GAU, Faculty of Engineering

Course Unit Title	Reinforced Concrete Structures I
Course Unit Code	CVEN306
Type of Course Unit	Compulsory, All civil engineering students
Level of Course Unit	3rd Year BSc
National Credits	3
Number of ECTS Credits Allocated	5 ECTS
Theoretical (hour/week)	3
Practice (hour/week)	-
Laboratory (hour/week)	-
Year of Study	3
Semester when the course unit is delivered	6
Mode of Delivery	Face to face
Language of Instruction	English
Prerequisities and co-requisities	CVEN303
Recommended Optional Programme Components	Basic background in engineering mechanics and civil engineering drawing

Objectives of the Course:

- Behaviour of reinforced concrete and its main components; concrete and steel
- Design (flexural and shear) and review of reinforced concrete beams(rectangular, double-reinforced, T-beams)
- Basics of bond, anchorage, development length and drawings for layout of reinforcement

Learning Outcomes

When this course has been completed the student should be able to		Assesment.
1	Understand behaviour of concrete and steel in tension and compression and the concepts of design methods and general safety principles	1
2	Understand the importance of ductility and factors effecting ductility	1
3	Understand behaviour of reinforced concrete members subject to both shear forces and bending moment	1
4	Develop an ability on design and review of beams (for flexure and shear) using a relevant Code	1
5	Understand principles of bond, anchorage, development length	1
6	Develop an ability to read and draw layout of reinforcement plans	1

Assesment Methods: 1. Written Exam, 2. Assignment 3. Project/Report, 4.Presentation, 5. Lab. Work

Course's Contribution to Program

		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	4
2	Ability to design and conduct experiments as well as to analyze and interpret data	1
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	1
4	Ability to apply systems thinking in problem solving and system design	4
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	2
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	4
7	Ability to express their ideas and findings, in written and oral form	1
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	3
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	3
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 to course and requirements.	
2		Design methods, codes, safety provisions of TS 500. Materials.	
3		Analysis and design of beams subject to bending. Behaviour of plain concrete and reinforced concrete under flexure. Elastic behaviour.	
4		Inelastic behaviour of reinforced concrete. Balanced failure.	
5		Flexural strength of rectangular beams with tension reinforcement only.	
6		Beam problems and design tables.	
7		Design and review of double reinforced beams.	
8		Revision and class exercises.	
9			Mid Term
10		Design and review of T-beams.	
11		Design and review of T-beams.	
12		Shear design of beams.	
13		Bond , anchorage, development lengths and practical considerations.	
14		Revision	Quiz
15			Final

Recommended Sources

Textbook: Karaboğa, E., Reinforced Concrete I, 2nd Edition, EMU Press, Gazimagusa, 2004
Supplementary Material (s): Nilson,A. H., Darwin, D., Dolan, C.W. Design of Concrete Structures,14th ed. McGraw-Hill, Singapore, 2010.

Assessment

Attendance	-	
Laboratory	-	
Midterm Exam (Written)	35%	
Quiz (Written)	20%	
Final Exam (Written)	45%	
Total	100%	

ECTS Allocated Based on the Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including the Exam week)	15	3	45
Labs and Tutorials	-	-	-
Assignments	-	-	-
Project/Presentation/Report Writing	-	-	-
E-learning Activities	-	-	-
Quizzes	1	8	8
Midterm Examination	1	14	14
Final Examination	1	22	22
Self Study	14	4.5	63
Total Workload			156
Total Workload/30 (h)			5.2
ECTS Credit of the Course			5