COMPUTER ENGİNEERİNG FOR STUDENTS WHO START THEIR EDUCATION IN DEPARTMENT AFTER 2020-2021 ACADEMIC YEAR FALL SEMESTER

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Origins and Consequences	KHAS 101	Fall	03+00+00	Compulsory	3	5
Course Objectives:	This course aims to introduce the students with a broad outline on fundamental sciences by focusing on a discussion of groundbreaking discoveries, innovations and inventions in various scientific fields. The course also aims to develop the students' curiosity for scientific fields and their connections, help them understand the consequences of scientific developments and the role science and technology play in shaping today's world.					
Course Contents:	The course explores groundbreaking discoveries / innovations / inventions in astronomy, geoscience, biology, chemistry, physics and technology, and provides the students with a background in science and today's world.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
History of Humankind	KHAS 103	Fall	03+00+00	Compulsory	3	5
Course Objectives:	The main objective of this course is to introduce the students with major concepts in humanities and social sciences as they relate to world civilizations and history. It is expected that the students will become familiar with social scientific theories that utilize and build upon these concepts and understand that concepts and ideas change in time and space, and are institutionally framed. The course also aims to help the students develop their capacities for critical thinking and analysis; learn ways of reading (primary) texts and expressing arguments and ideas verbally, visually, and in writing; and develop intellectual responsibility and respect for others.					
Course Contents:	This course focuses on the content and social context of concepts such as civilization, science, history, time, space, myth, religion, individual, society, family, state, nation, race, gender, culture, globalization, which the students will encounter in their four years of university education. Following a quasi-chronology, the course will enable the students to understand the historical context and intellectual conditions that give rise to certain developments. The overarching theme will be how we understand civilization and the implications of different notions of civilization on how we interpret the world around us and how we organize our everyday practices. The course will cover the period from the beginnings of the world, as depicted in scientific, religious, and mythical origin stories to the times of colonialisms and revolutions up until early twentieth century. Throughout the term the students will read primary or secondary texts and watch documentary and/or feature films dealing with history, family, religion, city, and/or nation, and respond to them utilizing the concepts covered in class.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Universal Values and Ethics	KHAS 105	Fall	03+00+00	Compulsory	3	5
Course Objectives:	This transdisciplinary course is designed to help students reflect critically on the ethical implications of their conceptions of life and of their relationship with other human beings, with the society at large, and with the rest of existence. It aims to encourage them to think freely - to be free of prejudice and misinformed preconceptions; to build self-confidence and become responsible individuals who appreciate the rights of other living beings; and to empower them to become active agents in society's development through civic engagement. The course also aims to equip the students with basic research skills and reinforce their command of English by developing their reading, writing, listening, and speaking skills, and to expand students' academic vocabulary both at the receptive and productive level.					
Course Contents:	The course consists of five modules designed to focus on some of the most pressing issues of our times, i.e. diversity, cit-y-zenship, gender, information technologies, and bioethics, all of which involve ethical dilemmas that are hard to resolve and even hard to recognize most of the time. Rather than equipping the students with normative moral values that would supposedly guide them in such situations, the course emphasizes the ability to evaluate issues with empathy, to think and analyze contextually and relationally, and, most importantly, with the ability to see tones of grey in ethical matters, and to recognize that their personal views and choices may have broader implications that go well beyond their immediate consequences.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Design	KHAS 107	Fall	03+00+00	Compulsory	3	5
Course Objectives:	This course aims to introduce the students to the wide world of design and its change-inducing mindset through a variety of perspectives and examples by forming links with the concepts of creativity, innovation, problem-defining and solving, intellectual sensibility, viable improvement and sustainability. The course presents design in an expanded scope including technical/technological, material, spatial, ecological, political, economic, and global perspectives. It presents a rich variety of works in various scales blurring the boundaries between design, arts, architecture, engineering, science, business and many other fields in which design-thinking can be implemented and can exert large-scale impact and positive change. Seeing students as creative individuals and parts of a creative community, the course also aims to foster team work and acute communication (verbal, written and visual) along with the skills of project management, presentation and storytelling.					
Course Contents:	The course comprises of 4 main modules concentrating on different aspects, stages and implementations of design-thinking in relation to various fields, complemented by a following workshop (studio) session of 5 weeks engaging students to work in interdisciplinary teams and in a design project of their own devising which will also be tutored by a respective mentor. 1. Understanding the nature and power of design-thinking and doing: The module will concentrate on the fundamentals, values and purposes vested in design-thinking in general. Students will be introduced to the impact and place of design in everyday life, culture, history and many contemporary fields – all in relation with the concepts and practices of creative-thinking, innovation, human-centered design and social change. 2. Stories of Design: As a more expanded episode to the previous module, students will be introduced various inspirational cases from various fields (architecture, product / UX design, engineering, business, health, non-profit projects etc.) directly by the stories told by the makers and organizers of these respective examples. 3. Problem-Defining, Field-Research, Analysis and Visualization: The module will be focusing on the initial and vital stages of design-thinking. Students will be introduced to the preliminary preparations and necessary perspectives in setting up a design-project as well as conducting it further. Various tools and modes of research, problem-defining,					

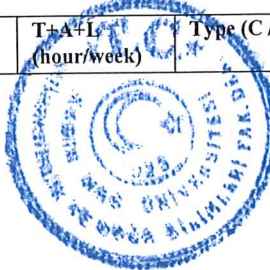analysis, ideation and effective visualization will also be introduced through examples and small assignments.

