DERS İÇERİKLERİ, DERS KİTAPLARI VE YARDIMCI KİTAPLAR

I. SEMESTER

Course Code	Course Name	C/E	T	P	C	ECTS
FZI1101	Physics I	**Compulsory Course**	**3**	**2**	**4**	**5**

Language of Instruction: English

Objectives of the Course: To teach the concepts of statics, dynamics and kinematics given in the course content, their applications in daily life and modern technology.

Course Content: Units, Physical quantities and vectors, Linear motion, Motion in two and three dimensions, The Newton laws of motion, Applications of Newton's laws, Work and kinetic energy, Potential energy and conservation of energy, Linear momentum, Impuls and collisions, Rotation of a rigid body, Dynamics of rotational motion, Equilibrium and elasticity, Gravitation

Resource: Fen ve Mühendislik için Fizik I (Mekanik), R. A. Serway; Çeviri Editörü: Kemal Çolakoğlu, (5. baskıdan çeviri), Palme Yay., 2002.

Additional Resources:

- Fizik I (Mekanik), F. J. Keller, W. E. Gettys, M. J. Skove, Çeviri Editörü: R. Ömür Akyüz, Literatür Yay., 2006.
- Temel Fizik I, P. M. Fishbane, S. Gasiorowicz ve S. T. Thornton, 2. baskıdan çeviri; Çeviri Editörü: Cengiz Yalçın; Arkadaş Yay., 2003.
- Fizik İlkeleri 1, F. J. Bueche, D. A. Jerde, Çeviri Editörü: Kemal Çolakoğlu;(6. baskıdan çeviri), Palme Yay., 2000.
- Fundamentals of Physics, 9th Edition, David Halliday, Robert Resnick, Jearl Walker, John Willey & Sons, Inc., 2011.
- University Physics with Modern Physics, 13th Edition, Hough D. Young, Roger A. Freedman, Addisin-Wesley, 2012.

Course Code	Course Name	C/E	T	P	C	ECTS
MTI1121	**Mathematics I**	**Compulsory Course**	**5**	**0**	**5**	**5**

Language of Instruction: English

Objectives of the Course: This course aims at giving students the concept of sets, types of numbers, properties of one variable functions, meaning of limit, continuity and derivative over one variable functions. Explaning how the student use the derivative concept in engineering applications. Constructing the ability of solving maxima-minima problems. Giving the ability of solving engineering problems by using mathematics knowledge.

Course Content: This course covers, numbers, absolute value, inequalities, induction, coordinates. The concept of a function and function types. Some kinds of special functions and their domains. Limit and continuity of functions. Properties of continuous functions. The concept of the derivative. Rate of change, the mean value theorem and applications. Finding the maximum and minimum and their applications. Hyperbolic functions and derivatives, implicit and inverse functions and derivatives, parametric equations and their derivatives, and curve sketching. Polar coordinates.

Resource: Calculus, a complete course, Adams, R.A, Addison-Wesley 2003.

Additional Resources:

- Yüksek Matematik 1-2 H. Halilov, A. Hasanoğlu, M. Can.
- Temel ve Genel Matematik I& II, Balcı M., Balcı Yayınları 2000.
- Temel ve Genel Matematik M. Balcı, H. Hacısalihoğlu, F. Gökdal.
- Genel Matematik I- II Prof. H. Arıkan, Yrd. Doç. Dr. İ. Özgür, Yrd. Doç. Dr. Ö. F. Gözükızıl.
- Calculus with analytic geometry, Silverman R.A.

Course Code	Course Name	C/Z	T	P	C	ECTS
BMI1121	**Linear Algebra**	**Compulsory Course**	**3**	**0**	**3**	**4**

Language of Instruction: English

Objectives of the Course: The aim of this course is to introduce the concepts of matrices, determinant, vector spaces and inner products.

