

(Semester 1) - Year 1, Fall Semester

Course Code	Course Name	PreReq	Theoretical Hours	Practical Hours	Credits	ECTS
<u>MATH 151</u>	Calculus I		5	0	5	6
	Science Elective*					5
<u>COMP 101</u>	Art of Computing		3	2	4	6
XXX	Nontechnical Elective-4					4
<u>GLB 101</u>	Agu Ways		3	0	3	4
<u>ENG 101</u>	English I		4	0	4	4
TOTAL			15	2	16	29

(*) One of the following: PHYS 101, CHEM 101, BIO 101

COURSE RECORD	
Code	PHYS 101
Name	Physics-I
Hour per week	5 (3+2)
Credit	4
ECTS	5
Level	Undergraduate
Semester/Year	Fall/1
Type	Compulsory
Prerequisites	-
Content	This course covers the fundamentals of physical quantities, concepts and mechanics' laws. The content of the course can be summarized as following: Units, Scalar and Vector Quantities, Motion in One Dimension, Motion in Two and Three Dimensions, Newton's Law of Motion, Work, Kinetic and Potential Energy, Gravity, Momentum, Impulse and Collisions, Rotation of Rigid Bodies, Dynamics of Rotational Motion.
Objectives	The main objective is to get students gain analyzing the physics problems and also phenomena in the nature. In this context, a set of core concepts: space, time, mass, force, energy, momentum, torque, and angular momentum will be introduced in in order to solve the fundamental classical mechanical problems. Translational and rotational motions and also combination of them.
Learning Outcomes	<p>LO1. Definitions of the fundamental kinematic quantities like position, velocity, acceleration for translational motion and establishing relations between these quantities. Analyzing the motions in one, two and three dimensions using these fundamental definitions and to extend all these to rotational motions of the rigid objects.</p> <p>LO2. A deep insight to Newton's motion laws. Relation between force and acceleration, reason of the gravitational acceleration, definitions of the work, energy, and momentum. The strong relation between force and momentum, and conservation rules for energy and momentum. Applications of the conservation rules.</p> <p>LO3. Dynamics of rotating rigid bodies. Extending Newton's law to rotating objects. Definitions of the tork and angular momentum and strong relation between of them. Extending the conservation rules to the rotating solid objects. Static equilibrium and its conditions.</p>

Textbook	Essential University Physics Volume 1 by Richard Wolfson, 3rd or 4th Edition, Pearson									
Additional Reference Book	-									
CONTRIBUTION TO PROGRAMME OUTCOMES										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1	X									
LO2	X									
LO3	X									
COURSE CONTENT DETAILS										
Topics	Outcomes									
W1	Fundamental Units and Measurements									
W2	Motion in a straight-line									
W3	Vectors and Motion in two- and three-dimensions									
W4	Vectors and Motion in two- and three-dimensions									
W5	Force and motion.									
W6	Using Newton's Laws									
W7	Fall Break									
W8	Work, Energy, and Power									
W9	Conservation of Energy									
W10	Gravity									
W11	Systems of particles									
W12	Rotational Motion									
W13	Rotational vectors and angular momentum									
W14	Static Equilibrium									

COURSE RECORD	
Code	MATH 151
Name	Calculus 1
Hour per week	5 (5 + 0)
Credit	4
ECTS	6
Level	Undergraduate/1
Semester/Year	Fall/1
Type	Compulsory
Prerequisites	-
Content	<p>This course is an introduction to single variable calculus for engineering students and covers the fundamentals of differentiation and integration. In this context, taking limits of functions, differentiating, optimizing, graphing and integrating functions are being taught. By the end of the semester, the students will be able to analyze the behavior of a single variable function by means of limits, differentiation and integration.</p> <p>The course covers the following topics: Limits and Continuity, Differentiation and Applications (Linearization, Optimization, Curve Sketching, L'Hopital's Rule), Integration and Applications (Areas, Volumes, Lengths of Curves, Surface Areas), Transcendental Functions, Integration Techniques, Improper Integrals.</p>
Objectives	<p>Develop knowledge of the fundamentals of computer programming.</p> <p>Learn Agile Software Development Methodology in a major project.</p> <p>Develop skills for software designing and testing methodologies.</p> <p>Apply the concepts learned to a real problem from top to bottom</p>

Learning Outcomes	By the end of this course, students will be able to LO1. Understand the concepts of limits and continuity of single variable functions LO2. Establish the theoretical understanding of derivative of a function and build the geometric interpretation of it and to calculate the derivative of a given function. LO3. Gain the ability of sketching a detailed graph of a function. LO4. Apply derivative rules to optimize a given source. LO5. Calculate the integral of a given function by using different techniques LO6. Apply integration to find the area under a curve, to find length of a curve and to calculate the volume and surface area of the solid.
Textbook	-
Additional Reference Book	-

CONTRIBUTION TO PROGRAMME OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1	X									
LO2	X									
LO3	X									
LO4	X									
LO5	X									
LO6	X									

COURSE CONTENT DETAILS

Topic	Outcomes
W1 Rates of Change and Tangent Lines to Curves, Limit of a Function and Limit Laws, One-sided Limits Continuity	LO1
W2 Limit Involving Infinity: Asymptotes of Graphs, Tangent Lines and the Derivative at a Point, The Derivative as a Function	LO1, LO2
W3 Differentiation Rules, The derivative as a Rate of Change, Derivatives of Trigonometric Functions	LO2
W4 The Chain Rule, Implicit Differentiation, Derivatives of Inverse Functions and Logarithms	LO2
W5 Inverse Trigonometric Functions, Related Rates, Linearization and Differentials	LO2
W6 Extreme Values of Functions, The Mean Value Theorem	LO2, LO4
W7 Monotonic Functions and the First Derivative Test, Concavity and Curve Sketching, Indeterminate Forms and L'Hopital's Rule	LO2, LO3
W8 Applied Optimization, Newton's Method, Antiderivatives	LO4
W9 Area and Estimating with Finite Sums, Sigma Notation and Limits of Finite Sums, The Definite Integral	LO1, LO5
W10 The Fundamental Theorem of Calculus, Indefinite Integrals and the Substitution Method, Substitution and Area Between Curves	LO1, LO5, LO6
W11 Volumes Using Cross-Section, Volumes Using Cylindrical Shell	LO5, LO6
W12 Arc Length, Areas of Surfaces of Revolution, The Logarithm Defined as an Integral	LO5, LO6
W13 Integration by Parts, Trigonometric Integrals, Trigonometric Substitutions	LO5
W14 Integration of Rational Functions by Partial Fractions, Improper Integrals	LO5

COURSE RECORD

Code	COMP 101
Name	Art of Computing
Hour per week	3+2 (Theory + Practice)
Credit	4
ECTS	6
Level/Year	Undergraduate
Semester	Fall
Type	Compulsory
Prerequisites	
Description	The course aims to teach the essentials of computer programming to students who have little or no background in programming. The students will learn how to write computer programs using SNAP and Java languages. The course will introduce the fundamental concepts and techniques of programming using the graphical programming language SNAP and the contemporary general-purpose programming language Java.
Objectives	<p>O1. To develop knowledge of the fundamentals of computer programming.</p> <p>O2. To solve a problem by creating an algorithm.</p> <p>O3. To comprehensively develop programming skills in software design.</p> <p>O4. Apply the concepts learned to a real problem from top to bottom.</p>
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>LO1. Explain what a computer programming language and an algorithm are.</p> <p>LO2. Understand how to formulate a problem into an algorithm that can be programmed in a computer</p> <p>LO3. Gain an understanding of how computer programs work.</p> <p>LO4. Build a script in the SNAP language and write a program in the Java language.</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	5	5	5	3	5	5	3	3	1	0	4	5	5	2	4
LO2	5	5	5	2	4	2	2	4	5	3	5	4	5	2	5
LO3	4	5	3	1	1	0	4	1	1	0	5	3	5	2	5
LO4	5	5	5	4	5	4	1	5	5	3	4	5	5	2	5

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Introduction to Art of Computing	LO1, LO2
W2 Introduction to Programing Languages, snap.berkeley.edu, Hackerrank	LO1, LO2
W3 Intro to JAVA, eclipse installation, snap questions, Blocks Desing Principles	LO1, LO2
W4 Variables, IO operations	LO1, LO2, LO3

W5 Conditional Statements - Snap	LO1, LO2, LO3
W6 Conditional Statements - Java	LO1, LO2, LO3
W7 Loops, nested loops - Snap	LO1, LO2, LO3
W8 Loops, nested loops - Java	LO1, LO2, LO3
W9 Methods - Snap & Java	LO1, LO2, LO3, L04
W10 Methods - Snap & Java	LO1, LO2, LO3, LO4
W11 Lists, 2D Lists in SNAP	LO1, LO2, LO3, LO4
W12 Arrays, 2d Arrays - Java	LO1, LO2, LO3, LO4
W13 Classes and Objects	LO1, LO2, LO3, LO4
W14 Overall Recap	LO1, LO2, LO3, LO4

DERS BİLGİLERİ

Kodu	COMP 101
İsmi	Programlama Sanatı
Haftalık Saati	3 + 2 (Teori + Pratik)
Kredi	4
AKTS	6
Seviye/Yıl	Lisans
Dönem	Güz
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	-
İçerik	Bu ders,, programlama konusunda bilgisi olan veya hiç bilgisi olmayan öğrencilere bilgisayar programlamanın temellerini öğretmeyi amaçlamaktadır. Öğrenciler, SNAP ve Java dillerini kullanarak bilgisayar programlarının nasıl yazılacağını öğreneceklerdir. Derste, grafik programlama dili SNAP ve çağdaş genel amaçlı programlama dili Java'yı kullanarak programlamanın temel kavramlarını ve tekniklerini tanıttacaktır.

COURSE RECORD

Code	GLB 101
Name	AGU Ways
Hour per week	3+0 (Theory + Practice)
Credit	3
ECTS	4
Level/Year	Undergraduate
Semester	Fall
Type	Must
Location	ONLINE / The course will be on Tuesdays between 9:20 and 12:00
Prerequisites	None
Special Conditions	
Coordinator(s)	Evren M. Dinçer, evren.dincer@agu.edu.tr
Webpage	canvas.agu.edu.tr
Course Description	<p>This is the first of the five Global Challenges (GLB) classes you will take at AGÜ. With the spring semester sister class, GLB 102, the freshman year GLB classes target a comprehensive introduction to United Nation's (UN) Sustainable Development Goals (SDGs). There are seventeen (17) SDGs and at the end of GLB 101 you will be familiar with the first seven of them. You will learn about not only the urgent reasons why we need such goals regarding these key topics, but also the specific 2030 goals we aspire to reach at.</p> <p>The class is also designed to introduce you to those goals using innovative and student-oriented methods, thus there will be no traditional lecturing involved. Your individual course instructors will introduce you to group-based learning models and encourage expressing yourselves in creative ways. You will learn from your peers across other disciplines as much as or more than the material shared throughout the semester.</p>
Objectives	The goal of this class is to ensure awareness among AGU students about the urgency regarding SDGs in today's world. In doing so, we want students to appreciate and apply group-oriented learning methods and learn from each other's disciplines.
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>LO1. Identify key features of UN's Sustainable Development Goals (SDGs). LO2. Demonstrate how SDGs are aligned with AGU values by using a media they chose. LO3. Analyze 7 SDGs according to its political, economic, and social dimensions in local and global context LO4. Relate these goals with your individual fields as well as other fields. LO5. Recognize the impact of your own action and lifestyle as related to specific topic with SDG component by using UDT steps (universal design thinking model). LO6. Defend the necessity of interdisciplinary understanding of SDGs. LO7. Identify sources and resources for learning more about SDGs to make important personal and professional decisions.</p>

ASSESSMENT

The final grade will be determined numerically by averaging your scores with the following weights:

Evaluation Criteria	Weight (%)
In class team assignments	%35
Active participation	%30
Individual Assignments	%30
Attendance	%5
Total	100%

Most grades given during the course of the term will be based on a 100-pt scale. The **official decimal class grades** (0.0 - 4.0) will be determined from a weighted average of your individual grades. For a detailed description of grading policy and scale of AGU please refer to the website <https://goo.gl/HbPM2y> section 28.

COURSE LOAD

Activity	Duration (hour)	Quantity	Workload (hour)
Course Length	3	14	42
In class team activities	2	12	24

Personal reflection	1	10	10
Out of class study time	1	14	14
Internet search, library work, literature search	2	14	14
Presentation of work	12	2	24
		General Sum	134

ECTS: total work load / 30 = 134 / 30 = 4 ECTS

CONTRIBUTION TO PROGRAMME OUTCOMES*

	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7
LO1					4	4	
LO2			4	3	4	4	
LO3	4		4	3	4	4	2
LO4				3	4	4	
LO5	4		4	3	4	4	
LO6		4	4	3	4	4	
LO7		4	4	3	4	4	

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

WEEKLY SCHEDULE

W	Topic	Outcomes
W1	Welcome and Introduction of the Course Activity: Lecture, Online warm up activities	LO1
W2	Guest Speaker: Prof. Dr. Bülent Yılmaz, Vice Rector Activity: Personal Reflection	LO2
W3	Guest Speaker: Prof. Dr. Cengiz Yılmaz, Rector Activity: Groups work reflection	LO1, LO2, LO4, LO5
W4	Guest Speaker Yeliz Hacıhaliloğlu, Sustainability Solutions Business Development Manager, Intertek Activity: Group work reflection	LO4, LO5
W5	Methods and Applications for Group Study Activity: Group Work	LO4, LO5
W6	Methods and Applications for Group Study-2 Activity: Group Work	LO4, LO5
W7	FALL BREAK	
W8	SDG 1: No poverty Activity: Pre-study, interactive lecture, Group work	L.O3, LO4, LO5, LO6, LO7
W9	SDG 2: Zero Hunger Activity: Pre-study, interactive lecture, Group work	LO3, LO4, LO5, LO6, LO7
W10	SDG 3: Good Health and Well-Being Activity: Pre-study, interactive lecture, Group work	LO3, LO4, LO5, LO6, LO7
W11	SDG 4: Quality Education Activity: Pre-study, interactive lecture, Group work	LO3, LO4, LO5, LO6, LO7
W12	SDG 5: Gender Equality Activity: Pre-study, interactive lecture, Group work	LO3, LO4, LO5, LO6, LO7
W13	SDG 6: Clean Water and Sanitation Activity: Pre-study, interactive lecture, Group work	LO3, LO4, LO5, LO6, LO7
W14	SDG 7: Affordable and Clean Energy Activity: Pre-study, interactive lecture, Group work	LO3, LO4, LO5, LO6, LO7
W15	Course evaluation and Wrap-up	LO3, LO4, LO5, LO6, LO7

(Semester 2) - Year 1, Spring Semester

Course Code	Course Name	PreReq	Theoretical Hours	Practical Hours	Credits	ECTS
<u>MATH 152</u>	Calculus II	MATH 151	5	0	5	6
<u>PHYS 102</u>	Physics II		3	2	4	5
<u>COMP 112</u>	Object Oriented Programming	COMP 101	3	2	4	6
<u>COMP 104</u>	Exploring Computer Engineering		3	2	4	5
<u>CP_100_COMP</u>	Career Planning		1	0	1	1
<u>GLB1XX</u>	Global Issues Elective I		3	0	3	4
<u>ENG 102</u>	English II	ENG 101	4	0	4	4
TOTAL			22	6	25	31

COURSE RECORD

Code	MATH 152
Name	CALCULUS II
Hour per week	5 (5+0)
Credit	5
ECTS	6
Level	Undergraduate
Semester/Year	Spring/1
Type	Compulsory
Prerequisites	MATH 151
Content	This course is a continuation of single variable calculus and covers the fundamentals of differentiation and integration in 3-dimensional and bigger spaces which is called multi-variable calculus. In this context, series, taking limits, differentiating, optimizing, graphing and integrating in 3-d are being taught. By the end of the semester, the students will be able to demonstrate an understanding of a multi-variable function in every aspect by using the scientific skills gained during semester.
Objectives	This course aims to teach the differential and integral part of multi-variable Calculus by Giving the ability to understand series and sequences by determining convergency-divergency and finding the sum Providing fundamental knowledge and skills to analyze the behavior of a multi-variable function in every aspect Constructing theoretical and conceptual understanding of essential mathematical tools to study multi variable calculus. Developing the ability of using the notions and tools of basic mathematics to recognize and analyze a problem deduced from real life/nature and offering solutions to these problems by applying relevant computation and analysis techniques.

Learning Outcomes	By the end of this course, students will be able: LO1. To distinguish sequences and series and relate them mathematically, LO2. To determine convergence/divergence behavior of different types of series by using various convergence tests, LO3. To calculate the partial derivative of several variable functions. Use these partial derivatives for application, LO4. To evaluate double in both cartesian and polar coordinate system and triple integral in Cartesian, cylindrical and spherical, LO5. To evaluate line and path integrals which are very important for engineers LO6. To evaluate Surface integrals
Textbook	Thomas' Calculus Early Transcendentals, Thomas, Weir, J. Hass, 14 th Global Edition, Pearson, ISBN-13: 9781292253114 (Electronic copy of this book is available on MyLab)
Additional Reference Book	-

CONTRIBUTION TO PROGRAMME OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1	X									
LO2	X									
LO3	X									
LO4	X									
LO5	X									
LO6	X									

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Sequences; Infinite Series; Integral Test; Comparison Test	LO1, LO2
W2 The Ratio and Root Test; Alternating Series, Absolute and Conditional Convergence; Power Series	LO2
W3 Taylor and Maclaurin Series; Convergence of Taylor Series; Applications of Taylor Series	LO2
W4 Parametrizations of Plane Curves; Calculus with Parametric Curves; Polar Coordinates; Graphing in Polar Coordinates; Areas and Lengths in Polar Coordinates	LO3, LO4
W5 Three-Dimensional Coordinate Systems; Vectors; The Dot Product; The Cross Product	LO3
W6 Lines and Planes in Space; Cylinders and Quadric Surfaces; Curves in Space and Their Tangents; Integrals of Vector Functions; Projectile Motion	LO3
W7 Arc Length in Space; Curvature and Normal Vectors of a Curve; Tangential and Normal Components of Acceleration; Functions of Several Variables; Limits and Continuity in Higher Dimensions	LO3
W8 Partial Derivatives; The Chain Rule; Directional Derivatives and Gradient Vectors; Tangent Planes and Differentials; Extreme Values and Saddle Points	LO3, LO4
W9 Lagrange Multipliers; Taylor's Formula for Two Variables; Partial Derivatives with Constrained Variables	LO3, LO4
W10 Double and Iterated Integrals over Rectangles; Double Integrals over General Regions; Area by Double Integration; Double Integrals in Polar Form	LO4
W11 Triple Integrals in Rectangular Coordinates; Triple Integrals in Cylindrical and Spherical Coordinates; Substitutions in Multiple Integrals	LO5
W12 Green's Theorem in the Plane; Surfaces and Area; Surface Integrals	LO6
W13 Stoke's Theorem; The divergence theory and unified Theory	LO6

COURSE RECORD	
Code	PHYS 102
Name	PHYSICS II
Hour per week	5(3+2)
Credit	4
ECTS	5
Level	Undergraduate
Semester/Year	Spring/1
Type	Compulsory
Prerequisites	-
Content	
Objectives	Historically, a set of core concepts: 1-Electromagnetics as a vast area of study to understand the electromagnetic propagation, its interaction with matter, optical phenomena. 2-Electric charges and their properties when they are static and in motion results in electric and magnetic fields.
Learning Outcomes	LO1. Electric charge, force, and field. LO2. Gauss Law, Electric potential, electrostatic energy and capacitors LO3. Electric current and DC circuits LO4. Magnetism, force, and field LO5. Ampere's Law, Electromagnetic induction LO6. Alternating currents and AC circuits, Maxwell's equations and EM Waves
Textbook	Essential University Physics Volume 2 by Richard Wolfson, 3rd or 4th Edition, Pearson University Physics with Modern Physics in SI Units by Hugh D. Young, Roger A. Freedman, 15th edition, Pearson
Additional Reference Book	-
CONTRIBUTION TO PROGRAMME OUTCOMES	
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10
LO1	X
LO2	X
LO3	X
LO4	X
LO5	X
LO6	X
COURSE CONTENT DETAILS	
Topics	Outcomes
W1 Electric charge: Force and Field	LO1
W2 Gauss's Law	LO1
W3 Electric potential	LO1
W4 Electrostatic Energy and Capacitors	LO1
W5 Electric current	LO1
W6 Electric circuits	LO1
W7 Chapter 26	
W8 Magnetism: Force and field	LO1, LO2
W9 Alternating-Current and circuits	LO1, LO2
W10 Maxwell's equations and Electromagnetic Waves	LO1, LO2

COURSE RECORD	
Code	PHYS 102
Name	PHYSICS II
Hour per week	5(3+2)
Credit	4
ECTS	5
Level	Undergraduate
Semester/Year	Spring/1
Type	Compulsory
Prerequisites	-
Content	
Objectives	Historically, a set of core concepts: 1-Electromagnetics as a vast area of study to understand the electromagnetic propagation, its interaction with matter, optical phenomena. 2-Electric charges and their properties when they are static and in motion results in electric and magnetic fields.
Learning Outcomes	LO1. Electric charge, force, and field. LO2. Gauss Law, Electric potential, electrostatic energy and capacitors LO3. Electric current and DC circuits LO4. Magnetism, force, and field LO5. Ampere's Law, Electromagnetic induction LO6. Alternating currents and AC circuits, Maxwell's equations and EM Waves
Textbook	Essential University Physics Volume 2 by Richard Wolfson, 3rd or 4th Edition, Pearson University Physics with Modern Physics in SI Units by Hugh D. Young, Roger A. Freedman, 15th edition, Pearson
Additional Reference Book	-
CONTRIBUTION TO PROGRAMME OUTCOMES	
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10
LO1	X
LO2	X
LO3	X
LO4	X
LO5	X
LO6	X
COURSE CONTENT DETAILS	
Topics	Outcomes
W1 Electric charge: Force and Field	LO1
W2 Gauss's Law	LO1
W3 Electric potential	LO1
W4 Electrostatic Energy and Capacitors	LO1
W5 Electric current	LO1
W6 Electric circuits	LO1
W7 Chapter 26	
W8 Magnetism: Force and field	LO1, LO2
W9 Alternating-Current and circuits	LO1, LO2
W10 Maxwell's equations and Electromagnetic Waves	LO1, LO2

COURSE RECORD

Code	COMP 112
Name	Object Oriented Programming
Hour per week	3+2 (Theory + Practice)
Credit	4
ECTS	6
Level/Year	Undergraduate
Semester	Spring
Type	Compulsory
Prerequisites	
Description	Within the scope of this course, students will develop object-oriented programs using the Java programming language. The main purpose of the course is to teach students the concepts of object-oriented programming and other auxiliary concepts commonly used in modern computer systems. In the course, subjects such as inheritance, polymorphism, exception handling, various data structures and graphical interface design will be covered.
Objectives	O1. will be able to define the basic concepts of Object Oriented Programming, O2. will be able to systematically analyze a computer software problem. O3. will be able to use the libraries included in the Java API O4. will be able to develop object-oriented programs with Java and develop methods and modules together.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. Explain fundamental principles of object oriented programming. LO2. Solve a computer programming problem by applying the appropriate Object oriented programming methodologies LO3. Implement object oriented methods using an appropriate approaches. LO4. Apply a object oriented method to a real world problem.

