COURSE DESCRIPTION FORM	
Course Code and Name	CENG477 MICROCONTROLLERS (TECH.ELECT.)
Course Semester	7
Catalogue Data of the Course (*Course Content***)**	Microcontrollers, microcontroller architecture, microcontroller peripherals, high-level embedded programming and real-time operating systems
Course Textbooks	Microprocessor 3: Core Concepts - Hardware Aspects, Wiley, 2020.
Supplementary Textbooks	Microprocessors and Microcontrollers (Second Edition), I.K. International Publishing House Pvt. Limited, 2013.
Credit (*ECTS***)**	6
Prerequisites for the Course (*Attendance Requirements***)**	There is no prerequisite or co-requisite for this course.
Course Type	Technical Elective
Language of Instruction	English
Course Objectives	1. Choosing the most suitable processor for the job to be done by knowing the microcontroller basic structure architecture, 2. Being able to create an algorithm and switch to the programming language from there, 3. Uploading the compiled program to the microcontroller 4. Choosing a microcontroller to solve a problem and to understand how to create an embedded system with a microcontroller by creating the necessary algorithm.
Course Learning Outcomes	1. Have knowledge about microcontrollers and microprocessors. 2. Learns and designs processor systems such as ALU, integrated and control circuits. 3. Writes basic programs in assembly language. 4. Makes PIC programming applications.
Instruction Method (*Face-to-face, Distance education etc.*)	This course will only face-to-face training.
Weekly Schedule of the Course	Week 1: Introduction to micro controllers Week 2: Microcomputer systems basics Week 3: Microprocessors and structures Week 4: ALU, recorders and control units Week 5: Computer data transmission, Week 6: Machine language Week 7: Assembly language and types Week 8: Addressing methods Week 9: Command types and assembly programming Week 10: Input-output control and applications Week 11: Integrated circuits Week 12: Control circuits Week 13: Control circuits Week 14: PIC programming
Teaching Activities (*The time spent for the activities listed here will determine the amount of credit required*)	Weekly theoretical course hours: 3 Reading activities Internet search and library work Midterm and revision for midterm Final exam and revision for final exam

		Number(s)	Weight (%)
Assessment Criteria	Midterm exam	1	40
	Assignment	4	20
	Application	0	0
	Project	0	0
	Practice	0	0

	Quiz	0	0				
	Final exam	1	40				
	Total	6	100				

Workload of the Course	**Activity**		**Number of Weeks**	**Duration (Weekly Hour)**	**End of Semester Total Workload**		
	Weekly theoretical course hours		14	3	42		
	Weekly practical course hours		0	0	0		
	Reading activities		14	3	42		
	Internet search and library work		14	3	42		
	Designing and implementing materials		0	0	0		
	Making a report		0	0	0		
	Preparing and making presentations		0	0	0		
	Midterm and revision for midterm		1	12	12		
	Final exam and revision for final exam		1	12	12		
	Total workload				150		
	Total workload/ 25				6		
	Course Credit (ECTS)				6		

Contribution Level between Course Outcomes and Program Outcomes	No	Program Outcomes	1	2	3	4	5
	1	Knowledge of mathematics, science, basic engineering, computing, and computer engineering; ability to use this knowledge in solving complex engineering problems.			x		
	2	Ability to define, formulate and analyze complex engineering problems using basic science, mathematics and engineering knowledge and considering the UN Sustainable Development Goals relevant to the problems addressed.		x			
	3	Ability to design creative solutions to complex engineering problems; ability to design complex systems, processes, devices, software, algorithms or products to meet current and future requirements, considering realistic constraints and conditions.			x		
	4	Ability to select, use and develop appropriate techniques, resources and modern engineering and informatics tools, including estimation and modeling, for the analysis and solution of complex engineering problems while being aware of their limitations.			x		
	5	Ability to use research methods to examine complex engineering problems or research topics in computer engineering, including reviewing the literature, designing experiments, conducting experiments, collecting data, analyzing and interpreting results.		x			
	6	Knowledge of the effects of engineering practices and the standards used in these practices on society, health and safety, economy, sustainability and environment within the scope of the UN Sustainable Development Goals; awareness of the consequences of engineering solutions in the fields of information security and law.					
	7	Acting in accordance with engineering professional principles and knowledge on ethical responsibility; awareness of acting					

		impartially, without discrimination on any issue, and being inclusive of diversity.						
	8	Ability to work effectively individually and as a team member or leader in intradisciplinary and multidisciplinary teams (face-to-face, remote, or hybrid).						
	9	Ability to conduct effective verbal and written communication on technical issues in Turkish or English, prepare reports, make effective presentations and prepare software documentation, considering the various differences of the target audience (such as education, language, profession).						
	10	Knowledge of business practices such as project, risk and change management and economic feasibility analysis; awareness of entrepreneurship and innovation.						
	11	Lifelong learning skill that includes the ability to learn independently and continuously, to adapt to new and developing scientific practices and technologies, and to think inquisitively about technological changes.		x				
Lecturer(s) and Contact Information	Lecturer Dr. Bilgehan Arslan bilgehanarslan@gazi.edu.tr							