

T.C.
ANTALYA AKEV UNIVERSITY
FACULTY OF ENGINEERING ARCHITECTURE
DEPARTMENT OF SOFTWARE ENGINEERING COURSE CONTENTS

FIRST YEAR

FALL SEMESTER

YAZ 101 Physics I

ECTS: 5

It is aimed to teach the basic concepts and laws of mechanics. Upon successful completion of this course, students will be able to: Have knowledge about measurement, unit systems, vectors, linear kinematics, linear dynamics, work, energy, thrust, momentum, rotational kinematics, rotational dynamics and oscillations. Learns the meaning of the basic laws of mechanics and how to apply these laws in solving problems. Develops the ability to think and ask questions about physics. Gains the ability to apply knowledge of physics and mathematics. Reconciles the laws of physics with natural events.

YAZ 103 Math 1

ECTS: 5

Basic math topics, functions and graphs, matrices, equations and their solutions, limit, continuity, differentials. To introduce the basic subjects of analysis, to teach the concepts of limit, derivative, integral and their applications.

YAZ 105 Computer Basics

ECTS: 5

Introduction to information technologies, information age and information society; information systems, getting to know the computer laboratory, computer organization, operating systems, using an operating system system, as well as using peripheral units (Printer, Scanner, Plotter, Digiteser, etc.), computer software, introduction to application software, word processors, and reporting / spreadsheet packages, to have the ability to use computer and information technology, which is necessary in professional life, with computer field terms, office software, internet and technologies used today. To equip students with the knowledge of information technology (IT) skills as a life skill and the main concepts of IT, and to gain competence in the use of personal computers.

YAZ 107 Introduction to Programming and Algorithm

ECTS: 6

Definition of algorithm, designing algorithms, expressing problems with flowchart, discussing the effectiveness of algorithms, basic algorithms, sorting algorithms, selection algorithms, object definition and use, using graphic algorithms, giving information about graphic algorithms of 2 and 3 dimensional objects and talking about the basics of programming.

YAZ 109 Introduction to Software Engineering

ECTS: 3

The aim of this course is to introduce computer software and its types, basic concepts of software engineering discipline, various software process models, progressive software development approach, activities, tools and techniques used, software project, configuration and quality management. Students who successfully complete this course; Ability to understand computer software, its varieties and basic concepts of the Software Engineering discipline, to define and compare various software process models, to understand software development stages, to

understand the fundamentals of software project, configuration and quality management, and to learn and use the tools and techniques used in the various activities of the software development phased approach they can be.

ATA 101 Ataturk's Principles and History of Revolution I

ECTS: 2

The students' knowledge about the establishment process of the Republic of Turkey as a result of the National Struggle under the leadership of Mustafa Kemal Atatürk and the reform movements carried out within the framework of the search for a solution in the Ottoman Empire, which began to collapse in the face of political, economic, social and military problems, and the political events during the transition from the Empire to the National State, were based on scientific foundations.

TUR 101 Turkish Language I

ECTS: 2

Understanding the structure of Turkish and basic grammar features, understanding the texts read properly, expanding the students' vocabulary. History and basic rules of Turkish, reading exemplary literary and scientific texts.

ING 101 English I

ECTS: 2

This course aims to develop students' basic knowledge of English. It is a basic course of learning English and its main purpose is to teach students to use your vocabulary and language rules in a practical way based on four skills. This course is more based on reading, comprehension, speaking and writing including basic English.

SPRING SEMESTER

YAZ 102 Software Requirement Engineering

ECTS: 5

The aim of this course is to cover the most up-to-date processes, methods and techniques in software requirements engineering. It also provides the detailed knowledge and skills necessary to define high quality software requirements, which are vital in software development projects. Students who successfully complete this course; They will be skilled at understanding the basics of requirements development, understanding the basics of requirements management, documenting requirements, and using the methodology, methods and tools for the software requirements identification report.

YAZ 104 Data Structures and Algorithms

ECTS: 5

The aim of this course is to teach students the concept of Abstract Data Structures (CVR), which is the basis for the design and analysis of computer algorithms. This course covers basic CDMs and presents some data structures and algorithms that enable these structures to be implemented in practice. In the course, the running times of algorithms are analyzed asymptotically and algorithm efficiency is emphasized.