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	5	5	4	1	1	3	3	1	1	0	1	5	4	5	4
LO2	5	5	5	4	4	1	2	4	5	4	4	4	4	5	5
LO3	5	5	5	1	1	0	4	1	1	1	1	5	5	5	4
LO4	3	5	5	5	5	1	1	5	5	5	5	5	5	5	4

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Why Object Oriented Programming	LO1, LO2
W2 Classes and Objects	LO1, LO2
W3 Inheritance	LO1, LO2
W4 Polymorphism, Abstract Class	LO1, LO2
W5 Class design examples	LO1, LO2
W6 Polymorphism, Interface	LO1, LO2
W7 Object Oriented Design Examples	LO1, LO2
W8 Midterm	LO1, LO2, LO3
W9 Swing Class, Event Handler	LO1, LO2, LO3, LO4
W10 Array Class, ArrayList	LO1, LO2, LO3, LO4
W11 Exception Handling	LO1, LO2, LO3, LO4
W12 Generic Method, Generic Class	LO1, LO2, LO3, LO4
W13 Generic Collections	LO1, LO2, LO3, LO4
W14 Project Demos	LO1, LO2, LO3, LO4

DERS BİLGİLERİ

Kodu	COMP 112
İsmi	Nesneye Yönelimli Programlama
Haftalık Saati	3 + 2 (Teori + Pratik)

Kredi	4
AKTS	6
Seviye/Yıl	Lisans
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	
İçerik	Bu ders kapsamında, öğrenciler Java programlama dilini kullanarak nesne tabanlı programlar geliştireceklerdir. Dersin basilica amacı, öğrencilere nesne tabalı programlama kavramlarını ve modern bilgisayar sistemlerinde yaygın kullanılan diğer yardımcı kavramları öğretmektir. Ders kapsamında inheritance, polymorphism, exception handling, çeşitli veri yapıları ve grafik arayüz tasarımı gibi konular işlenecektir.

COURSE RECORD	
Code	COMP 104
Name	Exploring Computer Engineering
Hour per week	5 (3+2)
Credit	4
ECTS	5
Level/Year	Undergraduate
Semester	Spring
Type	Compulsory
Prerequisites	
Description	The course aims to introduce the field of computer engineering to the students via investigating fundamental topics such as programming languages, algorithm design, and basic robot programming. The material covered in this course includes different specializations of Computer engineering such as machine learning, computer networks, image processing, bioinformatics, computer organization, blockchain technologies, augmented reality, text mining. Lectures will be supplemented by the talks given by the experts from the field of computer engineering. This course will also focus on professional communication skills and ethical issues.
Objectives	<p>O1. Provide an understanding of the computer engineering, with a focus on practical aspects and ethical issues</p> <p>O2. Develop knowledge for different specialties in computer engineering</p> <p>O3. Study the basic commands and building blocks of different programming languages</p> <p>O4. Get familiarized with the computer engineering industry by meeting with the experts from the field</p>
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>LO1. Explain different specialties and ethical issues in computer engineering</p> <p>LO2. Use different programming languages such as C</p> <p>LO3. Use Linux/Unix environment (e.g., Bash scripting)</p> <p>LO4. Program a simple robot via using Lego Mindstorms robots</p>
CONTRIBUTION TO PROGRAMME OUTCOMES*	
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PO13 PO14 PO15
LO1	5 5 4 5 4 5 5 5 4 4 4 4 5 5 4
LO2	5 4 5 4 4 5 4 4 4 4 4 4 4 4 4
LO3	5 5 5 4 4 5 5 4 4 5 4 4 4 4 4
LO4	4 5 5 4 4 5 5 4 5 5 4 4 4 4 4

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 Introduction to Linux Environment (Bash Scripting, make, vim)	LO3
W2 Fundamentals of C	LO2
W3 Dynamic Memory Allocation & Pointers in C	LO2
W4 Debugging, GitHub	LO2
W5 Projection to a Computer Engineer's Life (Computer Architecture, Parallel Architecture)	LO1
W6 Projection to A Computer Engineer's Life (Machine Learning, Deep Learning, Pattern Recognition)	LO1
W7 Projection to A Computer Engineer's Life (Artificial Intelligence, Data Mining, Graph Mining)	LO1
W8 Robot Programming with Lego Mindstorms	LO4
W9 Projection to A Computer Engineer's Life (Computer Networks, Wireless Sensor Networks)	LO1
W10 Projection to A Computer Engineer's Life (Network Security)	LO1
W11 Projection to A Computer Engineer's Life (Block Chain, Augmented Reality)	LO1
W12 Projection to A Computer Engineer's Life (Image Processing, Computer Vision)	LO1
W13 Projection to A Computer Engineer's Life (Bioinformatics, Computational Genomics)	LO1
W14 Speaker from Industry, working in the field of Computer Engineering	LO1

DERS BİLGİLERİ

Kodu	COMP 104
İsmi	Bilgisayar Mühendisliğini Keşif
Haftalık Saati	5 (3+2)
Kredi	4
AKTS	5
Seviye/Yıl	Lisans
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	
İçerik	<p>Bu ders, programlama dilleri, algoritma tasarımı ve temel robot programlama gibi temel konuları inceleyerek, bilgisayar mühendisliği alanını öğrencilere tanıtmayı amaçlamaktadır. Bu derste kapsanan materyal, makine öğrenimi, bilgisayar ağları, görüntü işleme, biyoinformatik, bilgisayar organizasyonu, blok zincir teknolojileri, artırılmış gerçeklik, metin madenciliği gibi Bilgisayar mühendisliğinin farklı uzmanlıklarını içerir. Dersler, bilgisayar mühendisliği alanından uzmanların yapacağı konuşmalarla desteklenecektir. Bu ders aynı zamanda mesleki iletişim becerileri ve etik konulara da odaklanacaktır.</p>

COURSE RECORD

Code	CP100.COMP
Name	Career Planning
Hour per week	1 (1 + 0)
Credit	1
ECTS	1
Level/Year	Undergraduate / 1
Semester	Spring
Type	Compulsory
Prerequisites	-
Description	This course aims to make it possible for students to be employed in suitable fields based on their education and skills while creating the creation of career awareness in the early period of higher education. Furthermore, it aims to raise awareness about the expectations and dynamics of business life and to enable help students to develop personal and professional skills. Career Planning provides information about different sectors, to develop students' skills, as well as to get to know the tools they can use.
Objectives	<p>Increasing awareness about the importance of career planning in the preparation process for the professional world.</p> <p>Discovering their competencies and to understand the expectations of the professional world correctly;</p> <p>Developing their knowledge and skills in line with the requirements of the relevant sectors.</p>
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>LO1. Explain career centre activities</p> <p>LO2. Identify options for career development</p> <p>LO3. Apply the necessary skills for effective communication</p> <p>LO4. Argue the importance of professional relationship networks</p> <p>LO5. Recognize the support units at the university</p> <p>LO6. Identify the effective use of necessary resources for their career</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1		1		1						1	3				
LO2		2		2		2			1	2	4				
LO3		2				3				4	4	4			2
LO4		3		2		3			2	4	4	3			2
LO5		3								2	2				2
LO6						3				4	4				

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 - W2 What is the Career?	LO1, LO2
W3 What are the concepts of intelligence, personality, knowledge, skill, talent, and competence?	LO3, LO2
W4 Basic Communication Skills, Diction and Body Language	LO2
W5 Soft Skills	LO2
W6 National and International Exchange Programs	LO5, LO6
W7 - W10 Sector Days: NGOs, Public, Private Sectors, SME, Academy...	LO4, LO6
W11 Effective Interview Techniques	LO1, LO4, LO6
W12 - W13 Resume and Cover Letter Preparation	LO1, LO4, LO6

DERS BİLGİLERİ

Kodu	CP100.COMP
İsmi	Kariyer Planlama
Haftalık Saati	1 (1 + 0)
Kredi	1
AKTS	1
Seviye/Yıl	Lisans / 1
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	Yok
İçerik	Bu ders, öğrencilerin yükseköğretimin erken döneminde kariyer bilincinin oluşturulmasını sağlarken, eğitim ve becerilerine göre uygun alanlarda istihdam edilmelerini sağlamayı amaçlamaktadır. Ayrıca, iş hayatının beklenti ve dinamikleri hakkında farkındalık yaratmayı, öğrencilerin kişisel ve mesleki becerilerini geliştirmelerine yardımcı olmayı amaçlamaktadır. Kariyer Planlama, öğrencilerin becerilerini geliştirmek ve kullanabilecekleri araçları tanımak için farklı sektörler hakkında bilgi sağlar.

COURSE RECORD

Code	GLB 104
Name	AGU Ways II
Hour per week	3 (3 Theory + 0 Practice)
Credit	3
ECTS	4
Level/Year	Undergraduate
Semester	Spring
Type	Compulsory
Prerequisites	None
Description	<p>This is the second of the five Global Challenges (GLB) classes students will take at AGU. With the fall semester sister class, GLB 101, the freshman year GLB classes target a comprehensive introduction to United Nation's (UN) Sustainable Development Goals (SDGs). There are seventeen (17) SDGs and at the end of GLB 104 students will be familiar with all of them. Students will learn about not only the urgent reasons why we need such goals regarding these key topics, but also the specific 2030 goals we aspire to reach at.</p> <p>The class is also designed to introduce students to those goals using innovative and student-oriented methods, thus there will be no traditional lecturing involved. Individual course instructors will introduce group-based learning models and encourage students expressing themselves in creative ways. Students will learn from their peers across other disciplines as much as or more than the material shared throughout the semester.</p>
Objectives	Ensuring awareness among AGU students about the urgency regarding SDGs in today's world while applying group-oriented learning methods and learn from each other's disciplines.
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>LO1. Demonstrate how SDGs are aligned with AGU values by using a media they choose.</p> <p>LO2. Analyze selected UN's Sustainable Development Goals key features according to its political, economic, and social dimensions in local and global context.</p> <p>LO3. Relate these goals with individual fields as well as other fields.</p> <p>LO4. Recognize the impact of student's own action and lifestyle as related to specific topic with SDG component by using UDT steps (universal design thinking model).</p> <p>LO5. Defend the necessity of interdisciplinary understanding of SDGs.</p> <p>LO6. Identify sources and resources for learning more about SDGs to make important personal and professional decisions.</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7
LO1					4	4	4
LO2			4	3	4	4	4
LO3	4		4	3	4	4	4
LO4				3	4	4	4
LO5	4		4	3	4	4	4
LO6		4	4	3	4	4	4

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Welcome and Introduction of the Course	LO1
W2 Guest Speaker I	LO2
W3 SDG 8: Decent Work and Economic Growth,	LO3, LO4, LO5, LO6, LO7
W4 SDG 9: Industry, Innovation and Infrastructure,	LO3, LO4, LO5, LO6, LO7
W5 SDG 10: Reducing Inequality	LO3, LO4, LO5, LO6, LO7
W6 SDG 11: Sustainable Cities & Communities	LO3, LO4, LO5, LO6, LO7
W7 SDG 12: Responsible Consumption and Production	LO3, LO4, LO5, LO6, LO7
W8 SDG 13: Climate Action	LO3, LO4, LO5, LO6, LO7
W9 SDG 14: Life Below Water	LO3, LO4, LO5, LO6, LO7
W10 SDG 15: Life On Land	LO3, LO4, LO5, LO6, LO7
W11 SDG 16: Peace, Justice, and Strong Institutions	LO3, LO4, LO5, LO6, LO7
W12 SDG 17: Partnerships for the Goals	LO3, LO4, LO5, LO6, LO7
W13 Guest Speaker	LO2
W14 Course evaluation and Wrap-up	LO3, LO4, LO5, LO6, LO7

DERS BİLGİLERİ

Kodu	GLB 104
İsmi	AGU Ways II
Haftalık Saati	3 (3 Teori + 0 Pratik)
Kredi	3
AKTS	4
Seviye/Yıl	Lisans
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	Yok

İçerik Bu ders, AGÜ'de alınan beş Global (GLB) dersinin ikincisidir. Sonbahar döneminde açılan GLB 101 dahil olmak üzere birinci sınıflar için açılan GLB dersleri, Birleşmiş Milletler'in (BM) Sürdürülebilir Kalkınma Hedeflerine (SKH'ler) kapsamlı bir giriş yapmayı hedeflemektedir. On yedi (17) SKH vardır ve GLB 104'ün sonunda hepsine aşına olunması hedeflenmektedir. Bu derste bu hedeflere neden acilen ihtiyaç duyulduğunu ve aynı zamanda ulaşılması hedeflenen 2030 Sürdürülebilir Kalkınma Hedefleri öğrenilecektir. Ders ayrıca yenilikçi ve öğrenci odaklı yöntemler kullanarak bu hedeflerle öğrencileri tanıştırmak için tasarlanmıştır, dolayısıyla geleneksel bir ders anlatımı bulunmamaktadır. Öğitmenler öğrencileri grup temelli öğrenme modelleriyle tanıştıracak ve kendilerini yaratıcı yollarla ifade etmelerini teşvik edecektir. Dönem boyunca paylaşılan bilgilerin daha fazlasını diğer disiplinlerden iş birliği yapılan öğrencilerden öğrenilecektir.

COURSE SYLLABUS	
Code	ENG 102
Name	English II
Hour per week	4 (4+0)
Credit	4
ECTS	4
Level	Undergraduate
Semester/Year	Spring/1
Type	Compulsory
Prerequisites	ENG 101
Content	<p>The primary aim of this course is to enable students to develop critical thinking and reading skills during the process of researching, designing, and writing an academic report focused on one aspect of the course theme. Students are required to select their own research subject in consultation with the course instructor. Moreover, an exploration of a wide range of possible research subjects related to the course theme forms a key learning focus across Week1 and 2.</p> <p>In relation to the course theme, an emphasis will be placed on critically evaluating specific issues arising from the numerous development opportunities provided throughout the university experience, while analysing ways to successfully manage some of the common challenges.</p>
Objectives	<p>To develop critical thinking and reading skills during the process of researching, analysing, and evaluating academic texts;</p> <p>To develop effective research skills in relation to identifying appropriate academic sources that connect directly to the research question and thesis position;</p> <p>To develop an ability to design and write a research report that provides a coherent introduction of the research question and a logical defence of the thesis statement;</p> <p>To develop an ability to explain and defend arguments by selecting appropriate evidence, reasons, and supporting examples provided by academics;</p> <p>To develop an ability to manage time and acquire effective self-managed learning skills;</p> <p>To develop an ability to express and defend arguments confidently, including during email exchanges and during the compulsory zoom sessions;</p> <p>To consolidate and deepen an understanding of academic English and conventions initially explored on English 101.</p>
Learning Outcomes	<p>LO1. To assess the extent to which the student is able to identify an appropriate research subject, construct a research question, and design a deliverable thesis argument.</p> <p>LO2. To assess the extent to which the student is able to research, identify, and summarise four academic texts that develop the research question subject and directly support the thesis statement argument.</p> <p>LO3. To assess the extent to which the student has successfully constructed a coherent research report expressed in an academic style that develops the research question, while defending the thesis statement with reference to the work cited in the literature review.</p> <p>LO4. To assess the extent to which the student has successfully edited, redrafted, polished and proofread the final report based on the feedback provided on the draft report.extent to which the initial hypothesis has been proven or otherwise.</p>
Textbook	Edwards, R. A. (2013). Critical thinking skills in the process of academic writing. <i>Modern English Teacher</i> , 22(1), 5–10.
Additional Reference Book	<p>Scouller, K. (2001). <i>Becoming a more effective learner</i>. Learning Centre, University of Sydney. https://www.sydney.edu.au/content/dam/students/documents/learning-resources/learning-centre/becoming-a-more-effective-learner.pdf</p> <p>Ariely, D. (2008). <i>Predictably irrational: The hidden forces that shape our decisions</i> (Ch. 6). HarperCollins.</p> <p>Edwards, R. A. (2020). Understanding the purpose of summaries in relation to assigned tasks. <i>Modern English Teacher</i>, 29(1), 12–16.</p> <p>Edwards, R. A. (2020). Identifying key information and making effective notes. <i>Modern English Teacher</i>, 29(2).</p>

Edwards, R. A. (2020). Planning, writing and proofreading. Modern English Teacher, 29(3).

CONTRIBUTION TO PROGRAMME OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1					X					
LO2					X					
LO3					X					
LO4					X					

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Introduction to the course theme, Introduction to the course outline and course, Information, Introduction to A1 (30%)	
W2 Opportunities arising from the university experience, The general overview, The key personal development issues, The balance between social attractions and the study schedule, The development of emotional intelligence	
W3 Opportunities to develop self-directed learning skills, The key self-directed learning skills, The process of self-directed learning, The challenges of the development of selfdirected learning	
W4 Opportunities to learn critical reading and thinking skills, The challenge of learning critical reading, The relationship between critical reading and thinking, The basic process of critical reading, The most common strategy for critical reading, The method used to identify academic texts	
W5 Opportunities to enhance employability skills, The primary employability skills The key problem-solving and decisionmaking skills, The process of project planning and effective time management, The design of career planning schedules	
W6 Revision of the opportunities and challenges of the university experience, Revision of the Research Proposal format	
W7 Introduction to the HELPs, Introduction to the DRR (40%), Revision of the key Part One materials in relation to academic texts and EAP conventions	
W8 Planning the LR and completing the References, Logical order within and between paragraphs	
W9 Planning and writing the Findings	
W10 Introduction to the FRR	
W11 Planning and writing the Discussion	
W12 Writing the Conclusion	
W13 Writing the Introduction and Abstract	
W14 Checking and proofreading the FRR	

(Semester 3) - Year 2, Fall Semester

Course Code	Course Name	PreReq	Theoretical Hours	Practical Hours	Credits	ECTS
<u>MATH 203</u>	Linear Algebra		3	0	3	5
<u>COMP 203</u>	Data Structures and Algorithms	COMP 112	3	2	4	7
<u>COMP 205</u>	Mobile Programming	COMP 101	3	2	4	7
<u>EE 203</u>	Digital Design		3	0	3	4
<u>EE 213</u>	Digital Design Lab		1	2	2	2
<u>GLB2XX</u>	Global Issues Elective II		3	0	3	4
<u>TURK XXX</u>	Turkish Language Pool - Elective		2	0	2	2
TOTAL			18	6	21	31

COURSE RECORD

Code	MATH 203
Name	Linear Algebra
Hour per week	3 (3+0)
Credit	3
ECTS	5
Level	Undergraduate
Semester/Year	Spring/2
Type	Compulsory
Prerequisites	-
Content	<p>The main goal of the course is to help students master the basic concepts and skills they will use later in their careers. The topics here follow the recommendations of the experts in this area, which were based on a careful investigation of the real needs of the students and a consensus among professionals in many disciplines that use linear algebra. Hopefully, this course will be one of the most useful and interesting mathematics classes that you will be taking during your undergraduate studies.</p> <p>The main subjects of the course are the following topics: Linear equations, solving systems of linear equations, matrix algebra, determinants and their properties, vector spaces, linear independence of a set of vectors, subspaces and bases of vector spaces, linear transformations and the matrix of a linear transformation, eigenvalues and eigenvectors, orthogonality, orthogonal projections, least-square approximations, inner products, diagonalization of symmetric matrices and some of their applications.</p>
Objectives	The objectives of this course are to cover basic topics in elementary linear algebra.
Learning Outcomes	<p>The learning outcomes of this course is to provide an opportunity for students to</p> <p>LO1. Be able solve systems of linear equations by using matrices via the use of Gaussian elimination, inverse of matrices or Cramer's rule, and give geometric interpretation of the solution set by use of vector spaces</p> <p>LO2. Do matrix operations including addition, multiplication, inverting, taking determinant and computing rank</p> <p>LO3. Understand the basics of vector spaces including subspaces, linear independence, basis, dimension, and be able describe null space, column space and row space of a matrix as vector spaces</p> <p>LO4. Understand linear transformations and their relations to matrices</p> <p>LO5. Be able to compute eigenvectors and eigenvalues</p>

	LO6. Test if a given matrix is diagonalizable and apply diagonalization of symmetric matrices to constrained optimization problems and to the classification of quadratic forms LO7. Understand orthogonal projections and apply them to least-square problems LO8. Understand the very basics of inner products spaces at an introductory level
Textbook	Linear Algebra and Its Applications, 5th Edition (or new edition). Authors: David C. Lay.
Additional Reference Book	Elementary Linear Algebra, 11th Edition. Authors: Howard Anton and Chris Rorres. Elementary Linear Algebra, Authors: Bernard Kolman and David Hill. Introduction to Linear Algebra Authors: Gilbert Strang.

CONTRIBUTION TO PROGRAMME OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1	X									
LO2	X									
LO3	X									
LO4	X									
LO5	X									
LO6	X									
LO7	X									
LO8	X									

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Systems of linear equations, Row reduction and echelon forms	
W2 Vector equations, The matrix equation $Ax=b$	
W3 Solution sets of linear systems, Linear independence, Introduction to linear transformations	
W4 The matrix of a linear transformation, Matrix operations, The inverse of a matrix	
W5 The inverse of a matrix, Characterization of invertible matrices, Matrix factorization, Subspaces of R^n	
W6 Dimension and rank, Introduction to determinants, Properties of Determinants, Cramer's rule, volume, and linear transformations	
W7 Vector spaces and subspaces, Null space, column space, and linear Transformations, Linearly independent sets, bases	
W8 Vector spaces and subspaces, Null space, column space, and linear Transformations, Linearly independent sets, bases	
W9 Coordinate systems, The dimension of a vector space, Rank	
W10 Change of bases, Eigenvectors and eigenvalues, The characteristic equation	
W11 Diagonalization, Eigenvectors and linear transformations	
W12 Inner product, length, and orthogonality, Orthogonal sets	
W13 Orthogonal projections, The Gram-Schmidt process	
W14 Least-square problems, Inner product spaces, Diagonalization of symmetric matrices	

COURSE RECORD

Code	COMP 203
Name	Data Structures and Algorithms
Hour per week	5 (3 + 2)
Credit	4
ECTS	7
Level/Year	Undergraduate / 2
Semester	Fall
Type	Compulsory
Prerequisites	COMP 112
Description	The purpose of this course is to provide the students with solid foundations in the basic concepts of programming: data structures and algorithms. The main objective of the course is to teach the students how to select and design data structures and algorithms that are appropriate for problems that they might encounter. This course is also about comparing algorithms and studying their correctness and computational complexity. This course offers the students a mixture of theoretical knowledge and practical experience using Java
Objectives	<ul style="list-style-type: none"> - Improving Data Structure and Algorithmic Thinking abilities - Improving Computational thinking abilities and runtime - Understanding the problems and problem-solving steps - Improving coding skills
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>L01 Use data structure and algorithms principles to analyze real-world problems L02 Create solution models for real-world problems and analyze the solution L03 Identify proper solution steps L04 Code the problem solutions with programming languages L05 Design different solutions to a given problem(s)</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	4	5	4	1	1	3	3	1	1	0	3	5	4	5	4
LO2	3	5	5	4	4	1	2	4	5	2	4	4	4	5	5
LO3	4	5	5	4	3	0	4	1	1	1	4	5	5	5	4
LO4	3	5	5	5	5	1	1	5	5	5	5	5	5	5	4
LO5	5	3	5	2	2	5	5	1	2	1	1	5	5	5	4

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 - W2 Mathematical background	LO1, LO2, LO3
W3 Analysis of Algorithms	LO2, LO5
W4 Data structures	LO1, LO3, LO5
W5 Data structure and runtime analysis of data structures	LO4, LO5
W6 Introduction to Trees	LO4, LO5
W7 - W10 Tree types and their algorithmic analysis	LO2, LO3, LO5
W11 Introduction to Graphs	LO1, LO5
W12 - W13 Graph Analysis	LO2, LO3, LO5

DERS BİLGİLERİ

Kodu	COMP 203
İsmi	Veri Yapıları ve Algoritmalar
Haftalık Saati	5 (3 + 2)
Kredi	4
AKTS	7
Seviye/Yıl	Lisans / 2
Dönem	Güz
Dersin Dili	İngilizce
Tip	Zorunlu

Ön Şart	COMP 112
İçerik	Dersin temel amacı Veri Yapıları ve Algoritmik Düşünce sisteminin iyileştirilerek, problem çözme becerilerinin geliştirilmesidir. Gerçek hayat problemleri ile bilgisayar bilimleri problemleri arasındaki ilişkiyi kuracaktır. Bir problemin matematiksel olarak nasıl modelleneceği, bilgisayar ortamında nasıl ele alınması gerektiği ve çözümü kurgulama aşamalarında hangi veri yapılarının kullanılması gerektiği öğrenilecektir. Dersi alan öğrenciler matematik, algoritma, temel bilgisayar alanları (veri yapıları, algoritma analizi, programlama, vb.) hakkında bilgi sahibi olacaktır.