4. Prototyping, Testing and Iteration:

The final module, expanding on the concepts and stages introduced in the previous one, will be centered on the methods and means of devising the design work through modelling, testing and further iterative development through its finalization. This and the third module will also be following the main stages in design-thinking, and will include small assignments for each phase in a way that corresponds with the following workshop session which will proceed in a similar, stage-by-stage fashion.

PROJECT WORKSHOPS:

In this 5-week phase, students will shape and conduct a design project of their own, working in teams and with the mentorship of a tutor, and will experience the design process in a customized fashion resulting a final work that aims to meet the needs of the end-user or the intended social impact.

a. Defining problem & needs, market / field / user identification and specifying requirements

b. Concept design / Ideation

c. Design Specifics & Development

d. Modelling / Production

e. Testing & Feedback

f. Documentation

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Computational Thinking	KHAS 109	Fall	03+00+00	Compulsory	3	5
Course Objectives:	This course aims to present an applied introduction to algorithmic thinking for complex problem solving tasks. It seeks to build up a wide variety of interdisciplinary problem and conflict-resolution skills and competencies derived from computation, mathematics, logic and design. It introduces a multitude of problem solving skills such as pattern recognition, abstraction, induction-deduction that students will work on in groups, as well as preparing students to use programming interfaces like Python to work with datasets to address popular and exciting riddles and problems. Overall, the course prepares students for the rest of their university life and the problems they may encounter throughout.					
Course Contents:	• Critical Thinking and Logical Reasoning • Deduction and Induction • Computational Thinking and its 4 pillars: Problem Decomposition • Pattern Recognition • Abstraction • Fun with Algorithms • Algorithms and Procedures • Data Collection • Data Analysis • Data Representation / Presentation					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Critical Reading and Writing in Turkish I	TLL 101	Fall	02+00+00	Compulsory	2	3
Course Objectives:	This course aims to develop skills to express themselves orally and in writing in daily life and to comprehend argumentative essays in various forms and analyze them critically. This course encourages students to express their thoughts / arguments individually or as a member of a group in accordance with the manners of discussion. In this course students gain the ability to use relevant materials and resources in conducting academic research and the reflex to apply the rules of academic integrity in written and oral productions.					
Course Contents:	Critical Reading and Writing in Turkish I is designed each week as a 2-hour reading and writing workshop in order to improve students' reading and writing skills in Turkish and to develop their critical thinking and ensure to express their thoughts in a proper, comprehensible and fluent Turkish. In the course, students are encouraged to express themselves individually or in a group work, verbally and in written form in daily life, to read and understand critically argumentative essays, to be able to produce arguments and conduct academic research on a particular subject using relevant sources. The course is also designed to raise awareness in terms of academic integrity among the students.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Computer Programming I	CME 140	Fall	02+02+00	Compulsory	3	6
Course Objectives:	This is a good course for those with little or no programming experience. Students develop skills to program and use computational techniques to solve problems. Topics include the notion of computation, simple algorithms and data structures, using an editor, program design, implementation with Python, testing and debugging, and algorithmic complexity.					
Course Contents:	Software, hardware, problem solving (algorithms and pseudocode), Python programming language, input and output operations, variables, arithmetic and data types, conditional statements, loops, scoping, collections, introduction to functions and recursion.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Civic Responsibility Project	KHAS 110	Spring	00+02+00	Compulsory	1	2
Course Objectives:	This course introduces students to the concept of social responsibility with theoretical knowledge and universal values. It aims to transform this information into active citizenship skills through civic engagement activities.					
Course Contents:	This course introduces civic engagement and active citizenship concepts within the framework of social responsibility. The course presents basic knowledge and understanding in the field of social responsibility theoretically. Additionally, the course also allows the students to design and implement a project to develop their skills of realizing problems of the society they live in and developing solutions for these problems.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS

Nafia Nur Başürün
MDBF Sekreteri

Mehmet Emre Özdoğan
MDBF Sekreteri

Thinking Mathematically	KHAS 112	Spring	03+00+00	Compulsory	4	6

Course Objectives:	The goal of this course is to cover basic concepts of mathematics that will be of use to the students of any background using a modular teaching model. Students will be able to identify solution strategies for real-life problems and comprehend the need for mathematical tools. Mathematical concepts will be discovered/thought through experiments hence the student will be able to observe the need for mathematics.
Course Contents:	-Joy of Numbers (Introduction Module) -Uncertainty in Life (Module 1) -Finding Trends in Everyday Life (Module 2) -Rate of Change (Module 3) -Areas and Volumes (Module 4) -Abstract Thinking (Module 5)

