

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY



**KTO KARATAY
ÜNİVERSİTESİ**

KTO KARATAY UNIVERSITY FACULTY OF ENGINEERING

ERASMUS+ Course Catalogue

for the academic year 2019/2020 Spring Semester

KONYA, 2019-2020

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

(ALPHABETICAL) LIST OF COURSES WITH CODES

Calculus I - **MAT112**

Physics I – **FIZ112**

Calculus II- **MAT 212**

Physics II – **FIZ212**

Differential Equations – **MAT 231**

Linear Algebra – **MAT 134**

General Chemistry for Materials Science – **MNT 103**

General Chemistry for Materials Science Lab. – **MNT 107**

Algorithms and Programming I – **MNT 105**

Introduction to Materials Science and Nanotechnology Engineering – **MNT 102**

Algorithms and Programming II – **MNT 106**

Materials Science I – **MNT 201**

Materials Science Lab. I – **MNT 203**

Materials Science II – **MNT 204**

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Materials Science Lab. II – MNT 214

Introduction to Polymeric Materials– MNT 331

Casting Principles and Techniques – MNT 335

Sensors, Detectors and Their Applications – MNT 403

Biomaterials – MNT 412

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Calculus I - Course Code: MAT112

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 4	ECTS TYPE: ECTS (5)
SEMESTER: Fall	CLASS LEVEL: 1st Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: Functions, limits, continuity and derivatives. Applications. Extreme values, the Mean value Theorem and its applications. L'Hopital's rule. Graphing. Optimization problems. The indefinite integral. Techniques of integration. The definite integral. Area and volume as integrals.	
EFFECTS OF EDUCATION PROCESS: The sequence MAT112 is the standard complete introduction to the concepts and methods of calculus. It is taken by all engineering students. The emphasis is on concepts, solving problems, theory and proofs. Students will develop their reading, writing and questioning skills in Mathematics.	
LITERATURE (OPTIONAL): George B.Thomas, Maurice D. Weir, Joel R.Hass, Thomas' Calculus 11th Edition	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Physics I - Course Code: FIZ112

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 3+1	ECTS TYPE: ECTS (5)
SEMESTER: Fall	CLASS LEVEL: 1st Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
<p>CONTENTS: The main objectives are combining with specialist learning in some areas, that lays the foundation for research in physics and related sciences, attracting high quality students from a variety of backgrounds, Increasing students' awareness of the industrial, environmental and social context of the subject.</p> <p>Subjects: Measurement; vectors. Motion in one dimension. Plane motion. Dynamics of particuls Work and energy. Collision.Kinetics of rotation. Oscillation. Inflection of the mass. Fluid mechanics. Heat and the first law of thermodynamics. Kinetic theory of gas. Second law of thermodynemics.</p>	
EFFECTS OF EDUCATION PROCESS: To provide an education in physics that: provides students with a physics education with breadth across the physics disciplines, develops the potential of each student to meet new challenges and to lay the foundations of versatility and innovative thinking they will need in careers in industry, commerce, the public sector and education.	
LITERATURE (OPTIONAL): Raymond A. Serway, John W. Jewett, Physics for Scientists and Engineers (8th Edition), Volume 1, Chapters 1-22	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Calculus II - Course Code: MAT212

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 4	ECTS TYPE: ECTS (5)
SEMESTER: Spring	CLASS LEVEL: 1st Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: Sequences. Series with positive terms, series with arbitrary terms, absolute and conditional convergence, power series, Taylor and Maclaurin series. Vector calculus. Functions of multiple variables; limits, continuity, partial derivatives, chain rule, directional derivatives, maxima and minima, Lagrange multipliers, Taylor's formula. Double and triple integrals, line integrals, Green's theorem in the plane, Surface area and surface integrals, Divergence and Stokes theorem.	
EFFECTS OF EDUCATION PROCESS: The emphasis is on concepts, solving problems, theory and proofs. Students will develop their reading, writing and questioning skills in Mathematics.	
LITERATURE (OPTIONAL):	
TEACHING METHODS: Verbal course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Physics II - Course Code: FIZ212

