COURSE PROFILE

Course Name	Code	Semester	Term	Theory+PS+Lab (hour/week)	Local Credits	ECTS
Data Structures and Algorithms	IT202	Spring	4	3 + 1 + 2	4	6

Prerequisites	None

Course Language	English
Course Type	Required
Course Lecturer	Assist. Prof. Dr. Gülay Ünel
Course Assistant	Kerem Ok
Course Objectives	This course aims to provide design, analysis, and implementation of data structures including stacks, queues, linear lists, trees, heaps, and graphs. The course also aims to teach how to analyse, design, and program the data structures in order to solve different problems.
Course Learning Outcomes	Upon successful completion of the course, students will be able to: • Use each of the data structure in the course • Apply data structures in programming problems • Evaluate the efficiency of data structures using Big O notation • Design and implement abstract data types such as linked lists, stacks, and queues by using Java programming language
Course Content	Arrays, stacks and queues, linked lists, trees, sorting, hashing; heap structures, search structures. Algorithm analysis, complexity, parallel algorithms, file organization.

COURSE CONTENT

Week	Subjects	Related
1	Introduction	
2	Recursion, Stacks	
3	Stacks	
4	Queues	
5	General Linear Lists	
6	Introduction to Trees	
7	Binary Search Tree	
8	Binary Search Tree	
9	Heaps	
10	B-Trees	
11	Graphs	
12	Sorting	
13	Sorting	
14	Searching	

Course Textbook	R.F. Gilberg, B.A. Forouzan, Data Structures, 2nd Ed., 2005, Thomson Course Technology.
Recommended References	

Semester Requirements	Number	Percentage of Grade
Attendance/Participation		
Laboratory	14	30
Application		
Special Course Internship (Work Placement)		
Quizzes/Studio Critics	4	10
Homework Assignments		
Presentation		
Project		
Seminar/Workshop		
Midterms/Oral Exams	1	30
Final/Resit Exam	1	30
Total	20	100

PERCENTAGE OF SEMESTER WORK	19	70
PERCENTAGE OF FINAL WORK	1	30
Total	20	100

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

COURSE'S CONTRIBUTION TO PROGRAM

#	Program Qualifications / Outcomes	* Level of Contribution				
		1	2	3	4	5
1	A foundation in mathematics and basic sciences and ability to apply acquired knowledge as they relate to the study and practice of information technology					X
2	An ability to analyze a problem, identify and define the computing requirements appropriate to its solution, to understand, select and use appropriate technology, tools, standards, protocols, building blocks, and components to solve the problem					X
3	An ability to propose, analyze, design, develop, test and maintain an information technology system including software solutions, security model, computer and network infrastructure, information systems etc. to solve information technology problems	X				
4	An ability to analyze local and global impact of computing on individuals, organizations and society; and the ability to apply information technology techniques, skills, and tools for regular computing practices as well as to improve effectiveness of current methodologies	X				
5	An ability to effectively communicate in oral and written media with all kinds of related audiences; and prepare documentation for this purpose as required	X				
6	An understanding of professional, ethical, legal, and social issues and responsibilities of information technology profession	X				
7	A taste and breadth of knowledge across several social topics outside the immediate requirements of the information technology profession, and the ability to work within heterogeneous teams to accomplish a common goal including people from the information technology area as well as other disciplines		X			
8	An ability to engage in life-long learning and professional development for personal improvement to follow contemporary information technology issues		X			

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

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION

Activities	Number	Duration	Total Workload
Course Hours (Including Exams)	14	3	42
Tutorials			
Laboratory	14	2	28
Application			
Special Course Internship (Work			
Field Work			
Study Hours Out of Class	14	3	42
Presentations / Seminar			
Project			
Preparatory reading	14	3	42
Homework Assignments			
Quizzes			
Midterm Exams	1	2	2
Final / Resit Exam	1	2	2
		Total Workload	158

COURSE CATEGORY

ISCED GENERAL AREA CODES	GENERAL AREAS	ISCED BASIC AREA CODES	BASIC EDUCATIONAL AREAS	
1	Education	14	Teacher Training and Educational Sciences	0
2	Humanities and Art	21	Art	0
2	Humanities and Art	22	Humanities	0
3	Social Sciences, Management and Law	31	Social and Behavioural Sciences	0
3	Social Sciences, Management and Law	32	Journalism and Informatics	0
3	Social Sciences, Management and Law	38	Law	0
4	Science	42	Life Sciences	0
4	Science	44	Natural Sciences	0
4	Science	46	Mathematics and Statistics	0
4	Science	48	Computer	100
5	Engineering, Manufacturing and Civil	52	Engineering	0
5	Engineering, Manufacturing and Civil	54	Manufacturing and Processing	0
5	Engineering, Manufacturing and Civil	58	Architecture and Structure	0
6	Agriculture	62	Agriculture, Forestry, Livestock, Fishery	0
6	Agriculture	64	Veterinary	0
7	Medicine and Welfare	72	Medical	0
7	Medicine and Welfare	76	Social Services	0
8	Service	81	Personal Services	0
8	Service	84	Transport Services	0
8	Service	85	Environment Protection	0
8	Service	86	Security Services	0