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Critical Reading and Writing in Turkish II	TLL 102	Spring	02+00+00	Compulsory	2	3

Course Objectives:	The course aims to define the elements of fiction (novel and short story) such as character, plot, point of view, description, time, space etc. and to interpret and criticize Turkish novels and short stories in an analytical way. Additionally, the course enable students to write critical articles on fiction using secondary sources and to develop their skills on storytelling/depiction/editing with short creative writing studies. The course also aims to explore the various relationships of novel and short story with different genres through concepts such as intertextuality, adaptation and rewriting.
Course Contents:	The content of the course is based on the genres, novel and short stories. Focusing on the concept of "fiction" through novels and short stories in modern Turkish literature, students will be able to interpret and criticize novels and stories in an analytical way and produce their own critical points of view. In addition, the relationship between novels and short stories with other texts and genres is discussed through concepts such as intertextuality, adaptation and rewriting. Besides, in-class activities are designed in order to encourage the creative writing skills of students.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Discrete Computational Structures	CME 201	Fall	03+00+00	Compulsory	3	6

Course Objectives:	The main objective of this course is to provide the students with a knowledge on theoretical foundations of problem solving and experience in working with discrete computational structures common in computrer science and computational problems.
Course Contents:	Introduction to the main concepts of discrete computational structures. Overview of formal tools for mathematical reasoning and proof construction. A thorough discussion of mathematical induction as a proof technique and how it relates to problem solving, algorithm design and program verification. An introduction to combinatorial analysis and its application on discrete structures including sets, permutations, graphs, and trees.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Computer Programming II	CME 241	Fall	02+00+02	Compulsory	3	5

Course Objectives:	Develop computer code with functions, analyze algorithms or computer code for correctness, use parameter passing methods, use pointers and strings effectively, know the relationship between pointers and arrays, analyze user-defined types (classes), develop computer code with classes.
Course Contents:	Functions, recursive functions, void functions, arguments by value, default arguments to a function, function overloading, arrays, 2-D arrays, pointers, arguments by reference, accessing arrays with pointers, passing arrays to functions, strings, accessing strings with pointers, classes, dynamic memory management, operatör overloading.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Fundamentals of Electronic Circuits	CME 263	Fall	03+00+02	Compulsory	4	6

Course Objectives:	To teach the students fundamentals of circuit theory and, the analysis and design of simple electronic circuits employing semiconductor components, building and operating the such circuits in the laboratory
Course Contents:	Basic passive and active circuit components, analysis, design, simulations and realization of simple circuits

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Digital Design	EE 205	Fall	03+00+00	Compulsory	3	5

Course Objectives:	This course aims to introduce the Boolean algebra and, basic analysis and synthesis techniques for logic circuits. Both combinational and sequential circuits are covered. However, the emphasis is on combinational circuits.
Course Contents:	Boolean Algebra; logic networks and their simplification; logic design techniques with gates and MSI chips; combinational circuits; basic sequential circuits.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
History of Modern Turkey I	HST 101	Fall	02+00+00	Compulsory	2	2

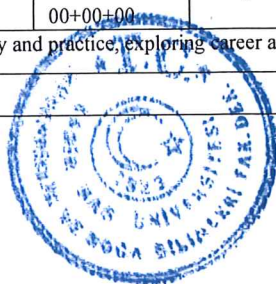| Course Objectives:	The main objective of this course is to introduce students major themes and events in the history of modern Turkey with a focus on the modernization process during the Ottoman era. Students will become familiar with the major issues in the modernization process of Turkey through a variety of sources, including archival, visual and fictional ones. It is expected that students will be able to develop critical thinking and historical perspective to analyze current social, political and economic developments.

