ABM105 Algorithm and Programming (3 2 4)

Problem-solving. Input-Process-Output cycle. Algorithm design. Certainty, finiteness, effectiveness, input-output in algorithms. Constants, variables, and expressions. Arithmetic, relational, and logical operators. Input-output statements. Conditional and loop statements. Vector and matrix representations. Character data processing. Subroutines and function subprograms. Recursion. Applications in a structured programming language. Introduction to Object-Oriented Programming and introduction to a suitable programming environment. Basic concepts in this language (expressions, data types, variables, control structures, arrays, etc.). Divide and Conquer Method. Modular software development (methods and classes). Class variables and local variables. Form elements. Introduction to Event-Driven Programming. Dynamic arrays. Linked lists. Search and sorting algorithms. File processing. Selection of appropriate structures in algorithms. Development of efficient algorithms.

ABM107 Fundamentals of Digital Forensic Engineering (2 1 3)

Introduction to cybercrimes, forensic informatics technologies, data recovery from disk and file systems, evidence collection, ownership verification, data validation, preservation and protection, identification and authentication, analysis of Windows, Linux, and Mac-OS architectures, file structure analysis, network analysis, autonomous system analysis, forensic informatics methodology, algorithms, protocols, and tools, current developments in forensic informatics.

ABM109 Fundamental Law (2 0 2)

The definition of law, the importance and principles of law in social life, its rules, and other social order norms regulating social life; the branches of law and the fields included within these branches; types of legal rules, their application, and interpretation; topics related to the Turkish judicial system; Turkish positive law and its challenges; the application of law from various perspectives; rights, ownership of rights, and the beginning and end of legal personality; rights and legal capacities of natural persons, personality rights and their protection methods, liability, and the enforcement of liability are among the main topics covered.

FIZ 121 Physics I (4 0 4)

Measurement knowledge, vectors, motion along a line, motion in two or three dimensions, Newton's laws of motion, applications of Newton's laws, work and kinetic energy, conservation of energy and potential energy, multi-particle systems and center of mass, linear momentum and collisions, rotational motion, rolling motion and angular momentum, the law of universal gravitation, static equilibrium and elasticity, vibrational motion and waves, harmonics, applications.

FIZ 125 Physics Laboratory-I (0 2 1)

The aim is to enable students to gain knowledge and skills in measurement techniques through mechanical experiments, processing of experimental data, and principles and skills of error analysis.

MAT 161 Mathematics I (4 0 4)

Numbers; Complex numbers, functions (definition, types, and specially defined functions); trigonometry, hyperbolic functions, limits; continuity; derivatives; maximum and minimum problems; graph plotting; coordinate systems; function differentials; integral calculus; methods for indefinite integrals; definite integrals; area and volume calculations, area between curves, arc length, center of mass, and moment of inertia; matrices and their types; rank operations in matrices; determinants; systems of linear equations; Cramer's theorem.

TRD 109 Turkish Language I

Definition of language; the role and importance of language as a social institution in national life; relationship between language and culture; the position of Turkish among world languages; historical evolution and stages of Turkish; current status and areas of use; phonetics and classification of sounds in Turkish; rules of Turkish phonology; syllable structure, spelling rules, punctuation marks, and their applications.

YDI 107 English I (2 0 2)

Reading strategies, Discussion Essay organization, Studies on daily language use, Texts on current issues, Vocabulary development exercises

ABM106 Programming Languages (3 2 4)

Fundamental concepts of Programming languages and basic programming paradigms, exemplification of introduced concepts, structures provided by various programming languages such as Pascal, C, C++, and Java.

ABM108 Computer Systems (3 2 4)

Software: System software, utility software, application software, compiler software, special-purpose commercial software, performance factors. Peripheral devices: Printers, plotters, cameras, scanners, keyboards and mice, displays, graphics card drivers, multimedia devices, storage units, network components, portable drives, plug-and-play elements, performance factors. Computer system design: Needs analysis, assembling optimal hardware, determining system specifications, performance factors. Laboratory: Safe working in the lab, system installation, system configuration, system testing, software maintenance, hardware maintenance, and file management.