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 3+1	ECTS TYPE: ECTS (5)
SEMESTER: Spring	CLASS LEVEL: 1st Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: The electric fields and Gauss' law, Electrical potential, Capacitors and dielectrics, Current and resistance, Elektromotive force and electric circuits Magnetic field and Ampere's law, Farday's law, Inductance and L-C-R circuits, Magnetic properties of solids, Alternating Currents. Electromagnetic waves, Optics, Wave optics and interference. Diffraction. Light and quantum physics.	
EFFECTS OF EDUCATION PROCESS: To provide an education in physics that: provides students with a physics education with breadth across the physics disciplines, develops the potential of each student to meet new challenges and to lay the foundations of versatility and innovative thinking they will need in careers in industry, commerce, the public sector and education.	
LITERATURE (OPTIONAL): Raymond A. Serway, John W. Jewett, Physics for Scientists and Engineers (8th Edition), Volume 2, Chapters 23-44.	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Differential Equations - **Course Code:** MAT 231

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 4	ECTS TYPE: ECTS (5)
SEMESTER: Fall	CLASS LEVEL: 2nd Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: Higher order differential equations, Applications of second order differential equations with constant coefficients, Linear differential equations, Solutions of linear differential equations with power series, Partial differential equations, Euler type differential equations	
EFFECTS OF EDUCATION PROCESS: To teach differential equations and applications	
LITERATURE (OPTIONAL):	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Linear Algebra - **Course Code:** MAT 134

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 4	ECTS TYPE: ECTS (5)
SEMESTER: Spring	CLASS LEVEL: 2nd Year
LANGUAGE OF INSTRUCTION: Türkçe	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: Matrix algebra. Systems of linear algebraic equations. Eigenvalues and eigenvectors. Linear vector spaces. Fundamentals of vector analysis. Vector algebra. Line, surface and volume integrals. Green`s theorem in the plane, Stokes and Gauss theorems. Matrices. Determinant. Systems of linear equations.	
EFFECTS OF EDUCATION PROCESS: To provide students with a good understanding of the concepts and methods of linear algebra. To help the students develop the ability to solve problems using linear algebra. To connect linear algebra to other fields.	
LITERATURE (OPTIONAL): Kreyszig, E., Advanced Engineering Mathematics, 9th Ed., John Wiley & Sons, 2005	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: General Chemistry for Materials Science - **Course Code:** MNT 103

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 3	ECTS TYPE: ECTS (5)
SEMESTER: Fall	CLASS LEVEL: 1st Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: Introduction, Matter and Measurement. Atoms, Molecules and Ions. Stoichiometry: Calculations with Chemical Formulas and Equations. Oxidation-Reduction Reactions. Thermochemistry. Electronic Structure of Atoms. Periodic properties of the Elements. Basic Concepts of Chemical Bonding. Molecular Geometry and Bonding Theories. Gases. Intermolecular Forces, Liquids and Solids. Chemical Kinetics. Chemical Thermodynamics. Electrochemistry.	
EFFECTS OF EDUCATION PROCESS: Ability to use natural sciences in engineering design, Ability to make material production and characterization.	
LITERATURE (OPTIONAL): (Ralph H. Petrucci-William S. Harwood-Geoffrey Herring)--General Chemistry: Principles and Modern Applications (8th Edition) 8th Edition	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: General Chemistry for Materials Science Lab.- **Course Code:** MNT 107

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 2	ECTS TYPE: ECTS (2)
SEMESTER: Fall	CLASS LEVEL: 1st Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: Introduction, Matter and Measurement. Atoms, Molecules and Ions. Stoichiometry: Calculations with Chemical Formulas and Equations. Oxidation-Reduction Reactions. Thermochemistry. Electronic Structure of Atoms. Periodic properties of the Elements. Basic Concepts of Chemical Bonding. Molecular Geometry and Bonding Theories. Gases. Intermolecular Forces, Liquids and Solids. Chemical Kinetics. Chemical Thermodynamics. Electrochemistry.	
EFFECTS OF EDUCATION PROCESS: Ability to use natural sciences in engineering design, Ability to make material production and characterization	
LITERATURE (OPTIONAL): (Ralph H. Petrucci-William S. Harwood-Geoffrey Herring)--General Chemistry: Principles and Modern Applications (8th Edition) 8th Edition	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Quiz exams.	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Algorithms and Programming I - **Course Code:** MNT 105