Course Contents:	This course explores the modernization process in the Ottoman Empire and how those transformations were reflected in the making of modern Turkey. Although there is a chronological frame, the course is organized as modules focusing on certain themes. Throughout six modules, modernization of the state apparatus, integration to the global economy, transformation of the cities, modern forms of art and changes in social life will be discussed. Students will become familiar with the political reforms of the late Ottoman period, Ottoman political and intellectual figures of the modern era, changes in social structure with the process of modernization, demographic structure of the cities, urban planning, cultural life and lastly wars which triggered change in various areas. These topics will be covered through the primary and secondary sources.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Engineering Mathematics I	MA 211	Fall	03+02+00	Compulsory	4	6
Course Objectives:	The aim of this course is to provide mathematical background (derivatives, integrals, linear systems of equations, linear differential equations) necessary for engineering applications.					
Course Contents:	• Engineering applications of differentiation and integration • First order ordinary differential equations and their applications • Linear systems of equations • Higher order ordinary differential equations					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Data Structures and Algorithms	CME 242	Spring	03+00+02	Compulsory	4	6
Course Objectives:	The main objective of this course is to provide the students with a knowledge on foundations of problem solving and experience in the design and implementation of discrete data structures commonly employed in computer science and computational problems.					
Course Contents:	Introduction to the main concepts of data structures and algorithms. Overview of analysis tools and asymptotic notation. Discussion of recursion and its application to problem solving in computer science. Design and implementation of important abstract data types such as linked lists, doubly linked lists, stacks, queues, priority queues. Discussion of efficient sorting, searching and search tree structures.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Computer Organization and Architecture	CME 244	Spring	03+00+00	Compulsory	3	6
Course Objectives:	1. To establish a solid background in computer design and evaluation. 2. To teach the students how to design the assembly language instruction set for a computer. 3. To teach the fundamentals of a computers datapath, memory organization, controller, and input-output structure such that the students can then actually design these functional units.					
Course Contents:	This course provides the basic knowledge necessary to understand the hardware operation of computers. Main topics are, ?introduction to various digital components used in the organization and design of computers, ?design of an elementary basic computer, ?introduction to the concept of microprogramming, ?introduction to the algorithmic state machine (ASM) chart as a representation for sequencing and controlling operations.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
History of Modern Turkey II	HST 102	Spring	02+00+00	Compulsory	2	2
Course Objectives:	The main objective of this course is to introduce the students major themes and events in the history of modern Turkey. Students will learn about different perspectives about the major issues of Turkey through a variety of sources, including archival, visual, and fictional ones. The course aims to help students in situating Turkey in a global context besides realizing the pluralistic nature of the history of Turkey. In the end, the course is intended to make students informed and questioning citizens.					
Course Contents:	This course explores the history of modern Turkey from the early Republican period until today in its political, social, economic, and cultural aspects. Following a module-based structure based on specific themes, the course centers on the ruptures and continuities in general trends and processes of the history of Turkey. Throughout six modules, the shifts from empire to Republic, a single-party system to a multi-party system, the Cold War to the new global world will be discussed in relation to various social and economic aspects including rural to urban migration, social movements, neoliberalism, political Islam and identity politics. In this regard, the class is planned on three principles: First, it places Turkey in a global context hence emphasizes connections as well as disconnections. Second, it evaluates both the transformations at the state level and how 'ordinary' people are influenced by those transformations. Third, besides secondary guiding sources, primary sources are used to help students relate in a personal way to the past and promote a deeper understanding of history instead of a series of events.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Engineering Mathematics II	MA 212	Spring	03+02+00	Compulsory	4	6
Course Objectives:	The aim of this course is to provide mathematical background on functions of many variables (partial derivatives, gradient fields, optimization; divergence, curl; volume and surface integrals, special topics on differential equations) necessary for engineering applications.					
Course Contents:	• Functions of many variables, partial derivatives, optimization • Gradient, divergence and curl and their applications • Surface and volume integrals and their applicaitons • Advanced topics in differential equations					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Internship I	MDBF 299	Fall	00+00+00	Compulsory	0	6
Course Objectives:	Building work experience., integrating theory and practice, exploring career alternatives .					
Course Contents:						

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Operating Systems	CME 341	Fall	02+00+02	Compulsory	3	6

