Course Description Form	
Course Code and Name	CENG479 PARALLEL COMPUTER ARCHITECTURES AND PROGRAMMING (TECH.ELECT.)
Course Semester	7
Catalog Content	Parallel computers. Parallel virtual machines. Parallel computing. Parallel computer modeling, super computers, shared memory, distributed memory, scaling processors. Parallel programming techniques, Parallel programming, processing with data transmission, consecutive order processing, shared memory processing etc. Parallel processing and programming techniques and algorithms. MPI usage.
Textbook	An Introduction to Parallel Programming 1st Edition by Peter Pacheco, 2011.
Supplementary Textbooks	A 2017 Introduction to Parallel Programming with OpenMP, PThreads and MPI by Robert Cook, 2011. Parallel Programming 1st Edition Concepts and Practice, Bertil Schmidt, Jorge Gonzalez-Dominguez, Christian Hundt, Moritz Schlarb, 2017
Credit	6
Prerequisites of the Course **(** *Attendance Requirements***)**	There is no prerequisite or co-requisite for this course.
Type of the Course	Technical Elective
Instruction Language	English
Course Objectives	It is aimed to provide knowledge about parallel computer architectures and designing parallel programs and writing parallel programs.
Course Learning Outcomes	1. To have knowledge about parallel computing and parallel computer architecture, 2. Understanding of shared and distributed memory structures 3. Ability to implement parallel programming techniques 4. Ability to use MPI for parallel programming in distributed memory architectures. 5. Ability to write parallel programs for shared memory architectures.
Instruction Methods	The mode of delivery of this course is face to face.
Weekly Schedule	1. Week: Parallel computers 2. Week: Parallel virtual machines 3. Week: Parallel computing 4. Week: Parallel computer models 5. Week: Super computers 6. Week: Shared memory 7. Week: Distributed memory, scalable processors 8. Week: Parallel programming techniques 9. Week: Parallel programming 10.Week: Message delivery and parallel processing 11. Week: Sequential processing 12. Week: Shared memory processing 13. Week: Comprehensive techniques and parallel processing algorithms and applications 14. Week: MPI usage
Teaching and Learning Methods *(These are examples. Please fill which activities you use in the course)*	Weekly theoretical course hours: 3 Reading Activities Internet browsing, library work Designing and implementing materials Preparation of Midterm and Midterm Exam Final Exam and Preparation for Final Exam

Assessment Criteria

	Numbers	Total Weighting (%)
Midterm Exams	1	30
Assignment	1	30
Application	0	
Projects	0	
Practice	0	
Quiz	0	
Percent of In-term Studies (%)		60
Percentage of Final Exam to Total Score (%)		40
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	3	42
Weekly Tutorial Hours			0
Reading Tasks	14	2	28
Studies	14	2	28
Material Design and Implementation	1	15	10
Report Preparing			0
Preparing a Presentation			0
Presentations			0
Midterm Exam and Preparation for Midterm Exam	1	15	15
Final Exam and Preparation for Final Exam	1	20	20
Other (should be emphasized)			0
Total Workload			148
Total Workload / 25			5.92
Course Credit (ECTS)			6

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Sufficient knowledge on mathematics, science and computer engineering; ability to apply theoretical and practical knowledge in these areas to model and solve engineering problems				X	
2	Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these purposes				X	
3	Ability to design a complex system, process, device, software, algorithm, or product under realistic constraints and circumstances to meet certain requirements; ability to apply modern design techniques for this purpose				X	
4	Ability to choose, develop and use modern techniques and tools necessary for engineering applications; ability to effectively use computing technologies			X		
5	Ability to design and implement systems or experiments to solve engineering problems, collect and interpret data to evaluate and analyze the results of solutions			X		
6	Ability to work effectively in intradisciplinary and interdisciplinary teams or individually	X				

	7	Ability to efficiently prepare, evaluate and interpret reports					X
	8	Ability to make presentations and conduct effective verbal and written communication in Turkish and English	X				
	9	Awareness of the necessity of lifelong learning; ability to access information, follow scientific and technological developments; ability to perpetually renew oneself				X	
	10	Awareness of professional and ethical responsibility, ability to act in accordance with ethical principles	X				
	11	Ability to apply knowledge on project management, risk management and change management	X				
	12	Awareness of entrepreneurship and innovation, ability to design and build sustainable systems		X			
	13	Ability to devise local and global solutions to contemporary issues considering the effects of engineering applications on health, environment and security	X				
	14	Awareness of the legal consequences of engineering solutions	X				
	15	Ability to apply knowledge on software development process and documentation rules				X	
	16	Knowledge on standards used in engineering applications				X	
	17	Awareness of occupational health and security, information security and privacy	X				
The Course's Lecturer(s) and Contact Information		Lecturer Dr. Muhammet Ünal muhunal@gazi.edu.tr					