Course Content: Matrix Algebra, Elementary Row Operations on Matrices and Solution of Linear Equations, Special Types of Matrices, Elementary Matrices, Equivalent Matrices, nxn Determinants, properties of Determinants, Vector Spaces, Subspaces, Linear Independence, Basis and Dimension. Linear Transformation and matrix of a Linear Transformation, Eigenvalues and Eigenvectors, Diagonalization Inner Product Spaces

Resource: Basic Linear Algebra, Cemal Koç, METU, 1998.

Additional Resources:

- Ö.Faruk Gözükızıl, Lineer Cebir problemleri, Sakarya.
- İ.M. Gelfand, Lectures on Linear Algebra, Nauka, Moskova, 1971(Rus.).
- Elementary Linear Algebra with Applications, Ninth edition, B. Kolman, D. Hill, 2008, Pearson.

Course Code	Course Name	C/Z	T	P	C	ECTS
BMI1122	**Introduction to Computer Engineering**	**Compulsory Course**	**2**	**0**	**2**	**3**

Language of Instruction: English

Objectives of the Course: The aim of the course is to enable students to have information about computer engineering and to form background of the course that they will have along their computer engineering education.

Course Content: Computer Engineering, Research and Application Areas of CE, Program and Course Contents of CE in BANU, Working Areas of CE, What's the Computer?, Basic Process of Computers, Basic Components of a Computer, Software, Hardware, Hardware Components in Detail, Internet and Computer Networks, Operating Systems, Basic DOS Commands, Number Systems, Arithmetical Coding Rules, OFFICE PROGRAMS: Word Processors, Spreadsheets, Presentation Programs, Database (DBMS)

Resource: Introduction to Computer Engineering: Hardware and Software Design, T. L. Booth.

Additional Resources:

- Bilgisayar Mühendisliğine Giriş, Dr. Rifat Çölkesen, Papatya Bilim,
- Introduction to Computer Engineering, Franco Preparata.

Course Code	Course Name	C/Z	T	P	C	ECTS
BMI1123	**Introduction to Programming**	**Compulsory Course**	**3**	**2**	**3**	**5**

Language of Instruction: English

Objectives of the Course: To be able to understand the principles and phases that are required to solve a problem. To be able to design algorithms and flowcharts which are required to solve a problem. To be able to understand the structure of a programming language and to use it by studying C programming language. To be able to write code for the problems that have algorithms and flowcharts. To be able to understand and use variable, control command, loop, string, subroutine concepts. To be able to use graphics interface and write graphics prpgrams in C. To be able to use C libraries.

Course Content: Algorithms, Flowcharts, Pseudocode, Intro to C, C program structure, Values, Variables, Types, Simple input/output, Programming idioms, Arithmetic expressions, Precedence, Control statements, Boolean data, Functions, procedures, Stepwise refinement, Concept of an interface, A simple graphicslibrary, Characters and strings.

Resource: C How to Program, Deitel&Deitel.

Additional Resources:

- Programming Languages: Design and Implementation, Terrence W. Pratt, Marvin W. Zelkowitz,
- C ile Bilgisayar Programlamaya Giriş, Ali Orhan Aydın, Pusula Yayıncılık

Course Code	Course Name	C/Z	T	P	C	ECTS
KAR1101	**Kariyer Planlama**	**Z**	**1**	**0**	**1**	**2**

Language of Instruction: English

Objectives of the Course: The aim of this course is to gain knowledge and skills about getting to know the individual in line with the interests, abilities and values of individuals during the development process, career planning according to career development theories and what can be done in career counseling after formal education.

Course Content: Career concept, career planning, individual career development, CV preparation and CV types, job interview, career counseling.

Resource: Kuzgun, Y. (2003). Meslek Rehberliği ve Danışmanlığına Giriş. Ankara: Nobel

Additional Resources:

- Erdoğmuş, N. (2003). Kariyer Geliştirme. Ankara, Nobel
- Kulaksızoğlu, A. (2005). Ergenlilk Psikolojisi. İstanbul Remzi

Course Code	Course Name	C/Z	T	P	C	ECTS
AIT1101	**Atatürk's Principles and History of Revolutions I**	**Compulsory Course**	**2**	**0**	**2**	**2**

Language of Instruction: Turkish

Objectives of the Course: This course teaches the spirit and significance of Atatürk's Revolution which aimed at achieving contemporary civilization.

