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| Bilgisayar Mühendisliği Bölümü / Bilgisayar Mühendisliği Bölümü / Bilgisayar Mühendisliği Lisans (%100 İngilizce) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |          |             |             |      |
| Ders Kodu                                                                                                         | Ders Adı                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Teorik | Uygulama | Laboratuvar | Yerel Kredi | AKTS |
| CENG 417                                                                                                          | Dağıtık Sistemler                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3,00   | 0,00     | 0,00        | 3,00        | 6,00 |
| Ders Detayı                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |          |             |             |      |
| Dersin Dili                                                                                                       | : İngilizce                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |          |             |             |      |
| Dersin Seviyesi                                                                                                   | : Lisans                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |          |             |             |      |
| Dersin Tipi                                                                                                       | : Seçmeli                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |          |             |             |      |
| Ön Koşullar                                                                                                       | : Yok                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |          |             |             |      |
| Dersin Amacı                                                                                                      | : The aim of this course is to equip the students with theoretical and practical aspects of computer networking, especially TCP/IP protocol suite. The focus will be on upper layers. Homework assignments, labs and class project will primarily be used by students for a deeper understanding on the operational issues and design principles of the Internet and especially application layer protocols. The class project will give the students the ability to design an application layer protocol to work over TCP/IP as well. |        |          |             |             |      |
| Dersin İçeriği                                                                                                    | : This course is an introduction computer networks. Topics include network architectures, local and wide-area networks, network technologies and topologies; data link, network, and transport protocols, point-to-point and broadcast networks; routing, addressing, naming, multicasting, switching, internetworking congestion/flow/error control, quality of service, and network security.                                                                                                                                        |        |          |             |             |      |
| Dersin Kitabı / Malzemesi / Önerilen Kaynaklar                                                                    | : Computer Networking with Internet Protocols and Technologies, William Stallings, ISBN: 0-13-191155-4                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |          |             |             |      |
| Planlanan Öğrenme Etkinlikleri ve Öğretme Yöntemleri                                                              | : İnteraktif öğrenme, göreve dayalı öğrenim<br>Ders anlatımı<br>Soru çözme oturumu<br>Pratik deneyler                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |          |             |             |      |
| Ders İçin Önerilen Diğer Hususlar                                                                                 | : Computer Networks related course materials should be included.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |          |             |             |      |
| Dersi Veren Öğretim Elemanları                                                                                    | : Prof. Dr. Aytuğ Onan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |          |             |             |      |
| Dersi Veren Öğretim Elemanı Yardımcıları                                                                          | : Dr. Fatma Günseli ÇIKLAÇANDIR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |          |             |             |      |
| Dersin Verilişi                                                                                                   | : yüzyüze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |          |             |             |      |
| En Son Güncelleme Tarihi:                                                                                         | : 17.01.2023 19:49:23                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |          |             |             |      |

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| Ders Öğrenme Çıktıları                                                                                                                                                                                                                                |
| Bu dersi tamamladığında öğrenci :                                                                                                                                                                                                                     |
| 1 Define the basic terminology and characteristics of computer networks, networking equipment and standard reference models and wireless and wired communication media                                                                                |
| 2 Design and analyze basic models of packet and/or circuit switched networks                                                                                                                                                                          |
| 3 Demonstrate detailed understanding of selected TCP/IP application layer protocols including design and implementation of an application layer protocol using TCP/IP sockets or other inter-device communication primitives                          |
| 4 List the primary function, activities, and application areas of local area networks and analyze various performance metrics of medium access control protocols                                                                                      |
| 5 Apply and analyze various flow and error detection/control algorithms on direct communication links                                                                                                                                                 |
| 6 Demonstrate understanding of IP (Internetworking Protocol) and TCP (Transmission Control Protocol) and all related mechanisms at TCP and IP layers including routing, addressing, traffic control and congestion control algorithms and mechanisms. |