COURSE RECORD	
Code	COMP 205
Name	Mobile Programming
Hour per week	5 (3 + 2)
Credit	4
ECTS	7
Level/Year	Undergraduate
Semester	Fall
Type	Compulsory
Prerequisites	COMP 101 Art of Computing
Description	The course aims to teach the essentials of mobile programming to students who have some background on object-oriented programming. The students will learn how to write cross-platform (iOS and Android) mobile applications using Flutter framework in the Android Studio IDE. The course introduces the fundamental components used in mobile programming such as user interface components, routes and navigation, local and remote data storage using databases, and data retrieval from the Web. The course has both lecture and practice sessions. The lecture session covers theoretical concepts whereas the practice sessions give students a hands-on experience on the topics covered in the lecture sessions.
Objectives	Students will be aware of requirements for developing applications for resource-constrained and mobile devices. Students will gain experience on using Android Studio IDE to develop mobile applications. Students will learn to develop fully-fledged mobile applications.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. Identify components of a mobile application LO2. Visualize routes in a mobile application by sketching each screen in the application LO3. Use Android Studio IDE to develop mobile applications LO4. Analyze functional and non-functional requirements of a mobile application LO5. Debug their code to achieve bug-free applications LO6. Create fully-fledged mobile applications
CONTRIBUTION TO PROGRAMME OUTCOMES*	
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PO13 PO14 PO15
LO1	0 3 2 0 0 0 0 0 0 0 3 0 3 2 0
LO2	2 0 1 1 0 0 1 0 1 0 4 0 3 3 0
LO3	0 0 0 0 0 0 0 0 0 0 5 0 5 5 3
LO4	4 5 4 5 1 2 4 4 2 4 4 0 4 4 5
LO5	5 4 3 4 2 0 0 3 3 0 5 0 5 5 5
LO6	3 3 4 2 4 3 3 4 3 3 5 1 5 5 5
* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High	

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Introduction and Flutter Basics, Part 1	LO1, LO3, LO6
W2 Flutter Basics, Part 2	LO1, LO3, LO5, LO6
W3 Widgets, Styling, and Adding Logic, Part 1	LO1, LO2, LO3, LO6
W4 Widgets, Styling, and Adding Logic, Part 2	LO1, LO2, LO3, LO6
W5 Responsive & Adaptive User Interfaces and Apps; Widget and Flutter Internals	LO2, LO3, LO4, LO6
W6 Navigation & Multiple Screens	LO2, LO3, LO6
W7 State Management	LO4, LO6
W8 Working with User Input & Forms, <i>Midterm Exam</i>	LO3, LO4, LO6
W9 From Web to App: Data & Backend	LO3, LO4, LO6
W10 Adding User Authentication	LO2, LO3, LO4, LO6
W11 Using Native Device Features (Camera, Maps, Location, etc.)	LO3, LO4, LO6
W12 Firebase SDK and Push Notifications	LO3, LO4, LO6
W13 Running Native Java or Kotlin Code, Publishing Android Apps, Adding Animations	LO4, LO6

DERS BİLGİLERİ

Kodu	COMP 205
İsmi	Mobil Programlama
Haftalık Saati	5 (3 + 2)
Kredi	4
AKTS	7
Seviye/Yıl	Lisans
Dönem	Güz
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	COMP 101 Programlama Sanatı
İçerik	<p>Bu ders, nesne-tabanlı programlama konusunda ön bilgisi olan öğrencilere mobil programlamanın temellerini öğretmeyi amaçlamaktadır. Öğrenciler, Android Studio IDE’de Flutter çerçevesini kullanarak çok platformlu (iOS ve Android) mobil uygulamalar geliştirmeyi öğrenecektir. Bu ders, kullanıcı arayüzü bileşenleri, güzergâhlar ve navigasyon, veritabanlarını kullanarak yerel ve uzak veri depolama ve Web’den veri getirme gibi mobil programlamada kullanılan temel konuları sunmaktadır. Bu dersin hem sınıf hem de laboratuvar oturumları bulunmaktadır. Sınıf oturumları teorik kavramları işlerken laboratuvar oturumları öğrencilere sınıf oturumlarında işlenen konular üzerinde pratik deneyim imkanı sunmaktadır.</p>

COURSE RECORD	
Code	EE 203
Name	DIGITAL DESIGN
Hour per week	3
Credit	3
ECTS	4
Level/Year	Undergraduate
Semester	Fall
Type	Compulsory
Prerequisites	
Description	This course introduces the fundamentals of digital logic design. The topics include number systems, Boolean algebra, logic gates, combinational logic design, logic circuit simplification, latches and flip-flops, sequential logic design, registers, counters, arithmetic logic design, state machines, register transfer, and single-cycle computer.
Objectives	(1) To understand the fundamental concepts in digital logic circuits. (2) To apply the obtained knowledge for analysis and design of digital logic circuits.
Learning Outcomes	By the end of this course, students will be able: 1. to analyze and design combinational logic circuits. 2. to analyze and design sequential logic circuits. 3. to analyze behaviors or finite state machines by deriving state diagrams.
COURSE CONTENT DETAILS	
Topics	Outcomes
Number systems	LO1
Logic gates	LO1, LO2, LO3, LO4
Boolean algebra	LO1, LO2, LO3, LO4
Logic simplification	LO1, LO2, LO3, LO4
Combinational logic design	LO1, LO3, LO4
Sequential logic – latches and flip-flops	LO2, LO3, LO4
Sequential logic – registers and counters	LO2, LO3, LO4
Finite state machines	LO1, LO2, LO3, LO4
Register transfer	LO1, LO2, LO3, LO4
Memory	LO1, LO2

COURSE RECORD	
Code	EE 213
Name	DIGITAL DESIGN LAB
Hour per week	3
Credit	3
ECTS	2
Level/Year	Undergraduate
Semester	Fall
Type	Compulsory
Prerequisites	EE 203
Description	This laboratory course teaches how to design digital circuits and systems using hardware description language (HDL), and how to implement the circuits and systems by using an FPGA board. The course also includes implementation of digital circuits by using MSI chips.
Objectives	(1) To understand the fundamental concepts in digital logic circuits. (2) To apply the obtained knowledge for analysis and design of digital logic circuits.
COURSE CONTENT DETAILS	
Topics	Outcomes
HDL introduction	LO1, LO2, LO3, LO4

Block design with IP	LO1, LO2, LO3, LO4
Combinational logic design	LO1, LO4
Sequential logic design	LO2, LO4
Finite state machines	LO1, LO2, LO3, LO4

COURSE RECORD

Code	GLB 203
Name	Good Health and Well Being
Hour per week	3 (Theory)
Credit	3
ECTS	4
Level/Year	Undergraduate
Semester	Fall / Spring
Type	Elective
Prerequisites	English Bridge Course
Description	<p>The course will focus on today's and future health concerns and solutions in the light of 5 different perspectives. Health is one of the most important meters of sustainable development. Scientific breakthroughs in this topic improve life expectancy and quality. However, with increasing population, environmental challenges, new types of health issues are occurring. In this SDG students will be discussing topics that will challenge society in the future such as obesity, diabetes, vaccines, biomaterials, age-related diseases, personal & economical behaviors, emotions & attitudes.</p> <p>The course expects students to bring their disciplinary knowledge in conversation to advance treatment and prevention options to "ensure healthy lives and promote well-being for all at all ages" (SDG3).</p>
Objectives	<p>Our aim is to assist student to increase their awareness on the definition of good health and wellbeing SDG3. Expectations from individuals and team members are wide-range conversations with a deep participation and improving the knowledge and consciousness about good health and wellbeing.</p>
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>LO 1. Identify key features of SDG 3</p> <p>LO 2. Analyze SDG 3 according to its political, economic, scientific, technological and social dimensions in local and global context.</p> <p>LO 3. Compare how SDG 3 are related to their fields.</p> <p>LO 4. Evaluate the impact of their action and lifestyle as related to specific SDG.</p> <p>LO 5. Defend the necessity of interdisciplinary understanding of SDG 3.</p> <p>LO 6. Identify sources and resources for learning more about SDG 3 to help to make important personal and professional decisions.</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7
LO1					4	4	4
LO2			4	3	4	4	4
LO3	4		4	3	4	4	4
LO4				3	4	4	4
LO5	4		4	3	4	4	4
LO6		4	4	3	4	4	4

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topics	Outcomes
Common Lectures on SDG 3	L01 – L06
Guest Speakers on SDG 3	L01 – L06
Individual Lectures on SDG 3	L01 – L06

DERS BİLGİLERİ

Kodu	GLB 203
İsmi	Sağlık ve Kaliteli Yaşam
Haftalık Saati	3 (Teori)
Kredi	3
AKTS	4
Seviye/Yıl	Lisans
Dönem	Güz /Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	Bridge
İçerik	<p>Bu ders, 5 farklı bakış açısı ışığında bugünün ve geleceğin sağlık sorunlarına ve çözümlerine odaklanacaktır. Sağlık, sürdürülebilir kalkınmanın en önemli ölçütlerinden biridir. Bu konudaki bilimsel atılımlar, yaşam beklentisini ve kalitesini iyileştirmek amacıyla. Bununla birlikte, artan nüfus, çevresel zorluklar ve yeni tür sağlık sorunları ortaya çıkmaktadır. Bu SDG'de öğrenciler obezite, diyabet, aşılarda, biyo-malzemeler, yaşa bağlı hastalıklar, kişisel ve ekonomik davranışlar, duygular ve tutumlar gibi gelecekte toplumu zorlayacak konuları tartışacaklardır.</p> <p>Ders, öğrencileri “sağlıklı yaşamı sağlamak ve her yaşta herkes için refahı teşvik etmek” (SDG3) ve aynı zamanda tedavi ve önleme seçeneklerini kendi disiplin bilgileri doğrultusunda tartışmalarda kullanmalarını beklemektedir.</p>

COURSE RECORD

Code	GLB 205
Name	Sustainable Cities & Communities
Hour per week	3 (Theory)
Credit	3
ECTS	4
Level/Year	Undergraduate
Semester	Fall / Spring
Type	Elective
Prerequisites	English Bridge Course
Description	<p>Aiming to motivate students to be part of the SDG 11 - Sustainable Cities and Communities and develop tangible solutions for our world's urgent problems, including but not limited to refugee crises, integration problems, citizens' attitudes towards immigrant communities, health impacts of transportation, sustainable transportation, planning of transportation systems, improving road safety, the effects of public transportation on public health, traffic-related air pollution and intelligent transportation systems. In the course, students from different disciplines are encouraged to conduct research in determined areas individually and as a team.</p>
Objectives	<p>Our aim is to assist students to increase their awareness of the definition of Sustainable Cities and Communities SDG 11</p> <p>Expectations from individuals and team members are wide-range conversations with a deep participation and improving the knowledge and consciousness about sustainable cities SDG 11</p>

Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>LO 1. Identify key features of SDG 11.</p> <p>LO 2. Analyze SDG 11 according to its political, economic, scientific, technological and social dimensions in local and global context.</p> <p>LO 3. Compare how SDG 11 are related to their fields.</p> <p>LO 4. Evaluate the impact of their action and lifestyle as related to specific SDG.</p> <p>LO 5. Defend the necessity of interdisciplinary understanding of SDG 11.</p> <p>LO 6. Identify sources and resources for learning more about SDG 11 to help to make important personal and professional decisions.</p>
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CONTRIBUTION TO PROGRAMME OUTCOMES*

	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7
LO1					4	4	
LO2			4	3	4	4	
LO3	4		4	3	4	4	2
LO4				3	4	4	
LO5	4		4	3	4	4	
LO6		4	4	3	4	4	

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topics	Outcomes
Common Lectures on SDG 11	LO1 – LO6
Guest Speakers on SDG 11	LO1 – LO6
Individual Lectures on SDG 11	LO1 – LO6

DERS BİLGİLERİ

Kodu	GLB 205
İsmi	Sürdürülebilir Şehirler & Topluluklar
Haftalık Saati	3 (Teori)
Kredi	3
AKTS	4
Seviye/Yıl	Lisans
Dönem	Güz / Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	Bridge
İçerik	SDG 11 (Sürdürülebilir Şehirler ve Topluluklar) öğrencileri dünyadaki mülteci durumu, entegrasyon sorunu, vatandaşların göçmen topluluklarına yönelik tutumları, sürdürülebilir ulaşım ve yaşam pratiklerimizin toplum ve kendi sağlığımıza etkileri gibi dünyamızın acil sorunlarına somut çözümler geliştirmeyi amaçlamaktadır. Bu SDG çatısı altında olası tartışılacak diğer konular; ulaşım sistemlerinin planlanması, yol güvenliğinin iyileştirilmesi, toplu ulaşımın halk sağlığına etkileri, trafikle ilgili hava kirliliği ve akıllı ulaşım sistemleri gibi sıralanabilir. Derste farklı disiplinlerden gelen öğrencilerin bireysel ve takım olarak belirlenen alanlarda araştırma ve tartışma yapmaları beklenir.

COURSE RECORD

Code	GLB 206
Name	Clean Water & Sanitation
Hour per week	3 (Theory)
Credit	3
ECTS	4
Level/Year	Undergraduate
Semester	Fall / Spring
Type	Elective
Prerequisites	BRG 001 English Bridge Course

Description	Today, 2 billion people do not have access to safe drinking water, and 3.6 billion do not have access to safe sanitation facilities. Unsafe hygiene practices are common, and this practice has negative effects on people's health. Microbial contamination is still regarded as the most serious risk factor in drinking water quality across the world. However, chemical pollution from both natural and manmade causes, such as arsenic, fluoride, pesticides, petrochemicals, and salt contamination, affects millions of people. This course focuses on appropriate and sustainable technologies for water and sanitation. It also incorporates technical, socio-cultural, public health, and economic factors into the planning and design of water and sanitation systems.
Objectives	Expectations from individuals and team members are wide-range conversations with a deep participation and improving the knowledge and consciousness about SDG 6.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO 1. Identify key features of SDG 6 LO 2. Analyze SDG 6 according to its political, economic, scientific, technological and social dimensions in local and global context. LO 3. Compare how SDG 6 is related to their fields. LO 4. Evaluate the impact of their action and lifestyle as related to SDG 6. LO 5. Defend the necessity of interdisciplinary understanding of SDG 6. LO 6. Identify sources and resources for learning more about SDG 6 to help to make important personal and professional decisions.

CONTRIBUTION TO PROGRAMME OUTCOMES*

	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7
LO1					4	4	4
LO2			4	3	4	4	4
LO3	4		4	3	4	4	4
LO4				3	4	4	4
LO5	4		4	3	4	4	4
LO6		4	4	3	4	4	4

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 Welcome. Introduction of the Course, Instructure & Students Activity: Lecture, online warm up activities,	LO1
W2 Guest Speaker I: Dr. Ayşe Gül Activity: Pre-work: Question to Speakers Personal Reflection	LO2, LO3, LO4, LO5, LO6
W3 Guest Speaker II: Dr. Evren M. Dinçer Activity: Pre-work: activity to be determined Interactive lecture, Group work	LO2, LO3, LO4, LO5, LO6
W4 Individual Sessions I Activity: Pre-work: activity to be determined Interactive lecture, Group work	LO3, LO4, LO5, LO6
W5 Individual Sessions II Activity: Pre-work: activity to be determined Interactive lecture, Group work	LO3, LO4, LO5, LO6
W6 Guest Speaker III Dr. Sarah Alexander, Flint Michigan water Crisis	LO2, LO3, LO4, LO5, LO6

Activity: Pre-work: activity to be determined Interactive lecture, Group work	
W7 Guest Spaker IV KASKI	LO2, LO3, LO4, LO5, LO6
Activity: Pre-work: activity to be determined Interactive lecture, Group work	
W8 Individual Sessions III	LO3, LO4, LO5, LO6
Activity: Pre-work: activity to be determined Interactive lecture, Group work	
W9 Individual Sessions IV	LO3, LO4, LO5, LO6
Activity: Pre-work: activity to be determined Interactive lecture, Group work	
W10 Guest Speaker V Prof. Nigmet Uzal (Ayşe Gül)	LO2, LO3, LO4, LO5, LO6
Activity: Pre-work: activity to be determined Interactive lecture, Group work	
W11 Guest Speaker VI UNDP / UNICEF	LO2, LO3, LO4, LO5, LO6
Activity: Pre-work: activity to be determined Interactive lecture, Group work	
W12 Commemoration of Atatürk, Youth and Sports Day Individual Sessions V (Make-up day will be announced)	LO3, LO4, LO5, LO6
Activity: Pre-work: activity to be determined Interactive lecture, Group work	
W13 Individual Sessions VI	LO3, LO4, LO5, LO6
W14 Final Task, Course evaluations and Wrap-up	LO3, LO4, LO5, LO6
DERS BİLGİLERİ	
Kodu	GLB 206
İsmi	Temiz su ve Sanitasyon
Haftalık Saati	3 (Teori)
Kredi	3
AKTS	4
Seviye/Yıl	Lisans
Dönem	Güz /Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	BRG 001 English Bridge Course
İçerik	Günümüzde 2 milyar insanın güvenli içme suyuna ve 3,6 milyar kişinin güvenli sanitasyon tesislerine erişimi bulunmamaktadır. Güvenli olmayan ve insan sağlığı üzerinde olumsuz etkileri bulunan hijyen uygulamaları yaygın olarak görülmektedir. Mikrobiyal kontaminasyon hala dünya genelinde içme suyu kalitesinde en ciddi risk faktörü olarak kabul edilmektedir. Bununla birlikte, arsenik, florür, pestisitler, petrokimyasallar ve tuz kontaminasyonu gibi hem doğal hem de yapay nedenlerden kaynaklanan kimyasal kirlilik milyonlarca insanı etkilemektedir. Bu ders, temiz su ve sanitasyon için uygun ve sürdürülebilir teknolojilerin tanıtılmasına odaklanmaktadır. Ayrıca teknik, sosyo-kültürel, halk sağlığı ve ekonomik faktörler gibi pek çok etkeni de temiz su ve sanitasyon sistemlerinin planlanması ve tasarımına dahil etmektedir.

COURSE RECORD

Code	TURK 101
Name	Turkish I
Hour per week	2 (2+0)
Credit	2
ECTS	2
Level	Undergraduate
Semester/Year	Fall/2
Type	Compulsory
Prerequisites	-
Content	
Objectives	<p>Türk dili derslerinin amacı, YÖK tarafından hazırlanan çerçeve programda şöyle ifade edilmiştir:</p> <p>Yükseköğrenimini tamamlamış olan her gence, ana dilinin yapı ve işleyiş özelliklerini gereğince kavrayabilmek; dil - düşünce bağlantısı açısından, yazılı ve sözlü ifade vasıtası olarak, Türkçeyi doğru ve güzel kullanabilme yeteneği kazandırabilmek; öğretimde birleştirici ve bütünleştirici bir dili hâkim kılmak ve ana dili şuuruna sahip gençler yetiştirmektir.</p> <p>Bunlara ek olarak bu derslerde; edebî metinler aracılığıyla öğrencileri okumaya özendirme, okuma alışkanlığı kazandırma, küresel ve eleştirel düşünmeye alıştırma, onlara iyi bir anlatımın niteliklerine uygun özgün yazılar yazabilme becerisi ve üslup kazandırma da hedeflenmektedir.</p>
Learning Outcomes	<p>LO1. Dil ve kültürün özelliklerini, önemini kavrama, LO2. Türkçenin dünü ve bugünü hakkında birikim sahibi olma, LO3. Türkçenin güncel sorunlarının ve dil yanlışlarının farkına varma, Doğru konuşmaya ve yazmaya özen gösterme, LO4. Örnek metinlerle üslup kazanma ve kelime hazinesini geliştirme, LO5. Planlı yazılar yazarken uygun kelime seçme, sağlam cümle kurabilme, yazım kurallarına uyma, noktalama işaretlerini doğru kullanabilme becerisi kazanma, LO6. Sözlü ve yazılı anlatımın temel ilkelerini kavrama, LO7. Hazırlıklı ve hazırlıksız konuşabilme, etkili sunum yapabilme becerisi kazanma, LO8. Türk ve dünya edebiyatından örnek metinleri şekil ve içerik bakımından karşılaştırabilme, yorumlayabilme, eleştirebilme becerisi kazanma, LO9. Farklılıkları kabullenme, başkalarının düşüncelerine saygılı olma.</p>
Textbook	Anadolu Üniversitesi, Türk Dili 1
Additional Reference Book	Atatürk Üniversitesi, Türk Dili 1, İstanbul Üniversitesi, Türk Dili 1

CONTRIBUTION TO PROGRAMME OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1					X					
LO2					X					
LO3					X					
LO4					X					
LO5					X					
LO6					X					
LO7					X					
LO8					X					
LO9					X					

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Türk Dili dersinin amacı, içeriği, işlenişi; yararlanılacak kaynaklar, ağ sayfaları, yazılımlar, uygulamalar ve okunacak kitap hakkında bilgiler, Dil, dilin özellikleri ve önemi	
W2 Kültür, dil - kültür ilgisi	
W3 Dilekçe yazma	
W4 Güzel konuşmanın önemi, Konuşma yanlışları, güzel konuşma kuralları , Hazırlıklı konuşmalar	

W5 Etkili sunum hazırlama teknikleri
W6 Ana hatlarıyla Türkçenin tarihi devirleri, Türkçenin gücü
W7 Türkçenin bugünkü durumu ve güncel sorunları
W8 AGU LFW (Türkçenin önemli ses özellikleri, hangi ses olayları yazıda gösterilmez? Yazım sorunları, yazım kuralları ve noktalama işaretleri Yazım ve noktalama uygulamaları)
W9 Zarflarla ilgili bilinmesi gereken önemli hususlar, Sık yapılan tamlama yanlışları
W10 Cümle teşkili, Sağlam cümle kurma alıştırmaları
W11 Akademik ve günlük hayatta kompozisyon ne işe yarar? Kompozisyon nasıl yazılmaz?
W12 Kelime türetme
W13 Yanlış kullanılan çekim ekleri
W14 Retorik uygulamalar (Kitaplarla ilgili değerlendirmeler, yorumlar, eleştiriler)

