

Module (Course Syllabus) Catalogue

2022-2023

College/ Institute	Erbil Technical Engineering College	
Department	Technical Civil Engineering Dept.	
Module Name	Computer Applications Techniques (ETABS, SAFE, and MS PROJECT)	
Module Code	CAT802	
Degree	Technical Diploma <input type="checkbox"/>	Bachelor <input checked="" type="checkbox"/>
	High Diploma <input type="checkbox"/>	Master <input type="checkbox"/> PhD <input type="checkbox"/>
Semester	Eighth Semester	
Qualification	B.Sc	
Scientific Title	Engineer	
ECTS (Credits)	4	
Module type	Prerequisite <input type="checkbox"/>	Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/>
Weekly hours	3	
Weekly hours (Theory)	(N/A) hr Class	(N/A) Total hrs Workload
Weekly hours (Practical)	(3) hr Class	(108) Total hrs Workload
Number of Weeks	12	
Lecturer (Theory)		
E-Mail & Mobile NO.		
Lecturer (Practical)	Asst. Prof. Dr. Bahman O. Taha Zina A. Abduljaleel bikhtiyar.abdulrahman @epu.edu.iq	
E-Mail & Mobile NO.	Email: bahman.taha@epu.edu.iq Zina.abduljaleel@epu.edu.iq bikhtiyar.abdulrahman @epu.edu.iq	
Websites	https://zinaabduljaleel90.wordpress.com/	

Course Book

<p>Course Description</p>	<ul style="list-style-type: none"> • This course represents the required skills in the field of structural analysis and design using computer software (ETABS 2019, SAFE2016). Furthermore, the students will be taught how to apply MS project to control project construction activities. • ETABS and SAFE are engineering software that gives students the ability to analyze and design structural buildings. • Microsoft Project is a project management application that gives students the ability to control project construction activities.
<p>Course objectives</p>	<ul style="list-style-type: none"> • Applying ETABS software to analyze 2D structural problems. • Developing skills in using Computer software in analyzing and designing 3D building “ETABS and SAFE”. • Applying MS project tools to create and controlling constructional project activities.
<p>Student's obligation</p>	<p>The students are required to:</p> <ul style="list-style-type: none"> -Attend all the lectures and participate in the classwork and assignments; attend all practical parts by using a computer. -Participate in the exam.
<p>Specific learning outcome</p>	<p>On successful completion of this module, each student is able to:</p> <ol style="list-style-type: none"> Analyze 2D structures (moments, shears, torsions, and deflection) by applying ETABS. Analyze and Design 3D RC/steel structural buildings using ETABS software. Analyze and Design RC foundation/slab using SAFE software. Demonstrate and Control project construction activities by performing MS Project software.
<p>Required Learning Materials</p>	<p>Different pedagogical methods are used in this course; for example, reports, seminars, and homework. Student will receive the required handouts such as the references, Pdf files PowerPoint files, and tutorial videos.</p>

Evaluation	Task	Weight (Marks)		Due Week	Relevant Learning Outcome
	Paper Review				
	Assignments	Homework	12%		
		Class Activity			
		Report	8%		
		Seminar	8%		
		Essay			
		Project			
	Quiz	8%			
	Lab.				
Midterm Exam	24%				
Final Exam	40%				
Total	100%				
Course References:	<p><u>ETABS software</u></p> <p>https://www.csiamerica.com/products/etabs/videos</p> <p>ETABS 2016 welcome to ETABS</p> <p>ETABS 2016 User's Guide manual</p> <p>ETABS 2016 Introductory Tutorial manual</p> <p>CSI Analysis Reference Manual (SAP2000, ETABS, SAFE) manual ETABS 2016 Concrete Frame Design Manual-ACI-318-08 manual ETABS 2016 Steel Frame Design Manual-AISC-360-10 manual</p> <p>Tutorial Videos on YouTube "Computers and Structures, Inc."</p> <p>https://youtube.com/playlist?list=PLvfsqIqjBW58i-IZCMASzoAVRT05sKqgo</p> <p><u>SAFE software</u></p> <p>SAFE Tutorial manual</p> <p>SAFE Reinforced Concrete Design manual</p> <p>Tutorial Videos on YouTube "Computers and Structures, Inc."</p> <p>https://youtube.com/playlist?list=PL7D20E90175F6F307</p> <p><u>MS Project</u></p> <p>Microsoft Project 2019 – Step by Step, by Cindy Lewis & Carl Chatfield & Timothy Johnson [Lewis, Cindy]</p>				