Course Objectives:	Operating Systems, History of operating systems, Process Concept: States & process control blocks, OS Kernel, Concurrent Processes, Mutual exclusion, Process Synchronization, Semaphores, Memory Management & Scheduling, Multiprogramming, Virtual Memory, Paging & Segmentation, On demand paging & segmentation, Operations on Moving Head Disks, Disk Scheduling Policies, File System Functions, Blocking and Buffering, File Organization.
Course Contents:	Operating Systems, History of operating systems, Process Concept: States & process control blocks, OS Kernel, Concurrent Processes, Mutual exclusion, Process Synchronization, Semaphores, Memory Management & Scheduling, Multiprogramming, Virtual Memory, Paging & Segmentation, On demand paging & segmentation, Operations on Moving Head Disks, Disk Scheduling Policies, File System Functions, Blocking and Buffering, File Organization.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Object Oriented Programming Languages	CME 343	Fall	03+00+00	Compulsory	3	6
Course Objectives:	The goal of this course is to provide the object-oriented programming concepts using Java. It will teach students OO techniques which are very useful for large scale software development. Software engineering techniques will be presented to teach how to build high-quality software.					
Course Contents:	This course teaches object oriented approach for software design and development using Java language. Students will have a working understanding of object oriented design methodology and implementation techniques. The topics include, Java Language Basics, Data Types in Java, Strings and Characters, Classes and Objects, Methods, Control Structures, GUI Components, Arrays, Inheritance, Concurrency and Exception Handling. In addition, it includes more discussion about writing and enhancing classes, polymorphism, abstract classes and interfaces.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Probability and Statistics for Engineers	GE 204	Spring	03+00+00	Compulsory	3	5
Course Objectives:	This course aims to introduce the students to the theory of probability and statistics, and its applications in order to provide some fundamental knowledge for the analysis of data in engineering systems.					
Course Contents:	In this course, data presentation and analysis, probability concepts, axioms of probability, random variables, mathematical expectations, discrete and continuous probability distributions, joint distributions, conditional probability, concepts of confidence interval and hypothesis testing, and applications related to probability and statistics are introduced.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Graph Theory	CME 304	Spring	03+00+00	Compulsory	3	6
Course Objectives:	The main objective of this course is for students to learn some classical theorems and algorithms in the field of algorithmic graph theory. It is expected that students will be able to demonstrate their knowledge of algorithms by solving concrete problems. Students will learn some of the applications of graph algorithms in computer engineering and will be able to define some engineering problems on graphs and develop algorithms to solve them. They will be required to complete a small project and make a short simulation in class.					
Course Contents:	In this course we will discuss elements of graph theory with emphasis on algorithms. Approximately half of the course will be devoted to graph-theoretic topics and the other half will be devoted to algorithmic applications. Topics include spanning trees, Eulerian graphs, colorings, matchings, connectivity, network flows and Hamiltonian graphs. In addition they will learn advanced topics such as list coloring and combinatorial games on graphs.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Software Engineering	CME 356	Spring	03+00+00	Compulsory	3	6
Course Objectives:	This course aims to teach students an understanding of how to develop a software system from scratch by guiding them through development process and giving them fundamental principles of system development with object oriented technology. The course will initiate students to different software process models, software requirements engineering, project management, system analysis, design, implementation, validation, documentation and presentation.					
Course Contents:	This course covers software development process, requirements elicitation and analysis, specification, design, implementation, testing and evolution. A variety of concepts, techniques and tools are presented for software process, software requirements, project management, people management, system models, architectural design, implementation, verification, validation and software evolution. The team of students will develop a real-life project to practice topics they learned in this course.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Numerical Methods	MA 304	Spring	03+00+00	Compulsory	3	6
Course Objectives:	This course aims to introduce the students to the language, logic, and mathematics of numerical methods as used in engineering and the sciences. The students will learn how numerical analyses can be applied to a wide range of problems of importance in the sciences, industry.					
Course Contents:	Description of numerical methods and application of them particularly in engineering. Error analyses in numerical methods, analytical solutions, numerical methods for the solution of systems (linear and nonlinear), approximation methods, interpolation, linear regression, numerical integration.					

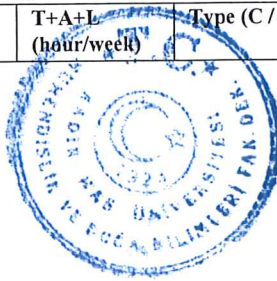| Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Internship II	MDBF 399	Fall	00+00+00	Compulsory	0	6
Course Objectives:	Building work experience, integrating theory and practice, exploring career alternatives.					
Course Contents:						

Nafia Nur Başürün
MDBF Sekreteri

Mehmet Emre Özdoğan
MDBF Sekreteri

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Engineering Problem Solving and Project Management	GE 401	Fall	02+00+00	Compulsory	2	6
Course Objectives:	The aim of the course is to give engineering students the basic definitions and nature of engineering problem solving along with the theory and application of the well-known methodologies. The course also covers the project management and related topics that will be very helpful for engineering students.					
Course Contents:	This course covers the following topics: definition of engineering problems, classification of open- and closed-ended problems, engineering design, conceptual design, embodiment design, detailed design, concurrent engineering, teamwork, human as a social entity in team works, project management, project proposal writing, innovation problem-solving.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Engineering Design Project	GE 400	Spring	00+08+00	Compulsory	4	10
Course Objectives:	In the design project course, students will find realistic solutions to open-ended engineering problems, and will lead to a product or model by using the knowledge gained from their undergraduate education.					
Course Contents:	A design project is the last stage of undergraduate education. An interdisciplinary project with a team of 2-4 students is carried out under the supervision of one or more faculty members. The faculty assignment, the proposal dates and the final report submission along with the defense dates are announced before the semester begins.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Mobile Application Development	CE 414	Spring	03+00+00	Elective	3	8
Course Objectives:	The emergence of a new generation of smart mobile devices and platforms such as the Apple iOS and Google Android have opened up new opportunities for application developers. This course teaches mobile app development on the Android platform. This course involves a careful examination of mobile app programming. Students will gain knowledge of how to design, develop, and deploy mobile apps using Android Studio.					
Course Contents:	This course covers topics such as model-view-controller (MVC) hierarchy, user-interface principles, persistent information and databases, CRUD operations, multi-fragment app development, usage of app bar and implicit intents.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Database Application Development	CE 461	Spring	03+00+02	Elective	4	8
Course Objectives:	To develop internet/3-tier and client-server applications for end users based on a relational database management system, namely Oracle. The students will be able to design and implement forms and reports using the Oracle Internet Applications Developer tools which are development environments with a graphical user interface. They will also learn how to implement triggers, subprograms and access control using PL/SQL within the application scheme.					
Course Contents:	Form development, forms builder, data blocks, frames, text items, LOV`s, input items, Windows and canvases, triggers, messages and alerts, query triggers, validation, navigation, transaction processing, multiple form applications, menu modules, data sources, record groups, timers, charts, report builder, report development.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Internet Engineering and Web Site Develo	CE 476	Fall	03+00+00	Elective	3	8
Course Objectives:	Introduction to basic web design and web development technologies, the development of basic skills in HTML and web programming.					
Course Contents:	* Temel Web Sayfası Yapısı * HTML ve HTML stilleri * Javascript					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
e-Business/e-Commerce	CE 481	Fall	03+00+00	Elective	3	8
Course Objectives:	To understand concepts of e-business/e-commerce, and to conduct work on project based analysis, design and application development activities.					
Course Contents:	e-business/e-commerce, business plan, legal issues, customer orientation, application development, platforms.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Database Management Systems	CME 344	Fall	02+00+02	Elective	3	6
Course Objectives:	To provide a solid understanding of RDBMS (Relational Database Management Systems). The students will be able to carry out analysis, design, and implementation in the development of a RDBMS.					
Course Contents:	Database management systems and IT data modeling E-R diagrams conceptual, logical and physical database design constraint modeling database architectures and the relational database model SQL: selection, DML, DCL, DDL operations stored procedures/functions, and triggers fundamentals of application development.					

