing drawings (Steel members and connections) Structural framing plan; Beams; Columns; Staircase; Slabs; Connections	3, 4
	6	Test I (Topic 1 and 2)	
	7,8	AutoCAD Fundamentals I and drawing class Getting started AutoCAD; AutoCAD screen components; drafting settings; snap symbols; drawing lines; coordinate systems;	5
	9,10	AutoCAD Fundamentals II and drawing class Basic drawing commands; Drawing circles and arcs; geometric constructions; tangencies; text; block diagrams; layers; line types; 2-D commands and drawings; orthographic views;	5
	11,12	AutoCAD Fundamentals III and drawing class Further modification commands; sectional views; formats; dimensioning; plotting drawing; paper size selection and fitting;	5
	13	Test II (Topic 3 and 4)	
	14	Introduction to Building Information Modeling (BIM)	5

Percentage Content of:	Mathematics and Basic Sciences	Engineering Subjects	Complementary Studies	Total	
	0	100	0	100	
Timetabled work in hours per week:	Lecture	Tutorial	Laboratory	Other	Total
	3	---	---		3

Contribution to Programme Outcomes:	Programme Outcomes		Contribution to POs	
			Primary	Secondary
	(a)	an ability to apply knowledge of mathematics, science, and engineering appropriate to the degree discipline	✓	
	(b)	an ability to design and conduct experiments, as well as to analyse and interpret data		
	(c)	an ability to design a system, component or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability		
	(d)	an ability to function on multi-disciplinary teams		
	(e)	an ability to identify, formulate and solve engineering problems		✓
	(f)	an ability to understand professional and ethical responsibility		
	(g)	an ability to communicate effectively		
	(h)	an ability to understand the impact of engineering solutions in a global and societal context, especially the importance of health, safety and environmental considerations to both workers and the general public		
	(i)	an ability to stay abreast of contemporary issues		
	(j)	an ability to recognise the need for, and to engage in life-long learning		
	(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice appropriate to the degree discipline		
(l)	an ability to use the computer/IT tools relevant to the discipline along with an understanding of their processes and limitations	✓		
Course Instructor:	Prof. Chi Chiu Lam (Please refer to the following link for the consultation hours of the course instructor: http://www.fst.umac.mo/cee/contacthour.html)			