Course Content: Introduction, Fall of the Ottoman Empire, Tanzimat and Islahat Eras, Tripoli and Balkan Wars, World War I, The Armistice of Moudros, the Occupation of Anatolia and the National Reactions, The Birth of the Turkish Revolution, Turkish War of Independence, The Armistice of Mudanya, The Treaty of Lausanne

Resource: Atatürk İlkeleri ve İnkılâp Tarihi I/1, Türk İnkılâbı´nın Hazırlık Dönemi ve Türk İstiklâl Savaşı, Yüksek Öğretim Kurulu Yayınları, Ankara 1997.

Additional Resources:

- Atatürk İlkeleri ve İnkılâp Tarihi, Atatürkçülük, Yüksek Öğretim Kurulu Yayınları, Ankara 1997.
- H. EROĞLU "Türk İnkılâp Tarihi", Millî Eğitim Basımevi, İstanbul 1982.

Course Code	Course Name	C/Z	T	P	C	ECTS
TDI1101	**Turkish Language I**	**Compulsory**	**2**	**0**	**2**	**2**

Language of Instruction: Turkish

Objectives of the Course: The aim of this course is to inform students about the content, characteristics, and development of Turkish language and to provide them with writing and reading skills in Turkish and to raise the awareness of using Turkish as the national language.

Course Content: This course is designed to teach the definiton of language and culture, language-culture relation, the role of language as a social institution in societies, the situation of Turkish Language among world languages, the development and historical periods of Turkish language, the current condition of Turkish Language and span of usage, Turkish Phonology, inflectional and derivational morphemes in Turkish, types of lexicon in Turkish, and elements of the sentence.

Resource: Ankara, 2001 Üniversiteler için Türk Dili, M, Ergin, Bayrak Yayınları, Ankara, 2007.

Additional Resources:

- Üniversiteler için Uygulamalı Türk Dili ve Kompozisyon Bilgileri, Y. Karasoy, O. Yavuz, A. Kayasandık, B. Direkci, Selün Vakfı Yayınları, 2001.
- Yükseköğretim öğrencileri için Türk Dili ve Kompozisyon Bilgileri, Z. Korkmaz, Yargı Yayınları.

Course Code	Course Name	C/E	T	P	C	ECTS
YDI1101	**Foreign Language I**	**Compulsory Course**	**3**	**0**	**3**	**4**

Language of Instruction: English

Objectives of the Course: To enable students make meaningful sentences in English using grammatical rules and express themselves orally and in written form

Course Content: Reading passages and exercises, listening passages and drills, writing regarding a specific subject, holding discussion on a given topic.

Resource: Language To Go- Upper Intermediate Student's Book/Workbook, Antonia Clare, JJ Wilson, Simon Greenall (LONGMAN-PEARSON).

Additional Resources:

- Essential Grammar in Use.
- Oxford Dictionary.

II. SEMESTER

Course Code	Course Name	C/E	T	P	C	ECTS
FZI1201	**Physics II**	**Compulsory Course**	**3**	**2**	**4**	**5**

Language of Instruction: English

Objectives of the Course: The application of the electrical and magnetic interaction to static and mobile charges and the related fundamental laws and principles.

Course Content: Electric charge and electric fields, Gauss's law, Electric potential, Capacitance and dielectrics, Current, resistance and electromotive force, Direct-current circuits, Magnetic fields and magnetic forces, Source of the magnetic field, Electromagnetic induction and Faraday's law, Inductance, Alternating current, Electromagnetic waves

Resource: Fen ve Mühendislik için Fizik II (Elektrik ve Manyetizma), R.A.Serway; Çeviri Editörü: Kemal Çolakoğlu, (5. baskıdan çeviri), Palme Yay., 2002.

