**ITU**

**DERS KATALOG FORMU**

**(Course Catalogue Form)**

| **Dersin Adı:**  Mikrobilgisayar Laboratuvarı | **Course Name:**  Microcomputer Lab |
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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)** |
| BLG351E | 5 | 1 | 2 | - | - | 2 |

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

| **Dersin Türü**  **(Course Type)** | Mühendislik, Zorunlu /  Engineering, Compolsory | **Dersin Dili (Course Language)** | Türkçe /  English |
| --- | --- | --- | --- |
| **Ders Zorunluluğu (Course Compulsion)** | | Zorunlu (Compulsory) | |

| **Dersin Önkoşulları (Course Prerequisites)** | BLG 222/E Computer Organization  or  BLG 212/E Microprocessor Systems | | | |
| --- | --- | --- | --- | --- |
| **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)** | Aşağıda verilen laboratuvar deneyleri izlenerek, Mikroişlemciler dersinde öğretilen temel kavramların uygulaması yapılmaktadır:  - Mikroişlemci deney kitine giriş.  - Örnek programlar.  - İTU-Egit işletim sisteminin temel bileşenlerine giriş.  - Prosedürler ve yığın işlemleri.  - Freescale deney kitine giriş.  - Asenkron iletişim arayüzü.  - Paralel iletişim arayüzü.  - Gerçek zamanlı devreler.  - Kesme uygulamaları. |
| --- | --- |
| In order to implement the fundamental concepts taught in microprocessor course, following  lab experiments are included:  - Introduction of microprocessor experiment kit  - Example programs  - Introduction to basic components in ITU-Egit operating system  - Procedures and stack operations  - Introduction to Freescale experiment kits  - Asyncronous communication interface  - Parallel communication interface  - Real time circuits  - Interrupt applications |
| **Dersin Amacı (Course Objective)** | 1. Türkçe dMikroişlemci Sistemleri hakkında temel bilgi. 2. Mikroişlemci Sistemlerinde yazılım geliştirme becerisi. 3. Mikroişlemci Sistemlerinde G/Ç arayüzü kullanma becerisi. 4. Mikroişlemci Sistemlerinde kesmeleri ve süreç fonksiyonlarını kullanma becerisi. |
| 1. Fundamental information about microprocessor systems 2. Ability to develop software on microprocessor systems 3. Ability to use I/O interfaces on microprocessor systems 4. Ability to use interrupts and timing functions of microprocessor systems |
| **Dersin Öğrenme Çıktıları (Course Learning Outcomes)** | 1. Mikroişlemci Sistemleri’nin yazılımı ve donanımı hakkında bilgi kazanma. 2. Bellek sistemleri tasarımı yapabilme. 3. Assembly dilinde program geliştirme ve analiz edebilme. 4. GÇ ve kesmeler hakkında bilgi kazanma. |
| 1. Gain knowledge about software and hardware of microprocessor systems 2. Ability to design memory systems 3. Ability to develop analyze programs in assembly language 4. Gain knowledge about IO and interrupts |

| **Ders Kitabı (Textbook)** | Eşref Adalı, 2009, ITU Egit deney kitapçığı.  Eşref Adalı, Cüneyd Tantuğ, Mustafa Kamaşak, 2009, Freescale deney kitapçığı |
| --- | --- |
| **Diğer Kaynaklar (Other References)** |  |

| **Ödevler ve Projeler (Homeworks & Projects)** | - |
| --- | --- |
| - |
| **Laboratuvar Uygulamaları (Laboratory Work)** | - |
| - |
| **Bilgisayar Kullanımı (Computer Use)** | - |
| - |
| **Diğer Uygulamalar (Other Activities)** | - |
| {Free text in English} |

| **Başarı Değerlendirme Sistemi**  **(Assessment Criteria)** | **Faaliyetler (Activities)** | **Adedi (Quantity)** | **Değerlendirmedeki Yüzde Katkısı**  **(Effects on Grading by Percentage)** |
| --- | --- | --- | --- |
| **Yıl İçi Sınavları (Midterm Exams)** | - | - |
| **Kısa Sınavlar (Quizzes)** | - | - |
| **Ödevler (Homework)** | 8 | 50% |
| **Projeler (Projects)** | - | - |
| **Dönem Ödevi/Projesi (Term Paper/Project)** | - | - |
| **Laboratuvar Uygulaması (Laboratory Work)** | 8 | 50% |
| **Diğer Uygulamalar (Other Activities)** | - | - |
| **Final Sınavı (Final Exam)** | - | - |

**DERS PLANI**

**(Course Plan)**

| **Hafta** | **Konu** | **Dersin Çıktıları** |
| --- | --- | --- |
| **1** | Lab hakkında bilgi ve lab kuralları | 1 |
| **2** | ITU-Egit laboratuvar kitine giriş | 1 |
| **3** | ITU-Egit kitine örnek program yükleme ve yürütme | 1-3 |
| **4** | Bellek tasarımı – bellek testi | 1-2 |
| **5** | Bellek bloklarının taşınması | 1-2 |
| **6** | Freescale laboratuvar kitine giriş: Freescale kitine örnek program yükleme ve yürütme | 1-3 |
| **7** | Döngüler ve dizi işlemleri | 3 |
| **8** | Mikrobilgisayar donanım temelleri | 1-2-3 |
| **9** | Paralel iletişim arayüzü | 4 |
| **10** | Asenkron iletişim arayüzü | 4 |
| **11** | Yığın, alt yordam ve kesme işlemleri | 3-4 |
| **12** | Telafi laboratuvarı | 1-2-3-4 |
| **13** | Kesmeler ve süreç fonksiyonları | 1-2-3-4 |
| **14** | Donanım uzantısı | 1 |

| **Week** | **Topic** | **Course Outcome** |
| --- | --- | --- |
| **1** | Lab information and lab rules | 1 |
| **2** | Introduction to ITU-Egit lab kit | 1 |
| **3** | Uploading and executing sample programs to ITU-Egit | 1-3 |
| **4** | Memory design – memory testing | 1-2 |
| **5** | Moving blocks of memory | 1-2 |
| **6** | Intr. to freescale lab kit:Uploading and execution of sample programs to freescale lab kit | 1-3 |
| **7** | Loops and array operations | 3 |
| **8** | Microprocessor hardware essentials | 1-2-3 |
| **9** | Parallel communication interface | 4 |
| **10** | Asyncronous communication interface | 4 |
| **11** | Stack, sunroutine and interrupt operations | 3-4 |
| **12** | Make-up lab. | 1-2-3-4 |
| **13** | Interrupts and timing functions | 1-2-3-4 |
| **14** | Hardware extension | 1 |

**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 | X |  |  |
| 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 |  |  |  |
| 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 |  |  | X |
| 7 | an ability to acquire and apply new knowledge as needed, using appropriate learning strategies |  | X |  |

**HAZIRLANMA BİLGİSİ**

**Edition Information**

| **Prepared by** | **Date** | **Signature** |
| --- | --- | --- |
| **İlkay Öksüz** | **26.11.2020** |  |
| **Approved by** | **Date** | **Signature** |
| **Dr.Tolga Ovatman** | **30.11.2020** |  |