COURSE DESCRIPTION FORM	
Course Code and Name	CENG479 PARALLEL COMPUTER ARCHITECTURES AND PROGRAMMING (TECH. ELECT.)
Course Semester	7
Catalogue Data of the Course (*Course Content*)	Parallel computers. Parallel computing. Parallel computer modeling, shared memory, distributed memory, scaling of processors. Parallel programming techniques, Parallel programming, processing by data transmission, sequential processing, shared memory processing, etc. Parallel processing and programming techniques and algorithms. MPI, POSIX and CUDA usage and theoretical background.
Course Textbooks	An Introduction to Parallel Programming, Peter Pacheco, MK Publishing, 2021
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	Students will be able to design parallel programs and gain the ability to write parallel programs by learning parallel computer calculation methods.
Course Learning Outcomes	1.Paralel hesaplama ve bilgisayar mimarileri hakkında bilgi sahibi olur 2.Paylaşımlı ve dağıtık hafıza yapılarını anlar 3.Paralel programlama tekniklerini öğrenerek uygular 4.MPI ile dağıtık bellek mimarileri için parallel programlar yazar.
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 parallel computing Week 2: Parallel hardware architectures Week 3: Parallel software structures - I Week 4: Parallel software patterns and Foster Methodology Week 5: Performance Analysis Week 6: Distributed MIMD - MPI -I Week 7: Distributed MIMD - MPI -II Week 8: Shared MIMD - POSIX Thread - I Week 9: Shared MIMD - POSIX Thread - II Week 10: Shared SIMD - CUDA - I Week 11: Shared SIMD - CUDA - II Week 12: Component networks - Switching Week 13: Component networks - Topology Week 14: Map Reduce based data processing.
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 Midterm and revision for midterm Final exam and revision for final exam
Assessment Criteria	

	Number(s)	Weight (%)
Midterm exam	1	30
Assignment	2	30
Application		
Project		
Practice		
Quiz		
Final exam	1	40
Total	4	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	3	42
Internet search and library work	14	3	42
Designing and implementing materials	2	5	10
Making a report			
Preparing and making presentations			
Midterm and revision for midterm	1	10	10
Final exam and revision for final exam	1	10	10
Total workload			156
Total workload/ 25			6,24
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		X			

	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