FIZ 122 Physics II (3 0 3)

Electricity and Magnetism

FIZ126 Physics Laboratory – II (0 2 1)

Length measurements, error analysis, motion in one and two dimensions, oscillatory motion, collisions, conservation laws.

MAT104 Linear Algebra (2 0 2)

Teaching the solution methods of linear and nonlinear equations used in engineering applications.

MAT162 Mathematics II (4 0 4)

Definition and types of functions, absolute value functions, floor functions, trigonometric functions, sign functions and their graphs, exponential and logarithmic functions and their applications, sequences, continuity and limits, derivatives, differential and approximate calculation applications, integrals.

TRD 110 Turkish Language II (2 0 2)

Composition knowledge, literary genres, scientific research and writing methods, spelling rules, punctuation marks, sentence elements, sentence analysis and application, studies on expression and sentence errors.

YDI 108 English II (2 0 2)

Simple Past Tense, Auxiliary Verbs (Be, Do), Must, Have to, Has to, Going to From, Adverbs of Time, Regular and Irregular Verbs, Possessive Pronouns

ABM209 Computer Networks (3 1 4)

Fundamentals of digital communication, digital encodings. Computer network concepts, OSI model and explanations of layers, definitions of Segment, Packet, Frame. Inter-layer communication, error detection methods, network topologies, addressing and conversion. Functions and definitions of network devices, routing algorithms. LAN technologies and basic features, structured cabling. WAN technologies, TCP/IP model and basic features of protocol suite. TCP/IP and the Internet, an overview of network operating systems. Basic information related to network security.

ABM211 Digital Forensic Laws (3 0 3)

Introduction to computer crimes, electronic evidence, searching for information in electronic environments, the authorization process for electronic evidence, issues in the search process, search warrants and passwords, wireless phone tracking, seizing electronic evidence, network problems and undefined problems (outside the box), legal protections (written documents, wiretap laws, electronic surveillance, communication laws, obscenity and child pornography: distribution, possession, and monitoring; search and seizure; halting publication; sexual messaging, internet child exploitation, falsified addresses and property crimes in computing, computer fraud and abuse laws, international and national legal regulations in digital forensics, intellectual property crimes, malware and unsolicited emails, identity crimes and threats, internet harassment and defamation, special criminal law topics in cybercrimes, prominent internet security events (the Conficker worm, Stuxnet and Flame, the NSA's TSP).

ABM213 Data Structures (3 2 4)

Problem-solving and algorithm development: the determinism, finiteness, and effectiveness of algorithms, input/output and analysis. Data structures and models: algorithms and sparks: data, variables, assignments, arithmetic, boolean, character type statements. List, tree, and graph data models. Algorithmic program design and flowcharts: terms, conditional terms, input/output terms, iterative terms. Pseudocode, actual code, flowcharts. Operations: arithmetic and logical operations and their priorities. Elements of programming style: representations of vectors, matrices, and arrays. Program runtime and memory requirements: execution time, time complexity, space cost and complexity, algorithm analysis, complexity, memory requirements, asymptotic notations. Sorting algorithms (shell sort, bubble sort, heap sort, quick sort, merge sort, selection sort, insertion sort). Searching algorithms (linear search, binary search, binary tree search). Linked lists: singly and doubly linked lists and their applications. Stack and Queue Structures: Stack and queue design, stack and queue design with arrays and linked lists. Tree structures: basic tree concepts, memory storage of trees, binary trees, AVL tree structures, B/B+ tree structures, tree design and applications. Graph data model: graph concepts, storage methods of graphs in memory, adjacency matrices and lists, graph traversal, shortest path problem and algorithms, depth-first search algorithm, breadth-first search algorithm.

ABM215 Database Management Systems (3 1 4)

Database processing, fundamentals of relational implementation, query languages, data modeling, normalization, databases and internet technology, managing multi-user databases.