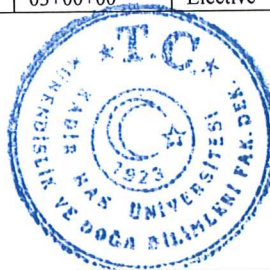| Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS

Nafia Nur Başürün
MDBF Sekreteri

Mehmet Emre Özdoğan
MDBF Sekreteri

Formal Languages and Automata Theory	CME 348	Fall	03+00+00	Elective	3	5
Course Objectives:	The emphasis of is on learning three basic concepts: what is computation, what can be computed, what can not be computed? The course topics are mathematical by nature and proofs are presented throughout. Skills in reasoning about computation and constructing proofs should be developed.					
Course Contents:	Introduction to the main concepts of computation. The connection between problems and languages is established. Languages are classified (regular, context-free etc) according to how "difficult" they are and corresponding to each language class a model of computation is described. Each model is represented via a corresponding machine (automaton).					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Computer Networks	CME 351	Fall	03+00+02	Elective	4	6
Course Objectives:	The fundamental principles in the design and implementation of computer communication networks, their protocols and applications will be studied. Upon successful completion of the course, a student will have a good understanding of the layered network architecture, design issues in each layer and the solution approaches towards addressing these issues.					
Course Contents:	Overview of computer networks. Network architecture and the OSI model. Network topology, connectivity analysis, delay analysis and backbone analysis. Physical layer, transmission and multiplexing, terminal handling, errors. Data link layer and link protocols. Network layer, routing and congestion, satellite and packet radio networks, local networks. Transmission and session layer, presentation layer, application layer.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Embedded System Design	CME 354	Fall	03+00+00	Elective	3	8
Course Objectives:	To give sufficient background for undertaking embedded systems design and also introduction to embedded mobile application development.					
Course Contents:	This course presents state-of-the-art methods, concepts, tools and techniques for embedded system design.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Computer Simulation	CME 412	Fall	03+00+00	Elective	3	8
Course Objectives:	A variety of techniques for specifying system models will be studied. Theory and techniques available for constructing a simulation from a model will be taught and theory and techniques for determining the accuracy of a simulated system will be examined. Through several computer based simulations, students will be able to practice the techniques that they have learned.					
Course Contents:	Simulation is the practice of designing a model of an actual or theoretical system, executing that model to observe its behavior and then analyzing the results. This course focuses on computer-based simulation, where the model is implemented as part of a computer program, which can then be executed to compute and record the data which describes the simulated system?s behavior					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Mobile Application Development	CME 414	Fall	03+00+00	Elective	3	8
Course Objectives:	The emergence of a new generation of smart mobile devices and platforms such as the Apple iOS and Google Android have opened up new opportunities for application developers. This course teaches mobile app development on the Android platform. This course involves a careful examination of mobile app programming. Students will gain knowledge of how to design, develop, and deploy mobile apps using Android Studio.					
Course Contents:	This course covers topics such as model-view-controller (MVC) hierarchy, user-interface principles, persistent information and databases, CRUD operations, multi-fragment app development, usage of app bar and implicit intents.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Cloud Infrastructure and Services	CME 415	Fall	03+00+00	Elective	3	8
Course Objectives:	This course aims to teach about the key considerations and steps involved in transitioning from the current state of a data center to a cloud computing environment. Upon completing this course, students will have the knowledge to make informed decisions about migrating to cloud infrastructure and choosing the best deployment model for an organization.					
Course Contents:	The Cloud Infrastructure and Services (CIS) course educates students about cloud deployment and service models, cloud infrastructure, and the key considerations in migrating to cloud computing.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Information Storage and Management	CME 416	Fall	03+00+00	Elective	3	8
Course Objectives:	This course aims comprehensive learning of storage technology, which will enable you to make more informed decisions in an increasingly complex IT environment. ISM builds a strong understanding of underlying storage technologies and prepares students to learn advanced concepts, technologies, and products.					
Course Contents:	Information Storage and Management (ISM) is the only course of its kind to fill the knowledge gap in understanding varied components of modern information storage infrastructure, including virtual environments.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Introduction to Combinatorics	CME 418	Fall	03+00+00	Elective	3	8

