Year

Department of Electricity and Energy / Department of Electricity and Energy /

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
AEK212	MICROCONTROLLERS	2.00	2.00	0.00	3.00	3.00

Course Detail

Course Language	: Turkish
Qualification Degree	: PreBachelor
Course Type	: Optional
Preconditions	: Not
Objectives of the Course	: To teach the historical development process of microprocessors and microcontrollers. To understand the functions and operation of microcontroller hardware units. To write the appropriate program to control the microcontroller. To make button, LED, 7 segment display, matrix display, character LCD, keypad, ADC and serial communication applications with microcontroller.
Course Contents	: Differences between microprocessor and microcontroller systems systems, microcontroller systems, programmer card, the program into machine language translation, the compiled program to microcontroller installation, algorithms, flow charts, the memory map of the microcontroller, the microcontroller commands editor program the microcontroller, the microcontroller basic blocks of the program, the basic input-output programs , microcontroller program, compile, run the compiled program step by step, push-button and LED applications with microcontroller, microcontroller circuit applications with a 7-segment display, keypad with microcontroller applications, lcd with microcontroller applications.
Recommended or Required Reading	: Çiçek, S. (2021). CCS C ile PIC Programlama. Altaş Yayıncılık. Akademi B. (2014). Herkes için PIC Programlama. Pusula Yayıncılık. Haftalık Ders Notlarına Linkten Ulaşabilirsiniz: https://drive.google.com/drive/folders/1JY0la86RLu2xkxje4GjYSB83KjmuYHcN?usp=sharing
Planned Learning Activities and Teaching Methods	: Lecturing, question and answer, group work, skills development training
Recommended Optional Programme Components	: Haftalık Ders Notlarına Linkten Ulaşabilirsiniz: https://drive.google.com/drive/folders/1JY0la86RLu2xkxje4GjYSB83KjmuYHcN?usp=sharing
Course Instructors	: Öğr. Gör. Dr. Ayberk Calpbinici
Instructor's Assistants	: ....
Presentation Of Course	: The course is taught in the Computer Laboratory with Microcontroller Training Sets.
Update Date	:
Dosya İndirilme Tarihi	: 2/6/2026

Course Outcomes

Upon the completion of this course a student :

1 Knows the general structure of microcontrollers, their hardware units, where they are used and the differences between them and microprocessors.

2 Knows the C programming language command structure required to program the microcontroller.

3 Knows how to use a compiler program. Translates a program written in C programming language into machine language using a compiler program and can load the program into the microcontroller.

4 You can perform button and LED applications (Button usage, LED usage, 7 segment display usage, matrix display usage, keypad usage) by using basic level input and output commands on the microcontroller.

5 Can perform advanced circuit designs (using LCD screen, ADC, serial communication) on microcontroller.

Pre / Side Conditions

Course Code	Course Name	Condition	Teorical	Practice	Laboratory	Credits	ECTS

Weekly Contents

	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods	Course Learning Outcomes
1.Week	*Historical development of microprocessors and microcontrollers., The differences between microprocessors and microcontrollers, microcontroller hardware units	*Historical development of microprocessors and microcontrollers., The differences between microprocessors and microcontrollers, microcontroller hardware units	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 1. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:11-32	*Lecturing, question and answer	
2.Week	*The differences between high- and low-level languages, C language, C language fundamentals and presentation editor program	*The differences between high- and low-level languages, C language, C language fundamentals and presentation editor program	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 2. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:33-46	*Lecturing, question and answer	
3.Week	*Creating algorithms and flow charts for solving problems, recognizing basic commands with microcontroller in C language	*Creating algorithms and flow charts for solving problems, recognizing basic commands with microcontroller in C language	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 3. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:47-86	*Lecturing, question and answer, group work, skills development training	
4.Week	*Use of input and output commands in microcontrollers and Button-LED applications	*Use of input and output commands in microcontrollers and Button-LED applications	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 4. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:105-108	*Lecturing, question and answer, group work, skills development training	
5.Week	*Use of input and output commands in microcontrollers and Button-LED applications	*Use of input and output commands in microcontrollers and Button-LED applications	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 5. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:109-119	*Lecturing, question and answer, group work, skills development training	
6.Week	*Use of control structures in microcontroller	*Use of control structures in microcontroller	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 6. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:123-148	*Lecturing, question and answer, group work, skills development training	
7.Week	*Using 7 segment display in microcontroller	*Using 7 segment display in microcontroller	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 7. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:134-148	*Lecturing, question and answer, group work, skills development training	
8.Week	*Ara Sınav					
9.Week	*Using Matrix Display in Microcontroller	*Using Matrix Display in Microcontroller	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 9. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:149-172	*Lecturing, question and answer, group work, skills development training	
10.Week	*Using Character LCD in Microcontroller	*Using Character LCD in Microcontroller	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 10. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:247-281	*Lecturing, question and answer, group work, skills development training	
11.Week	*Using Character LDC in Microcontroller	*Using Character LDC in Microcontroller	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 11. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:247-281	*Lecturing, question and answer, group work, skills development training	
12.Week	*Creating our own library for character LCD	*Creating our own library for character LCD	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 12. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:269-281	*Lecturing, question and answer, group work, skills development training	
13.Week	*Using Keypad in Microcontroller	*Using Keypad in Microcontroller	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 13. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:237245	*Lecturing, question and answer, group work, skills development training	
14.Week	*Use of Analog to Digital Conversion in Microcontroller	*Use of Analog to Digital Conversion in Microcontroller	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 14. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:291-308	*Lecturing, question and answer, group work, skills development training	
15.Week	*Using serial communication in microcontroller	*Using serial communication in microcontroller	*In the Computer Laboratory, CCS C compiler program and ISIS electronic program are used.	*Sisteme yüklü 15. Hafta Ders Notu, CCS C ile PIC Programlana Kitabı Sayfa:337-346	*Lecturing, question and answer, group work, skills development training	

Assesment Methods %

1 Ara Sınav (Bütünlemede Kullanılan) : 40.000

2 Final : 60.000

ECTS Workload

Activities	Count	Time(Hour)	Sum of Workload
Teorik Ders Anlatım	14	2.00	28.00
Uygulama / Pratik	14	2.00	28.00
Ev Ödevi	10	2.00	20.00
Proje	1	4.00	4.00

Activities	Count	Time(Hour)	Sum of Workload
Ara Sınav Hazırlık	4	1.00	4.00
Vize	1	1.00	1.00
Final Sınavı Hazırlık	4	1.00	4.00
Final	1	1.00	1.00
			Total : 90.00
			Sum of Workload / 30 (Hour) : 3
			ECTS : 3.00

Program And OutcomeRelation

	P.O.1	P.O.2	P.O.3	P.O.4	P.O.5	P.O.6	P.O.7	P.O.8	P.O.9	P.O.10	P.O.11	P.O.12	P.O.13	P.O.14
	P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14
L.O. 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L.O. 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L.O. 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L.O. 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L.O. 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Avarage	3.00	0	2.00	4.00	0	0	0	0	0	0	3.00	0	0	0

Ders/Program Çıktıları İlişkisi

P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14
15	0	10	20	0	0	0	0	0	0	15	0	0	0

Engel Durumu/Uyarlama Talebi : Engel durumuna ilişkin herhangi bir uyarlama talebinde bulunmak isteyen öğrenciler, dersin öğretim elemanı ya da Nevşehir Engelli Öğrenci Birimi ile en kısa sürede iletişime geçmelidir.