AIT209 Atatürk's Principles and History of the Turkish Revolution I (2 0 2)

The purpose of studying the course on Turkish Revolution History and Atatürkism, the concept of revolution, the collapse of the Ottoman Empire and the causes leading to the Turkish revolution, the fragmentation of the Ottoman Empire, the Mondros Armistice and subsequent events, the situation of the country in the face of occupations and Mustafa Kemal Pasha's reaction, Mustafa Kemal Pasha's arrival in Samsun and the opening of the last Ottoman Parliament, the opening of the Grand National Assembly of Turkey and its taking control of the War of Independence.

MAT219 Differential Equations (4 0 4)

First-order Ordinary Differential Equations and Engineering Applications, Linear Differential Equations and Engineering Applications, Green's Functions, Introduction to Linear Algebra, Simultaneous Linear Differential Equations, Finite Differences, Mechanical Systems and Electrical Circuits, Fourier Series and Integrals, Laplace Transform. Partial Differential Equations, Derivation of Equations, D'Alembert Solution of the Wave Equation, Separation of Variables Method, Numerical Solution of Partial Differential Equations, Bessel Functions and Legendre Polynomials, Vector Spaces and Linear Transformations, Vector Analysis, Variational Calculus, Complex Variable Analytic Functions.

İŞL451 Entrepreneurship I (2 0 2)

The concepts of entrepreneurship and the entrepreneur, the characteristics of entrepreneurs, the entrepreneurial process, the fundamentals of entrepreneurial thinking, and the functions of entrepreneurs.

ABM206 Professional English (3 0 3)

The ability to read, translate, and understand technical texts written in English in the fields of Electrical-Electronics and related areas.

ABM210 Network and System Security (3 1 4)

Introduction to Network Security and Basic Concepts, Risk Assessment, Security Policy, Classification of Threats, Passwords, Access Permissions, Traditional Methods, Public Key Methods, Authentication, Digital Signatures, Protocols, Security in TCP/IP Protocol and Services, Firewalls, Virtual Private Networks, Intrusion Detection Systems and Solutions.

ABM212 Internet and E-Commerce Security (3 2 4)

Attacks and Defenses over the Internet, Security Principles, Deterrence, HTTP Servers, Incident Management, HTML Forms, SQL Injection, Java Security, Identity and Access Control, Cryptography, Certificates, SSL, Password Management, Communication Security, SSH, Firewall, VPN, Legal Issues, Contracts, Legislation and Regulations, Web Attacks, Vulnerabilities, Application Attacks, Network Security, Web Server Security, Buffer Overflow.

ABM214 Information Security and Cryptography Techniques (3 1 4)

Introduction to Cryptography, Symmetric Encryption Methods, Cryptanalysis of Block Cipher Methods, Hash Functions, Number Theory, Public Key Cryptography (Basic and RSA), Public Key Cryptography (El-Gamal), Elliptic Curve-Based Cryptography, Secret Sharing and Threshold Cryptography, Key Distribution and Management.

ABM218 Mobile Digital Forencis Software (3 2 4)

Examination of the structures of mobile device operating systems, analysis of open-source and commercial software used for forensic investigations on these devices.

AIT210 Atatürk's Principles and History of the Turkish Revolution II (2 0 2)

Abolition of the Caliphate, the Progressive Republican Party and the Takrir-i Sükun period, Education Reform, Cultural Reform, the Alphabet Reform, Turkish History Reform, Turkish Language Reform, the İzmir Economic Congress, transition to multi-party system, reforms in women's rights, the Hat Law, the Clothing and Attire Reform, the foreign policy of the Turkish Republic, Atatürk's principles, political events, relations between the Grand National Assembly of Turkey (GNAT) government and the Istanbul government, military developments, the Treaty of Kars, the Ankara Agreement, the Great Offensive, the Mudanya Armistice, abolition of the Ottoman Sultanate, and the Treaty of Lausanne.