Nafia Nur Başürün
MDBF Sekreteri

Mehmet Emre Özdoğan
MDBF Sekreteri

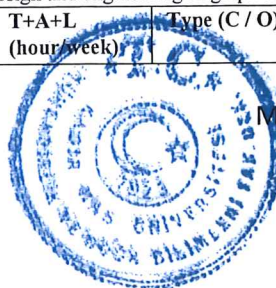|						
Course Objectives:	This course aims to introduce some of the fundamental concepts and theorems in enumerative combinatorics and basic combinatorial objects in combinatorial designs and graph theory.					
Course Contents:	Topics include set theory, mathematical induction, integers, functions and relations, counting methods, recurrence relations, generating functions, permutations, combinations, principle of inclusion and exclusion, combinatorial designs and graphs (including planar graphs).					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Network Engineering I	CME 451	Fall	03+00+02	Elective	4	8
Course Objectives:	The goal of Introduction to Networks section is to make students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. The goal of Routing and Switching Essentials session is to make students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPng, OSPF, VLANs, and inter-VLAN routing.					
Course Contents:	The aim of this course is provide a comprehensive overview of networking from fundamentals to advanced practical applications and services. It is based on the top-down approach to networking.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Network Engineering II	CME 453	Fall	03+00+02	Elective	4	8
Course Objectives:	The goal of LAN Switching and Wireless session is to develop an understanding of how switches are interconnected and configured to provide network access to LAN users. This course also teaches how to integrate wireless devices into a LAN. The goal of Accessing the WAN session is to introduce students to fundamental networking concepts and technologies.					
Course Contents:	Differentiating between the following WAN services: LAPB, Frame Relay, ISDN/LAPD, HDLC, PPP, and DDR key frame relay terms and features, commands to configure frame relay LMIs, maps, and subinterfaces commands to monitor frame relay operation in the router identify PPP operations to encapsulate WAN data on Cisco routers State a relevant use and context for ISDN networking, Identify ISDN protocols, function groups, reference points, and channels Cisco?s implementation of ISDN BRI.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Database Application Development	CME 461	Fall	03+00+00	Elective	3	8
Course Objectives:	To develop internet/3-tier and client-server applications for end users based on a relational database management system, namely Oracle. The students will be able to design and implement forms and reports using the Oracle Internet Applications Developer tools which are development environments with a graphical user interface. They will also learn how to implement triggers, subprograms and access control using PL/SQL within the application scheme.					
Course Contents:	Form development, forms builder, data blocks, frames, text items, LOV`s, input items, Windows and canvases, triggers, messages and alerts, query triggers, validation, navigation, transaction processing, multiple form applications, menu modules, data sources, record groups, timers, charts, report builder, report development.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Design and Analysis of Algorithms	CME 467	Fall	03+00+00	Elective	3	8
Course Objectives:	The main objective of this course is to provide the students with a knowledge on foundations of problem solving, computational efficiency, and experience in the design and implementation of algorithms commonly employed in computer science and computational problems.					
Course Contents:	Introduction to the main concepts of design and analysis of algorithms. Overview of basic analysis techniques: approximating functions asymptotically, bounding sums , and solving recurrences. Discussion of efficiently solvable problems with a focus on design techniques such as divide-and-conquer, randomization,dynamic programming, amortization, and greedy algorithms. Illustration of various new concepts through algorithms applied to problems related to sets, sequences, strings, graphs etc.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Compiler Design	CME 473	Fall	03+00+00	Elective	3	8
Course Objectives:	Introduction to compiler organization and implementation, including formal specifications and algorithms for lexical and syntactic analysis, internal representation of the source program, semantic analysis, run-time environment issues and code generation. Students will write a compiler for a reasonably large subset of a contemporary language, targeted to a virtual machine.					
Course Contents:	The phases of compilation, lexical analysis, parsing, type checking, JVM code generation, survey of famous Java compilers and discussion of modern compiler issues.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Introduction to Computational Biology	CME 474	Fall	03+00+00	Elective	3	8
Course Objectives:	To help students gain (1) An understanding of modelling biological problems as computer science problems. (2) Knowledge on computational methods and algorithms applicable on biological problems. (3) Skills to design and implement new algorithms for similar problems (4) Experience with computational biology&bioinformatics tools.					
Course Contents:	An introduction to the use of computer science methods, tools, and algorithms for the analysis of proteins, genes, and collections of DNA comprising an organism. An overview of string matching algorithms and data structures applied to sequence data and alignment problems in biology. A discussion of the concepts on sample sequence databases. Clustering algorithms from data mining with an application to microarray data and gene expression analysis. A discussion of bioinformatics networks (protein interaction networks, regulatory networks, metabolic pathways etc.) and their analysis via design and engineering of graph algorithms and data structures from computer science.					