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 4	ECTS TYPE: ECTS (4)
SEMESTER: Fall	CLASS LEVEL: 1st Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: Basic Computer Hardware, Problem solving using computers. The concept and notation of algorithms. Problem analysis and algorithm design. Development of algorithms and their implementation in a procedure-oriented language. Topics include; Integrated programming environment (editing, computing, debugging), data types, operators, input/output, structured programming, program control, subprograms, passing parameters. Arrays and array processing.	
EFFECTS OF EDUCATION PROCESS: The course aims to teach the computer hardware and to make an introduction to the C and C++ Programming Language and Algorithms	
LITERATURE (OPTIONAL): Dr. Rifat Çölkesen, Bilgisayar Mühendisliğine Giriş, Papatya Yayıncılık, 2010	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Introduction to Materials Science and Nanotechnology Engineering - **Course Code:** MNT 102

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 4	ECTS TYPE: ECTS (5)
SEMESTER: Spring	CLASS LEVEL: 1st Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: Provide information about nanotechnology, nanoscience, intermolecular forces, surface forces and measurement, carbon nanotubes, obtaining method of nano-structure etc. and teach their applications in engineering.	
<ol style="list-style-type: none">1. Have basic level of knowledge of material science and able to apply in an engineering application.2. Able to define nanomaterials.3. Able to know application areas and importance of nanomaterials.4. Able to know production methods and properties of carbon nanotubes.5. Able to understand the working principles of nanomaterials characterization devices	
LITERATURE (OPTIONAL): <ol style="list-style-type: none">1. Introduction to Nanoscience and Nanotechnology, Chris Binns2. Fundamentals of Materials Science and Engineering, William D. Callister, Jr.	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Algorithms and Programming II - **Course Code:** MNT 106

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 4	ECTS TYPE: ECTS (4)
SEMESTER: Spring	CLASS LEVEL: 1st year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: Basic Computer Hardware, Problem solving using computers. The concept and notation of algorithms. Problem analysis and algorithm design. Development of algorithms and their implementation in a procedure-oriented language. Topics include; Integrated programming environment (editing, computing, debugging), data types, operators, input/output, structured programming, program control, subprograms, passing parameters. Arrays and array processing.	
EFFECTS OF EDUCATION PROCESS: The course aims to teach the computer hardware and to make an introduction to the C and C++ Programming Language and Algorithms	
LITERATURE (OPTIONAL): Dr. Rifat Çölkesen, Bilgisayar Mühendisliğine Giriş, Papatya Yayıncılık, 2010	
TEACHING METHODS: Verbal course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Material Science I- Course Code: MNT 201

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 4	ECTS TYPE: ECTS (6)
SEMESTER: Fall	CLASS LEVEL: 2nd year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: Introduction to material science and engineering, atomic structure and interatomic bonding, the structure of crystalline solids, imperfections of solids, diffusion, mechanical properties of metals, dislocations and strengthening mechanisms, failure, structures, properties and applications of ceramics .	
EFFECTS OF EDUCATION PROCESS: Students are taught types of atomic bondings and crystal structures in different type of materials, the defects and atomic movements in the structure and these structural perfection and imperfections effect of properties of materials and how to control the microstructure and properties of materials.	
LITERATURE (OPTIONAL): Fundamentals of Materials Science and Engineering, William D. Callister, Jr.	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Material Science Lab. I- **Course Code:** MNT 203

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 2	ECTS TYPE: ECTS (2)
SEMESTER: Fall	CLASS LEVEL: 2nd Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS Melting and solidification, metallographic sample preparation, metallography, hardness measurements, tensile testing, compression testing, carburization, hardenability testing, the charpy impact test.	
EFFECTS OF EDUCATION PROCESS: Strudents will be taught to melting, solidification, teaching metallography and mechanical testing of materials by their own laboratory practices which they have theoretical knowledge before.	
LITERATURE (OPTIONAL): Mechanical Metallurgy, George Dieter	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Introduction to Polymeric Materials - **Course Code:** MNT 331