COURSE RECORD	
Code	TURK 102
Name	Turkish II
Hour per week	2 (2+0)
Credit	2
ECTS	2
Level	Undergraduate
Semester/Year	Spring/2
Type	Compulsory
Prerequisites	-
Content	-
Objectives	<p>Türk dili derslerinin amacı, YÖK tarafından hazırlanan çerçeve programda şöyle ifade edilmiştir:</p> <p>Yükseköğrenimini tamamlamış olan her gence, ana dilinin yapı ve işleyiş özelliklerini gereğince kavratılmak; dil - düşünce bağlantısı açısından, yazılı ve sözlü ifade vasıtası olarak, Türkçeyi doğru ve güzel kullanabilme yeteneği kazandırılmak; öğretimde birleştirici ve bütünleştirici bir dili hâkim kılmak ve ana dili şuuruna sahip gençler yetiştirmektir.</p> <p>Bunlara ek olarak bu derslerde; edebî metinler aracılığıyla öğrencileri okumaya özendirme, okuma alışkanlığı kazandırma, küresel ve eleştirel düşünmeye alıştırma, onlara iyi bir anlatımın niteliklerine uygun özgün yazılar yazabilme becerisi ve üslup kazandırma da hedeflenmektedir.</p>
Learning Outcomes	<p>LO1. Planlı yazılar yazarken uygun kelime seçme, sağlam cümle kurabilme, yazım kurallarına uyma, noktalama işaretlerini doğru kullanabilme becerisi kazanma,</p> <p>LO2. Özlü ve yazılı anlatımın temel ilkelerini kavrama,</p> <p>LO3. Okunan metnin türünü ve özelliklerini belirleyebilme,</p> <p>LO4. Örnek metinlerle üslup kazanma ve kelime hazinesini geliştirme,</p> <p>LO5. Türkçenin güncel sorunlarının ve dil yanlışlarının farkına varma, doğru konuşmaya ve yazmaya özen gösterme,</p> <p>LO6. Hazırlıklı ve hazırlıksız konuşabilme, etkili sunum yapabilme becerisi kazanma,</p> <p>LO7. Türk ve dünya edebiyatından örnek metinleri şekil ve içerik bakımından karşılaştırabilme, yorumlayabilme, eleştirebilme becerisi kazanma,</p> <p>LO8. Farklılıkları kabullenme, başkalarının düşüncelerine saygılı olma</p>
Textbook	<i>Üniversiteler İçin Uygulamalı Türk Dili ve Kompozisyon Bilgileri</i> , Dr. Ahmet Kayasandık (Orya), 15. baskı, Palet, Konya, 2017.
Additional Reference Book	-

CONTRIBUTION TO PROGRAMME OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1					X					
LO2					X					
LO3					X					
LO4					X					
LO5					X					
LO6					X					
LO7					X					
LO8					X					

COURSE CONTENT DETAILS

Topics	Outcomes
W1 İzence, kaynaklar Konu/Soru nedir?	
W2 Kompozisyonda plan , Planın yararları, plan nasıl yapılır? Plan uygulamaları	
W3 Paragraf bilgisi, Paragraf yazma uygulamaları	
W4 Eleştirel okuma (Örnek metin: Poetika, NFK)	
W5 Hazırlıksız konuşma çeşitleri, Konuşma uygulamaları	
W6 Yazılı anlatım türleri ve uygulaması, Rapor, tutanak	
W7 Davetiye, afiş hazırlama, Mülakat	
W8 Öz geçmiş yazma	
W9 AGU LFW (İyi bir anlatımın nitelikleri, Sık yapılan anlatım bozuklukları)	
W10 Anlatım bozuklukları (uygulama), ARA SINAV	
W11 Metin ve cümle tashihi	
W12 Deneme yazma	
W13 Edebî ve ilmî yazı örneklerini okuma, inceleme ve yorumlama	
W14 Retorik uygulamaları, Değerlendirmeler, yorumlar, eleştiriler	

(Semester 4) - Year 2, Spring Semester

Course Code	Course Name	PreReq	Theoretical Hours	Practical Hours	Credits	ECTS
<u>MATH 206</u>	Discrete Mathematics		4	0	4	5
<u>COMP 202</u>	Software Engineering	COMP 101	3	0	3	7
<u>COMP 204</u>	Database Management Systems	COMP 101	3	0	3	6
<u>COMP206</u>	Mathematical Modeling And Algorithmic Thinking	COMP203	3	2	4	5
<u>GLB2XX</u>	Global Issues Elective III		3	0	3	4
<u>TURK XXX</u>	Turkish Language Pool - Elective		2	0	2	2
TOTAL			17	2	18	29

COURSE RECORD

Code	MATH 206
Name	DISCRETE MATHEMATICS
Hour per week	4
Credit	4
ECTS	5
Level/Year	Undergraduate
Semester	Spring
Type	Compulsory
Prerequisites	Math 152
Description	<p>This is an introductory course to Discrete Mathematics for computer engineering students. The goal of this course is to introduce students the ideas of constructing mathematical arguments, proving them and furthermore strengthen students' problem solving skills.</p> <p>The course covers the following topics: Logic and proofs, sets and functions, number theory and cryptography, counting and graphs.</p>
Objectives	<p>This course aims to teach basic concepts in discrete mathematics by</p> <ul style="list-style-type: none"> - Providing fundamental knowledge and skills on logic, functions, counting and graphs. -Constructing theoretical and conceptual understanding of techniques in mathematical proofs. - Developing the ability to convert problems in cryptography, error correction and network design into mathematical problems.

COURSE CONTENT DETAILS

Topics	Outcomes
The Foundations: Logic and Proofs	LO1, LO2, LO3
Basic Structures: Sets and Functions	LO1, LO3
Number Theory and Cryptography	LO1, LO5
Induction and Recursion	LO1, LO3, LO4
Counting	LO1, LO3, LO4
Relations	LO1, LO3, LO5
Graphs	LO1, LO3, LO5
Trees	LO1, LO3, LO5

COURSE RECORD

Code	COMP 202
Name	Software Engineering
Hour per week	3+0 (Theory + Practice)
Credit	3
ECTS	7
Level/Year	Undergraduate
Semester	Spring
Type	Compulsory
Prerequisites	COMP 101
Description	This course aims to teach methodologies and tools aimed at developing computer software as a team. The students will learn how to plan a project, gather requirements, build up user stories, design & test the code, and document the whole process in an organized fashion. Generally, the Agile Software Development methodologies will be the main focus of this course. The students will also learn how to use software development tools such as collaboration tools, version controlling, and software designing.
Objectives	O1. Develop knowledge for the fundamentals of Software Engineering. O2. Learn Agile Software Development Methodology in a major project. O3. Develop skills for software designing and testing methodologies. O4. Apply the concepts learned to a real problem from top to bottom.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. Understand how to iteratively develop a software system using the Agile Software Development methodology. LO2. Manage and maintain the development process of a project LO3. Use crucial software dev. tools, such as Trello, GIT, GITHUB, UML, and Continuous Integration LO4. Experience a four iteration-long agile software dev. process for projects related to real-world problems.

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	5	5	5	3	5	5	3	3	1	0	4	5	5	2	4
LO2	5	5	5	2	4	2	2	4	5	3	5	4	5	2	5
LO3	4	5	3	1	1	0	4	1	1	0	5	3	5	2	5
LO4	5	5	5	4	5	4	1	5	5	3	4	5	5	2	5

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Intro to Course Details and Software Development: Agile Software Development, Iterative Development	LO1, LO2
W2 Requirement Analysis: Gathering Requirements for the Software	LO1, LO2
W3 Project Planning, User Stories, Tasks, and Team Collaboration Tools	LO1, LO2
W4 Software Design Principles	LO1, LO2, LO3
W5 Defensive Programming, Code Reviewing, Version Controlling	LO1, LO2, LO3
W6 Project Meeting #1 – Kick-off	LO1, LO2, LO3
W7 Defensive Programming, Code Reviewing, Version Controlling (Continued)	LO1, LO2, LO3
W8 Test-Driven Development (TDD) – Unit Testing	LO1, LO2, LO3
W9 Project Meeting #2 – Iteration 1	LO1, LO2, LO3, LO4
W10 Test-Driven Development (TDD) – Unit Testing (Continued)	LO1, LO2, LO3, LO4
W11 Project Meeting #3 – Iteration 2	LO1, LO2, LO3, LO4
W12 Clean Coding & Frameworks	LO1, LO2, LO3, LO4
W13 Project Meeting #4 – Iteration 3	LO1, LO2, LO3, LO4
W14 Project Meeting #5 – Final Iteration	LO1, LO2, LO3, LO4

DERS BİLGİLERİ

Kodu	COMP 202
İsmi	Yazılım Mühendisliği
Haftalık Saati	3 + 0 (Teori + Pratik)
Kredi	3
AKTS	7
Seviye/Yıl	Lisans
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	COMP 101
İçerik	Bu ders, ekip olarak bilgisayar yazılımı geliştirmeye yönelik metodolojileri ve araçları öğretmeyi amaçlamaktadır. Öğrenciler bir projeyi nasıl planlayacaklarını, gereksinimlerin nasıl toplanacağını, kullanıcı hikayeleri oluşturmayı, yazılım tasarlamayı ve test etmeyi ve tüm süreci organize bir şekilde belgelemeyi öğreneceklerdir. Genel olarak, Çevik Yazılım Geliştirme metodolojileri bu kursun ana odak noktası olacaktır. Öğrenciler ayrıca işbirliği araçları, sürüm kontrolü ve yazılım tasarımı gibi yazılım geliştirme araçlarının nasıl kullanılacağını öğreneceklerdir.

COURSE RECORD

Code	COMP 204
Name	Database Management Systems
Hour per week	3 (3 + 0)
Credit	3
ECTS	6
Level/Year	Undergraduate
Semester	Spring
Type	Compulsory
Prerequisites	COMP 101 Art of Computing
Description	This course provides a comprehensive overview of design and implementation of relational databases with web access for database-driven Web applications. The course aims to teach the essentials and applications of relational database management systems. The students will learn about database management systems (such as MySQL), database administration, and database querying with SQL. The students will also learn how to use databases to construct applications. Relational data modeling, relational algebra and structured query language (SQL) are indispensable components of this course. Then, relational database design and entity-relationship model will be discussed. Later, design for database-driven Web applications will be explained. Later on, data storage medium and formats for databases will be explained. Finally, database transactions will be explained.
Objectives	Students will be aware of requirements for developing applications for resource-constrained and mobile devices. Students will gain experience on using Android Studio IDE to develop mobile applications. Students will learn to develop fully-fledged mobile applications.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. Design normalized database tables LO2. Use a database management system to manipulate a database LO3. Develop database-driven Web applications

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	0	3	2	0	0	0	0	0	0	0	3	0	3	2	0
LO2	2	0	1	1	0	0	1	0	1	0	4	0	3	3	0
LO3	0	0	0	0	0	0	0	0	0	0	5	0	5	5	3
LO4	4	5	4	5	1	2	4	4	2	4	4	0	4	4	5
LO5	5	4	3	4	2	0	0	3	3	0	5	0	5	5	5
LO6	3	3	4	2	4	3	3	4	3	3	5	1	5	5	5

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 General Overview of DBMSs	LO1, LO2, LO3
W2 Introduction to Relational Model	LO1, LO3
W3 Introduction to SQL	LO1, LO2, LO3
W4 Intermediate SQL	LO1, LO2, LO3
W5 Advanced SQL	LO2, LO3
W6 Database Design and E-R Model	LO2, LO3
W7 Relational Database Design	LO1, LO2, LO3
W8 Application Design, <i>Midterm Exam</i>	LO3
W9 Storage and File Structure	LO3
W10 Indexing	LO2, LO3
W11 Transactions	LO3
W12 Advanced Topics in DBMSs (NoSQL, Graph Database, etc.)	LO3
W13 Advanced Topics in DBMSs (NoSQL, Graph Database, etc.)	LO3

DERS BİLGİLERİ	
Kodu	COMP 204
İsmi	Veri Tabanı Yönetim Sistemleri
Haftalık Saati	3 (3 + 0)
Kredi	3
AKTS	6
Seviye/Yıl	Lisans
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	COMP 101 Programlama Sanatı
İçerik	Bu ders, veri tabanına dayalı Web uygulamaları için ilişkisel veri tabanlarının tasarım ve gerçekleştirilmesine kapsamlı bir genel bakış sunar. Ders, ilişkisel veri tabanı yönetim sistemlerinin esaslarını ve uygulamalarını öğretmeyi hedefler. Öğrenciler bu derste veri tabanı yönetim sistemlerini (örneğin MySQL), veri tabanı yönetimini ve SQL ile veri tabanı sorgulamayı öğrenir. Öğrenciler ayrıca veri tabanlarını uygulama geliştirmede nasıl kullanmaları gerektiğini de öğrenir. İlişkisel veri modelleme, ilişkisel cebir, SQL bu dersin olmazsa olmaz bileşenleridir. Sonra, ilişkisel veri tabanı tasarlama ve varlık-ilişki modeli tartışılır. Sonrasında veri tabanına dayalı Web uygulamaları tasarımı ve veri tabanları için veri saklama ortam ve biçimleri öğrenilir. Son olarak veri tabanı işlemlerinin nasıl çalıştığı açıklanır.

COURSE RECORD	
Code	COMP 206
Name	Mathematical Modelling and Algorithmic Thinking
Hour per week	5 (3 + 2)
Credit	4
ECTS	5
Level/Year	Undergraduate / 2
Semester	Spring
Type	Compulsory
Prerequisites	COMP 203
Description	The main aim of this course is to improve Mathematical Modelling and Algorithmic Thinking methods for developing problem-solving abilities. There is always a relation between real-world problems and computer science-based solutions of them. This course will teach how to model a problem and think like a computer, especially for understanding the issues and finding a proper ways to solve them. This class will explain how to make computers efficiently solve problems by discussing Computational thinking and designing steps for problem solving. Students will improve their knowledge of mathematics, algorithms, fundamentals of computer science(data structures, algorithms analysis, programming, etc.), and number theory.
Objectives	<ul style="list-style-type: none">- Improving Algorithmic Thinking abilities- Improving Computational thinking abilities- Understanding the problems and problem-solving steps- Improving coding skills
Learning Outcomes	<i>By the end of the course, the student will be able to</i> L01 Use algorithmic thinking principles to analyze real-world problems L02 Create solution models for real-world problems L03 Identify proper solution steps L04 Code the problem solutions with programming languages

L05 Design different solutions to a given problem(s)

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	5	5	4	1	1	3	3	1	1	0	1	5	4	5	4
LO2	5	5	5	4	4	1	2	4	5	4	4	4	4	5	5
LO3	5	5	5	1	1	0	4	1	1	1	1	5	5	5	4
LO4	3	5	5	5	5	1	1	5	5	5	5	5	5	5	4
LO5	5	3	5	2	1	5	5	1	2	1	1	5	5	5	4

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 - W2 Introduction to algorithms and modelling in general	LO1, LO2, LO3
W3 Mathematical background, Number theory	LO2, LO3
W4 Computational thinking, Problem solving methods	LO1, LO4, LO5
W5 Data structure and basic algorithms	LO4, LO5
W6 Introduction to Graph Theory	LO4, LO5
W7 - W10 Dynamic Programming Concept	LO2, LO3, LO5
W11 Problem statement analysis	LO1, LO5
W12 Linear Programming Models	LO2, LO3, LO5

DERS BİLGİLERİ

Kodu	COMP 206
İsmi	Matematiksel Modelleme ve Algoritmik Düşünme
Haftalık Saati	5 (3 + 2)
Kredi	4
AKTS	5
Seviye/Yıl	Lisans / 2
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	COMP 203
İçerik	Dersin temel amacı Matematiksel Modelleme ve Algoritmik Düşünce sisteminin iyileştirilerek, problem çözme becerilerinin geliştirilmesidir. Gerçek hayat problemleri ile bilgisayar bilimleri problemleri arasındaki ilişkiyi yapı kurulacaktır. Bir problemin matematiksel olarak nasıl modelleneceği, bilgisayar ortamında nasıl ele alınması gerektiği ve çözümünü kurgulama aşamaları öğrenilecektir. Dersi alan öğrenciler matematik, algoritma, temel bilgisayar alanları (veri yapıları, algoritma analizi, programlama, vb.), ve sayı teorisi hakkında bilgi sahibi olacaktır.

(Semester 5) - Year 3, Fall Semester

Course Code	Course Name	PreReq	Theoretical Hours	Practical Hours	Credits	ECTS
COMP 351	Summer Training I		0	2	1	2
MATH 301	Probability and Statistics	MATH 152	3	0	3	5
COMP 301	Analysis of Algorithms	COMP 203	3	2	4	6
COMP 303	Operating Systems	COMP 203	3	0	3	6
COMP 305	Computer Organization	EE 203	3	0	3	6
GLB3XX	Global Issues Elective IV		3	0	3	4
HIST XXX	History of Turkey Pool - Elective		2	0	2	2
TOTAL			17	4	19	31

COURSE RECORD

Code	COMP 351
Name	SUMMER TRAINING I
Hour per week	2 (0 + 2)
Credit	1
ECTS	2
Level/Year	Undergraduate / 3
Semester	Fall
Type	Compulsory
Prerequisites	-
Description	This course aims to gain experience in the industrial environment or research laboratories. In Summer Training-I, students are obliged to do an internship for at least 6 weeks. During the internship; students will be able to practically apply the theoretical knowledge learned in the courses. They will experience the work environment and business relationships and culture in industry. They will have an idea to discover their interests and to clarify their job areas after graduation.
Objectives	<ul style="list-style-type: none"> - To understand the work environment in the industry. - To explain practical applications with theoretical concepts. - To learn business relationships and culture in industry. - To describe job areas related to Computer Engineering.
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>L01 describe the techniques that are used in the industry. L02 use practical techniques learned in the industry/research laboratories. L03 explain job areas in the industry. L04 interpret the knowledge with practical experience.</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5
LO2	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5
LO3	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5
LO4	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS	
Topic	Outcomes
W1 – W14 Training, Internship Project/Research	LO1, LO2, LO3, LO4
DERS BİLGİLERİ	
Kodu	COMP 351
İsmi	Yaz Stajı – I
Haftalık Saati	2 (0 + 2)
Kredi	1
AKTS	2
Seviye/Yıl	Lisans / 3
Dönem	Güz
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	-
İçerik	Bu ders endüstriyel ortamda veya araştırma laboratuvarlarında deneyim kazanmayı amaçlamaktadır. Bu dersde, öğrenciler en az 6 hafta staj yapmakla yükümlüdürler. Staj süresince; öğrenciler derslerde öğrendikleri teorik bilgileri uygulamalı olarak uygulayabileceklerdir. Endüstrideki çalışma ortamını ve iş ilişkilerini ve kültürünü deneyimleyeceklerdir. Mezun olduktan sonra ilgi alanlarını keşfetmek ve iş alanlarını netleştirmek için fikir sahibi olacaklardır.

COURSE RECORD	
Code	MATH 301
Name	Probability and Statistics
Hour per week	3 (3+0)
Credit	3
ECTS	5
Level	Undergraduate
Semester/Year	Fall/3
Type	Compulsory
Prerequisites	MATH 152
Content	The course provides an introduction to probability and statistics. Topics include descriptive statistics, principles of counting, permutations, combinations, probability, random variables, expectation, sampling statistics, parameter estimation and hypothesis testing.
Objectives	The students will be able to Learn basic concepts and rules of probability and statistics Learn the basic properties of discrete and continuous probability distributions and how to apply common distributions to random phenomena Learn basic methods for collecting and describing statistical data Learn how to apply basic methods of estimation and testing in problems of statistical inference
Learning Outcomes	The students who finish this course will be able to LO1. Explain basic concepts in probability and statistics LO2. Solve basic problems arising in engineering that involve discrete and continuous probability distributions LO3. Analyze datasets using computational software by applying statistical concepts such as means, variances and various types of graphs LO4. Perform statistical inference using confidence intervals and hypothesis testing
Textbook	Introduction to Probability and Statistics for Engineers and Scientists, S. Ross, 6th edition, Academic Press, 2020
Additional Reference Book	<i>Probability & Statistics for Engineers & Scientists, 9th edition</i> , R. E. Walpole, R. H. Myers, S. L. Myers, K. Ye, 2016 <i>A First Course in Probability</i> , 9th edition, S. Ross, Prentice Hall, 2014
CONTRIBUTION TO PROGRAMME OUTCOMES	

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1				X						
LO2				X						
LO3				X						
LO4				X						

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Introduction to statistics, descriptive statistics	
W2 Descriptive statistics	
W3 Elements of probability	
W4 Elements of probability	
W5 Random variables and expectation	
W6 Random variables and expectation	
W7 Spring break	
W8 Midterm exam 1	
W9 Random variables and expectation, special random variables	
W10 Distribution of sampling statistics	
W11 Parameter estimation	
W12 Midterm exam 2	
W13 Hypothesis testing	
W14 Hypothesis testing	

COURSE RECORD

Code	COMP 301
Name	Analysis of Algorithms
Hour per week	3+2 (Theory + Practice)
Credit	4
ECTS	6
Level/Year	Undergraduate
Semester	Fall
Type	Compulsory
Prerequisites	COMP 203 Data Structures and Algorithms
Description	This course introduces students to the analysis and design of computer algorithms. The material covered in this course draws from discrete mathematics, elementary real analysis, combinatorics, algorithms and data structures. Topics include sorting algorithms, growth of functions, divide and conquer, randomized algorithms, order statistics, elementary data structures.
Objectives	<p>O1. Gain an understanding of the mathematical concepts needed to study the performance of computer programs</p> <p>O2. Learn major algorithms and data structures</p> <p>O3. Learn asymptotic analysis of algorithms</p> <p>O4. Learn algorithm design techniques</p>
Learning Outcomes	<p>LO1. Analyze the worst-case running times of algorithms using asymptotic analysis</p> <p>LO2. Analyze average-case running times of probabilistic algorithms</p> <p>LO3. Implement algorithms in a computer programming language</p> <p>LO4. Explain major algorithms for sorting</p> <p>LO5. Compare the running times of algorithms</p> <p>LO6. Develop algorithms for solving computational problems</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	5	5	5	3	0	0	3	0	0	3	5	5	4	2	0
LO2	5	5	5	3	0	0	3	0	0	3	5	5	4	2	0
LO3	0	4	2	1	0	0	2	2	0	3	5	2	3	0	0
LO4	0	1	1	1	0	4	0	0	0	3	0	0	0	1	0
LO5	0	0	1	2	0	1	0	0	0	4	1	0	0	0	0
LO6	0	0	5	4	0	0	3	0	0	5	5	0	2	0	0

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 Introduction, insertion sort, merge sort	LO1, LO3, LO4, LO5
W2 Analyzing algorithms, designing algorithms, merge sort	LO1, LO3, LO4, LO5
W3 Growth of functions, asymptotic notation	LO1, LO2, LO3, LO4, LO5
W4 Growth of functions, standard notations and common functions	LO1, LO2
W5 Divide and conquer, maximum subarray problem, Strassen's matrix multiplication algorithm	LO1, LO3, LO4, LO5
W6 Substitution method, recursion tree method	LO1, LO2
W7 Master method, heap sort	LO1, LO2, LO3, LO4, LO5
W8 Semester break	
W9 Midterm exam 1	LO1, LO4, LO6
W10 Priority queues, probabilistic analysis and randomized algorithms	LO2, LO3, LO4, LO5
W11 Probabilistic analysis, quicksort	LO2, LO3, LO4, LO5
W12 Midterm exam 2	LO4, LO6
W13 Sorting in linear time	LO1, LO2, LO3, LO4, LO5
W14 Medians and order statistics	LO1, LO2, LO3, LO5

DERS BİLGİLERİ

Kodu	COMP 301
İsmi	Algoritma Analizi
Haftalık Saati	3+2 (Teori + Pratik)
Kredi	4
AKTS	6
Seviye/Yıl	Lisans
Dönem	Güz
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	COMP 203 Veri yapıları ve algoritmalar
İçerik	Algoritma analizi ve tasarımına giriş niteliğinde olan bu ders ayrık matematik, temel gerçel analiz, kombinezon, algoritmalar ve veri yapıları ile ilgili konuları içermektedir. Derste anlatılacak konular arasında sıralama algoritmaları, fonksiyonların büyümesi, parçala böl yut yöntemi, rastgele algoritmalar, sıra istatistiği, ve temel veri yapıları bulunmaktadır.