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|-------------|----------|--|--------|----------|-------------|------------------|
| Ön Koşullar |          |  |        |          |             |                  |
| Ders Kodu   | Ders Adı |  | Teorik | Uygulama | Laboratuvar | Yerel Kredi AKTS |

| Haftalık Konular ve Hazırlıklar |                                                                                   |          |             |                    |                   |                                                    |
|---------------------------------|-----------------------------------------------------------------------------------|----------|-------------|--------------------|-------------------|----------------------------------------------------|
|                                 | Teorik                                                                            | Uygulama | Laboratuvar | Hazırlık Bilgileri | Öğretim Metodları | Dersin Öğrenme Çıktıları                           |
| 1.Hafta                         | *Protocol layers and service models. OSI and Internet protocols                   |          |             |                    |                   | Ö.Ç.1<br>Ö.Ç.2<br>Ö.Ç.3<br>Ö.Ç.4<br>Ö.Ç.5<br>Ö.Ç.6 |
| 2.Hafta                         | *What is the Internet. Concepts of delay, security, and Quality of Service (QoS). |          |             |                    |                   |                                                    |
| 3.Hafta                         | *Application layer protocols and client-server model                              |          |             |                    |                   |                                                    |
| 4.Hafta                         | *Sockets programming in C (client-server and web server programs).                |          |             |                    |                   |                                                    |
| 5.Hafta                         | *Reliable data transfer. Stop-and-Go evaluation. TCP and UCP semantics and syntax |          |             |                    |                   |                                                    |
| 6.Hafta                         | *TCP RTT estimation. Principles of congestion control                             |          |             |                    |                   |                                                    |
| 7.Hafta                         | *Principles of routing: link-state and distance vector. IP semantics and syntax.  |          |             |                    |                   |                                                    |
| 8.Hafta                         | *Link layer. Error detection. Multiple access protocols. Midterm Exam.            |          |             |                    |                   |                                                    |
| 9.Hafta                         | *IEEE 802.3 Ethernet.                                                             |          |             |                    |                   |                                                    |
| 10.Hafta                        | *Switching and bridging. Media. Signal strength. Data encoding                    |          |             |                    |                   |                                                    |
| 11.Hafta                        | *Wireless and mobile networks                                                     |          |             |                    |                   |                                                    |
| 12.Hafta                        | *Security. Overview of threats, cryptography, authentication, and firewalls       |          |             |                    |                   |                                                    |
| 13.Hafta                        | *Network management including SNMP. Network troubleshooting                       |          |             |                    |                   |                                                    |
| 14.Hafta                        | *Hot topics. Sensor networks and Software Defined Networks                        |          |             |                    |                   |                                                    |

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|-------------------------|
| Değerlendirme Sistemi % |
| 1 Final : 60,000        |
| 2 Vize : 40,000         |

|                                                                 |      |              |                                  |
|-----------------------------------------------------------------|------|--------------|----------------------------------|
| AKTS İş Yüğü                                                    |      |              |                                  |
| Aktiviteler                                                     | Sayı | Süresi(Saat) | Toplam İş Yüğü                   |
| Vize / Midterms                                                 | 2    | 3,00         | 6,00                             |
| Ödev / Assignment                                               | 10   | 2,00         | 20,00                            |
| Kısa Sınav / Quizzes                                            | 10   | 1,00         | 10,00                            |
| Final / Final                                                   | 1    | 10,00        | 10,00                            |
| Ders Sonrası Biresysel Çalışma / Individual study after lecture | 15   | 3,00         | 45,00                            |
| Ara Sınav Hazırlık / Preparation for midterm                    | 2    | 15,00        | 30,00                            |
| Final Sınavı Hazırlık / Preparation for final                   | 1    | 20,00        | 20,00                            |
| Teorik Ders Anlatım / Theoretical Lecturing                     | 15   | 3,00         | 45,00                            |
|                                                                 |      |              | Toplam : 186,00                  |
|                                                                 |      |              | Toplam İş Yüğü / 30 ( Saat ) : 6 |
|                                                                 |      |              | AKTS : 6,00                      |

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|----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| Program Öğrenme Çıktısı İlişkisi |        |        |        |        |        |        |        |        |        |         |         |
|                                  | P.Ç. 1 | P.Ç. 2 | P.Ç. 3 | P.Ç. 4 | P.Ç. 5 | P.Ç. 6 | P.Ç. 7 | P.Ç. 8 | P.Ç. 9 | P.Ç. 10 | P.Ç. 11 |
| Ö.Ç. 1                           | 3      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0       |
| Ö.Ç. 2                           | 0      | 4      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0       |
| Ö.Ç. 3                           | 0      | 0      | 3      | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0       |
| Ö.Ç. 4                           | 0      | 0      | 0      | 3      | 0      | 0      | 0      | 0      | 0      | 0       | 0       |
| Ö.Ç. 5                           | 0      | 0      | 0      | 2      | 0      | 0      | 0      | 0      | 0      | 0       | 0       |
| Ö.Ç. 6                           | 0      | 0      | 0      | 0      | 3      | 0      | 0      | 0      | 0      | 0       | 3       |