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Computer Networks and Mobile Computing	CME 475	Fall	03+00+00	Elective	3	8

Course Objectives: In this course we will cover different approaches towards networking in mobile wireless networks, as well as specific applications and uses of these networks.

Course Contents: Start with principles and walk through processes that led to todays Networks, using TCP/IP Internet and as a model illustrate how networks works in practice, emphasize how network software is implemented, i.e, to understand how a complete network operates, all the way from application to the hardware of network design.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Internet Engineering and Web Site Development	CME 476	Fall	03+00+00	Elective	3	8

Course Objectives: Introduction to basic web design and web development technologies, the development of basic skills in HTML and web programming.

Course Contents: * Temel Web Sayfası Yapısı * HTML ve HTML stilleri * Javascript

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Artificial Intelligence	CME 480	Fall	03+00+00	Elective	3	8

Course Objectives: Students will gain understanding on the basics of artifical intelligence. They will learn logic programming and how to apply it to problems related to artifical intelligence. They will solve problems coming from application areas related to artifical intelligence.

Course Contents: Representation of knowledge. Search and heuristic programming. Logic and logic programming. Applications related to problem solving, games and puzzles, expert systems, planning, learning, vision, and natural language understanding.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Network Management	CME 482	Fall	03+00+00	Elective	3	8

Course Objectives: 1. To provide information about telecommunication network structure and components 2. To design network management systems 3. To forecast telecommunication traffic 4. To provide network management tasks: (fault, configuration, performance, security, and accounting management information. 5. To provide telecommunication market structure, socioeconomic aspects

Course Contents: Technologies and processes used to plan, design, analysis, optimize and manage telecommunication networks including the functions of network standards, protocols and architecture. OSI protocol and, TMN standard. Telecommunication traffic forecasting. Evaluation of voice and data networks, local and wide area networks, and overall network management. Network management components and functions: tasks (fault, configuration, performance, security and accounting) of network management. Convergence of networks. Telecommunications market structure, socioeconomic aspects, services, standard bodies, regulations and policies.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Distributed Systems	CME 484	Fall	03+00+00	Elective	3	8

Course Objectives: Distributed systems are highy popular way of data processing and computing. Essantial property of such a system is possesing a single system image. Such a basic structure provides a base for application spanning from mobile systems to ubiqutious and pervasive systems. With in that co ntext, basic and detailed information on establishing distributed systems will be explained. From the perspective of application, students are expected to produce typical examples by utilising the information provided by both lecture and literature surveys.

Course Contents: This course covers operating system concepts that provide a single system image in a distributed environment. Characterization of distributed systems and system transparencies are given. Basic design issues such as resource management, interprocess communication, synchronization, process/processor management, consistency control, memory management and file management in distributed systems and cloud computing are discussed.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Software Quality and Testing	CME 485	Fall	03+00+00	Elective	3	8

Course Objectives: The students who will take this course will: 1. Understand the need for quality development and management in the evolution of software technologies 2. Gain a deeper understanding of version-control systems and related best practices 3. Understand which testing or code analysis strategies can catch a given type of software bug 4. Set up and use automated continuous integration services 5. Be able to contribute quality improvements to an existing project

Course Contents: This course covers software quality issues and the key concepts of software testing. Students will learn about the best processes to follow to produce better quality software that is also more maintainable. The course will discuss different types of tests, automated quality assurance tools and pipelines, and quality models. Students working in project groups are required to complete the implementation of a system or significant subsystem and undertake unit, integration and acceptance testing.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Smart Multimedia Systems	CME 487	Fall	03+00+00	Elective	3	8

Course Objectives: This course aims to introduce hardware and software architectures in next-generation smart television systems and to inform about the main software modules implemented in smart television systems. Software layers and modules developed for smart television systems are covered.

Course Contents: Smart TV systems; hardware and software architectures; next-generation DVB standards; next-generation broadcast systems; smart connected applications; next-generation audio and video technologies.

Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS

Nafia Nur Başürün
MDBF Sekreteri

Mehmet Emre Özdoğan
MDBF Sekreteri

Information Technologies Security	CME 488	Fall	03+00+00	Elective	3	8
Course Objectives:						
Course Contents:						

Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Special Topics in Computer Engineering I	CME 489	Fall	03+00+00	Elective	3	8
Course Objectives:	This course provides new and emergent topics in computer engineering field. We uses this course name as a template to give a new and special topics cours.					
Course Contents:	The content can change according to special topic.					

Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Special Topics in Computer Engineering II	CME 490	Fall	03+00+00	Elective	3	8
Course Objectives:	The aim of this course is to expose the students to emergent areas of computer engineering and related topics.					
Course Contents:	The content will vary depending on the topics covered in the course.					

Nafia Nur Başürün
MDBF Sekreteri

Mehmet Emre Özdoğan
MDBF Sekreteri