İST218 Probability and Statistics (3 0 3)

Introduction to Probability, Discrete Random Variables, Continuous Random Variables, Two-Dimensional Distributions, Introduction to Estimation, Statistical Hypothesis Testing, Linear Models

İŞL452 Entrepreneurship II (2 0 2)

Concepts of Entrepreneurship and Entrepreneur, Characteristics of an Entrepreneur, The Entrepreneurial Process, Fundamentals of Entrepreneurial Thinking, and the Functions of an Entrepreneur.

ABM311 Introduction to Computer Crimes and Electronic Evidence (3 0 3)

Introduction to computer crimes and fundamental concepts. Legal issues in computer crime investigations and systematic approaches to criminal investigations using scientific methods. File systems, data recovery, internet tracking, electronic evidence collection, and examination procedures and tools.

ABM313 Operating Systems (3 0 3)

Introduction to Operating Systems, Computer System Architecture, Operating System Architecture, Processes, Threads, CPU Scheduling, Process Synchronization, Deadlocks, Memory Management, Virtual Memory, File System Interface, File System Implementation, Input/Output Systems, Storage Devices, Introduction to C Programming, Comparison of Different Operating Systems, System Architectures.

ABM315 Cybercrime Investigation Software (3 2 4)

Data viewing and recovery software, email analysis software, file and data analysis software, Mac-OS software, mobile device software, internet tracking software, log analysis software, application analysis software, IP address tracking software, network monitoring software, chat room tracking software.

ABM317 Cybercrime Investigation Hardware (3 2 4)

Disk data reading tools, disk write protection tools, signal jamming tools, portable RAID disk tools, image duplicators, mobile phone tools, Tableau digital forensics tools, ICS IM Solo 102 Forensic Copier, Faraday bag, Faraday data kit, RAID devices, HD image duplicators, Tarantula analysis tool, Eclipse mobile phone screenshot capture tool.

ABM319 Multimedia Information Systems (3 2 4)

Introduction to multimedia, multidimensional data structures, image databases, video databases, operating system support, system services, user interfaces and devices, multimedia file systems and information models, multimedia files over networks, presentation and ownership verification, multimedia communication systems and applications, knowledge-based multimedia systems, current trends.

ABM302 File System Analysis (3 1 4)

Binary encoding, file formats, categories of computer crimes, network monitoring and analysis, electronic evidence in traditional crimes, file systems (FAT, NTFS, UNIX), analysis of active systems, password-protected files, encrypted files, corporate data security.

ABM304 Identification Methods And Biometry (3 2 4)

Biometric traits, comparison of biometric traits, methods of transferring biometric traits to digital environments, introduction to biometric systems, modes of operation of biometric systems: data identification, recognition, verification, tracking, steps in the development of biometric systems, various algorithms for biometric system development steps, preprocessing of biometric traits, extraction of feature sets for biometric traits, classification of biometric traits, comparison of biometric traits, decision-making mechanisms in biometric systems, accuracy analysis and performance evaluation of biometric systems, multi-modal biometric systems, attacks on biometric systems and ensuring the security of these systems.

ABM306 Web-Based Information Access (3 1 4)

Fundamental concepts, Zipf's laws in text processing, feedback mechanisms, query languages, operations, and structural queries, access models, Boolean model, vector space model, TF-IDF algorithms, text similarity measures, statistical language models, social network analysis, recommendation systems and data filtering, content-based filtering, user feedback, web mining (clustering, classification, sentiment analysis, log file analysis, etc.), cloud computing (MapReduce, NoSQL, Hive, Pig, etc.), next-generation search engines, advanced search, information extraction, information extraction in multiple languages.

ABM308 Labor Law (2 0 2)

Introduction to law, introduction to labor law, general concepts, rights and obligations imposed on the parties, protection of employees, termination of labor law, collective labor agreements.

ABM330 Online Crime Tracking (3 1 4)

Software for online crime tracking, tracking methods, online malicious software detection systems, real-time data analysis, types of cybercrimes.

