

1514x6339 Reinforced Concrete I, Prof. Dr. Ahmet TOPÇU

Academic cycle:	Undergraduate
Year of Study:	3 rd year of study
Prerequisites:	None
Language:	Turkish
Local Credits:	4
ECTS credits:	6
Weekly lectures/practice/laboratory:	3-2-0
Duration:	1 semester
Semester:	Spring
Examination:	Mid-term and final exam, written form.
Assessment:	Mid-term exam: 30%, final exam: 70%

Content:

The main aim of the course is to introduce the behavior and design principles of reinforced concrete members. Content of the course is as follows: Summary of Cement, water, aggregates, concrete mixture, admixtures. Mechanical properties of concrete and reinforcing steel. Mechanical behavior of concrete. Assumptions for limit state design. Safety factors for material and loads. Reinforced concrete short columns, types of columns, importance of binder. Reinforced concrete beams, types of beams, behavior of the beam in pure bending. Capacity and design of the beam, minimal conditions (National Codes). Shear strength and reinforcement. Axially and eccentrically loaded columns, minimal conditions. design of columns.

Learning objectives:

By the end of this module students will be able to:

1. Know material properties
2. Understand the behaviour of concrete.
3. Understand the behaviour of concrete members.
4. Learn how to design and draw the concrete members.
5. Use the related national codes.

Reading List:

1. **Celep, Z. , (2013).** Betonarme Yapılar, Beta dağıtım, İstanbul.
2. **Doğangün, A. (2013).** Betonarme Yapıların Hesap ve Tasarımı, Birsen Yayınevi, İstanbul.
3. **Ersoy, U., Özcebe, G. (2012).** Betonarme, Evrim yayınevi, İstanbul.
4. **Ersoy, U., Özcebe, G., Tankut, T. (2010).** Reinforced Concrete, ODTÜ, Ankara.
6. **Aydın, M. R., Akgün, Ö. R., Topçu, A. (2002).** Betonarme Kolon Tabloları, Eskişehir.
7. **Bakır, E., Bakır, A., R. (1986).** Kolon ve Perde Donatı Tabloları, (Taşıma Gücü Yöntemi), Ankara.
8. **TS 498 (1997).** Yapı Elemanlarının Boyutlandırılmasında Alınacak Yüklerin Hesap Değerleri, TSE.
9. **TS ISO 9194 (1997).** Yapıların Projelendirilme Esasları-Taşıyıcı Olan ve Olmayan Elemanlar-Depolanmış malzemeler-Yoğunluk, TSE.
10. **TS 500 (2000).** Betonarme Yapıların Hesap ve Yapım Kuralları, Türk Standardları Enstitüsü.
11. Deprem Bölgelerinde Yapılacak Binalar Hakkında Yönetmelik, Bayındırlık Bakanlığı, 2007. Türkiye
12. Deprem Bölgeleri Haritası, Yerleşim Birimleri ve Deprem Bölgeleri, Bayındırlık Bakanlığı, 1996.