COURSE RECORD

Code	COMP 303
Name	Operating Systems
Hour per week	3 (Theory)
Credit	3
ECTS	6
Level/Year	Undergraduate
Semester	Fall
Type	Required
Location	Online
Prerequisites	-
Special Conditions	None
Webpage	Canvas.agu.edu.tr
Content	This course explains role, purpose and functionality of operating systems, mechanisms used by them and discusses the design issues. Course topics include role and purpose of the operating system, preemptive and non-preemptive scheduling, schedulers and policies, processes and threads, process synchronization, interprocess communication, deadlocks, memory management and virtual memory (e.g. physical memory and memory management hardware, working sets and thrashing), file systems (e.g. data, metadata, operations, organization, buffering, sequential, nonsequential, directories: contents and structure, memory-mapped files, special-purpose file systems, Naming, searching,

	access, backups, journaling and log-structured file systems, mass-storage structure and management.
Objectives	- To help students to understand the OS concepts; - To introduce alternative approaches used in OS
Learning Outcomes	L01 To list common components of OS L02 To discuss the recent related techniques L03 To express the advantages and disadvantages of competing methods L04 To implement conceptual algorithms
Requirements	-
Reading List	Lecture notes
Ethical Rules and Course Policy	AGU Academic Honesty Principles

LEARNING ACTIVITIES

Activities	Number	Weight (%)
Zoom Synchronous meeting	14	20%
Asynchronous Activities (discussion board, pre-readings, etc)	14	20%
Active participation	14	20%
Attendance	14	5%
Implementations	4	35%
Total		100%

ASSESSMENT

Evaluation Criteria	Weight (%)
Midterms	40%
Assignments	50%
Quizzes	10%
Total	100%

For a detailed description of grading policy and scale, please refer to the website <https://goo.gl/HbPM2y> section 28.

COURSE LOAD

Activity	Duration (hour)	Quantity	Work Load (hour)
Required readings	2	14	28
Implementation	22	3	66
Preparing for Midterms	24	2	48
Preparing for Quizzes	1	14	14
		General Sum	156

ECTS: 6 (=156/25-30)

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	3	3	3	4	1	2	5	5	3	5	5	4	2	3	5
LO2	5	5	4	4	4	4	5	3	5	4	5	3	5	3	5
LO3	5	5	4	4	3	4	5	5	5	5	5	3	3	3	5
LO4	5	5	5	5	1	0	0	5	5	5	5	3	4	5	5

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

WEEKLY SCHEDULE

Topic	Outcomes
W1 – W2 Overview Activity: Required readings	LO1, LO2, LO3
W3 - W5 Process management Activity: Required readings, Implementation, Quiz	LO1, LO2, LO3, LO4
W6 – W10 Process synchronization Activity: Required readings, Implementation, Quiz	LO1, LO2, LO3, LO4
W7 Midterm 1 Activity: Required readings, Implementation, Quiz	LO1, LO2, LO3, LO4
W11 – W13 Memory and Storage Management Activity: Required readings, Implementation, Quiz	LO1, LO2, LO3, LO4

W14 File systems	LO1, LO2, LO3, LO4
Activity: Required readings, Implementation, Quiz	
W15 Midterm 2	LO1, LO2, LO3, LO4
Activity: Implementation	

COURSE RECORD

Code	COMP 305
Name	Computer Organization
Hour per week	3 (3 + 0)
Credit	3
ECTS	6
Level/Year	Undergraduate / 3
Semester	Fall
Type	Compulsory
Prerequisites	Digital Design
Description	This course provides a comprehensive presentation of the organization and architecture of modern-day computers, emphasizing both fundamental principles and the critical role of performance in driving computer design. The topics include number system, computer arithmetic, computer evolution and performance, memory, storage, input/output, details of a processor, multi-cores, multiprocessors and clusters.
Objectives	<ul style="list-style-type: none"> - Learn the methodology of calculating the performance of a computer - Learn the basics of parallelism - Learn the required components in a pipelined architecture
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>LO1. Explain the concepts in modern hardware.</p> <p>LO2. Calculate the performance of a computer and compare performances of two computers.</p> <p>LO3. Design components to improve performance and energy efficiency via parallelism, pipelining, and prediction.</p> <p>LO4. Explain the basics of parallel computers such as multicore multithreaded architectures and GPU hardware</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	5	4	5	5	1	5	4	2	5	3	5	5	4	5	4
LO2	5	4	5	5	1	5	2	2	4	3	5	5	4	5	2
LO3	5	2	5	5	1	5	2	1	4	3	2	3	4	5	2
LO4	5	5	3	3	4	5	2	1	2	5	2	1	3	5	1

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 Introduction to computer organization	LO1, LO2
W2 – W3 Machine Level Programming – Assembly	LO1, LO2
W4 ISA Addressing Modes	LO1, LO2
W5 Performance of a Computer	LO1, LO2, LO3
W6 RISC vs CISC Computer	LO1, LO2, LO3
W7 – W10 Pipeline and Its Hazards	LO1, LO2, LO3, LO4
W11 – W12 Memory Systems	LO1, LO2, LO3
W13 – W14 Parallel Processors and GPU	LO1, LO2, LO3, LO4

DERS BİLGİLERİ	
Kodu	COMP 305
İsmi	Bilgisayar Organizasyonu
Haftalık Saati	3 (3 + 0)
Kredi	3
AKTS	6
Seviye/Yıl	Lisans / 3
Dönem	Güz
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	Sayısal Tasarım
İçerik	Bu ders günümüz bilgisayar mimarilerini, özellikle temel ilkeler ve bilgisayar tasarımında başarımın kritik rolünü vurgulamaktadır. İşlenecek konular arasında sayı sistemleri, bilgisayar aritmetiği, bilgisayarın evrimi ve başarım, bellek, saklama, giriş/çıkış, işlemci, çok çekirdekli işlemciler ve kümelenmiş bilgisayar yapıları bulunmaktadır.

COURSE SYLLABUS	
Code	HIST 201
Name	History of Modern Turkey I
Hour per week	2(2+0)
Credit	2
ECTS	2
Level	Undergraduate
Semester/Year	Fall/3
Type	Compulsory
Prerequisites	-
Content	Osmanlı Devleti'nin çöküş nedenleriyle birlikte, Tanzimat Dönemi'nden başlayan süreç ile Türk İstiklal Harbi'nden Lozan Barış Konferansı'na kadar geçen dönem ayrıntılı bir şekilde verilmektedir.
Objectives	Öğrencilere Atatürk dönemi ve sonrası Türk İnkılabını zorunlu kılan tarihsel koşulları, Anadolu'nun işgaline karşı ortaya çıkan Mustafa Kemal Paşa liderliğindeki direniş hareketini ve bu hareketin askeri, siyasi, ve diplomatik boyutlarına ilişkin temel bir formasyon kazandırmayı amaçlar.
Learning Outcomes	Türkiye Cumhuriyeti'nin kuruluş süreci hakkında; LO1. Sosyal, kültürel, politik koşullar altında şekillenen bir süreç olarak tarihsel olayları şekillendiren dinamikler hakkında analiz yapabilme becerisine sahip olmak. LO2. Disiplinler arası tartışmalar üzerinden yazılı ve sözlü olarak iletişim kurabilme yeteneği kazanmak.
Textbook	-
Additional Reference Book	Atatürk İlkeleri ve İnkılap Tarihi, III Cilt, YÖK yayını. Türkiye Cumhuriyeti Tarihi, II Cilt, (Durmuş Yalçın vd.), Atatürk Araştırma Merkezi yayını. İlk İnkılap Tarihi Ders Notları, (Mahmut Esat Bozkurt, Recep Peker, Yusuf Kemal Tengirşek), Türk Dünyası Araştırmaları Vakfı yayını. Ergün Aybars, Türkiye Cumhuriyeti Tarihi I, Ercan Kitabevi. İmparatorluktan Ulus Devlete Türk İnkılap Tarihi, (Edt. Cemil Öztürk), Pegema Yayıncılık. Tuncer Baykara, Türk İnkılap Tarihi ve Atatürk İlkeleri, Akademi Kitabevi. Türk İnkılap Tarihi ve Atatürk İlkeleri, (Edt. Semih Yalçın vd.), Siyasal Kitabevi. Atatürk ve Türkiye Cumhuriyeti Tarihi, (Edt. Ayten Sezer), Siyasal Kitabevi. Semih Yalçın, Türkiye Cumhuriyeti Tarihi I / Kaynaklar, Siyasal Kitabevi. Toktamış Ateş, Türk Devrim Tarihi, İstanbul Bilgi Üniversitesi yayını
CONTRIBUTION TO PROGRAMME OUTCOMES	

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1								X		
LO2								X		

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Atatürk İlkeleri ve İnkılâp Tarihi dersini okutmanın amacı ve dersle ilgili temel kavramlar hakkında bilgi verilmesi ve Türk İnkılâbının stratejisi	
W2 Osmanlı Devleti'nin yıkılışını ve Türk İnkılâbını hazırlayan sebeplere toplu bir bakış (İç sebepler, Dış sebepler, Osmanlı Devleti'nin jeopolitik ve ekonomik durumu)	
W3 XIX. yüzyılda Osmanlı Devleti'nde yenileşme hareketleri (Tanzimat, Islahat ve I. Meşrutiyet dönemleri)	
W4 Osmanlı Devleti'nin Dağılması sürecinde meydana gelen iç ve dış olaylar (Kırım Savaşı, 1877-78 Osmanlı-Rus Savaşı, Makedonya meselesi, 31 Mart olayı, Girit ve Bosna-Hersek'in elden çıkışı, Trablusgarp Savaşı, Balkan Savaşlar)	
W5 Osmanlı Devleti'nin son dönemindeki fikir akımları (Osmanlıcılık, İslamcılık, Türkçülük, Batıcılık, Adem-i Merkeziyetçilik, Sosyalizm) ve II. Meşrutiyetin sürecinde Osmanlı Devleti	
W6 I. Dünya Savaşı (Savaşın çıkışı, Osmanlı Devleti'nin savaşa dâhil oluşu, cepheler ve savaşın sonu) ve Mondros Mütarekesinin imzalanması	
W7 İşgaller, Tepkiler (Kuva-yı Milliyenin ortaya çıkışı), Cemiyetler (Millî, Millî varlığa düşman ve azınlık cemiyetleri), Mondros Mütarekesinden sonra Mustafa Kemal Paşa'nın faaliyetleri ve Anadolu'ya geçmesi	
W8 Millî Mücadele için ilk adım ve Kongreler yoluyla teşkilatlanma (Amasya Genelgesi, Erzurum, Sivas Kongresi ve Batı Anadolu Kongreleri)	
W9 Son Osmanlı Meclis-i Mebusanı'nın toplanması, Misak-ı Millî'nin kabulü ve İstanbul'un işgali	
W10 Türkiye Büyük Millet Meclisi'nin açılışı, Meclisin yapısı, çıkardığı yasalar ve faaliyetleri, Meclisin açılışına iç ve dış tepkiler	
W11 San Remo Konferansı, Sevr Anlaşması, Sevr'de Ermeni ve Kürdistan meselesi, Sevr Anlaşması'nda bugüne yönelik tehditler, Doğu ve Güney cephelerindeki durum	
W12 Kuva-yı Milliye'nin tasfiyesi ve düzenli ordunun kuruluşu, Yunan genel taarruzu ve Batı Cephesi'ndeki savaşlar	
W13 Mustafa Kemal Paşa'nın Başkomutanlığı, Tekâlif-i Milliye emirleri, Sakarya Savaşı ve sonrasındaki dış politika gelişmeleri (Türk-Rus, Türk-Afgan münasebetleri, Londra Konferansı, Ankara İtilafnamesi)	
W14 Büyük Taarruz ve Mudanya Mütarekesi'nin imzalanması, Lozan konferansı öncesindeki gelişmeler, Konferansı toplanması ve Barış anlaşmasının imzalanması	

COURSE SYLLABUS

Code	HIST 202
Name	History of Modern Turkey II
Hour per week	2 (2+0)
Credit	2
ECTS	2
Level	Undergraduate
Semester/Year	Spring/3
Type	Compulsory
Prerequisites	-
Content	Cumhuriyet'in ilanından başlayarak çeşitli alanlarda gerçekleştirilen reformlar anlatılmaktadır.
Objectives	Bu ders, öğrencilerin, Türkiye'nin yakın tarihi hakkında bilgilendirilmesi amaçlanmaktadır. Bu bağlamda, öğrencileri, Türkiye Cumhuriyeti'nin kuruluş sürecine hâkim olarak dönemin politik ve ekonomik gelişmeleri hakkında bilgi vermeyi amaçlamaktadır.

Learning Outcomes	LO1. Politik, ekonomik ve toplumsal etmenlerin tarihsel olaylar üzerindeki etkilerini bilmek. LO2. Farklı disiplinleri bir araya getirerek, disiplinler arası analiz yapma becerisi kazanmak. LO3. Tarihsel sorunlara eleştirel yaklaşımı teşvik ederek, analitik ve eleştirel düşünce yetkinliğini desteklemek.
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Textbook -

Additional -

Reference Book

CONTRIBUTION TO PROGRAMME OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1								X		
LO2								X		
LO3								X		

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Siyasî alanda yapılan inkılablar (Saltanatın kaldırılması, Ankara'nın başkent oluşu, Cumhuriyetin ilanı ve Halifelik kaldırılması)	
W2 Terakkiperver Cumhuriyet Fırkası'nın kuruluşu, Şeyh Said İsyanı, Takrir-i Sükun yasası ve Atatürk'e suikast teşebbüsü	
W3 Atatürk'ün yurt gezileri, Serbest Cumhuriyet Fırkası'nın kuruluşu, İzmir mitingi, Fırkanın kapanışı, Menemen ve Bursa olayları	
W4 1924 Anayasası, diğer anayasalar, Hukuk alanındaki gelişmeler, Toplumsal hayatın düzenlenmesi ile ilgili inkılablarve Türkiye Cumhuriyeti'nin laikleşme süreci	
W5 Eğitim ve Kültür alanında gerçekleştirilen inkılablar (Tevhid-i Tedrisat kanunu, Latin harflerinin kabulü, Millet mektepleri, Türk Tarih ve Dil kurumlarının kurulması ve faaliyetleri, Türk tarih tezi, güneş-dil teorisi, 1933 Üniversite reformu, Halkevleri), Sağlık alanındaki gelişmeler	
W6 İzmir İktisat Kongresi, Cumhuriyetin ilk yıllarında ekonomi politikası, 1929 Dünya Ekonomik Buhranı'nın yansımaları olarak Türkiye'de devletçi ekonomi politikalarının gündeme gelmesi ve I. Beş Yıllık Kalkınma Programı	
W7 Atatürk döneminde Türk dış politikası (1923-1938 döneminde Türk-İngiliz, Türk-Sovyet, Türk-Fransız, Türk-İtalyan ilişkileri, Komşularla münasebetler, Balkan ve Sadabat Paktı)	
W8 Atatürkçü Düşünce Sistemi'nin tanımı, kapsamı, Atatürk İlkeleri (Cumhuriyetçilik, Laiklik, Milliyetçilik, Halkçılık, Devletçilik, İnkılabçılık) ve bu ilkelere yönelik tehditler	
W9 Atatürk'ten sonraki Türkiye (İnönü'nün cumhurbaşkanlığı, II. Dünya Savaşı ve Türkiye, Demokrat Parti'nin kuruluşu ve çok partili hayata geçiş)	
W10 Demokrat Parti'nin iktidar yılları, Türkiye'nin Nato'ya girişi ve 27 Mayıs 1960 askeri müdahalesi	
W11 27 Mayıs 1960'tan 12 Eylül 1980'e Türkiye'de iç siyaset gelişmeleri (Demirel ve Ecevit hükümetleri, 12 Mart 1971 askeri muhtırası, siyasi ve ekonomik krizler, terör olayları)	
W12 12 Eylül 1980'den günümüze Türkiye'de iç siyaset gelişmeleri (12 Eylül askeri müdahalesinden sonra ülkenin durumu, sivil idareye dönüş, ANAP iktidarı ve koalisyonlar, siyasi ve ekonomik krizler, askerinin sivil idareye müdahaleleri)	
W13 1960'dan günümüze Türkiye'nin dış politikası (Soğuk savaş sürecinde Türkiye, Avrupa birliği ile gelişmeler, Kıbrıs Barış Harekâtı, Sözde Ermeni soykırım iddiaları ve Türkiye, komşularla münasebetler)	
W14 Türkiye'nin jeopolitik konumu, bundan kaynaklanan tehditler, XXI. Yüzyılda Türkiye'nin çağdaşlaşmasına yönelik beklentiler	

COURSE SYLLABUS

Code	HIST 203
Name	History of Modern Turkey I
Hour per week	2 (2+0)
Credit	2
ECTS	2
Level	Undergraduate
Semester/Year	Fall/3
Type	Compulsory
Prerequisites	-
Content	This course is designed to introduce the historical turning points that made the modern Turkey, as we know today, up until the foundation of Turkish Republic in 1923. In this sense, it is an attempt to explain the historical features of the state and society in which we live. So, it will question how a multi-ethnic, multi-religious society and state in which individuals are exposed to arbitrary rule of a person assumed to have divine power was constructed and went through certain historical changes. In this sense, it will mainly focus on the following themes: establishment of the Ottoman Empire, its economic, political and social structure, and its rise and decline as a world power. Around these themes, we will follow the domestic and international developments influencing the Empire. As a result, we will try to understand how the contemporary Turkish society and state whose main pillars erected. For the second term, the course will cover dissolution of the Ottoman Empire and foundation and progress of the modern Turkey. We have approximately four months, so it is impossible to emphasize this huge time span in its all aspects. In the lectures, I hope to give you a basic narrative of the six centuries in total.

Objectives

Learning Outcomes

Textbook Erik Jan Zürcher, *Turkey: A Modern History*, third edition

Additional Reference Book -

CONTRIBUTION TO PROGRAMME OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
COURSE								X		

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Meeting and Introducing Syllabus	
W2 Movie Time, Europe's Muslim Emperors: Part I (2013, The UK-BBC Two, dir. Gillian Bancroft)	
W3 The Foundation and Succeeding Rise of the Ottoman Empire	
W4 Transformation of the Empire	
W5 Movie Time Why Hacivat and Karagöz Was Murdered? (2006, Turkey, dir. Ezel Akay)	
W6 The Early Reform Attempts in the Empire (Zürcher, pp. 9-29)	
W7 Fall Break	
W8 The Reign of Mahmud II (Zürcher, pp. 30-49)	
W9 Learning Free Week	
W10 Mid-Term Exam	
W11 The Tanzimat Reforms (Zürcher, pp. 50-70)	
W12 A Reformist or Autocratic Sultan? (Zürcher, pp. 71-90)	

W13 The Game

W14 The Last Presentations

COURSE SYLLABUS

Code	HIST 204
Name	The Historical Roots of Contemporary Turkey-II
Hour per week	2 (2+0)
Credit	2
ECTS	2
Level	Undergraduate
Semester/Year	Spring/3
Type	Compulsory

Prerequisites

Content This course is designed to introduce the historical turning points that made the modern Turkey, as we know today, up until current times. In this sense, it is an attempt to explain the historical features of the state and society in which we live. So, it will question how a multi-ethnic, multi-religious society and state in which individuals are exposed to arbitrary rule of a person assumed to have divine power transformed to a different structure being represented by a single nation which gained its sovereignty. In this sense, it will mainly focus on the following themes: establishment of a multi party regime, introduction of modern and secular institutions, emergence of ideas of rights and freedoms and citizenship, and changing economic and cultural structure. Around these themes, we will follow the domestic and international developments influencing the Empire and Turkish Republic. As a result, we will try to understand how the contemporary Turkish society and state whose main pillars erected during the transformation of the Ottoman Empire from the beginning of the twentieth century. For the second term, the course will cover dissolution of the Ottoman Empire and foundation and progress of the modern Turkey. We have approximately four months, so it is impossible to emphasize this huge time span in its all aspects. In the lectures, I hope to give you a basic narrative of the century.

Objectives

Learning Outcomes

Textbook Erik Jan Zürcher, Turkey: A Modern History, third edition

Additional Reference Book -

CONTRIBUTION TO PROGRAMME OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
COURSE								X		

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Meeting and Introducing Syllabus	
W2 Deciding About Presentations, The Young Turk Revolution and Its Aftermath-I Zürcher, pp. 93-113	
W3 Beginning of Presentations, The Young Turk Revolution and Its Aftermath-II Zürcher, pp. 113-133	

W4 The National Liberation War-I

W5 Movie Time The Water Diviner, dir. Russel Crowe (2014)

W6 The National Liberation War-II Zürcher, pp. 147-165

W7 Foundation and Progress of One-Party System Zürcher, pp. 166-205

W8 The Multi-Party System and the Rule of Democrat Party Zürcher, pp. 206-241

W9 Troubled Years of Turkey Zürcher, pp. 241-278

W10 Turkey From 1980 to 2002: Political Changes Zürcher, pp. 278-306

W11 Turkey From 1980 to 2002: Economic Developments and International Relations
Zürcher, pp. 306-338

(Semester 6) - Year 3, Spring Semester

Course Code	Course Name	PreReq	Theoretical Hours	Practical Hours	Credits	ECTS
COMP 302	System Programming	COMP 112	3	2	4	5
EE 304	Embedded Systems	EE 203	3	2	4	6
COMP 306	Formal Languages and Automata Theory		3	2	4	6
COMP 308	Computer Networks		3	0	3	6
XXX	Nontechnical Elective-4					4
HIST XXX	History of Turkey Pool - Elective		2	0	2	2
TOTAL			14	6	17	29

COURSE RECORD

Code	COMP 302
Name	System Programming
Hour per week	3+2 (Theory + Practice)
Credit	4
ECTS	5
Level/Year	Undergraduate
Semester	Spring
Type	Compulsory
Prerequisites	COMP 112 Object Oriented Programming
Description	The course aims to provide an introduction to Linux operating system. Topics include Linux commands, file system, I/O control, pipes, and shell scripting.
Objectives	O1. Learn essentials of Linux operating system O2. Learn how to write command-line expressions O3. Learn how to write shell scripts
Learning Outcomes	LO1. Explain the structure of Linux operating system and its components LO2. Explain commands related to command-line and shell scripting LO3. Write command-line expressions LO4. Develop shell scripts

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	0	2	1	1	0	3	3	0	0	3	1	2	1	3	0
LO2	0	2	1	1	0	3	3	0	0	3	1	2	1	3	0
LO3	0	4	3	2	0	0	4	0	0	4	5	2	3	4	0
LO4	0	4	3	2	0	0	4	0	0	4	5	2	3	4	0

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 What is shell, navigation, exploring the system	LO1, LO2, LO3
W2 Manipulating files and directories, expansions	LO1, LO2, LO3
W3 Quoting, Advanced keyboard tricks	LO1, LO2, LO3
W4 Permissions, processes	LO1, LO2, LO3
W5 The environment, networking, vim editor	LO1, LO2, LO3

W6 Searching for files, archiving and backup	LO1, LO2, LO3
W7 Regular expressions	LO1, LO2, LO3
W8 Semester break	
W9 Text processing	LO1, LO2, LO3
W10 Midterm exam	LO1, LO2, LO3
W11 Writing shell scripts, here documents, shell functions, variables	LO1, LO2, LO3
W12 If statements, reading keyboard input, while statements, until statements, troubleshooting	LO1, LO2, LO3, LO4
W13 Case statements, positional parameters, for statements	LO1, LO2, LO3, LO4
W14 Strings and numbers, arrays	LO1, LO2, LO3, LO4

DERS BİLGİLERİ

Kodu	COMP 302
İsmi	Sistem Programlama
Haftalık Saati	3+2 (Teori + Pratik)
Kredi	4
AKTS	5
Seviye/Yıl	Lisans
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	COMP 112 Nesne Yönelimli Programlama
İçerik	Linux işletim sistemine giriş niteliğinde olan bu derste Linux komutları, dosya sistemi, girdi/çıkı kontrolü, komutları ucuca ekeme, kabuk programlama konuları anlatılacaktır.