ABM332 Optimization Techniques (3 1 4)

Introduction and basic concepts / Unconstrained optimization / Analytical solution, numerical methods, and algorithms in unconstrained optimization / Constrained optimization: Optimization under equality constraints, optimization under equality and inequality constraints, optimization under special constraints / Application of algorithms to real-life problems and their solution using computers.

ABM334 Data Compression (3 1 4)

Introduction to data compression and source coding. Block coding. Huffman and arithmetic coding. Word-based coding. Quantization of numbers. Vector quantization. Predictive coding. Transform, sub-band coding, and wavelet-based coding. In-class presentations of compression methods for image, audio, video, and computer graphics.

ABM336 Data Mining (3 1 4)

Expert knowledge extraction process. Data warehousing concepts. Data preprocessing. Data mining functions. Data mining algorithms. Web mining concepts. Web mining applications.

ABM338 Text-Based Information Retrieval Systems (3 1 4)

Fundamental topics in text-based information retrieval systems (information retrieval models, querying and indexing). Advanced topics include internet search engines, text querying, query expansion, query result clustering, classification, and evaluation.

ABM340 Bioinformatics (3 1 4)

Use of computers in molecular biology and accessing biological information via the internet, gene and protein databases, genome databases and access to other databases, sequence alignment, homology searching in gene and protein sequences, phylogenetic analysis, restriction mapping, computer-assisted PCR primer design.

ABM342 Wireless/Mobile Multimedia Networks (3 1 4)

Introduction to IP multimedia services, IMS architecture, SIP (Session Initiation Protocol), content routing, registration, identification, and sharing, application servers, server filtering criteria, and SIP inter-network communication, AAA (Authentication, Authorization, and Accounting), online payment security, content delivery service quality, presentation services and architecture, content synchronization, compatibility, and compatibility methods, content selection and broadcast protocols for point-to-point broadcast services, wireless packet-switched, wireless packet-switched multimedia broadcasting, unicast and multicast services.

ABM344 Security Priority Computer Systems (3 1 4)

Definitions of security priority systems, security integrity levels, hazard analysis, risk analysis, development of security priority systems, hardware and software fault tolerance, redundant operation system security, usability, mean time to repair (MTTR), mean time to failure (MTTF), mean time between failures (MTBF), Markov diagrams, hardware and microprocessor design faults, redundant hardware topologies and examples, complete control of the effectiveness and operational states of each decision.

ABM346 Numerical Methods (3 1 4)

Mathematical modeling and the solution of engineering problems. Programming and software, error analysis. Solution of linear equations, solution of nonlinear equations. Optimization, curve fitting. Numerical differentiation, numerical integration. Solution of ordinary differential equations, solution of partial differential equations. Fourier series.

ABM407 Electronic Evidence Collection and Analysis (3 2 4)

Analysis of system logs, program and operating system installation logs, operating system event logs, system event log analysis, firewall and intrusion detection system logs, online chat analysis, call record analysis, analysis of recorded conversation remnants, connection event log analysis, detection of used online chat accounts, analysis of hidden sectors on hard and external disks, email analysis, analysis of message headers and identification of fake emails, analysis of fake email spam and phishing differentiation, mobile device analysis, Windows registry analysis, determination of the forensic importance of data backups.

ABM409 Software Ethics (2 0 2)

Ethical evaluation principles and models in information technology, research on malicious software, Windows hacking, password hacking, email hacking, web application hacking, website domain hacking, other types of hacking, information crimes in portable computers, VoIP connection hacking, security vulnerability testing, advanced hacking with Metasploit, firewalls, IDS systems, unauthorized access, methods of attack detection (Honeypot), system network security.

ABM413 Human Resources Management (2 0 2)

The development, objectives, and principles of Human Resources Management (HRM); The scope of HRM: Planning human resources, finding and selecting human resources, recruitment and onboarding, performance evaluation, training, development, establishing and applying the disciplinary system, compensation of human resources; Career management; International human resources management; The use of technology in human resources management.

