**ITU**

**DERS KATALOG FORMU**

**(Course Catalogue Form)**

| **Dersin Adı:**  Bilgisayar Ağları | **Course Name:**  Computer Networks |
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| **Kodu (Course Code)** | **Yarıyıl (Semester)** | **Kredisi (Local Credits)** | **AKTS Kredisi (ECTS Credits)** | **Ders Uygulaması, Saat/Hafta** | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Ders (Theoretical)** | **Uygulama (Tutorial/Recitation)** | **Laboratuvar (Laboratory)** |
| BLG430E | 8 | 2 | 4 | 2 | - | - |

| **Bölüm/Program**  **(Department/Program)** | Bilgisayar Mühendisliği / Computer Engineering |
| --- | --- |

| **Dersin Türü**  **(Course Type)** | Mühendislik Tasarım  (Engineering Design) | **Dersin Dili (Course Language)** | İngilizce  English |
| --- | --- | --- | --- |
| **Ders Zorunluluğu (Course Compulsion)** | | Seçmeli (Elective) | |

| **Dersin Önkoşulları (Course Prerequisites)** | - | | | |
| --- | --- | --- | --- | --- |
| **Dersin Mesleki Bileşene Yüzde Katkısı**  **(Course Category by Content Percentage)** | Temel Bilim  (Basic Science) | Temel Mühendislik (Engineering Science) | Mühendislik Tasarım (Engineering Design) | İnsan ve Toplum Bilim (General Education) |
| - | 20% | 80% | - |

| **Dersin İçeriği (Course Description)** | Bilgisayar Haberleşmesi dersini takip eden ders. İletim Katmanı, Uygulama Katmanı, TCP, UDP, Soket programlama, Performans modellemeye giriş, modern bilgisayar ağları terimleri, VPN, gigabit eternet, optik ağlar, depolama-alan ağları, kişisel-alan ağları, PON… Standartlar ve RFCler, Ağ güvenliği |
| --- | --- |
| A follow-up course after Computer Communication. Transport Layer, Application Layer, TCP, UDP, Socket Programming, Introduction to Performance Modeling, Modern Computer Network terms: VPN, gigabit ethernet, optical networks, storage-area networks, personal-area networks, PON,..., Standards and RFCs, Network security |
| **Dersin Amacı (Course Objective)** | 1. Bilgisayar ağlarındaki iletim ve uygulama katmanlarının temelleri 2. Ağ yapıları ve protokolleri hakkında genel bilgi edinme 3. Modern ağ kavramları hakkında bilgi sahibi olma ve kavramları tanımlayabilme 4. Giriş seviyesinde ağ programlama |
| 1. To learn the basic structure of transport layer and application layer of computer networks. 2. To gain a general understanding of network structures and protocols. 3. To obtain a knowledge of the modern networking concepts and be able to describe them. 4. To learn introduction level network programming. |
| **Dersin Öğrenme Çıktıları (Course Learning Outcomes)** | 1. İletim Katmanı yapısının öğrenilmesi 2. Soket programlamanın temellerinin öğrenilmesi ve ağ uygulamaları kullanılarak program yazılabilmesi 3. Uygulama katmanının yapısının ve bileşenlerinin öğrenilmesi 4. Bilgisayar ağlarındaki güncel konular hakkında fikir sahibi olma 5. Standartların nasıl ve kimin tarafından geliştirildiğinin öğrenilmesi 6. Ağlarda kullanılan çeşitli modern teknolojileri tanımlama becerisi |
| 1. To learn the structure of Transport layer 2. To learn the basics of socket programming and be able to write programs using network applications. 3. To learn the structure and components of application layer. 4. To gain a general knowledge of current issues in computer networks 5. To learn how and by whom the standards are developed. 6. To be able to describe various modern technologies used in networks. |

| **Ders Kitabı (Textbook)** | D. Comer, Computer Networks and Internets, 5th Ed., Prentice Hall, 2010 |
| --- | --- |
| **Diğer Kaynaklar (Other References)** | B. A. Forouzan,TCP/IP Protocol Suite, McGraw Hill, 2009  IEEE Communications Magazine, IEEE Network, various issues |