COURSE RECORD

Code	EE 304
Name	Embedded Systems
Hour per week	3 (Theory) + 2 (Laboratory)
Credit	4
ECTS	6
Level/Year	Undergraduate
Semester	Spring
Type	Must
Classroom	
Mode of Delivery	Online/Class
Prerequisites	-
Special Conditions	
Webpage	
Content	This course introduces students to microcontroller concepts and programming. Students have hands on experience on ARM microcontrollers. It covers microcontroller settings and initialization, embedded programming using ARM assembly, C languages and higher level libraries, I/O operations and settings, microcontroller structure, interrupts, communication protocols, e.g., SPI, UART, I2C, CAN, Direct Memory Access (DMA), timers, RTC, PWM and other various

	peripheral usages, power management, real time operating system and multitask programming, AI implementations on MCU.
Objectives	<ul style="list-style-type: none"> - To help students in understanding of foundations of - To introduce common microcontroller concepts, - To provide tools and techniques for practical embedded system development
Learning Outcomes	<p>L01 To have a broader view of embedded system development</p> <p>L02 To compare and discuss various alternative embedded system methods</p> <p>L03 To express the foundations of microcontrollers</p> <p>L04 To implement practical embedded system solutions</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	3	3	3	4	1	2	5	5	3	5	5	4	2	3	5
LO2	5	5	4	4	4	4	5	3	5	4	5	3	5	3	5
LO3	5	5	4	4	3	4	5	5	5	5	5	3	3	3	5
LO4	5	5	5	5	1	0	0	5	5	5	5	3	4	5	5

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

WEEKLY SCHEDULE

Topic	Outcomes
W1 Discussion of syllabus, labs, sample projects; Discussion of Arduino, Single Board Computers (SBC), e.g., RaspberryPi; ARM Development Studio, Keil uVision demonstration Activity: Lecture, Implementation	LO1, LO2, LO3, LO4
W2 Structure of a microcontroller; Registers of ARM; Most important assembly operations; Debugging and profiling tools; Logic Analyzer Activity: Lecture, Implementation	LO1, LO2, LO3, LO4
W3 ARM Assembly; MCU bus and clock setup in assembly; GPIO setup in assembly Activity: Projects and presentations 2	LO1, LO2, LO3, LO4
W4 Introduction to higher level libraries, CubeMX for visual setup, HAL for easy coding; GPIO example with HAL CUBEMX, Activity: Lecture, Implementation	LO1, LO2, LO3, LO4
W5 ADC, DAC; ADC example on ARM MCU Activity: Lecture, Implementation	LO1, LO2, LO3, LO4
W6 Online Quiz Activity: Lecture, Implementation	LO2, LO3, LO4
W7 Interrupts; NVIC, SysTick timer; Interrupt example on ARM MCU Activity: Lecture, Implementation	LO1, LO2, LO3, LO4
W8 Communication; USART, I2C, SPI protocols; USART example on ARM MCU Activity: Lecture, Implementation	LO1, LO2, LO3, LO4
W9 Direct Memory Access; Possible scenarios for DMA usages; DMA example on ARM MCU Activity: Lecture, Implementation	LO1, LO2, LO3, LO4
W10 Timers; SysTick timer, Watchdog Timer, RTC, Power Management, Sleep & Deep Sleep, Activity: Lecture, Implementation	LO1, LO2, LO3, LO4
W11 Realtime OS; Multi-task programming Activity: Lecture, Implementation	LO1, LO2, LO3, LO4
W12 Review and emerging technologies, Edge - embedded AI, TensorRT, TensorFlow Lite on MCU, Neuromorphic chips etc. Activity: Lecture, Implementation, Activity: Projects and presentations	LO1, LO2, LO3, LO4

W13 Recapitulation and Conclusion	LO1, LO2, LO3, LO4
Activity: Lecture, Implementation, Activity: Projects and presentations	
W14 Final Project presentations	LO1, LO2, LO3, LO4
Activity: Projects and presentations	

COURSE RECORD

Code	COMP 306
Name	Formal Languages and Automata Theory
Hour per week	3+2(Theory + Practice)
Credit	4
ECTS	6
Level/Year	Undergraduate
Semester	Spring
Type	Compulsory
Prerequisites	
Description	The course introduces some fundamental concepts in automata theory and formal languages such as grammar, finite automaton, regular expression, formal language, pushdown automaton, and Turing machine. These concepts form basic models of computation and they are the foundation of many branches in computer science including compiler, software engineering and concurrent systems.
Objectives	<p>O1. Develop knowledge for the fundamental concepts in formal languages.</p> <p>O2. Learn the techniques used for analyzing and comparing languages and models.</p> <p>O3. Develop skills for designing models for computer components</p>
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>LO1. Explain the mathematical and algorithmic principles of formal languages.</p> <p>LO2. Analyze a computational model.</p> <p>LO3. Design a model for computer components.</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PO1 3	PO1 4	PO1 5
LO 1	5	3	5	3	2	3	3	3	4	1	4	5	2	4	2
LO 2	5	4	5	5	2	2	3	3	4	1	5	4	2	4	2
LO 3	5	3	5	5	2	2	3	3	4	3	5	4	2	4	2

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Finite Automata Part 1: The mathematical construct of finite automata and the deterministic finite automata (DFA) will be explained and various examples will be given.	LO1, LO2,LO3
W2 Finite Automata Part 2: The non-deterministic finite automata (NFA) will be explained and various examples will be given.	LO1, LO2,LO3
W3 Finite Automata Part 2: The non-deterministic finite automata (NFA) will be explained and various examples will be given.	LO1, LO2,LO3
W4 Regular Languages: Regular Expressions and equivalence with finite automata will be explained. Also, A general look at non-regular languages and the pumping lemma for regular languages will be explained.	LO1, LO2,LO3
W5 Context-free Languages, Part 1: Formal definition of a context-free grammar will be given as well as the Chomsky normal form of context-free languages will be discussed.	LO1, LO2,LO3
W6 Context-free Languages, Part 1: Formal definition of a context-free grammar will be given as well as the Chomsky normal form of context-free languages will be discussed.	LO1, LO2,LO3

W7 Context-free Languages, Part 2: The pushdown automata will be explained and a formal definition of such machines will be given. Also, the non-context-free languages will be discussed briefly.	LO1, LO2,LO3
W8 Context-free Languages, Part 3: The pumping lemma for context-free languages will be explained. Also, Deterministic Context-Free Languages will be discussed briefly.	LO1, LO2,LO3
W9 Turing Machines, Part 1: The formal definition of Turing machines and some examples of Turing machines will be given. The Church-Turing thesis will be discussed briefly.	LO1, LO2, LO3
W10 Turing Machines, Part 2: Turing machine variants like multitape Turing Machines and Nondeterministic Turing Machines will be given and explained.	LO1, LO2, LO3
W11 Decidability, Part 1: The concept of the decidability of a problem will be given and explained. Also, decidable regular languages and context-free languages will be investigated.	LO1, LO2, LO3
W12 Decidability, Part 1: The concept of the decidability of a problem will be given and explained. Also, decidable regular languages and context-free languages will be investigated.	LO1, LO2, LO3
W13 Decidability, Part 2: The concept of undecidability will be explained. The class of undecidable problems will be investigated via several examples.	LO1, LO2, LO3
W14 Reducibility, Part 1: Key undecidable problems will be investigated. Methods of reducing problems into other problems will be explained. The formal definition of mapping reducibility will be given and various examples of it will be explained.	LO1, LO2, LO3
DERS BİLGİLERİ	
Kodu	COMP 306
İsmi	Formal Diller ve Automata Teori
Haftalık Saati	3 + 2 (Teori + Pratik)
Kredi	4
AKTS	6
Seviye/Yıl	Lisans
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	
İçerik	Ders kapsamında otomata teori ve formal diller için temel bilgiler verilecektir. Bu temel bilgiler, gramer, finite automaton, regular expression, formal language, pushdown automaton, and Turing machine vb.dir. Bu kavramlar, hesaplama ve bilgisayarlar için basit modeller oluşturmakla birlikte, bilgisayar bilimlerindeki pek çok alanın da temellerini şekillendirmektedir.

COURSE RECORD	
Code	COMP 308
Name	Computer Networks
Hour per week	3+0 (Theory + Practice)
Credit	3
ECTS	6
Level/Year	Undergraduate
Semester	Spring
Type	Compulsory
Prerequisites	
Description	This course provides a comprehensive overview of TCP/IP and computer networks. The topics include computer networks, Internet, TCP/IP, transport layer protocols, routing layer protocols, medium access control protocols, wireless channel models, cellular networks and wireless local area networks. After completing the course, students will get a basic understanding about the computer networks and mobile communications, and related problem solving discipline using mathematics / engineering principles.

Objectives	O1. Develop knowledge for the fundamentals of computer networks O2. Learn the techniques used for developing communication network models O3. Develop skills for practical aspects of computer networks O4. Apply the concepts learned to a real problem
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. Explain the mathematical and algorithmic principles of computer networks LO2. Solve a computer networking problem by applying the appropriate network methodologies LO3. Implement computer network methods using an appropriate software LO4. Apply a computer networking method to a real problem

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	5	5	4	1	1	3	3	1	1	0	1	5	4	5	4
LO2	5	5	5	4	4	1	2	4	5	4	4	4	4	5	5
LO3	5	5	5	1	1	0	4	1	1	1	1	5	5	5	4
LO4	3	5	5	5	5	1	1	5	5	5	5	5	5	5	4
LO5	5	3	5	2	1	5	5	1	2	1	1	5	5	5	4

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topics	Outcomes
W1 An overview of computer networks	LO1, LO2
W2 Description and review of Internet and TCP/IP Protocol Stack	LO1, LO2
W3 Description and review of Transport layer protocols	LO1, LO2
W4 Description and review of Transport layer protocols	LO1, LO2
W5 Description and review of Routing layer protocols	LO1, LO2
W6 Description and review of Routing layer protocols (Continued)	LO1, LO2
W7 Description and review of MAC layer protocols	LO1, LO2
W8 Description and review of MAC layer protocols (Continued)	LO1, LO2, LO3
W9 Description and review of Wireless Channel Models	LO1, LO2, LO3, LO4
W10 Description and review of Wireless Channel Models (Continued)	LO1, LO2, LO3, LO4
W11 Description and review of Wireless Local Area Networks	LO1, LO2, LO3, LO4
W12 Description and review of Wireless Local Area Networks (Continued)	LO1, LO2, LO3, LO4
W13 Description and review of Network and mobility management	LO1, LO2, LO3, LO4
W14 Description and review of Cellular Networks	LO1, LO2, LO3, LO4

DERS BİLGİLERİ

Kodu	COMP 308
İsmi	Bilgisayar Ağları
Haftalık Saati	3 + 0 (Teori + Pratik)
Kredi	3
AKTS	6
Seviye/Yıl	Lisans
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	
İçerik	Bu ders, TCP/IP ve bilgisayar ağları teknolojilerine kapsamlı bir genel bakış sağlar. Konular arasında bilgisayar ağları, İnternet, TCP/IP, taşıma katmanı protokolleri, yönlendirme katmanı protokolleri, ortam erişim kontrol protokolleri, kablosuz kanal modelleri, hüresel ağlar ve kablosuz yerel alan ağları yer alır. Dersi tamamladıktan sonra, öğrenciler bilgisayar ağları ve mobil haberleşme ve matematik / mühendislik ilkelerini kullanarak ilgili problem çözme disiplini hakkında temel bir anlayış kazanırlar.

COURSE RECORD

Code	GLB 301
Name	Sustainability
Hour per week	3+0 (Theory + Practice)
Credit	3
ECTS	4
Level/Year	Undergraduate
Semester	Fall
Type	Compulsory
Location	TBA
Prerequisites	None
Special Conditions	Access to CANVAS
Coordinator(s)	Dr. Özgür Balkılıç
Webpage	canvas.agu.edu.tr
Course Description	This course will cover different aspects of sustainable development and aim to motivate you to develop tangible solutions with the contemporary problems of our world. In consequence order you will be introduced with the basic concepts of sustainable development and several examples of sustainability (sessions and panels) with the participation of speakers, business firms and NGOs, and local government and at the same time you will proceed to conduct a project with a team covering various aspects of sustainability. During the projects, the mentors from different departments and interest areas will provide their mentorship for your projects.
Objective	<ol style="list-style-type: none">1. Through this course our aim is to assist you to understand the nature and the crucial elements of sustainability2. To improve your design thinking ability in order to solve real problems that global world faces3. To assist you to develop a project that is applicable for Kayseri by using design thinking model with your team.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO 1: Develop critical thinking skills to identify and evaluate problems and issues related to sustainability through online sessions, panels, workshops LO 2: Illustrate your oral presentation skills through several presentations in expressing the stages of your projects LO 3: Display your team working abilities by conducting a project with a team LO 4: Design a project with a team by using different aspect of sustainability LO 5: Develop a number of important soft skills such as summarizing, analyzing, synthesizing and presenting a material

COURSE CONTENT DETAILS

W	Date	Topic	Assignments/Activities
1	Oct 6	11.20 Introduction (online-synchronous) 12.00-The Presentations of Instructors (online-asynchronous)	
2	Oct 13	11.20-The E-Panel: The Sustainable Development (online-synchronous) Participants Dr. Hale Demirtepe (İYTE, The Department of Environmental Engineering) Damla Taşkın (UNHCR, Senior Livelihoods and Economic Inclusion Officer) Ezgi Gedik Güneş (Eskişehir Tepebaşı Municipality, Local Expert for the Municipal Partnership) Moderator Dr. Özgür Balkılıç (AGU, Department of Sociology)	-Upload a 500-word reflection on the assigned paper to Canvas (due date: Oct 19th, 02.00) -Submit google forms (Oct 18th, 10.00-24.00)
3	Oct 20	11.20-Team Dynamic Exercise and Forming of Teams (online-asynchronous) 12.20-The Wallet Design Activity (face-to-face) 13.20-How to conduct field surveys (online-asynchronous)	
4	Oct 27	11.20-The E-Panel: The Sustainable Development in the City of Kayseri (online-synchronous) Participants Ahmet Bahçecioğlu (Kayseri Metropolitan Municipality) Dr. Murat Cahid Cingi (Kayseri Erciyes Inc.) Mustafa Nebi Doğan (Kayseri Chamber of Industry)-alternatif Hamdi Elcüman (Kayseri Metropolitan Municipality) Moderator Dr. (AGU, Department of Sociology)	-Upload a 500-word reflection on the assigned paper to Canvas (due date: Nov 2nd, 02.00)
5	Nov 3	11.20-Overview of the second reflection papers (online-synchronous) Definition of the Project Problem Within Groups (online-synchronous) Conducting Field Surveys (Out of Classes)	-Submit a brief description of your project with an annotated outline of your paper and selected references (up to two pages). Your paper must include the definition of your problems, the literature review, examples and your field findings (due date: Nov 9th, 02.00)
6	Nov 10	11.20-The Team Presentations (online-synchronous) Feedback Sessions (online-synchronous)	

7	Nov 17	Fall Break	-Submit your individual solutions to the problem that you defined to discuss in your groups (due date: Nov. 23th, 02.00)
8	Nov 24	11.20-The Game (online-synchronous)	
9	Dec 1	11.20-Video: How to Create Many Ideas for a Problem (online-synchronous) Ideating: Creating many ideas in ideation sessions within teams (online-synchronous)	-Submit mini-conference presentations (due date: Dec 7th, 02.00) -1. Peer evaluation
10	Dec 8	11.20 The Mini-Conference by students (online-synchronous) Feedback Sessions (online-synchronous)	
11	Dec 15	11.20- Idea presentations in teams (online-synchronous) Feedback Sessions in classes (online-synchronous)	-Submit your detailed preliminary report including solutions (due date: Dec. 21nd, 02.00) -2. Peer evaluation
12	Dec 21	09.10- Prototype (face-to-face)	
13	Dec 28	09.10- Prototype (face-to-face)	
14	Jan 04	09.10- Field Test (online-asynchronous)	-Submit your last report including the feedbacks and your final solution (due date: Jan 11th, 02.00)
15	Jan 11	09.10- The Competition (online-synchronous)	

CONTRIBUTION TO PROGRAMME OUTCOMES*

	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7
LO1					4	4	
LO2			4	3	4	4	3
LO3	4		4	3	4	4	2
LO4				3	4	4	3
LO5	4		4	3	4	4	

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

(Semester 7) - Year 4, Fall Semester

Course Code	Course Name	PreReq	Theoretical Hours	Practical Hours	Credits	ECTS
<u>COMP 451</u>	Summer Training II	COMP351	0	2	1	4
<u>COMP 491</u>	Capstone Project I		2	0	2	8
	Technical Elective					5
	Technical Elective					5
	Technical Elective					5
XXX	Nontechnical Elective-3					3
<u>OHS 401</u>	Occupational Health and Safety I		2	0	2	1
TOTAL			4	2	5	31

COURSE SYLLABUS

Code	OHS 401
Name	Occupational Health & Safety I
Hour per week	2 (2+0)
Credit	2
ECTS	1
Level	Undergraduate
Semester/Year	Fall/4
Type	Compulsory
Prerequisites	-
Content	-
Objectives	This course aims to raise awareness of key health and safety issues in a workplace for the students.
Learning Outcomes	By the end of the course, the student will be able to LO1. The student learn about principle of occupational health and safety which is enough for them to work at the basic operational level. LO2. The student understand the relationship between occupational health and safety and engineering&architecture. LO3. The student can apply the knowledge obtained to the real working situation appropriately and efficiently
Textbook	-
Additional Reference Book	Karakaş, İ. (2013), Yeni İş Sağlığı ve Güvenliği Uygulama Rehberi, Muhasebe&Sosyal Güvenlik Kitapevi, Ankara. Goetsch, D.L. (2010), Occupational Safety and Health for Technologists, Engineers, and Managers, 8th Edition, Pearson

CONTRIBUTION TO PROGRAMME OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1									X	
LO2									X	
LO3									X	

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Definition and Importance of Occupational Health and Safety (OHS)	
W2 Occupational Health and Safety Law In Turkey (Law No. 6331)	
W3 Labor Law In Turkey (Law No. 4857)	
W4 OHS Basic Principles and Holistic Approach	
W5 General Responsibilities of Government, Employer and Worker for OHS Environment	
W6 Procedures and Principles of OHS Training for Employees	
W7 Spring Break, 15-19 November 2021	
W8 Midterm Exam Week, 22 November 2021	
W9 LFW, 29 November 2021-03 December 2021	
W10 Definitions and Basic Information for OHS	
W11 Safety and Control in the Workplace	
W12 Personal Protective Equipments (PPE)	
W13 Safety Signs and Emergency Plan	
W14 Examples of Hazards at Workplaces	
W15 Ergonomics at Workplaces and Fire Training	

COURSE RECORD	
Code	COMP 451
Name	SUMMER TRAINING II
Hour per week	2 (0 + 2)
Credit	1
ECTS	4
Level/Year	Undergraduate / 4
Semester	Fall
Type	Compulsory
Prerequisites	COMP 351
Description	This course aims to gain experience in the industrial environment or research laboratories. In Summer Training-II, students are obliged to do an internship for at least 6 weeks. During the internship; students will be able to practically apply the theoretical knowledge learned in the courses. They will experience the work environment and business relationships and culture in industry. They will have an idea to discover their interests and to clarify their job areas after graduation.
Objectives	<ul style="list-style-type: none"> - To understand the work environment in the industry. - To explain practical applications with theoretical concepts. - To learn business relationships and culture in industry. - To describe job areas related to Computer Engineering.
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>L01 describe the techniques that are used in the industry. L02 use practical techniques learned in the industry/research laboratories. L03 explain job areas in the industry. L04 interpret the knowledge with practical experience.</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5
LO2	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5
LO3	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5
LO4	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 – W14 Training, Internship Project/Research	LO1, LO2, LO3, LO4

DERS BİLGİLERİ

Kodu	COMP 451
İsmi	Yaz Stajı – II
Haftalık Saati	2 (0 + 2)
Kredi	1
AKTS	4
Seviye/Yıl	Lisans / 4
Dönem	Güz
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	COMP 351
İçerik	Bu ders endüstriyel ortamda veya araştırma laboratuvarlarında deneyim kazanmayı amaçlamaktadır. Bu dersde, öğrenciler en az 6 hafta staj yapmakla yükümlüdürler. Staj süresince; öğrenciler derslerde öğrendikleri teorik bilgileri uygulamalı olarak uygulayabileceklerdir. Endüstrideki çalışma ortamını ve iş ilişkilerini ve kültürünü deneyimleyeceklerdir. Mezun olduktan sonra ilgi alanlarını keşfetmek ve iş alanlarını netleştirmek için fikir sahibi olacaklardır.

COURSE RECORD

Code	COMP 491
Name	Capstone Project I
Hour per week	2 (2 Theory + 0 Practice)
Credit	2
ECTS	8
Level/Year	Undergraduate/4
Semester	Fall
Type	Compulsory
Location	-
Prerequisites	-
Special Conditions	None
Coordinator(s)	Prof. Dr. V. Çağrı Güngör
Webpage	canvas.agu.edu.tr
Content	Analysis and modeling, design, implementation, verification through tests, interpretation of results, reporting and presentation.
Objectives	<ul style="list-style-type: none">To prepare the student to real life technical and social challengesTo prepare the student to work in a group and be a part of a bigger projectTo teach how to conduct an original research by himself/herself.To develop written and oral skills for reporting the outcomes of his/her research
Learning Outcomes	<ul style="list-style-type: none">Be able to define, state a problem clearly, and propose solutions for problems related to global challengesBe able to manage the time in a projectBe able to conduct an original research in a self-directed mannerBe able to design and implement a system to meet the desired needs within realistic constraints such as economic, environmental, social, ethical, health and safety, manufacturability, and sustainabilityBe able to report and present the outcomes of a research in a proper scientific manner
Requirements	None
Reading List	N/A
Ethical Rules and Course Policy	All students should comply with the Honor Code. The highest standards of academic honesty will be applied in this class. Cheating and plagiarism will be dealt severely.

LEARNING ACTIVITIES

Activities	Number	Weight (%)
Presentations	2	50%
Research Activities	14	50%
Total		100

ASSESSMENT

Evaluation Criteria	Weight (%)	
Midterm Progress and Presentation	40%	
Final Report	30%	
Final Presentation	30%	
Total		100%

For a detailed description of grading policy and scale, please refer to the website <https://goo.gl/HbPM2y> section 28.

