İZMİR UNIVERSITY OF ECONOMICS

Faculty of Engineering
Computer Engineering
CE 450 - Distributed Systems and Parallel Computing

COURSE INTRODUCTION AND APPLICATION INFORMATION

Course Name	Distributed Systems and Parallel Computing

Code	Semester	Theory (hour/week)	Application/Laboratory (hour/week)	Local Credits	ECTS
CE 450	Fall/Spring	3	0	3	5

Prerequisites	None
Course Language	English
Course Type	Elective
Course Level	First Cycle
Mode of Delivery	-
	* Problem Solving * Lecture / Presentation
Course Coordinator	* Prof. Dr. Turhan TUNALI
Course Lecturer(s)	-
Course Assistants	-

Course Objectives	This course will introduce the algorithms and technologies of distributed systems. It will teach both fundamentals as well as systems where these fundamentals are applied in practice. The course will be further based on advanced material from both research papers and several textbooks on distributed and parallel computing. In addition to the theoretical work, during the semester, at least one programming project will be assigned.
Course Learning Outcomes	The students who succeeded in this course; * will be able to define the structure, type, and application areas of distributed systems.

	* will be able to exercise infrastructure, software, hardware, languages, and operating system applications for building distributed computing environments. * will be able to classify distributed process structures (clients, servers, threads, and code migration). * will be able to describe process communication, remote procedure call, and distributed process synchronization approaches and algorithms. * will be able to discuss basic distributed applications (distributed web-based systems, distributed object-based systems, and distributed file systems).
Course Description	To acquaint students with the major types, structures, functionality, and deployement of distributed systems, and to introduce students to the literature and terminology used for distributed systems and parallel computing.

Course Category	Core Courses	
	Major Area Courses	X
	Supportive Courses	
	Media and Managment Skills Courses	
	Transferable Skill Courses	

WEEKLY SUBJECTS AND RELATED PREPARATION STUDIES

Week16	Subjects	Related Materials
1	Introduction: Definition and types of distributed systrems	Distributed Systems Principles and Paradigms Tanenbaum - Ch1
2	Architectures	Distributed Systems Principles and Paradigms Tanenbaum - Ch2, pp. 3457
3	Processes	Distributed Systems Principles and Paradigms Tanenbaum - Ch3pp. 70110
4	Communication	Distributed Systems Principles and Paradigms Tanenbaum - Ch4pp. 116130, 140163
5	Naming	Distributed Systems Principles and Paradigms Tanenbaum - Ch5pp. 180222
6	Synchronization	Distributed Systems Principles and Paradigms Tanenbaum - Ch6pp. 232269
7	Consistency and Replication	Distributed Systems Principles and Paradigms Tanenbaum - Ch7pp. 274315
8	Fault tolerance	Distributed Systems Principles and Paradigms Tanenbaum - Ch8pp. 322360
9	MIDTERM EXAM	
10	Distributed objectbased systems: Architecture, processes, communication	Distributed Systems Principles and Paradigms Tanenbaum - Ch10pp. 443464
11	Distributed objectbased systems: naming, synchronization, consistency and replication, fault tolerance	Distributed Systems Principles and Paradigms Tanenbaum - Ch10pp. 466480
12	Distributed file systems	Distributed Systems Principles and Paradigms Tanenbaum - Ch11pp. 491,531
13	Distributed webbased systems	Distributed Systems Principles and Paradigms Tanenbaum - Ch12, pp.546582

14	Security	Distributed Systems Principles and Paradigms Tanenbaum - Ch9, pp. 378434
15	Semester Review	
16	Review of the Semester	

SOURCES

Course Notes / Textbooks	Distributed Systems Principles and Paradigms, 2nd Edition, Andrew Tanenbaum© 2007 | Pearson Prentice Hall | ISBN: 013239227
Suggested Readings/Materials	Distributed Computing Principles and Applications, M. L. Liu, ISBN10: 0201796449

EVALUATION SYSTEM

Semester Activities	Number	Percentage of Grade
Participation	-	-
Laboratory / Application	-	-
Field Work	-	-
Quiz/Studio Critic	-	-
Portfoilo	-	-
Homework Assignment	-	-
Presentation/Jury	-	-
Project	1	30
Seminar/Workshop	-	-
Oral Exam	-	-
Midterm	1	30
Final	1	40
Total	3	100

WEIGHTING OF SEMESTER ACTIVITIES ON THE FINAL GRADE	**2**	**60**
WEIGHTING OF END-OF-SEMESTER ACTIVITIES ON THE FINAL GRADE	**1**	**40**
Total	3	100

ECTS / WORKLOAD TABLE

Semester Activities	Number	Duration (Hours)	Total Workload
Course Hours (Including Exam Week: 16 x Total Hours)	16	3	48
Laboratory / Application Hours	16	-	-
Study Hours Out of Class	15	4	60
Field Work	-	-	-
Quiz / Studio Critique	-	-	-
Portfolio	-	-	-
Homework / Assignment	-	-	-
Presentation / Jury	-	-	-
Project	1	20	20
Seminar / Workshop	-	-	-
Oral Exam	-	-	-
Midterm	1	7	7
Final	1	15	15
		Total Workload	**150**

THE RELATIONSHIP BETWEEN COURSE LEARNING OUTCOMES AND PROGRAM QUALIFICATIONS

#	Program Qualifications / Outcomes	* Level of Contribution				
		1	2	3	4	5
1	To have adequate knowledge in Mathematics, Science and Computer Engineering; to be able to use theoretical and applied information in these areas on complex engineering problems.					
2	To be able to identify, define, formulate, and solve complex Computer Engineering problems; to be able to select and apply proper analysis and modeling methods for this purpose.					X
3	To be able to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the requirements; to be able to apply modern design methods for this purpose.				X	
4	To be able to devise, select, and use modern techniques and tools needed for analysis and solution of complex problems in Computer Engineering applications; to be able to use information technologies effectively.					
5	To be able to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or Computer Engineering research topics.					
6	To be able to work efficiently in Computer Engineering disciplinary and multi-disciplinary teams; to be able to work individually.				X	
7	To be able to communicate effectively in Turkish, both orally and in writing; to be able to author and comprehend written reports, to be able to prepare design and implementation reports, to present effectively, to be able to give and receive clear and comprehensible instructions.					
8	To have knowledge about global and social impact of Computer Engineering practices on health, environment, and safety; to have knowledge about contemporary issues as they pertain to engineering; to be aware of the legal ramifications of Computer Engineering solutions.					
9	To be aware of ethical behavior, professional and ethical responsibility; to have knowledge about standards utilized in engineering applications.					
10	To have knowledge about industrial practices such as project management, risk management, and change management; to have awareness of entrepreneurship and innovation; to have knowledge about sustainable development.					
11	To be able to collect data in the area of Computer Engineering, and to be able to communicate with colleagues in a foreign language. ("European Language Portfolio Global Scale", Level B1)					
12	To be able to speak a second foreign language at a medium level of fluency efficiently.					

13	To recognize the need for lifelong learning; to be able to access information, to be able to stay current with developments in science and technology; to be able to relate the knowledge accumulated throughout the human history to Computer Engineering.					

*1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest