COURSE DESCRIPTION FORM	
Course Code and Name	CENG442 MICRO SERVICE BASED SOFTWARE DEVELOPMENT (TECH. ELECT.)
Course Semester	8
Catalogue Data of the Course (*Course Content*)	This course provides an in-depth look at modern software development practices, with a particular focus on microservices-oriented architectures. Starting with the basics of web applications, we will examine the concepts of RESTful services and Service Oriented Architecture (SOA), and then compare monolithic architecture and microservice-oriented approaches.
Course Textbooks	Microservices Patterns, 2019, Chris Richardson, Manning
Supplementary Textbooks	
Credit (*ECTS*)	6
Prerequisites for the Course (*Attendance Requirements*)	There is no prerequisite or co-requisite for this course.
Course Type	Selective
Language of Instruction	English
Course Objectives	The aim of this course is to teach students microservice-oriented software development principles and practices. The course will cover the migration processes from web applications to RESTful services and Service Oriented Architecture (SOA), then show the differences and migration strategies between monolithic architectures and microservices.
Course Learning Outcomes	1. Understanding web application development, REST and SOA principles 2. Gain in-depth knowledge of monolithic and microservice architectural designs 3. Acquire skills to design, develop and maintain microservices-based applications
Instruction Method *(Face-to-face, Distance education etc.)*	The mode of delivery of this course is face to face
Weekly Schedule of the Course	Week 1: Introduction to web applications Week 2: Service Oriented Architecture - (SOA) Week 3: Web Services and REST Week 4: Monolithic architectures Week 5: Introduction to micro-service architecture Week 6: Decomposition Strategies Week 7: Inter-process communication Week 8: Distributed Transactions and Saga Week 9: Business logic design Week 10: Event-based management Week 11 Queries Week 12: Testing processes in microservice systems Week 13: Distributed message queues Week 14: DevOps CI/CD
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 Designing and implementing materials Making a report Midterm and revision for midterm Final exam and revision for final exam

Assessment Criteria

	Number(s)	Weight (%)
Midterm exam	1	30
Assignment		
Application		
Project	1	30
Practice		
Quiz		
Final exam	1	40
Total	3	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			
Reading activities	14	2	28
Internet search and library work	14	1	14
Designing and implementing materials	1	40	40
Making a report	1	6	6
Preparing and making presentations			
Midterm and revision for midterm	1	10	10
Final exam and revision for final exam	1	10	10
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		X			

		complex engineering problems or research topics in computer engineering, including reviewing the literature, designing experiments, conducting experiments, collecting data, analyzing and interpreting results.					
	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.				X	
	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.		X			
	8	Ability to work effectively individually and as a team member or leader in intradisciplinary and multidisciplinary teams (face-to-face, remote, or hybrid).				X	
	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).				X	
	10	Knowledge of business practices such as project, risk and change management and economic feasibility analysis; awareness of entrepreneurship and innovation.			X		
	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's First/Last Name: Asst.Prof. Dr. Hüseyin Temuçin E-mail address: huseyintemucin@gazi.edu.tr						