COURSE LOAD

Activity	Duration (hour)	Quantity	Work Load (hour)
Research (web, library)	6	14	60
Required Readings	3	10	30
Studying for Mid-Semester Presentation	10	2	20
Studying for Final Presentation	10	3	30
Term Project	110	1	110
General Sum			250

ECTS: 10 (Work Load/25-30)

WEEKLY SCHEDULE

Topic	Outcomes
W1 Analysis, modeling, and design Activity: Research Activities	LO1, LO2
W2 Design and implementation Activity: Research Activities	LO2, LO3, LO4
W3 Design and implementation Activity: Research Activities	LO2, LO3, LO4
W4 Design and implementation Activity: Research Activities	LO2, LO3, LO4
W5 Design and implementation Activity: Research Activities	LO2, LO3, LO4
W6 Design and implementation Activity: Research Activities	LO2, LO3, LO4
W7 Design and implementation Activity: Research Activities	LO2, LO3, LO4
W8 Design and implementation and Midterm presentations Activity: Presentation	LO2, LO3, LO4
W9 Design and implementation Activity: Research Activities	LO2, LO3, LO4
W10 Verification through tests and interpretation of results Activity: Research Activities	LO2, LO3, LO4
W11 Verification through tests and interpretation of results Activity: Research Activities	LO2, LO3, LO4
W12 Verification through tests and interpretation of results Activity: Research Activities	LO2, LO3, LO4
W13 Verification through tests, interpretation of results, and reporting Activity: Research Activities	LO2, LO3, LO4, LO5
W14 Final presentations and report Activity: Presentation	LO5

****Course content and Exam dates are tentative (it can be altered at the discretion of the instructor)****

COURSE RECORD																																																																																																	
Code	COMP 411																																																																																																
Name	Communication Networks																																																																																																
Hour per week	3+0 (Theory + Practice)																																																																																																
Credit	3																																																																																																
ECTS	5																																																																																																
Level/Year	Undergraduate																																																																																																
Semester	Spring																																																																																																
Type	Elective																																																																																																
Prerequisites																																																																																																	
Description	This course provides a comprehensive overview of wireless networks and mobile communications. The topics include network architectures and management, wireless networks, mobile communication technologies, queuing theory, wireless channel models, cellular networks, wireless local area networks, wireless ad hoc networks, packet size optimization, error control techniques. After completing the course, students will get an advanced understanding about wireless networks and mobile communications, and related problem solving discipline using mathematics / engineering principles.																																																																																																
Objectives	<p>O1. Develop knowledge for the fundamentals of wireless networks and mobile communications</p> <p>O2. Learn the techniques used for developing wireless networking models</p> <p>O3. Develop skills for practical aspects of wireless networks</p> <p>O4. Apply the concepts learned to a real problem</p>																																																																																																
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>LO1. Explain the mathematical and algorithmic principles of wireless networks</p> <p>LO2. Solve a wireless networking and mobile communications problem by applying the appropriate network methodologies</p> <p>LO3. Implement wireless network methods using an appropriate software</p> <p>LO4. Apply a wireless networking method to a real problem</p>																																																																																																
CONTRIBUTION TO PROGRAMME OUTCOMES*																																																																																																	
	<table border="1"> <thead> <tr> <th></th> <th>PO1</th> <th>PO2</th> <th>PO3</th> <th>PO4</th> <th>PO5</th> <th>PO6</th> <th>PO7</th> <th>PO8</th> <th>PO9</th> <th>PO10</th> <th>PO11</th> <th>PO12</th> <th>PO13</th> <th>PO14</th> <th>PO15</th> </tr> </thead> <tbody> <tr> <td>LO1</td> <td>5</td> <td>5</td> <td>4</td> <td>1</td> <td>1</td> <td>3</td> <td>3</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td>5</td> <td>4</td> <td>5</td> <td>4</td> </tr> <tr> <td>LO2</td> <td>5</td> <td>5</td> <td>5</td> <td>4</td> <td>4</td> <td>1</td> <td>2</td> <td>4</td> <td>5</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>5</td> <td>5</td> </tr> <tr> <td>LO3</td> <td>5</td> <td>5</td> <td>5</td> <td>1</td> <td>1</td> <td>0</td> <td>4</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>5</td> <td>5</td> <td>5</td> <td>4</td> </tr> <tr> <td>LO4</td> <td>3</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>1</td> <td>1</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>4</td> </tr> <tr> <td>LO5</td> <td>5</td> <td>3</td> <td>5</td> <td>2</td> <td>1</td> <td>5</td> <td>5</td> <td>1</td> <td>2</td> <td>1</td> <td>1</td> <td>5</td> <td>5</td> <td>5</td> <td>4</td> </tr> </tbody> </table>		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	LO1	5	5	4	1	1	3	3	1	1	0	1	5	4	5	4	LO2	5	5	5	4	4	1	2	4	5	4	4	4	4	5	5	LO3	5	5	5	1	1	0	4	1	1	1	1	5	5	5	4	LO4	3	5	5	5	5	1	1	5	5	5	5	5	5	5	4	LO5	5	3	5	2	1	5	5	1	2	1	1	5	5	5	4
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15																																																																																		
LO1	5	5	4	1	1	3	3	1	1	0	1	5	4	5	4																																																																																		
LO2	5	5	5	4	4	1	2	4	5	4	4	4	4	5	5																																																																																		
LO3	5	5	5	1	1	0	4	1	1	1	1	5	5	5	4																																																																																		
LO4	3	5	5	5	5	1	1	5	5	5	5	5	5	5	4																																																																																		
LO5	5	3	5	2	1	5	5	1	2	1	1	5	5	5	4																																																																																		
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COURSE CONTENT DETAILS																																																																																																	
Topics	Outcomes																																																																																																
W1 An overview of wireless networks	LO1, LO2																																																																																																
W2 Description and review of TCP/IP Protocol Stack	LO1, LO2																																																																																																
W3 Description and review of Network Architectures and Management	LO1, LO2																																																																																																
W4 Description and review of Network Architectures and Management (Continued)	LO1, LO2																																																																																																
W5 Description and review of Queuing Theory	LO1, LO2																																																																																																
W6 Description and review of Queuing Theory (Continued)	LO1, LO2																																																																																																
W7 Description and review of Queuing Theory (Continued)	LO1, LO2																																																																																																
W8 Description and review of Wireless Channel Models	LO1, LO2, LO3																																																																																																
W9 Description and review of Wireless Channel Models (Continued)	LO1, LO2, LO3, LO4																																																																																																
W10 Description and review of Wireless Local Area Networks	LO1, LO2, LO3, LO4																																																																																																
W11 Description and review of Wireless Ad Hoc Networks	LO1, LO2, LO3, LO4																																																																																																
W12 Description and review of Cellular Networks	LO1, LO2, LO3, LO4																																																																																																

W13 Description and review of Error Control Techniques	LO1, LO2, LO3, LO4
W14 Description and review of Packet Size Optimization	LO1, LO2, LO3, LO4
DERS BİLGİLERİ	
Kodu	COMP 411
İsmi	Haberleşme Ağları
Haftalık Saati	3 + 0 (Teori + Pratik)
Kredi	3
AKTS	5
Seviye/Yıl	Lisans
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	
İçerik	Bu ders, kablosuz ağlar ve mobil iletişim hakkında kapsamlı bir genel bakış sağlar. Konular ağ mimarileri ve yönetimi, kablosuz ağlar, mobil iletişim teknolojileri, kuyruk teorisi, kablosuz kanal modelleri, hücresele ağlar, kablosuz yerel alan ağları, kablosuz tasarsız ağlar, paket boyutu optimizasyonu, hata kontrol teknikleri, vs. içerir. Bu dersi tamamladıktan sonra, öğrenciler kablosuz ağlar ve mobil iletişim ve matematik / mühendislik ilkelerini kullanarak ilgili problem çözme disiplini hakkında ileri düzeyde bir anlayış kazanırlar.

COURSE RECORD	
Code	COMP 413
Name	Internet of Things
Hour per week	3 (3 + 0)
Credit	3
ECTS	5
Level/Year	Undergraduate / (4)
Semester	Fall
Type	Elective
Prerequisites	
Description	This course will give an overview of the fundamental concepts and enabling technologies for the Internet of Things. The course helps students to understand basic concepts and methods in related areas and will enhance the student's ability in applying them to solve real-world problems. The theoretical knowledge will be supported with practical sessions by applying programming skills to implement various IoT use cases and applications.
Objectives	<ol style="list-style-type: none"> 1. Learn the common applications and architecture models of the Internet of Things. 2. Understand various technologies and systems which integrate the Internet of Things data and services into Internet. 3. Gain transferable practical skills for real-world IoT environment.
Learning Outcomes	<p>LO1. Explain the basis of the Internet of Things and its enabling technologies</p> <p>LO2. Describe the fundamentals of design and development of IoT systems and applications</p> <p>LO3. Explain techniques and concepts involved in the basic software development for embedded Internet-of-Things systems</p> <p>LO4. Implement algorithms for practical use-cases in programming environment</p>
CONTRIBUTION TO PROGRAMME OUTCOMES*	
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PO13 PO14 PO15
LO1	4 0 4 3 0 4 4 0 5 5 4 0 0 0 0
LO2	4 0 4 3 0 4 4 0 3 2 4 0 0 4 0
LO3	5 4 5 5 0 4 4 0 5 2 4 4 4 4 0
LO4	5 5 5 5 5 0 4 4 5 5 5 4 4 4 3
* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High	

COURSE CONTENT DETAILS	
Topic	Outcomes
W1 Introduction to IoT	L01 LO2 L03 L04
W2 System Overview	L01 LO2 L03
W3 Hardware Platform I (Sensor & Node Architecture)	L01 LO2 L03 L04
W4 Hardware Platform II (Communication Architecture)	L01 LO2 L03 L04
W5 Network I (Solutions)	L01 LO2 L03 L04
W6 Network II (Technologies)	L01 LO2 L03 L04
W7 Semester break	
W8 Midterm exam	L01 LO2 L03
W9 IoT Security	L01 LO2 L03 L04
W10 Software Platforms and Services	L01 LO2 L03 L04
W11 IoT Data Processing	L01 LO2 L03 L04
W12 Semantic Technologies and Interoperability	L01 LO2 L03 L04
W13 IoT System Models and Applications	L01 LO2 L03
W14 Revision	
W15 Final Exam + Assignment Submission	L01 LO2 L03 L04

DERS BİLGİLERİ	
Kodu	COMP 413
İsmi	Nesnelerin İnterneti
Haftalık Saati	3 (3 + 0)
Kredi	3
AKTS	5
Seviye/Yıl	Lisans / (4)
Dönem	Güz
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	
İçerik	Bu ders, Nesnelerin İnterneti için temel kavramlara ve etkinleştiren teknolojilere genel bir bakış sunacaktır. Ders, öğrencilerin ilgili alanlardaki temel kavramları ve yöntemleri anlamalarına yardımcı olur ve öğrencinin bunları gerçek dünya problemlerini çözmek için uygulama becerisini geliştirir. Teorik bilgiler, çeşitli IoT kullanım durumlarını ve uygulamalarını hayata geçirmek için programlama becerileri uygulanarak pratik oturumlarla desteklenecektir.

COURSE RECORD	
Code	COMP 414
Name	Network Security
Hour per week	3 (3 + 0)
Credit	3
ECTS	6
Level/Year	Undergraduate
Semester	Spring
Type	Elective
Prerequisites	COMP 308 Computer Networks
Description	In a modern world, almost all of us has some type of electronic (and most of the time, smart) devices to connect to the Internet for accessing social media platforms, reading news, using instant messaging applications, and so on. Unfortunately, some malicious people target security of any online services that we communicate with. Here, in this course, students learn internals of these attacks and countermeasures that they need to take to protect security of those services and their users.
Objectives	Students will grasp a conceptual understanding of network security issues, challenges, and mechanisms Students will describe common network vulnerabilities and attacks, defense mechanisms against network attacks, and cryptographic protection mechanisms.

	Students will develop basic skills of secure network architecture and explain the theory behind the security of different cryptographic algorithms Students will learn to develop secure communication protocols
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. List basic principles and practices in computer and network security LO2. Explain the major types of threats to information security and the associated attacks LO3. Use cryptographic algorithms and methods that are used in the past and present LO4. Analyze communication protocols in terms of security LO5. Test communication protocols in terms of security LO6. Create secure communication protocols

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	1	1	3	2	0	1	0	0	0	0	0	0	0	2	0
LO2	1	2	4	1	1	2	0	0	0	0	0	0	0	3	0
LO3	4	3	4	2	3	0	1	0	0	0	3	0	3	4	0
LO4	3	5	3	5	4	0	1	0	3	4	0	4	2	2	4
LO5	3	5	2	5	4	0	1	0	0	0	3	3	4	3	5
LO6	5	4	3	4	5	4	2	4	3	4	5	4	5	5	5

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 Introduction to Information Security	LO1, LO2
W2 Symmetric Cryptography and Hash Functions	LO1, LO2, LO3, LO6
W3 Asymmetric Cryptography	LO1, LO2, LO3, LO6
W4 Key Management and User Authentication	LO3, LO6
W5 Attacks and Web Security	LO1, LO2, LO4
W6 IP Security	LO2, LO3, LO6
W7 VPNs and Firewall	LO3, LO5
W8 Intrusion Detection/Prevention Systems, <i>Midterm Exam</i>	LO3, LO5
W9 Network Access Control and Cloud Security	LO4, LO5
W10 Wireless Network Security	LO3, LO4
W11 Electronic Mail Security	LO4
W12 Malicious Software	LO2, LO4, LO5
W13 Project Presentations	LO3, LO4, LO5, LO6

DERS BİLGİLERİ

Kodu	COMP 414
İsmi	Ağ Güvenliği
Haftalık Saati	3 (3 + 0)
Kredi	3
AKTS	6
Seviye/Yıl	Lisans
Dönem	Güz
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	COMP 308 Bilgisayar Ağları
İçerik	Modern dünyada hemen hepimiz sosyal media platformlarına erişmek, haberleri takip etmek, anlık haberleşme araçlarını kullanabilmek ve benzer bir sürü şeyi daha yapabilmek için İnternete bağlanabilen elektronik (ve çoğu zaman da akıllı) cihazlara sahibiz. Ne yazık ki bazı kötü niyetli insanlar haberleşme için kullandığımız servislerin güvenliğini hedef alıyor. İşte bu ders, siz öğrenciler bu saldırıların iç yüzünü anlayabilesiniz ve bu servislerin ve kullanıcılarının güvenliğini sağlamak için ne tür önlemler alınması gerektiğini öğrenebilesiniz diye açıldı.

COURSE RECORD

Code	COMP 431
Name	Computer Vision
Hour per week	3 (Theory)
Credit	3
ECTS	5
Level/Year	Undergraduate
Semester	Fall
Type	Elective
Prerequisites	-
Description	This course introduces students to foundational methods, algorithms commonly used in computer vision field and discusses their applications. In relevant subjects, most popular deep learning based methods takes place. The topics include digital image processing basics such as histogram equalization, neighbourhood operations and filtering; feature detection, extraction and matching, SIFT, Hough transform, stereo and epipolar geometry, image to image projections, Homographies and mosaics, projective geometry, essential and fundamental matrix, camera calibration, object detection, recognition and segmentation using classical methods as well as more modern deep learning based approaches. It will provide hands on experience and ability to discuss of theoretical aspects of the methods.
Objectives	Introducing basic basic image processing and computer vision techniques. Discussing the foundations of image formation, measurement, analysis, object representations. Explaining the theoretical knowledge and practical applications of common and the state of the art CV and approaches.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. Identify current computer vision research problems LO2. Implement and apply the basic image processing techniques LO3. Calculate the 2D projection of 3D objects in camera scenes LO4. Extract the camera calibration matrix calibrate an distorted image LO5. Execute object matching including SIFT feature extraction and matching

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	3	4	3	0	0	2	2	0	0	0	1	3	2	3	0
LO2	2	2	4	3	3	0	0	3	3	2	4	4	3	4	1
LO3	3	4	4	3	2	0	2	0	0	1	4	5	4	3	2
LO4	2	4	4	4	5	0	0	3	4	5	5	5	4	4	2
LO5	3	2	4	0	0	4	3	0	0	0	0	5	0	5	4

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topics	Outcomes
Current approaches in DIP and CV	LO1, LO2
Camera projection plane and world coordinate system relations	LO2, LO3, L04
Feature point operations	LO1, LO2, LO5
Assignments	L02, L03, L04, L05
Projects and reports	L01, L02, L03, L04, L05

DERS BİLGİLERİ

Kodu	COMP 431
İsmi	Bilgisayarla Görü
Haftalık Saati	3 (Teori)
Kredi	3
AKTS	5
Seviye/Yıl	Lisansüstü
Dönem	Güz
Dersin Dili	İngilizce
Tip	Seçmeli

Ön Şart	-
İçerik	Bu ders öğrencilere bilgisayarla görü alanında yaygın olarak kullanılan temel yöntemler ve algoritmaları tanıtır ve uygulamalarını tartışır. İşlenecek konular içerisinde en popüler derin öğrenme tabanlı yöntemleri de yer almaktadır. Konular; histogram eşitleme, komşuluk işlemleri ve filtreleme gibi dijital görüntü işleme temellerini; özellik algılama, çıkarma ve eşleştirme, SIFT, Hough dönüşümü, stereo ve epipolar geometri, görüntüden görüntüye projeksiyonlar, homografiler ve mozaikler, projektif geometri, öz ve temel matris, kamera ayarı, nesne algılama, klasik yöntemlerle tanıma ve bölütleme içermektedir. Yöntemleri tartışabilmek için gerekli olan pratik ve teorik deneyim ve yeteneğin geliştirilmesine yardımcı olacaktır.

COURSE RECORD	
Code	COMP 461
Name	Deep Learning
Hour per week	3+0 (Theory + Practice)
Credit	3
ECTS	5
Level/Year	Undergraduate
Semester	Fall/Spring
Type	Elective
Prerequisites	
Description	This course provides an introduction to deep learning. It covers deep architectures for multi-layer perceptrons, convolutional neural networks, and recurrent neural networks and practical applications of deep learning. Methods will be implemented by a software and applied on various machine learning problems.
Objectives	O1. Gain an understanding of deep learning architectures O2. Learn the techniques used for developing deep learning models O3. Develop skills for practical aspects of deep learning
Learning Outcomes	LO1. Explain the mathematical and algorithmic principles of deep learning models LO2. Implement a deep learning model using a software LO3 Perform simulations and experiments to train, optimize and evaluate neural network models LO4. Solve a machine learning problem using deep learning methods

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1							3	0	0	3	1	2	1	3	0
LO2							3	0	0	3	1	2	1	3	0
LO3							4	0	0	4	5	2	3	4	0
LO4							4	0	0	4	5	2	3	4	0
LO5															

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 Deep feedforward networks	LO1
W2 Deep feedforward networks	LO1
W3 Regularization for deep learning	LO1, LO2, LO3, LO4
W4 Regularization for deep learning	LO1
W5 Optimization for training deep models	LO1, LO2, LO3, LO4
W6 Optimization for training deep models	LO1
W7 Convolutional networks	LO1, LO2, LO3, LO4
W8 Semester break	
W9 Convolutional networks	LO1, LO3, LO4, LO5
W10 Midterm exam	LO1, LO4
W11 Recurrent and recursive networks	LO1, LO2, LO3, LO4
W12 Recurrent and recursive networks	LO1
W13 Practical methodology of deep learning	LO1, LO2, LO3, LO4

W14 Deep learning applications	LO1, LO3, LO4, LO5
DERS BİLGİLERİ	
Kodu	COMP 461
İsmi	Derin Öğrenme
Haftalık Saati	3+0 (Teori + Pratik)
Kredi	3
AKTS	5
Seviye/Yıl	Lisans
Dönem	Güz, Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	
İçerik	Derin öğrenmeye giriş niteliğinde olan bu derste çok katmanlı algılayıcı ağlar, konvolüsyonel ağlar, öz-yinelemeli ağlar gibi derin öğrenme mimarileri ve derin öğrenmenin pratikteki uygulamaları incelenecektir. Yöntemler bir program ile gerçekleştirilerek çeşitli yapay öğrenme problemlerine uygulanacaktır.

COURSE RECORD	
Code	COMP 462
Name	Bioinformatics
Hour per week	3 (3 + 0)
Credit	3
ECTS	5
Level/Year	Undergraduate / (4)
Semester	Fall
Type	Elective
Prerequisites	
Description	This course introduces computational techniques for mining the large amount of data in the field of molecular biology and genetics, produced by high throughput technologies. The most essential algorithms for performing sequence analysis and their applications to current genomics, transcriptomics, proteomics, metagenomics research will be presented. The methods by which computers are used to manipulate and analyze biological sequences and molecular structures will also be taught. Topics to be covered also include clustering and classification algorithms for the analysis of gene expression data, methods to analyze large scale biological networks.
Objectives	O1. Learn different types and sources of data available in bioinformatics, O2. Learn the fundamental computational problems in molecular biology and genetics, O3. Learn a core set of widely used algorithms in bioinformatics, O4. Learn a set of algorithms that have important applications in bioinformatics, but which have key applications outside of biology as well. O5. Apply the concepts learned to a real problem
Learning Outcomes	By the end of the course, the student will be able to LO1. Explain the fundamental computational problems in molecular biology and genomics LO2. Explain different types and sources of data available in bioinformatics LO3. Implement a core set of widely used algorithms in bioinformatics LO4. Apply a bioinformatics method to a real problem
CONTRIBUTION TO PROGRAMME OUTCOMES*	
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PO13 PO14 PO15
LO1	4 0 4 3 0 4 4 0 5 5 4 0 0 0 0
LO2	4 0 4 3 0 4 4 0 3 2 4 0 0 4 0
LO3	5 4 5 5 0 4 4 0 5 2 4 4 4 4 0
LO4	5 5 5 5 5 0 4 4 5 5 5 4 4 4 3
* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High	

COURSE CONTENT DETAILS

Topic	Outcomes
W1 Description of the basic terms in Molecular Biology, Genetics and bioinformatics: a) The organization of DNA, proteins, cell; b) In silico biology	L01 LO2 L03 L04
W2 Review of real world applications of bioinformatics, Introduction of Fragment Assembly Problem	L01 LO2 L03
W3 Description of Fragment Assembly Problem, Overlap-Layout-Consensus Algorithm	L01 LO2 L03 L04
W4 Description of Pairwise alignment of biomolecular sequences: Global alignment	L01 LO2 L03 L04
W5 Description of Local alignment, Semi-global alignment	L01 LO2 L03 L04
W6 Description of similarity search algorithms such as BLAST algorithm; description of the scoring in similarity matrices: PAM and BLOSUM matrices	L01 LO2 L03 L04
W7 Description of the Multiple sequence alignment: a) Iterative Methods, b) Structure Based Methods	
W8 Description of the scoring in multiple alignments	L01 LO2 L03
W9 Description and review of the high-throughput biological data analysis methods: Detecting differential gene expression, multiple hypothesis testing, false-discovery-rate methods.	L01 LO2 L03 L04
W10 Description and review of the clustering and classification algorithms for gene expression data analysis.	L01 LO2 L03 L04
W11 Description and review of the clustering and classification algorithms for metagenomic data analysis.	L01 LO2 L03 L04
W12 Description of the protein-protein interaction, protein/DNA interaction, gene/protein interaction networks	L01 LO2 L03 L04
W13 Construction and analysis of large scale biological networks	L01 LO2 L03
W14 Description and review of the machine learning approaches for integrating data in molecular biology, genetics and medicine.	L01 LO2 L04

DERS BİLGİLERİ

Kodu	COMP 462
İsmi	Biyoenformatik
Haftalık Saati	3 (3 + 0)
Kredi	3
AKTS	5
Seviye/Yıl	Lisans / (4)
Dönem	Güz
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	
İçerik	Bu ders, moleküler biyolojide ve genetikte yakın zamanda gelişen yüksek ifade miktarlı teknolojiler neticesinde üretilen büyük verinin analizi için kullanılan hesaplamalı teknikleri tanıtır. Dizi analizi için en gerekli algoritmalar ve bunların güncel genomik, transkriptomik, proteomic, metagenomik araştırmalara uygulamaları bu derste sunulacaktır. Biyolojik dizileri ve moleküler yapıları manipüle etmek ve analiz etmek için kullanılan Bilgisayar Mühendisliği yöntemleri bu derste öğretilenlerdir. Kapsanacak konular, gen ifade verilerinin analizi için kümeleme ve sınıflandırma algoritmalarını ve büyük biyolojik ağların analizi için kullanılan yöntemleri de içerir.