YAZ 106 Web Designing and Programming

ECTS: 5

The aim of this course is to provide students with comprehensive knowledge and competencies about the basics of web design and web-based programming. Successful completion of this course students; will be able to have general information about the Internet and web architecture. Students will be able to master the basic principles and rules of web design. Students can create and publish Web pages using HTML5, CSS and client-Sided-Script language (JavaScript).

YAZ 108 Linear Algebra

ECTS: 4

Vectors in R^n and C^n , Space Vectors, Matrix Algebra, Systems of Linear Equations, Gaussian Elimination Method, Vector Spaces, Base and Size, Rank of a Matrix, Linear Transformations, Matrix Representation of a Linear Operator, Base Change, Permutations, Determinants, Minors and Cofactors, Cramer's Rule, Inverse Matrix Finding, Diagonalization: Eigenvalues and eigenvectors, Canonical Forms.

ATA 102 Ataturk's Principles and History of Revolution II**ECTS: 2**

The conditions under which the Turkish Republic was founded, Atatürk's great statesman, revolutionary personality and leadership, Atatürk's Principles and Revolutions carried out to raise the Turkish society to the level of contemporary nations, the political, social, economic and to enable them to obtain information about cultural developments and domestic and foreign political events. To contribute to their understanding of the Age they live in and the world they live in.

TUR 102 Turkish Language II**ECTS: 2**

It is aimed to give information about the general features of sentence structures in Turkish, based on the natural functioning of the language, to the students studying at the associate and undergraduate level, and to improve the comprehension and expression skills of the students through written and oral expression practices.

ING 102 English II**ECTS: 2**

English II course is a continuation of English I education and is a compulsory course at A1-A2 (beginner-upper) level. In this course, in addition to the parts of the three language skills (reading, writing, listening), it is aimed that the students will have basic level English communication skills with the language structures that people can use in life. It is maintained that they form a basic language proficiency by understanding the basic language structures, expressions and words used in the interiors. In addition, it is aimed to limit the elements of critical thinking and communication at a simple level.

SECOND YEAR**FALL SEMESTER****YAZ 201 English Reading and Writing****ECTS: 4**

The aim of this course is to contribute to the students' acquisition of reading and writing skills that will contribute to their transition from General English to English for Academic Purposes.

YAZ 203 Differential Equations**ECTS: 4**

First-order ordinary differential equations (homogeneous and inhomogeneous cases, direct integration, integral factors, substitution). Second order ordinary differential equations (change of parameters, order reduction). Laplace transforms and their applications. Power series solutions of second order linear differential equations, Frobenius method.

YAZ 205 Database Management Systems**ECTS: 5**

Basic concepts, entity-relationship model, keys, tabulation of entity-relationship model, relational data model, relational database design, normalization, relational algebra, sql structural query language, use of sql functions, analyzing data by grouping, multiple tables, combining tables, complex queries, dml (data manipulation language), database objects, tables, user access control.

YAZ 207 Object Oriented Programming**ECTS: 4**

Introduction to programming and problem solving using the object-oriented paradigm. Classes, objects, fields, methods, constructor methods, inheritance, abstract classes, interfaces, polymorphism, exception handling, file operations and I/O streams, generics, multi-threads, design patterns.

YAZ 209 Operating Systems**ECTS: 4**

Giving general information about Operating Systems, explaining the mechanism of operation and its relations with

architecture.

FALL SEMESTER ELECTIVE COURSES

YAZ 211 Operating Systems Security

ECTS: 4

Providing an overview of information security in an organizational context, this multidisciplinary core course enables students to develop a solid foundation for understanding the field of Cyber Security in general and in essence. The course examines the nature of enterprise security requirements and identifies threats to information technology systems, access control, and open systems. Security topics to be discussed include network security, cryptography, Information technology (IT) issues, database security, risk management, and policy issues represented by government/state guidance and regulations to support information privacy, integrity and availability. The course also addresses the social and legal issues of individual privacy in an information processing environment.