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Elective
NUMBER OF HOURS: 3	ECTS TYPE: ECTS (3)
SEMESTER: Fall	CLASS LEVEL: 3rd year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
<p>CONTENTS: Reaction mechanisms involved in polymer synthesis and the kinetics of these reactions. Basic concepts of polymer chain architecture, structure and morphology, with particular emphasis on the relationship between chemical structure (chain architecture) and the morphology of the solid state (semi-crystalline vs. amorphous polymers). Basic knowledge of the thermal properties of polymers, particularly the crystallization temperature and elementary aspects of crystallization kinetics, the melting temperature and the glass transition; how these properties depend on structure. Basic aspects of the solution properties of polymers, interactions and the relationship to chemical structure, including phase behaviour and the measurement of molecular weight. To teach students how the above material is related, the fundamentals of polymer structure/property relationships, so that they can make simple predictions for design.</p>	
<p>EFFECTS OF EDUCATION PROCESS: This course is an introduction to the field of polymer science and engineering, providing an overview of the synthesis and structure of these materials; the crystalline and glassy states; solution properties and phase behaviour; mechanical and rheological properties.</p>	
<p>LITERATURE (OPTIONAL): Fundamentals of Polymer Science: An Introductory Text, Painter and Coleman, Technomic Publishing, 1997</p>	
TEACHING METHODS: Verbal course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Casting Principles and Techniques - **Course Code:** MNT 335

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 3	ECTS TYPE: ECTS (3)
SEMESTER: Fall	CLASS LEVEL: 3rd Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: T	
EFFECTS OF EDUCATION PROCESS:	
LITERATURE (OPTIONAL):	
TEACHING METHODS: Verbal course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Sensors, Detectors and Their Applications- **Course Code:** MNT 403

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Mandatory
NUMBER OF HOURS: 3	ECTS TYPE: ECTS (5)
SEMESTER: Spring	CLASS LEVEL: 4th Year
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: Fundamentals of various sensing techniques will be discussed. Design, fabrication and testing of numerous nano-sensors for gas, liquid and bio-sensing applications will be presented. Sensor characteristics and physical effects, Nano based inorganic sensors, organic / biosensors, applications, detectors and applications will be discussed.	
EFFECTS OF EDUCATION PROCESS: Teaches the students the most appropriate nanosensors for scientific applications. Understand the underlying sensing phenomena used in nanosensors. Reliably process, evaluate and interpret the information presented by nanosensors. Evaluate the influences of interfering parameters on nanosensor performance.	
LITERATURE (OPTIONAL): Kourosh Kalantar – Zadeh, Benjamin Fry, “Nanotechnology- Enabled Sensors”, Springer, 2008 H.Rosemary Taylor, “Data acquisition for sensor systems”, Chapman & Hall, 1997.	
TEACHING METHODS: Verbal and applied course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	

FACULTY OF ENGINEERING – KTO KARATAY UNIVERSITY

Course Name: Biomaterials - Course Code: MNT 412

FACULTY: Faculty of Engineering	CLASS TYPE: Bachelor/Elective
NUMBER OF HOURS: 3	ECTS TYPE: ECTS (5)
SEMESTER: Spring	CLASS LEVEL:
LANGUAGE OF INSTRUCTION: English	
PRELIMINARY REQUIREMENTS: None	
CONTENTS: The course will cover basic imaging techniques, biosensors, targeted drug delivery methods, biofilms, etc.	
EFFECTS OF EDUCATION PROCESS: This course is aimed at providing information about the most up-to-date applications of nanotechnology to the life sciences. Basic principles and background information of binanotechnology with examples will also be provided.	
LITERATURE (OPTIONAL): Nanobiotechnology and Nanobiosciences, Claudio Nicolini, Pan Stanford Publishing, 2009 Nanobiotechnology, Pravin Chandra Trivedi, Pointer Publishers, 2008	
TEACHING METHODS: Verbal course	
ASSESSMENT METHODS: Midterm Exam and Final Exam	
LECTURER (NAME, EMAIL CONTACT):	