COURSE RECORD																																																																																	
Code	COMP 463																																																																																
Name	Computational Genomics																																																																																
Hour per week	3 (3 + 0)																																																																																
Credit	3																																																																																
ECTS	5																																																																																
Level/Year	Undergraduate / (4)																																																																																
Semester	Fall																																																																																
Type	Elective																																																																																
Prerequisites																																																																																	
Description	Following the Human Genome Project, the recent revolution in genomic technologies has enabled the generation of massive amounts of “omics” data. The challenge in this new era is to develop computational methods for integrating different data types and extracting complex patterns accurately and efficiently from a large volume of data. This course will give an overview of the fundamental concepts, enabling technologies and algorithms in the field of Computational Genomics. The course helps students to understand basic concepts and machine learning based methods in related areas and will enhance the student’s ability in applying them to solve real-world problems. Newly emerging disciplines, i.e. patient stratification, precision medicine and pharmacogenomics will also be discussed in this course.																																																																																
Objectives	<p>O1. Learn different types and sources of big data (-omics data) available in molecular biology,</p> <p>O2. Learn the computational methodologies for the analysis of various biological high throughput datasets, massively parallel sequencing datasets,</p> <p>O3. Learn a set of algorithms that have important applications in computational genomics, but which have key applications in other fields as well.</p> <p>O4. Apply the concepts learned to a real problem and convert the molecular data into medical knowledge.</p>																																																																																
Learning Outcomes	<p>By the end of the course, the student will be able to</p> <p>LO1. Describe different types and sources of -omics data</p> <p>LO2. Explain the fundamental computational problems in the analysis of big data available in molecular biology</p> <p>LO3. Implement a core set of widely used algorithms in computational genomics</p> <p>LO4. Apply a computational genomics method to a real problem</p>																																																																																
CONTRIBUTION TO PROGRAMME OUTCOMES*																																																																																	
	<table border="1"> <thead> <tr> <th></th> <th>PO1</th> <th>PO2</th> <th>PO3</th> <th>PO4</th> <th>PO5</th> <th>PO6</th> <th>PO7</th> <th>PO8</th> <th>PO9</th> <th>PO10</th> <th>PO11</th> <th>PO12</th> <th>PO13</th> <th>PO14</th> <th>PO15</th> </tr> </thead> <tbody> <tr> <td>LO1</td> <td>4</td> <td>0</td> <td>4</td> <td>3</td> <td>0</td> <td>4</td> <td>4</td> <td>0</td> <td>5</td> <td>5</td> <td>4</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>LO2</td> <td>4</td> <td>0</td> <td>4</td> <td>3</td> <td>0</td> <td>4</td> <td>4</td> <td>0</td> <td>3</td> <td>2</td> <td>4</td> <td>0</td> <td>0</td> <td>4</td> <td>0</td> </tr> <tr> <td>LO3</td> <td>5</td> <td>4</td> <td>5</td> <td>5</td> <td>0</td> <td>4</td> <td>4</td> <td>0</td> <td>5</td> <td>2</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>0</td> </tr> <tr> <td>LO4</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>0</td> <td>4</td> <td>4</td> <td>5</td> <td>5</td> <td>5</td> <td>4</td> <td>4</td> <td>4</td> <td>3</td> </tr> </tbody> </table>		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	LO1	4	0	4	3	0	4	4	0	5	5	4	0	0	0	0	LO2	4	0	4	3	0	4	4	0	3	2	4	0	0	4	0	LO3	5	4	5	5	0	4	4	0	5	2	4	4	4	4	0	LO4	5	5	5	5	5	0	4	4	5	5	5	4	4	4	3
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15																																																																		
LO1	4	0	4	3	0	4	4	0	5	5	4	0	0	0	0																																																																		
LO2	4	0	4	3	0	4	4	0	3	2	4	0	0	4	0																																																																		
LO3	5	4	5	5	0	4	4	0	5	2	4	4	4	4	0																																																																		
LO4	5	5	5	5	5	0	4	4	5	5	5	4	4	4	3																																																																		
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COURSE CONTENT DETAILS																																																																																	
Topic	Outcomes																																																																																
W1 Introduction to Computational Genomics, description of the basic concepts such as the organization of DNA, proteins, cells; in silico biology.	L01 L02 L03 L04																																																																																
W2 Description of -omics data, big data in molecular biology and genetics	L01 L02 L03																																																																																
W3 Description of the Human Genome Project, How to sequence the Human Genome	L01 L02 L03 L04																																																																																
W4 Description of the Computational Challenges in Genome Sequencing, Next Generation Sequencing (NGS) Data Analysis	L01 L02 L03 L04																																																																																
W5 Description of the Suffix Trees, Suffix Arrays for Read Mapping in NGS	L01 L02 L03 L04																																																																																
W6 Description of the Gene discovery algorithms using Hidden Markov Models (HMMs), metagenomics	L01 L02 L03 L04																																																																																
W7 Description of the Functional Enrichment Methods for -omics Data Analysis, Hypergeometric Test, Pathway Based Genomics																																																																																	

W8 Description of Network Based Genomics, Sub-network identification in protein-protein interaction (PPI) networks using simulated annealing (SA) and genetic algorithms (GA)	L01 LO2 L03
W9 Analysis of Genome-wide Association Study (GWAS) Datasets	L01 LO2 L03 L04
W10 Description of Metagenomics, Epigenomics, Cancer Genomics studies	L01 LO2 L03 L04
W11 Description of regression, applications of regression in genomics problems	L01 LO2 L03 L04
W12 Discovering Gene Regulatory Signals: Expectation Maximization, Gibbs sampling and related approaches	L01 LO2 L03 L04
W13 Description and review of the trans-omic data analysis, Personalized Medicine, Pharmacogenomics	L01 LO2 L03
W14 Description of Artificial Intelligence Based Methods for Precision Medicine	L01 LO2 L04

DERS BİLGİLERİ

Kodu	COMP 463
İsmi	Hesaplamalı Genomik
Haftalık Saati	3 (3 + 0)
Kredi	3
AKTS	5
Seviye/Yıl	Lisans / (4)
Dönem	Güz
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	
İçerik	İnsan Genom Projesi'ni takiben, genomik teknolojilerdeki ciddi gelişmelerin neticesinde, büyük "omik" veriler hızla üretilir oldu. Buradaki önemli bir sorun, bu karmaşık verilerden paternleri etkili bir şekilde çıkarmak ve farklı veri tiplerini entegre etmek için işlemsel metodlar geliştirmektir. Bu ders, Hesaplamalı Genomik alanındaki temel kavramlara, teknolojilere ve algoritmalara genel bir bakış sağlayacaktır. Bu ders, öğrencilerin ilgili alanlardaki temel kavramları ve makine öğrenimine dayalı yöntemleri anlamalarına yardımcı olur, ve öğrencilerin bunları gerçek dünya problemlerini çözmek için uygulama becerisini geliştirir. Hasta sınıflandırması, kişiye özgü (hassas) tıp, farmakogenomik gibi yeni gelişen alanlar da bu derste tartışılacaktır.

COURSE RECORD

Code	COMP 482
Name	Parallel Architectures
Hour per week	3+0 (Theory + Practice)
Credit	3
ECTS	5
Level/Year	Undergraduate
Semester	Fall / Spring
Type	Elective
Prerequisites	
Description	The main objective of the course is to build a strong understanding of the fundamentals of the architecture of parallel computers and the tradeoffs made in their design. These parallelisms, such as, multi-core architectures, parallel memory systems, vector architectures, dataflow machines, and interconnection networks will be explained in the class.
Objectives	Q1. Learn the methodology of calculating the performance of a computer Q2. Learn the required components in a pipelined architecture Q3. Learn designs to cope with the hazards in pipelined architectures.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. evaluate the benefits/drawbacks of recent parallel architectures. LO2. make a literature survey of very recent studies and to present it in front of an audience with little knowledge. LO3. advance the state of the art parallel architectures by making new designs

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	5	5	5	5	2	3	3	3	5	4	4	4	5	5	3
LO2	5	5	5	5	2	5	4	3	4	5	3	4	5	5	3
LO3	5	5	5	5	2	3	3	3	4	4	3	4	5	5	3

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topics	Outcomes
Introduction and focus Parallel Computer Architectures	LO1, LO2, LO3
Parallel Programming Models	LO1, LO2, LO3
Multicore Processors	LO1, LO2, LO3
Asymmetric Multicore Processors	LO1, LO2, LO3
Multithreading	LO1, LO2, LO3
Interconnection Network	LO1, LO2, LO3
Dataflow Architectures	LO1, LO2, LO3
Main Memory Management	LO1, LO2, LO3

DERS BİLGİLERİ

Kodu	COMP482
İsmi	Parallel Architectures
Haftalık Saati	3 + 0 (Teori + Pratik)
Kredi	3
AKTS	5
Seviye/Yıl	Lisans
Dönem	Güz/ Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	
İçerik	Bu dersin başlıca amacı paralel bilgisayar mimarileri hakkında güçlü bir bilgi birikimi anlayışı inşa edebilmek ve bu mimarilerin birbirlerine üstünlüklerini anlayabilmektir. Ders kapsamında, çok-çekirdekli mimariler, paralel bellek sistemleri, vektör bilgisayarlar, dataflow makinalar ve bağlantı ağı anlatılacaktır.

(Semester 8) - Year 4, Spring Semester

Course Code	Course Name	Theoretical Hours	Practical Hours	Credits	ECTS
<u>COMP 400</u>	Workplace Experience	5	0	5	28
<u>OHS 402</u>	Occupational Health and Safety II	1	0	1	1
TOTAL		6	0	6	29

COURSE RECORD

Code	COMP 400
Name	Long-term Internship: Workplace Experience
Hour per week	5 (5 + 0)
Credit	5
ECTS	28
Level/Year	Undergraduate / 4
Semester	Fall or Spring
Type	Compulsory
Prerequisites	195 ECTS should be completed
Description	This course provides an opportunity for the students to gain workplace experience by spending an entire semester at a company. The students are supposed to engage in engineering design and applications as well as project development/management works and industrial innovation studies ongoing at the companies. The weekly activities must be regularly reported to the supervisors in the company and the department.
Objectives	<ul style="list-style-type: none"> - To identify employer's, other employees', and customers' expectations in the workplace - To identify and solve real-world computer engineering problems. - To learn teamwork, and gain experience about potential problems to encounter when joined a new working group. - To gain experience and vision about career planning.
Learning Outcomes	<p><i>By the end of the course, the student will be able to</i></p> <p>LO1 describe the techniques that are used in the industry. LO2 use practical techniques learned in the industry/research laboratories. LO3 explain job areas in the industry. LO4 interpret the knowledge with practical experience.</p>

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5
LO2	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5
LO3	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5
LO4	5	5	4	4	5	5	5	5	5	5	3	5	3	5	5

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 – W14 Training, Internship Project/Research	LO1, LO2, LO3, LO4

DERS BİLGİLERİ

Kodu	COMP 400
İsmi	Uzun Dönemli Staj: İş Yeri Deneyimi
Haftalık Saati	5 (5 + 0)
Kredi	5
AKTS	28

Seviye/Yıl	Lisans / 4
Dönem	Güz veya Bahar
Dersin Dili	İngilizce
Tip	Zorunlu
Ön Şart	195 AKTS tamamlanmalı
İçerik	Bu ders öğrencilere tüm bir dönemi bir şirkette geçirecek işyeri deneyimi kazanma fırsatı sunar. Öğrenciler, mühendislik tasarım ve uygulamalarının yanı sıra, şirketlerde devam eden proje geliştirme/yönetim çalışmaları ve endüstriyel inovasyon çalışmaları ile meşgul olurlar. Haftalık faaliyetler düzenli olarak şirket ve bölüm danışmanına raporlanmalıdır.

COURSE RECORD

Code	OHS 402
Name	Occupational Health & Safety II
Hour per week	2 (2+0)
Credit	2
ECTS	1
Level	Undergraduate
Semester/Year	Spring/4
Type	Compulsory
Prerequisites	-
Content	-
Objectives	This course aims to raise awareness of key health and safety issues in a workplace for the students.
Learning Outcomes	By the end of the course, the student will be able to LO1. The student learn about principle of occupational health and safety which is enough for them to work at the basic operational level. LO2. The student understand the relationship between occupational health and safety and engineering&architecture. LO3. The student can apply the knowledge obtained to the real working situation appropriately and efficiently.
Textbook	Occupational Health and Safety Law (Law No. 6331, Date of Issuance: 20/06/2012)
Additional Reference Book	Karakaş, İ. (2013), Yeni İş Sağlığı ve Güvenliği Uygulama Rehberi, Muhasebe&Sosyal Güvenlik Kitapevi, Ankara. Goetsch, D.L. (2010), Occupational Safety and Health for Technologists, Engineers, and Managers, 8th Edition, Pearson.

CONTRIBUTION TO PROGRAMME OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
LO1									X	
LO2									X	
LO3									X	

COURSE CONTENT DETAILS

Topics	Outcomes
W1 Development of Concepts and Rules of Occupational Health and Safety	
W2 Overview of Occupational Health and Safety, Related Regulations and Security Culture	
W3 In the face of a pandemic: Ensuring Safety and Health at Work	
W4 National and International Organizations and Agreements	
W5 Occupational Health and Safety Committees	
W6 Occupational Health and Safety Management System	
W7 Spring Break, 15-19 November 2021	
W8 Midterm Exam Week, 23 November 2021	
W9 LFW, 29 November 2021-03 December 2021	
W10 Risk Management and Evaluation, Checks to Be Done Due to Job Security and Documents to Be Issued	

W11 Physical Risk Factors
W12 Chemical Risk Factors
W13 Biological Risk Factors
W14 Occupational Health and Safety in Engineering Applications and Maintenance- Repair Works
W15 Health Surveillance and Occupational Diseases
W16 Ergonomics at Workplaces and Fire Training

COURSE RECORD	
Code	CMPX 131
Name	Digital Learning Platform Transfer Elective 1
Hour per week	1 (1+0)
Credit	1
ECTS	3
Level/Year	Undergraduate / 2-3
Semester	Fall, Spring
Type	Elective
Prerequisites	-
Description	This course is constituted for the recognition of credit mobility and transferring non-technical or elementary level technical courses taken from digital learning platforms.
Objectives	Enriching students' perspective and background knowledge on different topics and fields that are not only limited to the resources of the university Improving personal or professional skills.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. Improve their self-learning skills LO2. Critique the course outputs (or course content) that they have registered LO3. Relate the course content with individual fields

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	2	2	2	4	3	3	3	4	3	3	2	1	1	1	3
LO2	1	1	1	3	2	2	3	2	3	4	1	1	1	1	3
LO3	1	1	1	3	2	3	3	2	3	3	1	1	1	1	3

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 – W14 Differs to the details of transferred course	LO1, LO2, LO3

DERS BİLGİLERİ

Kodu	CMPX 131
İsmi	Dijital Öğrenme Platformu Transfer Seçmeli 1
Haftalık Saati	1 (1+0)
Kredi	1
AKTS	3
Seviye/Yıl	Lisans / 2-3
Dönem	Güz, Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	-
İçerik	Bu ders, dijital eğitim ortamlarından alınan başlangıç seviyesindeki teknik ya da teknik olmayan derslerin, program dışı öğrenme hareketliliğinin tanınması, program ve bilgi sistemine transfer edilmesi için oluşturulmuştur

COURSE RECORD

Code	CMPX 132
Name	Digital Learning Platform Transfer Elective 2
Hour per week	1 (1+0)
Credit	1
ECTS	3
Level/Year	Undergraduate / 2-3
Semester	Fall, Spring
Type	Elective
Prerequisites	-
Description	This course is constituted for the recognition of credit mobility and transferring non-technical or elementary level technical courses taken from digital learning platforms.
Objectives	Enriching students' perspective and background knowledge on different topics and fields that are not only limited to the resources of the university Improving personal or professional skills.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. Improve their self-learning skills LO2. Critique the course outputs (or course content) that they have registered LO3. Relate the course content with individual fields

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	2	2	2	4	3	3	3	4	3	3	2	1	1	1	3
LO2	1	1	1	3	2	2	3	2	3	4	1	1	1	1	3
LO3	1	1	1	3	2	3	3	2	3	3	1	1	1	1	3

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 – W14 Differs to the details of transferred course	LO1, LO2, LO3

DERS BİLGİLERİ

Kodu	CMPX 132
İsmi	Dijital Öğrenme Platformu Transfer Seçmeli 2
Haftalık Saati	1 (1+0)
Kredi	1
AKTS	3
Seviye/Yıl	Lisans / 2-3
Dönem	Güz, Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	-
İçerik	Bu ders, dijital eğitim ortamlarından alınan başlangıç seviyesindeki teknik ya da teknik olmayan derslerin, program dışı öğrenme hareketliliğinin tanınması, program ve bilgi sistemine transfer edilmesi için oluşturulmuştur.

COURSE RECORD

Code	CMPX 141
Name	Digital Learning Platform Basic Level Transfer Elective 1
Hour per week	1 (1+0)
Credit	1
ECTS	4
Level/Year	Undergraduate / 2-3
Semester	Fall, Spring
Type	Elective
Prerequisites	-
Description	This course is constituted for the recognition of credit mobility and transferring elementary level disciplinary or interdisciplinary courses taken from digital learning platforms.
Objectives	Enriching students' perspective and background knowledge on different topics and fields that are not only limited to the resources of the university Improving personal or professional skills.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. Improve their self-learning skills LO2. Critique the course outputs (or course content) that they have registered LO3. Relate the course content with individual fields

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	2	2	2	4	3	3	3	4	3	3	2	1	1	1	3
LO2	1	1	1	3	2	2	3	2	3	4	1	1	1	1	3
LO3	1	1	1	3	2	3	3	2	3	3	1	1	1	1	3

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 – W14 Differs to the details of transferred course	LO1, LO2, LO3

DERS BİLGİLERİ

Kodu	CMPX 141
İsmi	Dijital Öğrenme Platformu Başlangıç Seviyesi Transfer Seçmeli 1
Haftalık Saati	1 (1+0)
Kredi	1
AKTS	3
Seviye/Yıl	Lisans / 2-3
Dönem	Güz, Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	-
İçerik	Bu ders, dijital eğitim ortamlarından alınan başlangıç seviyesindeki disipline özgü ya da disiplinlerarası derslerin, program dışı öğrenme hareketliliğinin tanınması, program ve bilgi sistemine transfer edilmesi için oluşturulmuştur.

COURSE RECORD

Code	CMPX 142
Name	Digital Learning Platform Basic Level Transfer Elective 2
Hour per week	1 (1+0)
Credit	1
ECTS	4
Level/Year	Undergraduate / 2-3
Semester	Fall, Spring
Type	Elective
Prerequisites	-
Description	This course is constituted for the recognition of credit mobility and transferring elementary level disciplinary or interdisciplinary courses taken from digital learning platforms.
Objectives	Enriching students' perspective and background knowledge on different topics and fields that are not only limited to the resources of the university Improving personal or professional skills.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. Improve their self-learning skills LO2. Critique the course outputs (or course content) that they have registered LO3. Relate the course content with individual fields

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	2	2	2	4	3	3	3	4	3	3	2	1	1	1	3
LO2	1	1	1	3	2	2	3	2	3	4	1	1	1	1	3
LO3	1	1	1	3	2	3	3	2	3	3	1	1	1	1	3

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
Differs to the details of transferred course	LO1, LO2, LO3, LO4

DERS BİLGİLERİ

Kodu	CMPX 142
İsmi	Dijital Öğrenme Platformu Başlangıç Seviyesi Transfer Seçmeli 2
Haftalık Saati	1 (1+0)
Kredi	1
AKTS	3
Seviye/Yıl	Lisans / 2-3
Dönem	Güz, Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	-
İçerik	Bu ders, dijital eğitim ortamlarından alınan başlangıç seviyesindeki disipline özgü ya da disiplinlerarası derslerin, program dışı öğrenme hareketliliğinin tanınması, program ve bilgi sistemine transfer edilmesi için oluşturulmuştur.

COURSE RECORD

Code	CMPX 151
Name	Digital Learning Platform Advanced Transfer Elective 1
Hour per week	1 (1+0)
Credit	1
ECTS	5
Level/Year	Undergraduate / 3-4
Semester	Fall, Spring
Type	Elective
Prerequisites	-
Description	This course is constituted for the recognition of credit mobility and transferring the disciplinary and interdisciplinary based courses taken from digital learning platforms.
Objectives	Enriching cultural perspectives, and architectural background. Improving professional skills.
Learning Outcomes	<i>By the end of the course, the student will be able to</i> LO1. Improve their self-learning skills LO2. Critique the course outputs (or course content) that they have registered LO3. Relate the course content with individual fields LO4. Create an academic output in an inter- and trans-disciplinary perspective.

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
LO1	2	2	2	4	3	3	3	4	3	3	2	1	1	1	3
LO2	1	1	1	3	2	2	3	2	3	4	1	1	1	1	3
LO3	1	1	1	3	2	3	3	2	3	3	1	1	1	1	3
LO4	1	1	1	3	2	3	3	2	3	3	1	1	1	1	3

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
W1 – W14 Differs to the details of transferred course	LO1, LO2, LO3, LO4

DERS BİLGİLERİ

Kodu	CMPX 151
İsmi	Dijital Öğrenme Platformu İleri Transfer Seçmeli 1
Haftalık Saati	1 (1+0)
Kredi	1
AKTS	5
Seviye/Yıl	Lisans / 3-4
Dönem	Güz, Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	-
İçerik	Bu ders, dijital eğitim ortamlarından alınan disiplin içi ve disiplinler arası derslerin, program dışı öğrenme hareketliliğinin tanınması, program ve bilgi sistemine transfer edilmesi için oluşturulmuştur

Technical Electives

Code	Course Name	Lec.	Lab	Credits	ECTS
EE 423	Optics and Photonics	3	0	3	5
EE 424	Fiber Optic Communication	3	0	3	5
EE 434	Sensors and Measurement	3	0	3	5
EE 440	Neural Engineering	3	0	3	5
EE 443	Biomedical Instrumentation and Signal Analysis	3	0	3	5
EE 465	Data Mining	3	0	3	5
EE 473	Introduction to Robotics	3	0	3	5
COMP 403	Blockchain and Cryptocurrencies	3	0	3	5
COMP 411	Communication Networks	3	0	3	5
COMP 414	Network Security	3	0	3	5
COMP 413	Internet of Things	3	0	3	5
COMP 430	Digital Image Processing	3	0	3	5
COMP 431	Computer Vision	3	0	3	5
COMP 455	Linux For Engineers and Scientists	3	0	3	6
COMP 461	Deep Learning	3	0	3	5
COMP 462	Bioinformatics	3	0	3	5
COMP 463	Computational Genomics	3	0	3	5
COMP 464	Pattern Recognition	3	0	3	5
COMP 465	Artificial Intelligence	3	0	3	5
COMP 482	Parallel Architectures	3	0	3	5

GLB1XX Electives

Code	Course Name	Lec.	Lab	Credits	ECTS
GLB102	Innovation and Entrepreneurship	3	0	3	4
GLB104	Agu Ways II	3	0	3	4

GLB2XX Electives

Code	Course Name	Lec.	Lab	Credits	ECTS
GLB203	Good Health and Well Being	3	0	3	4
GLB205	Sustainable Cities & Communities	3	0	3	4
GLB206	Clean Water & Sanitation	3	0	3	4
GLB207	Responsible Consumption and Production	3	0	3	4
GLB209	Innovation and Entrepreneurship	3	0	3	4
GLB210	Reduced Inequalities	3	0	3	4
GLB270	Affordable & Clean Energy	3	0	3	4

GLB3XX Electives

Code	Course Name	Lec.	Lab	Credits	ECTS
GLB301	Sustainability	3	0	3	4