| **Ödevler ve Projeler (Homeworks & Projects)** | 3 ödev ve 1 dönem projesi |
| --- | --- |
| 3 homeworks and 1 term project |
| **Laboratuvar Uygulamaları (Laboratory Work)** | - |
| - |
| **Bilgisayar Kullanımı (Computer Use)** | Dönem projesi ve ödevlerden en az biri bilgisayar üzerinde programlama ve test gerektirir. |
| The term project and at least one of the homeworks will require programming and tests on computer. |
| **Diğer Uygulamalar (Other Activities)** | Okuma ve sunum yapma ödevi |
| Reading and presentation assignment |

| **Başarı Değerlendirme Sistemi**  **(Assessment Criteria)** | **Faaliyetler (Activities)** | **Adedi (Quantity)** | **Değerlendirmedeki Yüzde Katkısı**  **(Effects on Grading by Percentage)** |
| --- | --- | --- | --- |
| **Yıl İçi Sınavları (Midterm Exams)** | 1 | 20% |
| **Kısa Sınavlar (Quizzes)** | - | - |
| **Ödevler (Homework)** | 3 | 15% |
| **Projeler (Projects)** | - | - |
| **Dönem Ödevi/Projesi (Term Paper/Project)** | 1 | 15% |
| **Laboratuvar Uygulaması (Laboratory Work)** | - | - |
| **Diğer Uygulamalar (Other Activities)** | 1 | 10% |
| **Final Sınavı (Final Exam)** | 1 | 40% |

**DERS PLANI**

**(Course Plan)**

| **Hafta** | **Konu** | **Dersin Çıktıları** |
| --- | --- | --- |
| **1** | Giriş, Katman 1-3 özeti | 1 |
| **2** | İletim Katmanı Hizmetleri | 1 |
| **3** | Adresleme, bağlantı kurma, akış kontrolü | 1 |
| **4** | UDP | 1 |
| **5** | TCP | 1 |
| **6** | Soket programlama | 2 |
| **7** | Uygulama Katmanı: DNS, e-posta | 3 |
| **8** | WWW, Http, Xml | 3 |
| **9** | Standartlar, öğrenci sunumları | 5 |
| **10** | Öğrenci sunumları | 5 |
| **11** | Bilgisayar ağlarında performans konuları | 2,3,4 |
| **12** | VPN, Gigabit Eternet, PON | 4,6 |
| **13** | Depolama-alan ağları, kişisel alan ağları, optik ağlar | 4,6 |
| **14** | Dönem projesi sunumları | 1,2,3,4 |

| **Week** | **Topic** | **Course Outcome** |
| --- | --- | --- |
| **1** | Introduction, Layer 1-3 summary | 1 |
| **2** | Transport layer services | 1 |
| **3** | Addressing, connection establishment, flow control | 1 |
| **4** | UDP | 1 |
| **5** | TCP | 1 |
| **6** | Socket Programming | 2 |
| **7** | Application layer: DNS, e-mail | 3 |
| **8** | WWW, Http, Xml | 3 |
| **9** | Standards, Student presentations | 5 |
| **10** | Student presentations | 5 |
| **11** | Performance issues in computer networks | 2,3,4 |
| **12** | VPN, Gigabit Ethernet, PON | 4,6 |
| **13** | Storage area networks, personal area networks, optical networks | 4,6 |
| **14** | Term project presentations | 1,2,3,4 |

**DERSİN BİLGİSAYAR MÜHENDİSLİĞİ ÖĞRENCİ ÇIKTILARI İLE İLİŞKİSİ**

**Relationship between the Course and Student Outcomes**

**(1: “Little”, 2: “Partial”, 3: “Full”, Leave blank if your answer is “None”)**

| **Computer Engineering Department Program Outcomes and Performance Criteria** | | **Level of Contribution** | | |
| --- | --- | --- | --- | --- |
| **1** | **2** | **3** |
| 1 | an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics |  |  | X |
| 2 | an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors |  | X |  |
| 3 | an ability to communicate effectively with a range of audiences |  |  |  |
| 4 | an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts |  |  | X |
| 5 | an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives |  |  | X |
| 6 | an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions |  |  |  |
| 7 | an ability to acquire and apply new knowledge as needed, using appropriate learning strategies |  |  |  |

**HAZIRLANMA BİLGİSİ**

**Edition Information**

| **Prepared by** | **Date** | **Signature** |
| --- | --- | --- |
| **Dr.Tolga Ovatman** | **01.12.2020** |  |
| **Approved by** | **Date** | **Signature** |
| **Dr.Tolga Ovatman** | **01.12.2020** |  |