

**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:	CIVL480	Year of Study:	4
Course Title:	Construction Management and Practice		
Compulsory/Elective:	Compulsory		
Course Prerequisites:	Nil		
Prerequisite Knowledge:	Basic concept in the construction industry		
Duration:	One semester	Credit Units:	3
Class/Laboratory Schedule:	Three hours of lecture per week.		
Laboratory/Software Usage:	Nil		
Course Description:	This course addresses various aspects of managing construction projects. Topics include: Organizational structure of construction companies; Project delivery systems: traditional, construction management, design-build, BOT; Project estimating and tendering; Project scheduling and tracking; Construction services during design and site administration; Safety considerations and quality control.		
Course Objectives:	<p>To provide the student knowledge in:</p> <ol style="list-style-type: none"> <li>1. management functions: planning, organizing, leading, and controlling</li> <li>2. the roles and responsibilities of the key construction participants</li> <li>3. the organizational structures for consultants and contractors</li> <li>4. different types of construction contracts</li> <li>5. construction services during design and site administration</li> <li>6. the principles involved in estimating, tendering, scheduling, tracking and controlling construction projects</li> <li>7. the importance of quality and safety on construction sites</li> </ol>		
Learning Outcomes (LO):	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. understand the basic functions of project management [POs: j];</li> <li>2. understand the roles and responsibilities of the key players in the construction industry [POs: j];</li> <li>3. understand the organizational structures for consultants and contractors [POs: j];</li> <li>4. understand the major types of contracts commonly adopted in the construction industry, with their advantages and disadvantages [POs: j];</li> <li>5. understand the processes of estimating, tendering, scheduling and controlling construction projects [POs: a,j];</li> <li>6. apply various tools in tracking and controlling construction projects [POs: a,j];</li> <li>7. discuss the construction services provided by a construction manager during the design phase including the practice of value engineering &amp; constructability [POs: j];</li> <li>8. understand the use of various construction document and the administrative process used to review and approve payments [POs: j];</li> <li>9. understand the basic principles of quality and safety management systems [POs: j].</li> </ol>		

Texts & References:  * recommended textbook	<ol style="list-style-type: none"> <li>Gould, Frederick E. &amp; Joyce Nancy E., (2009), <i>Construction Project Management*</i>, 3<sup>rd</sup> ed., Pearson Education International.</li> <li>Halpin, Daniel W., (2006), <i>Construction Management</i>, 3<sup>rd</sup> ed., John Wiley &amp; Sons.</li> <li>Tang, S.L., Poon S. W., Ahmed Syed M. &amp; Wong K.W., (2003), 2<sup>nd</sup> ed., <i>Modern Construction Project Management</i>, Hong Kong University Press.</li> <li>Oberlender, Garold D., (2000), <i>Project Management for Engineering and Construction</i>, 2<sup>nd</sup> ed., McGraw Hill.</li> </ol>																
Student Assessment:	<ul style="list-style-type: none"> <li>Mid-term examinations: 70%;</li> <li>Final examination: 30%</li> </ul>																
Learning Outcome Assessment:	<ul style="list-style-type: none"> <li>Tests and final examination.</li> <li>Course evaluation</li> </ul>																
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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 (please specify)
Class Participation/ Discussion (0%)														
Assignment(s) (0%)														
Test(s) (70%)												✓		
Examination (30%)												✓		
Others (please specify) _____ (0 %)														
Course Web: (if any)	Course materials are available in UMMoodle ( <a href="http://webcourse.umac.mo/">http://webcourse.umac.mo/</a> ).													

Course Content: (topic outline)	Week no.	Topics	LO no.
	1,2	<b>Introduction</b> Concepts of project management, project participants, project chronology.	1,2
	2,3	<b>Organizational structures</b> Principles of organizational structures, organizational structures for consultants and contractors.	3
	3,4,5	<b>Project delivery methods</b> Parties to a construction contracts, types of contracts, contract documents, contractual claims, resolution disputes.	4
	6,7	<b>Project estimating and tendering</b> Types and process of estimating, types and process of tendering	5
	8	<b>Development of work plan</b> Work breakdown structure, work packages, project work plan	5
	9	<b>Project scheduling</b> Development of network diagram from the WBS, scheduling methods, cost distribution.	5
	9,10	<b>Project tracking</b> Relationship between time & cost and time & work, integrated cost/schedule/work graphs, measurement of construction work, earned value concept, trend analysis and forecasting.	5,6
	11	<b>Construction services during design</b> Construction manager, value engineering, life-cycle costing, constructability	7
	12	<b>Construction site administration</b> Historical records, quantitative and financial records, qualitative records and 'as constructed' records, changes and delays,	8
	13	<b>Construction quality management</b> Quality management system (ISO9000), developing and implementing a QMS, cost and benefits of QMS.	9
	14	<b>Construction safety management</b> Safety management system, the cost of accidents, accident prevention.	9

Percentage Content of:	Math	Basic Science	Engineering Science	Engineering Design and Synthesis	Complementary Studies	Computer Studies	Total
	10	---	10	---	80	---	100
Timetabled work in hours per week:	Lecture	Tutorial	Laboratory	Other	Total		
	3	---	---	---	3		

Contribution to Program Outcomes:	Program Outcomes		Contribution to POs# 5 -----> 1 Significant                      Least				
			5	4	3	2	1
	(a) apply knowledge of mathematics, science, and engineering				✓		
	(b) design and conduct experiments, and analyze data						
	(c) design components, systems or processes in presence of constraints						
	(d) Function in a multi-disciplinary team						
	(e) Engineering problem solving						
	(f) Understand professional and ethical responsibility						
	(g) Communicate effectively						
	(h) Understand the impact of engineering solutions to the society						
	(i) Recognize the need and have the ability for lifelong learning						
	(j) Have knowledge of contemporary issues		✓				
	(k) Apply the skills, techniques, modern engineering tools						
	(l) Use the computer/IT tools relevant to the discipline						
# Note 5: Significant contribution; 4: Supporting contribution; 3: Moderate contribution; 2: Marginal support; 1: Least support							
Course Instructor(s):	Dr. Raymond Aoieong						