Microsoft Project 2019 Video Tutorials

https://youtube.com/playlist?list=PLzj7TwUeMQ3jaNyy4v_plf_5PMNK0bb5w

COURSE CONTENTS

Practical Topics	Week	Learning Outcome
Etabs: Introduction to the Software, 2D Frame, Member forces and Deflection, EX1-E4 (Solving 3rd Year Structural Analysis Problems 1)	Week 1	a)
Etabs: 2D Frame, Member forces and Deflection, EX5-E7 (Solving 3rd Year Structural Analysis Problems 2)	Week2	a)
Etabs: EX8 - Regular RC building, Columns, Beams and Slabs Forces and deflections	Week3	b)
Etabs: EX9 - Hectogon-shaped RC building, Columns, Beams and Slabs Forces and deflections	Week4	b)
Etabs: EX10 - Flat Plate Slab with Drop Panels RC building, Columns, Beams and Slabs Forces and deflections plus Beam and Column Reinforcement design	Week5	b)
Etabs and SAFE: EX11 - Flat Plate Slab with Drop Panels RC building, Columns, Beams and Slabs Forces and deflections plus Slab Reinforcement design	Week6	b), c)
Etabs and SAFE: EX12 - Flat Plate Slab with Drop Panels RC building, Columns, Beams and Slabs Forces and deflections plus Foundation and Walls Reinforcement design	Week7	b), c)
Etabs: EX13 - Steel Frame Building with Composite Slab, Columns, Beams and Slabs Forces and deflections plus Slab Reinforcement design	Week8	b)
Theoretical Introduction to Project activities and Arrow Diagrams	Week9	d)
Introduction to MS Project: Tutorial P1 Project	Week10	d)
MS Project Tutorial P2 Project	Week11	d)
MS Project Tutorial P3 Project.	Week12	d)

Questions Example Design

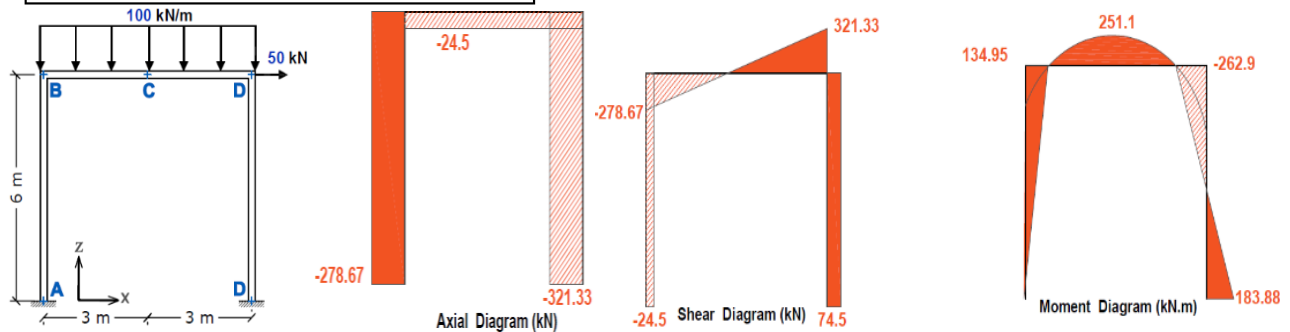
Calculation Questions:

Q1/ Using ETABS software, analyze the frame to draw the shear and moment diagrams, and to determine the deflection (or rotation) at point

- 1- The Horizontal displacement of joint C = **4.208** mm (Right, Left)
- 1- The vertical displacement of joint C = **5.484** mm (Down, Up)
- 2- The rotation of of joint C = **0.000191**rad (clock wise , counter clock wise)
- 4- Draw the Axial, Shear and Bending Moment Diagrams, showing the max & min values

All Members: Frame, E = 30 000 Mpa, Area: Square; width = depth = 500 mm.

Notes: 1- Do not include the self-weight of the members as loads for the analysis
2- Moment Diagram on Compression side.



Q2/ In this type of exam, the questions usually start with:

- For the project below, using (MS Project), determine: i) Completion Date ii); Project cost iii) The free slack for activities...

