Identification	**Subject**	CIV381, Reinforced Concrete Fundamentals, 6 ECTS	
	Department	Civil Engineering	
	Program (Undergraduate, Graduate)	Undergraduate	
	Term	Fall 2025	
	Instructor	Yusif Sadigov	
	Email:	sadigovyusif@gmail.com	
	Classroom/hours	Civil Lab/Thursday/18:40	
Prerequisites	Strength of Materials - Structural Analysis		
Language	English		
Compulsory/Elective	Compulsory		
Textbooks and course materials	Design of Concrete Structures Fourteenth edition. Arthur H. Nilson, David Darwin, 2009.		
Course description	General principals, Definition of ingredients & mix design, acceptance conditions, design for flexure, shear in concrete, torsion, axial loading, columns, slabs, walls, seismic design, introduction to precast/prestressed concrete		
Course objectives	This course presents the basic mechanics of structural concrete and methods for the design of individual members subjected to bending, shear, torsion, and axial forces. It additionally addresses in detail applications of the various types of structural members and systems, including an extensive presentation of slabs, beams, columns, walls, footings, retaining walls, and the integration of building systems. The ACI Building Code, which governs design practice in most of the United States and serves as a model code in many other countries, is significantly reorganized from previous editions and now focuses on member design and ease of access to code provisions.		
Learning Outcomes	• Understand the basic concepts of mixing, pouring, curing, and maintenance of concrete. • Perform design of beams, columns, slabs and walls subjected to gravity and lateral loads using ACI code, • Understand the analysis and design procedure of a regular building. • The student will be able to perform design of beams, columns, slabs and walls subjected to gravity and lateral loads using ACI code. The students will understand the analysis and design procedure of a regular building.		
Teaching methods	**Lecture**		x
	Experiential exercise		x
	Assisted work		x
	Assisted lab work		x
Evaluation Criteria	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam	**TBA**	25

	Quizzes		10
	Lab Exercises		20
	Activity		5
	Attendance		10
	Final Exam	**TBA**	30
	Total		100
Class Policy	• NO CELL PHONES are allowed during lecture and lab sessions. PLEASE turn them off before lecture! (Not silent or vibrating mode) • No late assignments will be accepted without prior arrangement with the instructor for acceptable excuses. Medical and family emergency will be considered on case-by-case basis. • No late homework will be accepted. Homework is to be completed on an individual basis. Students may discuss homework with classmates, but students are responsible for your own work. If students have consulted classmates, please note the individuals name on the top of students' assignment. • Quizzes may be given unannounced throughout the term and will count as one homework. There will be no make-up quizzes. • No make-up exams. If students miss an exam, a zero score will be assigned to the missed exam. • If students should miss class due to personal emergency or medical reasons, please notify the instructor by email immediately. A doctor's note will be required for make-up work. • Students are responsible for completing the reading assigned from the textbook related to the covered topics and for checking email regularly for important information and announcements related to the course. • University policy on academic honesty concerning exams and individual work will be strictly enforced. • BE ON TIME!		

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook/Assignments
1		Introduction to Reinforced concrete. Structural forms. Structural systems, Support connections	Chapter 1
2		Loads. Live loads, Dead loads, Building loads, Tributary Loadings, One-way loading systems, two-way loading systems.	Chapter 2
3		Design codes and specifications. Safety provisions of the American Concrete Institute ACI code Developing factored gravity loads	Chapter 2

4		Materials Cement, Aggregates, Admixtures Proportioning and mixing concrete Conveying, placing, compacting and curing Quality control	Chapter 3
5		Design of concrete structures and fundamental assumptions. Behavior of members subject to axial load, Axial tension, Bending of homogeneous beams	Chapter 3
6		**Midterm Exam**	
7		Flexural Analysis and Design of Beams Reinforced concrete beam behavior Stresses Elastic and Section Uncracked	Chapter 4
8		Stresses Elastic and Section Cracked Flexural strength	Chapter 4
9		Flexural design of Rectangular Reinforced concrete beam	Chapter 4
10		Software practice for Flexural design of rectangular reinforced beams	Lira 9.6
11		Doubly reinforced beams	Chapter 4
12		Analysis and design of T beams	Chapter 5
13		Shear analysis of RC beams	Chapter 5
14		Shear Design of RC beams	Chapter 5
15		Slab design	Chapter 6
		Final Exam	