ABM435 Workplace Application (0 15 8)

ABM437 Workplace Training (5 0 5)

To closely introduce workplaces related to the undergraduate programs, reinforce the knowledge and experience gained by students during their studies, develop the ability to apply them in practice, and keep up with technological developments in the industry while gaining practical skills.

ABM439 Professional Practice – I (0 2 1)

Evaluation of the internship report.

ABM441 Professional Practice – II (0 2 1)

Evaluation of the internship report.

ABM443 Speech Recognition and Production (3 1 4)

Fundamental characteristics of sound; Sound signals: Short-Time Fourier Transform (STFT), Linear Predictive Coding (LPC), Cepstrum analysis, Formant and Pitch structures; Encoding of sound signals; Text-to-speech methods: Text preprocessing (text normalization, phonetic analysis, prosodic analysis), Sound generation (concatenative methods, formant-based methods, articulatory methods); Speech-to-text conversion: Acoustic models, Language models, language models customized for Turkish, Lexical models, Decoders.

ABM445 Mobile Software Development (3 1 4)

Features of mobile applications, state machine diagrams, performance and memory management, multiprocessing, XML, graphics and user interface performance, packaging and distribution of mobile applications.

ABM447 Digital Image Processing Techniques (3 1 4)

Fundamentals of digital images, properties of light, color information, human vision system, cameras, computer vision systems, black and white images, color images, color models (RGB, CMY, TIQ), digital images. Sampling and quantization of image signals. Image formats, image enhancement techniques; point processing methods, black and white images, slicing gray tone values, brightness adjustment, contrast enhancement, and computer applications. Image filtering systems. Two-dimensional transformations of images; two-dimensional Fourier transform and the application of fast Fourier transform to images.

ABM449 Decision Support Systems (3 1 4)

Computer support in decision making. Structure and components of decision support systems. Analysis of expert systems. Decision support system software and usage. Applications of decision support systems. Performance analysis of decision support systems.

ABM451 Computer Vision (3 1 4)

Density surfaces and gradients. Linear operators and image smoothing. Edge detection. Corner detection (Harris corner detection algorithm). Contour detection. Image formation. Establishing relationships between multiple images. Parameter estimation and the RANSAC algorithm. Stabilization and creating panoramic images from multiple images. Stereo vision. Extracting 3D structure from motion. Color and lighting. Tracking. Object recognition in images.

ABM453 Human-Computer Interaction (3 1 4)

Psychological principles in human-machine interaction. Evaluation of user interfaces. Usability engineering. Job analysis. User-centered design and early sampling. Conceptual models and metaphors. Logical foundations of software design. Design of menus and command buttons. Voice and natural language input/output. Response time and feedback. Color, object, and sound characteristics. Concepts of international agreement and local adaptation. User interface architectures and application programs. Project and case study reviews.

ABM455 Machine Learning (3 1 4)

Automatic learning paradigms. Learning. The logic of observation results in learning, hypothesis result logic, and abductive forms. Factors related to the learning capability. Connection model. Programming environments for learning programs.

ABM457 Mobile Application Software Development (3 1 4)

Introduction to XCode, iOS, and Objective-C; basic controls; IBActions and IBOutlets; MVC (Model-View-Controller) paradigms; views and view controllers; container view controllers; alerts and action sheets; table views and application lifecycle; multitouch; location-based services; persistent data; network programming; graphics; maps; history of mobile applications; Windows Phone 7; Android operating system.

ABM459 Website Usability (3 1 4)

Learnability, memorability, efficiency, reliability, user satisfaction, controllability, trust, control, ease of use, speed, understandability, usability, user-centered design principles, content and visual organization, website navigation, web design for portable devices, data visualization, color and typography selection, accessibility issues, search, and visualization.

ABM461 Information Security Management (3 1 4)

Data and information security techniques and technologies; a managerial perspective on computer security and risk management; security services; legal and ethical issues; security operations; planning and implementation of security policies; emergency, continuity, and disaster recovery scenarios; software vulnerabilities; firewalls; encryption; and other security application tools.