<table>
<tr><th colspan="2">Course Description Form</th></tr>
<tr><td>Course Code and Name</td><td>CENG451 ADVANCED COMPUTER ARCHITECTURE (TECH.ELECT.)</td></tr>
<tr><td>Course Semester</td><td>7</td></tr>
<tr><td>Catalog Content</td><td>Computer architecture and parallel processing, ILP-processors, pipeline processors, VLIW structures, superscalar processors, process and control expressions, SIMD structures, vectorial structures, multithread structures.</td></tr>
<tr><td>Textbook</td><td>Advanced Computer Architecture, Hwang, MCGRAW-HILL, 2010.</td></tr>
<tr><td>Supplementary Textbooks</td><td>- Advanced Computer Architectures: A Design Space Approach, SIMA, Pearson Education, 2002.
- Advanced Computer Architecture: A Systems Design Approach, Richard Y. Kain, Prentice Hall, 1995.</td></tr>
<tr><td>Credit</td><td>6</td></tr>
<tr><td>Prerequisites of the Course
(Attendance Requirements)</td><td>-</td></tr>
<tr><td>Type of the Course</td><td>Technical Elective</td></tr>
<tr><td>Instruction Language</td><td>English</td></tr>
<tr><td>Course Objectives</td><td>To provide knowledge about computer architecture and parallel processing, ILP-processors, pipeline processors, VLIW structures, superscalar processors, process and control expressions, SIMD structures, vectorial structures, multithread structures.</td></tr>
<tr><td>Course Learning Outcomes</td><td>Students who successfully complete this course have knowledge on the following topics: Computer architecture and parallel processing, ILP-processors, pipeline processors, VLIW structures, superscalar processors, process and control expressions, SIMD structures, vectorial structures, multithread structures.</td></tr>
<tr><td>Instruction Methods</td><td>The mode of delivery of this course is face to face</td></tr>
<tr><td>Weekly Schedule</td><td>1.Week: Computer architecture and parallel processing input
2.Week: Computer architecture and parallel processing input
3.Week: Introduction to ILP-processor
4.Week: Introduction to ILP-processor
5.Week: Pipeline Processors
6.Week: Pipeline Processors
7.Week: VLIW structure
8.Week: VLIW structure
9.Week: Superscalar processors
10.Week: Superscalar processors
11.Week: Processing and control statements
12.Week: SIMD structures
13.Week: Vector structures
14.Week: Multithread structures</td></tr>
<tr><td>Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)</td><td>Weekly theoretical course hours: 3
Reading Activities
Internet browsing, library work
Preparation of Midterm and Midterm Exam
Final Exam and Preparation for Final Exam</td></tr>
<tr><td>Assessment Criteria</td><td>
<table>
<tr><th></th><th>Numbers</th><th>Total Weighting (%)</th></tr>
<tr><td>Midterm Exams</td><td>1</td><td>30</td></tr>
<tr><td>Assignment</td><td>5</td><td>30</td></tr>
<tr><td>Application</td><td>0</td><td>0</td></tr>
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Projects	0	0	
Practice	0	0	
Quiz	0	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	0	0
Reading Tasks	14	3	42
Studies	14	3	42
Material Design and Implementation	0	0	0
Report Preparing	0	0	0
Preparing a Presentation	0	0	0
Presentations	0	0	0
Midterm Exam and Preparation for Midterm Exam	1	12	12
Final Exam and Preparation for Final Exam	1	12	12
Other (should be emphasized)	0	0	0
Total Workload			150
Total Workload / 25			6
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		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		Prof. Dr. M. Ali AKCAYOL akcayol@gazi.edu.tr					