Additional Resources:

- Fizik II (Elektrik), F.J.Keller, W.E.Gettys, M.J.Skove, Çeviri Editörü: R.Ömür Akyüz, Literatür Yay., 2006.
- Temel Fizik II, (Fishbane, Gasiorowicz ve Thornton, 2. baskıdan çeviri; Çeviri Editörü: Cengiz Yalçın; Arkadaş Yay., 2003.
- Fizik İlkeleri 2, F.J. Bueche, D.A. Jerde, Çeviri Editörü: Kemal Çolakoğlu; (6. baskıdan çeviri), Palme Yay., 2000.

Course Code	Course Name	C/E	T	P	C	ECTS
MTI1221	**Mathematics II**	**Compulsory Course**	**5**	**0**	**5**	**5**

Language of Instruction: English

Objectives of the Course: To make students competent in mathematical field in their work life. To be able to use mathematical concept in practice, to use mathematics for developping solutions.

Course Content: Functions, trigomometry, linear equation systems and matrices, limit and continuity, derivation, integral, differential equations, statistics.

Resource: Temel ve Genel Matematik I& II, Balcı M., Balcı Yayınları 2000.

Additional Resources:

- Yüksek Matematik 1-2 H. Halilov, A. Hasanoğlu, M. Can.
- Genel Matematik I- II Prof. H. Arıkan, Yrd. Doç. Dr. İ. Özgür, Yrd. Doç. Dr. Ö.F. Gözükızıl.
- Calculus with analytic geometry, Silverman R.A.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI1221	**Discrete Mathematics**	**Compulsory Course**	**3**	**0**	**3**	**4**

Language of Instruction: English

Objectives of the Course: This course seeks to place on solid foundations the most common structures of computer science, to illustrate proof techniques, to provide the background for an introductory course in computational theory, and to introduce basic concepts of cryptology.

Course Content: Logic: Basic conjunctions, truth tables, logical equivalence and logical rules, inference rules, logical deductions of qualifiers and qualifiers, theorems and proofs, set theory, relations, order and equivalence relations, functions; Cardinality and the bijection, basic counting rules; Permutations and combinations, binomial coefficients, Pigeonhole principle, Cryptology and used approaches

Resource: Discrete Mathematical Structures with applications to Computer Science, J.P. Tremblay & R. Manohar, McGraw Hill.

Additional Resources:

- Discrete Mathematics and Its Applications, Kenneth H Rosen.
- Ayrık Matematik ve Uygulamaları, Rosen, Kenneth H., Çeviri Editörü: Prof. Dr. Ömer Akan, Palme Yayınevi

Course Code	Course Name	C/E	T	P	C	ECTS
BMI1222	**Object Oriented Programming**	**Compulsory Course**	**3**	**2**	**4**	**4**

Language of Instruction: English

Objectives of the Course: Teaching basic structures in order to express the solution of the problem related to the object oriented. Finding new flexible solutions by using the feature of multi-type and inheritence. Preparing a detailed report wihch includes all the processes in the solution of problem. Learning and practising the basic concepts of design.

Course Content: Introduction to object oriented programming, Java Programming Language Syntax Rules, Introduction to classes and objects, Methods in object oriented programming, Encapsulation, Inheritence, Polymorphism, Exception Handling, Generic & Collections, Multithreading. Applets, GUI programming & Events Handling, .

Resource: Introduction to Object Oriented Programming with Java, C. Thomas Wu.

Additional Resources:

- Java: Nesne Yönelimli Programlama, Ali Orhan Aydın.
- Java ile Nesne Programlama, Timur Karaçay.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI1223	**Analysis of Circuits**	**Compulsory Course**	**3**	**2**	**4**	**4**

Language of Instruction: English

Objectives of the Course: Aim of this course is to teach analysis methods for electrical circuits. Using these methods, student will learn how to calculate current, voltage, and power of circuit elements. This course prepares students for electronic course.