YAZ 213 Information Ethics

ECTS: 4

Enabling students to use information technologies by complying with the applicable ethical rules on the internet and other digital platforms, Developing a responsible understanding to use informatics for the good and welfare of society. Basic information about ethical rules, the importance of moral values in informatics, responsible software development, freedom of expression on the internet and similar environments, crimes in the network environment and professional ethics.

YAZ 215 Computer Graphics and Animation

ECTS: 4

The main purpose of the department; To train qualified designers for animation, game and design sectors. In the computer aided design and animation department; visual effects, mobile and computer game applications, animation, design and graphic making are taught. The general part of the department is based on practical training and, as the name of the department suggests, computer use is at the forefront.

YAZ 217 Computer Network

ECTS: 4

Use of computer networks, Network hardware and software, Reference models, Example networks, Network standards, Physical Layer, Data Link layer design, Error detection and correction, Data link protocols, examples, MAC sublayer, protocols, Ethernet protocol and standards, Wireless LAN, Broadband wireless networks, Bluetooth, Switching systems, bridges. Local network design, Network layer design, Routing algorithms, Congestion control algorithms, Quality of Service, IP v4, IPV6, IP protocols, Transport layer, services, elements of protocols, Internet transport Protocols, UDP, TCP, Multimedia Networks, Network Security.

SPRING SEMESTER

YAZ 202 Professional English

ECTS: 3

In this course, it is aimed to provide the student with basic professional concepts and definitions and basic professional grammar competencies.

YAZ 204 Outlier Math

ECTS: 4

Propositional Logic, Predicates and Quantifiers, Techniques of Proofs, Set Theory, Induction and Recursion, The Basics of Countings, The Pigeonhole Principle, Permutations and Combinations, Recurrence Relations, Inclusion-Exclusion and its Applications, Relations: Equivalence Relations, Partial Orders, Total Orders, Zorn's Lemma, Axiom of Choice and its Equivalences, Graphs.

YBS 206 Possibility and Statistics**ECTS:5**

Introduction to statistics, basic concepts, series, measures of central tendency, measures of dispersion, set theory, operations on sets, permutation and combination, probability of an event occurring, some probability theorems, conditional probability, total probability, bayes' theorem, distribution of random variables, discrete probability distributions, continuous probability distributions, sampling, regression and correlation analysis, contingency coefficient.

YAZ 208 Microprocessors**ECTS: 5**

Introduction to microcontrollers 2. Microcontrollers and their application areas 3. Execution of commands 4. Microcontroller general hardware features 5. Comparison of microcontroller families 6. Instruction set and program examples 7. LCD programming 8. Interrupts and interrupt-based clock application 9. Temperature control application 10 Serial communication and PC and LCD application 11. Microprocessor networks and protocols 12. ADC and PWM application 13. Loading executable code into the program memory 14. Examining the presentations and studies of the course projects.

YAZ 210 Advanced Web Applications**ECTS: 5**

The aim of the Advanced Web Application course is to prepare web applications and dynamic web sites that can be updated in line with today's needs.

SPRING SEMESTER ELECTIVE COURSES**YAZ 212 Cryptography and Network Security****ECTS: 4**

Introduction to Information and Computer Security: Information, Information Systems Security, Information Security Elements, Information Security Development and Security Classification; Enterprise Information Security: Access Control Systems and Methods, Security Architectures and Models, Authentication and authorization techniques, Access Control Methods, Threats and Protection Methods; Network and Communication Security: Network Security Technologies.

YAZ 214 Multimedia Software Development**ECTS: 4**

They are different software that provide content production for xAPI compatible systems. They enable to prepare multimedia content for different applications such as various tests, surveys, lectures and simulations.

YAZ 216 Linux Tools and Shell Programming**ECTS: 4**

This course is given as an undergraduate course in Computer Science about UNIX/Linux shell programming tools. The course gives an overview of the UNIX operating system and introduces the tools available to users and programmers.

