**COURSE RECORD**

|  |  |
| --- | --- |
| Code | **CE 477** |
| Name | **Design of Hydraulic Structures** |
| Hour per week | 3 (3+0) |
| Credit | 3 |
| ECTS | 4 |
| Level/Year | Undergraduate/ 4 |
| Semester | Fall |
| Type | Technical Elective |
| Prerequisites | CE 272 Fluid Mechanics and CE 371 Hydromechanics |
| Description | This course introduces the basics of the design of hydraulic structures in the engineering field. The classification of dams, hydropower plants and their components, the problems encountered in the various irrigation projects and their solutions are discussed. In addition to the calculations used in project designing of hydraulic structures, the design with the help of various computer software is taught. |
| Objectives | To teach the design of derivation channels  To teach the design of bottom outlet and inlet structures  To teach the design of spillways  To teach the design of energy dissipation structures  To teach the design of irrigation channel |
| Learning Outcomes | *By the end of this course, students will be able to:*  *LO1: describe the classification of dams*  *LO2: discover knowledge about the hydropower plants*  *LO3: identify the structures of dams and hydropower plants*  *LO4: design the irrigation projects*  *LO5: assess experience on the various software used for the design* |

**CONTRIBUTION TO PROGRAMME OUTCOMES\***

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| LO1 | 5 | 1 | 5 | 5 | 4 | 1 | 4 | 4 | 4 | 1 | 0 | 0 |
| LO2 | 5 | 1 | 5 | 5 | 5 | 1 | 5 | 3 | 3 | 1 | 0 | 0 |
| LO3 | 5 | 1 | 5 | 5 | 3 | 1 | 4 | 4 | 3 | 1 | 0 | 0 |
| LO4 | 5 | 1 | 5 | 5 | 5 | 1 | 5 | 3 | 3 | 1 | 0 | 0 |
| LO5 | 5 | 1 | 5 | 5 | 4 | 1 | 5 | 4 | 4 | 1 | 0 | 0 |

\* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

**COURSE CONTENT DETAILS**

|  |  |  |
| --- | --- | --- |
| **W** | **Topic** | **Outcomes** |
| 1 | Dam design concepts. | LO1, L02 |
| 2 | Design of outlet structures | L02, L03 |
| 3 | Project #1 | LO1, L02, L05 |
| 4 | Design of overflow structures | LO2, L03 |
| 5 | Design of dissipation structures | LO2, L03 |
| 6 | Project #2 | LO2, L03, L05 |
| 7 | **Spring Break** |  |
| 8 | Design of bottom outlets | LO2, L03 |
| 9 | Project #3 | LO2, L03, L05 |
| 10 | Introduction to Licensed Software used in the course |  |
| 11 | Design of intake structures | LO2, L03 |
| 12 | Design of Irrigation Systems | LO4 |
| 13 | Design of Drainage Systems | LO4 |
| 14 | Waterhammer in the penstocks | LO2, L03, L04 |
| 15 | Final Project | L03, L04, LO5 |
| 16 | Final (Project Submission) | L03, L04, LO5 |

**DERS BİLGİLERİ**

|  |  |
| --- | --- |
| Kodu | **CE 477** |
| İsmi | **Hidrolik Yapıların Tasarımı** |
| Haftalık Saati | 3(3+0) |
| Kredi | 3 |
| AKTS | 4 |
| Seviye/Yıl | Lisans / 4 |
| Dönem | Güz |
| Dersin Dili | İngilizce |
| Tip | Teknik Seçmeli |
| Ön Şart | CE 272 Akışkanlar Mekaniği ve CE 371 Hidromekanik |
| İçerik | Bu ders, mühendislik alanında karşılaşılacak hidrolik yapıların tasarımı ile ilgili temel esasları öğretir. Baraj tipleri, hidroelektrik santraller ve bu santralleri oluşturan elemanlar, çeşitli sulama projelerinde karşılaşılacak problemler ve çözüm yöntemleri ders kapsamında tartışılır. Hidrolik yapıların projelendirilmesinde kullanılan hesaplamalara ek olarak çeşitli bilgisayar programları ile tasarım öğretilir. |