Task Name	Sub task	Duration	Logic	(assignment units)	
				Workers,% /day	Brick/task
A		5 days		500	3000
B			follow A		
	B1	2 days		500	3000
	B2	10 days	follow B1	500	3000
	B3	10 days	follow B1	500	3000
C			follow B		
	C1	5 days		500	
	C2	10 days	follow C1	500	
D		5 days	Start 3 working days after the Start of C	1000	
E		10 days	follow D,C	500	

Task Type:
Fixed Duration, Auto Scheduled
Start Date: 20th January 2021

Working Time:	8 hrs/days, all days except Friday and Saturday
Worker cost	14 USD / hr
Brick	0.75 \$ each
Cost Payment	Prorated
Max. available Resources	1200%/ day

The completion date	18 March 2021	
The project Cost	43720 \$	
The task with the highest Free slack	Task: D	Free slack: 7 days
The days which are over allocated by workers:	17, 18, 21, 22, 23/ 02 / 2021	
The critical path (write down only the main tasks):	A B C E	

Extra notes: * ECTS Calculation

Erbil Technology College

Program: Bachelor (240 ECTS)

Department name:

Technical Civil Engineering Dept

Weeks/Semester: 15-20 weeks

(Min. 12 weeks active lecturing (Including Mid Term exams with no stopping of lectures) + 3 weeks Final & Re-sit Exams (including one week break inbetween))



Lecturer Name: Zina A. Abduljaleel
 Module Name: Computer Applications Techniques (MS PROJECT, ETABS, and SAFE)
 Module Code: CAT802

1.0 ECTS =	27	working hours
X	Y	Z
0	3	0

ECTS Workload Calculation Form

Activity	S	Description	Activity Type	No.	T.F. Range		Time Factor	Workload	
					Min	Max			
Course	1	Theory	In class	f	8			0	0
	2		Online	f	4			0	0
	3	Preparation: (1-2)* X)		h	12	0	0	0	0
	4	Practical		f	12			3	36
	5	Preparation: (1-1.5)* Y		h	12	3	4.5	3	36
	6	Tutorial		f	12	1	1	0	0
	7	Preparation (0.5-1.5) * Z)		h	12	0	0	0	0
Site Visits and Lab Experiments	8	Scientific/Field Trips		f	1	2	6	0	0
	9	Practical/Lab Reports		h	6	1	2	0	0
Assignment	10	Homework		h	2	1	4	3	6
	11	Report		h	0	1	4	1	0
	12	Seminar		h	1	2	10	3	3
	13	Paper		h		4	15		0
	14	Essay		h		1	6		0
	15	Project/Poster		h	1	4	15	7	7
Assessment	16	Quiz		h	2	1	2	2	4
	17	Mid Term	Theory	f	1			0	0
	18		Preparation: (1.5-3)*X	h	1	0	0	0	0
	19		Practical	f	1			1	1
	20	Preparation: (1-2)*Y		h	1	3	6	5	5
	21	Final	Theory	f	1			0	0
	22		Preparation: (3-5)*X	h	1	0	0	0	0
	23		Practical	f	1			2	2
24	Preparation: (2-4)*Y		h	1	6	12	9	9	
Face to face hours (f)/12 week		3.33		Face to face hours (f)				38	
Home hours (h)/15 week		4.53		Home hours (h)				70	
Total hours/15 week		7.20		Total hours				108	
ECTS (Total hours/ 27)								4.000	

Extra notes: *Mapping of Learning Outcomes

Course Learning Outcomes	Program Outcomes								
	Apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities.	Apply knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge.	Conduct standard tests and measurements, and to conduct, analyze, and interpret experiments related to civil engineering technology.	Demonstrate the ability to function effectively as a member of a technical team.	Identify, analyze, and solve narrowly defined engineering technology problems.	Apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature.	Identify the need for and an ability to engage in self-directed continuing professional development.	Demonstrate a commitment to address professional and ethical responsibilities, including a respect for diversity.	Demonstrate a commitment to quality, timeliness, and continuous improvement.
LOS 1	A	A		A	A				
LOS 2	A	A		A	A				
LOS 3	A	A	A	A	A				
LOS 4	A	A	A	A	A				

B: Beginning

I: Intermediate

A: Advanced

External Evaluator