YAZ 218 Wireless Communication**ECTS: 4**

The aim of this course is to teach students the basic concepts of modelling, analysis and performance measurement of wireless communication systems and to show their use in engineering problems.

THIRD YEAR**FALL SEMESTER****YAZ 301 Software Design and Architecture****ECTS: 5**

The aim of this course is to introduce software architecture in terms of its concept, principles and techniques. In

addition, this course aims to teach the student how to describe the architecture of a software using various techniques and what kind of operations can be performed on it. With this course, the student will be able to apply the knowledge he has learned on a project and will be able to define the architecture of sufficiently large and complex systems and gain experience in performing various operations on it. Finally, this course will also provide the student with the opportunity to do research.

YAZ 303 Formal Languages and Automata

ECTS: 4

Nondeterministik finite automata, NFA, chessboard, DFA, regular expressions, infiniteness problem, pumping lemma tekniği, parse trees, sample gfg, ambiguous grammer, push down automata, language of PDA, deterministic PDA's enumerations, turing machines, transition functions, languages of TM.

YAZ 305 System Programming

ECTS: 4

Number systems, basic computer architecture, programming in assembler language, converters, relocation, associatives, loaders, macro handlers, text editors, debugging programs, canonical specification of programming languages, interpreters, introduction to operating systems, Linux shell programming, term project.

YAZ 307 Numerical Analysis

ECTS: 5

Computer arithmetic, sources of error, propagation of error, simulating functions and interpolation, solving systems of linear equations, finding the roots of nonlinear equations, numerical integration, differentiation and ordinary differential equations.

YAZ 309 Human Computer Interaction

ECTS: 4

Nature of Human-Computer Interaction, Characteristics and Developing Practices Related to the Field, Effective Factors and Standards in Human-Computer Interaction, Communication Process and Information Process Models, Information Operation Models and Human Brain User-Oriented Design Criteria and Human Perception, Student Presentations, Sample Practices.

FALL SEMESTER ELECTİVE COURSES

YAZ 311 Distributed Database Systems

ECTS: 4

The aim of this course is to explain the principles of database systems such as data modeling, relational database design, query languages, transaction processing, distributed databases and physical database design.

YAZ 313 Computational Geometry

ECTS: 4

The aim of this course is to provide practical skills to students who want to have a deeper knowledge of computational geometry dynamics tools.

YAZ 315 Algorithm Analysis and Design

ECTS: 4

Algorithm activity. Analysis of computer algorithms. Classification, search, paging and parallelization. Analysis of mathematical algorithms. Analysis of games and puzzles, network algorithms and probability algorithms. Divide and conquer and transform and conquer approaches. Basic graph structures, functions and algorithms. Random algorithms and their analysis. Dynamic programming algorithms.

YAZ 317 Auto Learning Special Topics

ECTS: 4

The aim of this course is to provide practical skills to students who want to have a deeper knowledge of Auto Learning Special Topics.

SPRING SEMESTER

YAZ 302 Artificial Intelligence

ECTS: 5

Basic concepts and methods of artificial intelligence, problem solving using artificial intelligence; search methods using and not using problem information, local search methods and simulated annealing algorithm, meta-heuristic algorithms, introduction to artificial neural networks, game problems, prolog programming language, information representation and logical inference.

YAZ 304 Software Testing and Validation

ECTS: 4

Difference between validation and validation, V&V planning, code audit, code review, automated validation, testing techniques, tools, documentation.

YAZ 306 Occupational Health and Safety

ECTS: 4

This course covers occupational health and safety and occupational health and safety culture, national occupational health and safety system, occupational health and safety approach and legislation, occupational health and safety services to be provided by the employer, the concept and costs of work accident and occupational disease, occupational health and safety. It will provide an overview of issues such as risk factors in safety, individual and organizational factors, records to be kept in occupational health and safety, occupational health and safety in electrical works.

YAZ 308 Server Software Technologies

ECTS: 4

The aim of this course is to enable students to have information about the basic technologies offered by the J2EE platform in the direction of web applications development and to gain the ability to develop effective and flexible web-based applications with these technologies.

