ATILIM UNIVERSITY FACULTY OF ENGINEERING DEPARTMENT OF COMPUTER ENGINEERING COURSE DESCRIPTION AND PRACTICE					
Course Name	Code	Term	L+P Hour	Credits	ECTS
Formal Languages and Automata	COMPE326	2	3+0	3	5.5

Pre-requisite Courses	COMPE 251

Language of the Course	English
Course Type	Compulsory
Course Coordinator	
Instructors	
Assistants	
Course Objective	This course is designed to provide the skills to appreciate and understand the formal definition of computation, and language. The students will be introduced to the definitions and properties of mathematical models of computation with automata theory.
Learning Outcomes of the Course	Use finite automata as a tool to describe computing
	Analyze grammars and languages as they are applied to computer languages
	Construct Push-down automata as a parsing tool of compilation
	Develop Turing machine models for computability
	Build theoretical machines or models for hardware and software
Content of the Course	Languages and their representations. Finite automata and regular grammars. Context-Free Grammars. Concept of abstract machines and language acceptance. Deterministic and non-deterministic finite state machines. Pushdown automata. Turing machines and introduction to the theory of computation.

WEEKLY SCHEDULE AND PRE-STUDY PAGES		
Week	Topics	Pre-study Pages
1	Introduction	Chapters 0 (main text)
2	Regular Languages	Chapter 1
3	Finite Automata	Chapter 1.1
4	Nondeterminism	Chapter 1.2
5	Finite Automata with Output	(other sources 2)
6	Regular Expressions	Chapter 1.3

7	Context-Free Languages	Chapter 2
8	Context-Free Grammars	Chapter 2.1
9	Chomsky Normal Form	Chapter 2.1
10	Pushdown Automata	Chapter 2.2
11	Equivalence with Context-Free Grammars	Chapter 2.2
12	Computability Theory	Chapter 3
13	Turing Machines	Chapter 3.1
14	Variants of Turing Machines	Chapter 3.2

SOURCES	
Course Book	Introduction to the Theory of Computation, Michael Sipser, 2nd Edition, Thomson Course Technology, 2006.
Other sources	1. Efim Kinber and Carl Smith, Theory of Computing: A Gentle Introduction",Prentice-Hall, 2001. ISBN # 0-13-027961-7. 2. Daniel I.A. Cohen, Introduction to Computer Theory (2nd Edition), Wiley, 1997, ISBN # 0-471-13772-3 3. Yarımağan, Ünal, "Özdevinirler Kuramı ve Biçimsel Diller", Bıçaklar Kitabevi, 2003, ISBN# 975-8695-05-3 4. Martin, John C. "Introduction to Languages and the Theory of Computation",(2nd Edition), McGraw-Hill International Editions, 1997, ISBN# 0-07-115468-X 5. Linz, Peter, "An Introduction to Formal Languages and Automata", Jones and Bartlett Publishers, 2001.

EVALUATION SYSTEM		
IN-TERM STUDIES	QUANTITY	PERCENTAGE
Mid-terms	2	25 + 30 = 55
Attendance	-	05
Assignment	3	10
Final Exam	1	35
TOTAL		105
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		70
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		35
TOTAL		105

Course Category	
Supplementary Courses	
Basic Occupational Courses	X
Expertise/Field Courses	
Courses on Communication and Management Skills	
Transferable Skills Courses	

CORRELATION BETWEEN COURSE LEARNING OUTCOMES AND PROGRAM

COMPETENCIES						
No	Program Competencies	Percentage				
		1	2	3	4	5
1	An ability to apply knowledge of mathematics, science, and engineering.					X
2	An ability to design and conduct experiments, as well as to analyze and interpret data.					
3	An ability to design a system, component, or process to meet desired needs.					X
4	An ability to function in teams on multi-disciplinary domains.					
5	An ability to identify, formulate, and solve engineering problems.			X		
6	An understanding of professional and ethical responsibility.					
7	An ability to communicate effectively.					
8	The broad education necessary to understand the impact of engineering solutions in a global and societal context.				X	
9	Recognition of the need for, and an ability to engage in life-long learning.					
10	A knowledge of contemporary issues.					
11	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	X				
12	Skills in project management and recognition of international standards and methodologies					

TABLE OF ECTS / WORKLOAD			
Activities	QUANTITY	Duration (Hour)	Total Workload
Course Duration (Including the exam week: 16x Total course hours)	16	3	48
Hours for off-the-classroom study (Pre-study, practice)	16	4	64
Assignments	3	6	18
Mid-terms	2	10	20
Final examination	1	15	15
Total Work Load			165
Total Work Load / 30			5.5
ECTS Credit of the Course			5.5
Prepared By	Çiğdem Turhan		
Date	April 09, 2009		