

Course Description	
Course Code	
YZ 204 Course Name	ANALYSIS OF ALGORITHMS
Prerequisite Courses	Data Structure and Algorithms
Language of the Course	The English
Course Coordinator	
Instructor(s)	
Course Assistants	none
The aim of the course	The aim of the course is to introduce advanced techniques for the design and analysis of major classes of algorithms and to show their different application areas.
Course Content	Fundamentals of Effective Algorithm Analysis, Asymptotic Notations, Analysis of Divide and Conquer Algorithms, Hashing Algorithms, Graph Algorithms, Balanced Search Trees, Dynamic Programming, Fallback Algorithms, P, NP, NP-Complete Problems

Weekly Course Content	
Week 1	Fundamentals of Effective Algorithm Analysis
Week 2	Asymptotic Analysis
Week 3	Analysis of Non-Recursive and Recursive Algorithms
Week 4	Analysis of Divide and Conquer Algorithms
Week 5	Hashing Algorithms 1
Week 6	Hashing Algorithms 2
Week 7	Dynamic Programming 1
Week 8	Midterm Exam 1
Week 9	Dynamic Programming 2
Week 10	Graph Algorithms
Week 11	Balanced Search Trees (2-3 trees, B-trees, Red-Black Trees)
Week12	Fallback Algorithms
Week 13	Yearly Exam 2
Week 14	P, NP, NP-complete, Problems
Week 15	Final exam.

Course Learning Outcomes	
1	The student can analyze the accuracy of an algorithm.
2	The student will learn the time and space usage complexity of an algorithm, the calculation of worst-case, average-case and best-case complexities, and asymptotic notations.
3	Student can design effective algorithms for solving important engineering problems.
4	The student can calculate the complexity of algorithms.
5	The student can analyze the accuracy of an algorithm.

Contribution of the Course to Program Qualifications		Contribution Level
01	The student will have the ability to apply analytical approach, mathematics and science knowledge in software and engineering issues.	5
02	The student will have the ability to identify, define, formulate and solve a problem in software and computer systems.	4
03	The student will have gains scientific research skills in software and engineering problems, has the ability to design a system, part or process.	4
04	The student will have the ability to use the design capability, techniques and tools required for engineering applications.	3
05	The student will have the ability to design, implement and interpret experimental work and software projects by analyzing the results.	4
06	The student will have the ability to work between disciplines and teamwork.	2
07	The student will have the ability to work in international environments and adapt to different cultures.	3
08	The student will have verbal and written communication skills in Turkish and English.	2
09	The student will have the awareness of the necessity of lifelong learning and the ability to realize it.	1
10	The student will gain knowledge of legal issues with the awareness of professional and ethical responsibility.	2
11	The student will have managerial skills (leadership, organization, time and risk management, quality awareness, efficiency, etc.).	3
12	The student will have the ability to participate in social activities, to acquire regular sports habits and to use time in the best way.	1
13	The student will have the ability to find unusual ways and produce projects.	4
14	The student will have professional self-confidence, being an entrepreneur and taking initiative.	3
15	It is sensitive about the problems of the age and looks after the national interests.	1

ECTS WORKLOAD			
	Number	Duration (hours)	Number*Duration
Face to face education	14	3	42
Out-of-class study time (pre-study, reinforcement)	0	0	0
Homeworks	1	7	7
Presentation / Seminar preparation	4	1	4
Quizzes	0	0	0
Preparation for midterm exams	1	7	7
midterm exams	2	2	4
Project (Semester assignment)	1	8	8
Lab	0	0	0
field work	0	0	0
Preparation for the final exam	1	15	15
Semester final exam	1	2	2
Research	0	0	0
<b>TOTAL WORKLOAD</b>			<b>89</b>
<b>ECTS</b>			<b>3</b>

Evaluation		
SEMESTER EVALUATION	Number	Contribution Percentage
Midterm	2	20
Quiz	0	0
Homework	1	20
<b>SEMESTER TOTAL</b>		<b>40</b>
Contribution rate of mid-term evaluations to success		40

Contribution rate of the final exam to success		60
<b>GRAND TOTAL</b>		<b>one hundred</b>

<b>resources</b>	
Textbook	Introduction to the Design and Analysis of Algorithms (3rd Edition) by Anany Levitin, 2011 The Algorithm Design Manual(2nd Edition), Steven S Skiena, 2010
Helpful Resources	