YAZ 310 Internship

ECTS: 5

Our aim is to prepare the knowledge, skills, behaviors and habits of working together in practice in the business environment, and to train the qualified manpower needed by the business world.

SPRING SEMESTER ELECTIVE COURSES

YAZ 312 Technology and Innovation Management

ECTS: 4

Technology and technology management concept, approaches to technology management, technology management process. Innovation means innovation, commercialization of ideas and intellectual property rights.

YAZ 314 Computer Architecture and Organization

ECTS: 4

Topics of this course are MIPS instruction architecture and assembly programming, computer performance analysis, computer arithmetic and ALU design, introduction to pipelined architecture, hazards and solutions in pipeline architecture, parallelism, caches.

YAZ 316 Programming for Bioinformatics

ECTS:4

This course is an introduction to bioinformatics. Computational methods used to extract information from large-scale experimental methods such as genome sequencing and microarray technology will be introduced. The main emphasis of the course is to provide an overview of the field and to identify solutions to the fundamental problems of bioinformatics such as DNA and protein sequence alignment, structural protein alignment, protein/RNA structure prediction, phylogenetic tree building, microarray data analysis, and analysis of gene/protein networks.

YAZ 318 Introduction to Cloud Computing**ECTS: 4**

The aim of lesson; to explain the foundations of cloud computing technologies within the framework of business and technology perspectives. It introduces the concepts and components required for setting up a cloud computing environment.

FOURTH YEAR**FALL SEMESTER****YAZ 401 Design Project****ECTS: 5**

The main subject of this course is the design process and what kind of ways it will follow at different stages of this process. This course covers operating system objectives: resource management and extended virtual computing; historical development. Processes: critical sections and mutual exclusion, semaphores, monitors, classical problems, deadlock; process scheduling. Input and Output: hardware and software control. Memory management: multiprogramming; swap; virtual memory, paging and symbolic partitioning; File System: processes, application, performance.

YAZ 403 Software Quality Assurance**ECTS: 5**

The main purpose of this course is to provide students with a basic knowledge of software quality assurance. With the help of this course, students will have basic knowledge about the concept of quality, quality planning, risk analysis and analysis. This course also aims to teach software quality standards, software testing techniques, strategies and metrics.

YAZ 405 Software Development Stand. and Project Management**ECTS: 6**

This course covers enterprise systems, software applications that automate and integrate many of an organization's core business processes; Current development practices for such a system will be addressed through the development of relevant skills to apply them to real-world problems; Topics include development lifecycle for large-scale software systems, software architecture and development process, system context and domain analysis, component design and modelling, process design, data, process, subsystem, distribution design, architectural techniques to respond to business needs.

YAZ 407 Mobil Programming**ECTS: 6**

With this course, students will learn the infrastructure and logic of mobile programming, and gain the ability to develop mobile programming.

FALL SEMESTER ELECTIVE COURSES**YAZ 409 Distributed Systems and Parallel Computing****ECTS: 4**

Topics of this course, Structure of distributed systems: examples, resource sharing, challenges, system model: architectural models, networks and connections: network types, network principles, interprocess communication: internet protocol and usage, external data representation, client-server communication, group internal communication.

YAZ 411 Deep Neural Networks**ECTS: 4**

This course provides an advanced knowledge of the structures and algorithms of advanced deep neural networks. Along with the theoretical properties of deep neural networks structures and algorithms, the practical applications

arising from this theory will also be examined.

YAZ 413 Computer Vision

ECTS: 4

The aim of the course is to teach low and medium level image processing techniques and their applications.

YAZ 415 Introduction to Artificial Neural Networks

ECTS: 4

Flexible and high-performance methods have been developed, one of which is artificial neural networks, to facilitate the solution of difficult problems thanks to this method, and to show alternative scientific approach ideas with concepts such as Neural Fuzzy Logic Networks, Fuzzy rules and membership functions.

YAZ 402 Graduation Project

ECTS: 4

It is about the student's preparation of the project.

YAZ 404 Workplace Application

ECTS: 26

Our aim is to prepare the knowledge, skills, behaviors and habits of working together in practice in the business environment, and to train the qualified manpower needed by the business world.

