**COURSE RECORD**

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| Code | **CE 485** |
| Name | **Introduction to Earthquake Engineering** |
| Hour per week | 3 (3+0) |
| Credit | 3 |
| ECTS | 4 |
| Level/Year | Undergraduate/ 4 |
| Semester | Fall |
| Type | Elective |
| Prerequisites | - |
| Description | General information about earthquake phenomenon and earthquake engineering. Properties and propagation of earthquake waves. Earthquake magnitude and intensity. Dynamics of structural systems. World earthquake codes and Turkish Building Earthquake Code (2018). Response spectrum and time history methods. Design principles of earthquake resistant reinforced concrete structures. |
| Objectives | - To explain the basic concepts, mechanisms and characteristics of earthquake engineering.  - To give basic information about the seismicity of Turkey and the World.  - To teach the basic concepts and principles of earthquake engineering with regard to dynamic analysis and seismic design of structures.  - To provide information about earthquake codes. |
| Learning Outcomes | *By the end of this course, students will be able to:*  *LO1: define the basic concepts of seismology and earthquake engineering.*  *LO2: demonstrate the Earth's internal structure, the causes of earthquakes* *and* *the properties of earthquake wave motions.*  *LO3: identify the magnitude and intensity of earthquakes, their effects on nature, living things and human.*  *LO4: examine the seismicity of Turkey and the World*  *LO5:define the strong ground motion properties and construct the response spectrum.*  *LO6: define* *the basic concepts for the evaluation and design of buildings under the effect of earthquakes given in TBEC (2018).* |

**CONTRIBUTION TO PROGRAMME OUTCOMES\***

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|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P010 |
| LO1 | 1 | 3 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| LO2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| LO3 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| LO4 | 0 | 2 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| LO5 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| LO6 | 0 | 1 | 3 | 2 | 0 | 0 | 0 | 1 | 0 | 0 |

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

**COURSE CONTENT DETAILS**

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| **W** | **Topic** | **Outcomes** |
| 1 | Seismology, Earthquake Formation, Plate Tectonics, Faults | LO1, LO2 |
| 2 | Earthquake Waves | LO1, LO2, LO3 |
| 3 | Defining the earthquake: Time, place, magnitude and intensity | LO1, LO2, LO3 |
| 4 | Seismicity of the World and Turkey | LO1, LO2, LO3 |
| 5 | Strong Ground Motion: Measurement, Characteristics | LO3, LO4 |
| 6 | Strong Ground Motion: Parameters | LO3, LO4 |
| **7** | **Fall Break** |  |
| 8 | Response Spectra | LO4, LO5 |
| 9 | Seismic Hazard Analysis | LO4, LO5 |
| 10 | Effects of Local Soil Conditions in Earthquakes | LO4, LO5 |
| 11 | Vibration of Structures Under Ground Movement | LO4, LO5,LO6 |
| 12 | Inelastic Response Spectra | LO4, LO5,LO6 |
| 13 | Solution of structural systems for ground motion (earthquake). | LO4, LO5,LO6 |
| 14 | Earthquake regulations in the World and Turkish earthquake code | LO7,LO8 |
| 15 | Earthquake regulations in the World and Turkish earthquake code | LO7,LO8 |

**DERS BİLGİLERİ**

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| Kodu | **CE 485** |
| İsmi | **Deprem Mühendisliğine Giriş** |
| Haftalık Saati | 3(3+0) |
| Kredi | 3 |
| AKTS | 4 |
| Seviye/Yıl | Lisans / 4 |
| Dönem | Güz |
| Dersin Dili | İngilizce |
| Tip | Seçmeli |
| Ön Şart | - |
| İçerik | Mühendislik yönünden deprem olayı ve deprem mühendisliği hakkında genel bilgiler. Deprem dalgalarının özelikleri ve yayılması. Deprem büyüklüğü ve şiddeti. Yapısal sistemlerinin dinamiği. Dünya deprem yönetmelikleri ve Türkiye Bina Deprem Yönetmeliği (2018). Davranış spektrumu ve zaman tanım alanı yöntemleri. Depreme dayanımlı betonarme yapı projelendirme ilkeleri. |