

COURSE INFORMATION					
Course Title	Code	Semester	L+P Hour	Credits	ECTS
Performance Evaluation of Computer Systems	CSE524	1	3	3	7

Prerequisites	
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Language of Instruction	English
Course Level	Graduate Degree
Course Type	Elective
Course Coordinator	
Instructors	Assist.Prof. Esin Onbaşıoğlu
Assistants	
Goals	The aim of this course is to provide an introduction to the methods and techniques of performance analysis of computer systems. The course prepares students to effectively solve computer performance analysis problems related to measuring performance of computer systems, planning the capacity, predicting the future performance under different configurations, designing new applications that meet performance requirements, and comparison of computer systems.
Content	Hardware and software aspects of computer systems, performance metrics, performance measurement tools and techniques, benchmarking, statistical analysis of performance experiments, design of experiments, simulation, queueing theory, using these techniques to study the processor performance, cache memory performance and the performance of multiprocessor systems, hands-on experiments with modern hardware/software systems.

Learning Outcomes	Program Outcomes	Teaching Methods	Assessment Methods
1. Knowledge in performance aspects of computer systems	1,2,4	1	A
2. Ability to identify, formulate, and solve performance problems in computer systems; ability to select and apply proper analysis and modeling methods for this purpose	1,2,4	1,3	A,C
3. Ability to design and conduct experiments, gather data, analyze and interpret results for investigating performance problems in computer systems	1,2,4	1,3	A,B,C

Teaching Methods:	1: Lecture, 2: Question-Answer, 3: Lab
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Assessment Methods:	A: Testing, B: Experiment, C: Homework, D: Term Project
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COURSE CONTENT		
Week	Topics	Study Materials
1	Introduction	
2	Hardware and software aspects of computer systems	
3	Performance metrics	
4	Performance measurement tools and techniques (Timing, profiling, and tracing)	
5	Benchmarking	
6	Statistical analysis of performance experiments	
7	Design of experiments	
8	MIDTERM EXAM	
9	Processor performance	
10	Cache memory performance	
11	Performance of multiprocessor systems	
12	Simulation	
13	Queueing theory	
14	Queueing theory	

RECOMMENDED SOURCES	
Textbook	<p>D. Lilja, "Measuring Computer Performance: A Practitioner's Guide", Cambridge University Press</p> <p>Lab material: http://cse.yeditepe.edu.tr/v2/en/academic/course-pages</p>
Additional Resources	<p>P.J. Fortier, H.E. Michel, "Computer Systems Performance Evaluation and Prediction", Digital Press</p> <p>K.R. Wadleigh, I.L. Crawford, "Software Optimization for High Performance Computing", Prentice-Hall</p> <p>J.L. Hennessy, D.A. Patterson, "Computer Architecture", Morgan & Kaufmann</p> <p>B. O'Hallaron, "Computer Systems: A Programmer's Perspective", Pearson</p>

MATERIAL SHARING

Documents	
Assignments	
Exams	

ASSESSMENT		
IN-TERM STUDIES	NUMBER	PERCENTAGE
Mid-terms	1	50
Quizzes		
Assignment	8	50
Term Project		
Total		100
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		40
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		60
Total		100

COURSE CATEGORY	Expertise/Field Courses
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COURSE'S CONTRIBUTION TO PROGRAM						
No	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Knowledge in the advanced computer architecture field					X
2	Knowledge in advanced system design for computer engineering					X
3	Knowledge in the theoretical topics of computer science		x			
4	Ability to comprehend, analyse and critique academic publications and conduct scholarly research at the frontiers of computer engineering		x			
5	Ability and knowledge in the fields of Next-Generation and contemporary computer networks		x			

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Including the exam week: 14x Total course hours)	14	3	42

Hours for off-the-classroom study (Pre-study, practice)	13	4	52
Mid-terms	1	2	2
Homework	8	10	80
Term Project			
Final examination	1	3	3
Total Work Load			179
Total Work Load / 25 (h)			7,16
ECTS Credit of the Course			7