# Advanced Concrete Structures


**Han Ay Lie**
**Yulita Arni Priastiwi**

# Literature

**Required Texts:**

*ACI318-14 Building Code Requirements for Structural Concrete and Commentary,* American Concrete Institute, Farmington Hills, MI.

*Reinforced Concrete: Mechanics and Design*
MacGregor, 3th edition, Prentice Hall

**Optional Reference Texts:**

*Reinforced Concrete, A Fundamental Approach*
Nawy, 3th Edition, Prentice Hall

*Reinforced Concrete Design*
Wang & Salmon, Harper and Row

# Objectives

By the end of the course, students will be able to:

1. Analyze and design reinforced concrete structural members, including slabs, beams, columns, and footings.
2. Understand the material characteristics and behavior of reinforced concrete under various load and environmental conditions.
3. Visualize the 3D nature of concrete structures, and the interaction between various members.
4. Design conventional reinforced concrete structures.
5. Apply the fundamental principles of reinforced concrete to members consisting of alternate high-performance materials, including high performance steel/concrete, and fiber reinforced polymers.

# Grading

| | |
|---|---|
| Homework (cooperative learning): | 20% (approx. 10 assignments) |
| Report (cooperative learning): | 5% (due date to be determined) |
| Mid-term: | 25% |
| Final Exam (comprehensive): | 50% |

# Course Topics

1. Introduction to reinforced concrete structures
2. Material properties
3. Analysis of loads and design approaches
4. Analysis of Flexural members
5. Flexural design
6. Axial compression and bending
7. Shear in Beams
8. Deflection
9. Bond and Development