

## GAU, Faculty of Engineering

<b>Course Unit Title</b>	Computer Applications in Civil Engineering	
<b>Course Unit Code</b>	CVEN403	
<b>Type of Course Unit</b>	Compulsory, All civil engineering students	
<b>Level of Course Unit</b>	4th Year BSc	
<b>National Credits</b>	3	
<b>Number of ECTS Credits Allocated</b>	5 ECTS	
<b>Theoretical (hour/week)</b>	2	
<b>Practice (hour/week)</b>	2	
<b>Laboratory (hour/week)</b>	0	
<b>Year of Study</b>	4	
<b>Semester when the course unit is delivered</b>	7	
<b>Mode of Delivery</b>	Face to Face, E-learning activities, Computer Laboratory Practice	
<b>Language of Instruction</b>	English	
<b>Prerequisites and co-requisites</b>	CVEN303	
<b>Recommended Optional Programme Components</b>	Basic background in computer usage knowledge and in structural analysis	
<b>Objectives of the Course:</b>		
<ul style="list-style-type: none"> <li>➤ To teach the students to calculate the necessary forces, moments, shears forces and stresses.</li> <li>➤ To teach the structural design of one and multistory buildings with the help of the computer and the relevant softwares.</li> <li>➤ To provide the modern civil engineering student with practical training in structural engineering computer methods so that the student can both use the programs as they stand and modify them to achieve special needs.</li> <li>➤ To provide a useful collection of structural engineering programs and to have each supported by the relevant theory so that all who use them will be fully aware of the underlying assumptions.</li> </ul>		
<b>Learning Outcomes</b>		
When this course has been completed the student should be able to		Assessment.
1	After completion of this course students are expected to master basic structural analysis and skills by using at least one of some engineering softwares like SAP2000, IDECAD and STA4CAD.	1,2,5
Assesment Methods: 1.Written Exam, 2.Assignment, 3.Project/Report, 4.Presentation, 5.Laboratory Pract. Work		
<b>Course's Contribution to Program</b>		
		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	5
2	Ability to design and conduct experiments as well as to analyze and interpret data	2
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	4
4	Ability to apply systems thinking in problem solving and system design	5
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	4
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	5
7	Ability to express their ideas and findings, in written and oral form	3
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	4
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	4
10	Ability to manage time and resources effectively and efficiently while carrying out civil engineering projects	4
11	Ability to combine knowledge from different areas of civil engineering for problem solving and system design with an ethical and sustainable approach	4
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents			
Week			Exams
1		Introduction. Definition of structural systems.	
2		Utilization of package programs in modeling of reinforced building structures. RC Frame, Solution of Example-1.	
3		Utilization of package programs in modeling of reinforced building structures. Simple Frame, Solution of Example-2.	
4		Computer aided modeling and analysis of reinforced elements and structural systems. RC Box Section, Solution of Example-3.	
5		Learning basic structural parameters. Bridge Beam with Variable Section, Solution of Example-4.	
6		Learning basic principals of Turkish Standards and Turkish Codes related with reinforced structural design. Helical Stair, Solution of Example-5.	
7		Learning how to edit a project on graphic system. Space Truss System, Solution of Example-6.	
8		Evaluation of the analysis outcomes. Space Truss System, Solution of Example-7.	
9		Midterm Week	Midterm
10		RC Shear Wall with Hollow, Solution of Example-8	
11		RC Waffle Slabs, Solution of Example-9.	
12		4-Storey RC Structure, Solution of Example-10.	
13		4-Storey RC Structure, Solution of Example-11.	
14		RC Raft Foundation, Solution of Example-12.	
15		Final Week	Final

### Recommended Sources

**Textbook:** SAP2000 V17, G.Özmen, E.Orakdöğen, K.Darılmaz. Birsen Publication.

**Supplementary Material(s):** 1)SAP2000 guide books. 2)Turkish Standards: TS500 and TS498. 3)Turkish Code: TDY2007. 4)User manuel books of the package pograms. 5)Documents of ETABS, Sta4CAD, Probrina, IdeCAD, and so on. 6)Class notes.

### Assessment

Attendance	5%
Homework	25%
Midterm Exam (Written)	30%
Quiz (Written)	-
Final Exam (Written)	40%
<b>Total</b>	<b>100%</b>

### ECTS Allocated Based on the Student Workload

Activities	Number	Duration (hour)	Total Workload (hour)
Course duration in class (including the Exam week)	15	2	30
Labs and Tutorials	14	2	28
Assignments	4	5	20
Project/Presentation/Report Writing	-	-	-
E-learning Activities	14	0.5	7
Quizzes	-	-	-
Midterm Examination	1	15	15
Final Examination	1	15	15
Self Study	15	2	30
<b>Total Workload</b>			<b>145</b>
<b>Total Workload/30 (h)</b>			<b>4.8</b>

ECTS Credit of the Course	5
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