Course Content: Current, voltage, power, energy. Circuit elements: Voltage and current sources, resistance and Ohm's law. Kirchoff's laws. Simple resistive circuits: series, parallel combinations. Delta-to Wye transformation Techniques of Circuit Analysis: Node-voltage method, mesh-current method, source transformations, Thevenin and Norton equivalents, maximum power transfer, superposition. Operational Amplifier circuits. Inductance, capacitance, and mutual inductance. Response of first-order RL and RC Circuits. Natural and step responses of RLC Circuits

Resource: Applied Introductory Circuit Analysis for Electrical and Computer Engineering with Principles Digital Design, Reed, M.L., Rohrer, R. A.

Additional Resources:

- Elektrik Devre Analizi 1, Prof. Dr. Şerafettin Özbey, Seçkin Yayıncılık, 2011.
- Elektrik Devrelerinin Analizi, Prof. Dr. Cevdet Acar.

Course Code	Course Name	C/Z	T	P	C	ECTS
AIT1201	**Atatürk's Principles and History of Revolutions II**	**Compulsory Course**	**2**	**0**	**2**	**2**

Language of Instruction: Turkish

Objectives of the Course: This course provides the Turkish youth with consciousness about Ataturk's Principles and Revolutions and educates them in accordance with Kemalism.

Course Content: Political Reforms, Legal Reforms, Educational and Cultural Reforms, Economic Reforms, Social Reforms, Atatürk's Principles, Atatürk's Foreign Policy, Turkey in the World War II, The concept of Jeopolitics and Jeopolitics of Turkey.

Resource: Atatürk İlkeleri ve İnkılâp Tarihi I/2, Atatürk İnkılâpları, Yüksek Öğretim Kurulu Yayınları, Ankara 1997.

Additional Resources:

- Atatürk İlkeleri ve İnkılâp Tarihi I/1, Türk İnkılâbı´nın Hazırlık Dönemi ve Türk İstiklâl Savaşı, Yüksek Öğretim Kurulu Yayınları, Ankara 1997.
- Atatürk İlkeleri ve İnkılâp Tarihi, Atatürkçülük, Yüksek Öğretim Kurulu Yayınları, Ankara 1997.

Course Code	Course Name	C/Z	T	P	C	ECTS
TDI1201	**Turkish Language II**	**Compulsory Course**	**2**	**0**	**2**	**2**

Language of Instruction: Turkish

Objectives of the Course: This course aims at comprehending elements of sentences and their functions to form sentences; introducing and applying types of written and spoken expressions, differentiating and correcting the mistakes in language exercises; getting acquainted with the rules regarding the preperation of research articles; and developing students' writing and speaking skills via texts chosen from Turkish and World literature, and history of thought.

Course Content: This course is designed to teach the definition of sentence and elements of sentence; sentence analysis and examples of sentence analysis; types of sentences; composition skills; planning of written composition; types of written and oral expression and examples; means of expression and brainstorming in forming paragraphs; ambiguities in sentences; and the rules employed in the conduction of reseach articles.

Resource: Uygulamalı Türk Dili ve Kompozisyon Bilgileri, Yakup Karasoy, Dr. Orhan Yavuz, Ahmet Kayasandık, Bekir Direkci, Selçuk Üniversitesini Yaşatma ve Geliştirme Vakfı Yayınları.

Additional Resources:

- Yazım Kılavuzu; TDK Yayınları, Ankara, 2005.
- Türkçe Sözlük; TDK Yayınları, Ankara, 2005.

Course Code	Course Name	C/E	T	P	C	ECTS
YDI1201	**Foreign Language II**	**Compulsory Course**	**3**	**0**	**3**	**4**

Language of Instruction: English

Objectives of the Course: This course aims to provide the students understand sentences and frequently used expressions related to areas of most immediate relevance (e. g. very basic personal and family information, shopping, local geography, employment); communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters; describe in simple terms aspects of his background, immediate environment and matters in areas of immediate need in English.

Course Content: This course includes grammar, spelling and pronunciation practice, low level reading and writing skills, and vocabulary studies.

Resource: Language To Go- Upper Intermediate Student's Book/Workbook, Antonia Clare, JJ Wilson, Simon Greenall (LONGMAN-PEARSON).

Additional Resources:

- Essential Grammar in Use.
- Oxford Dictionary.

III. SEMESTER

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2120	**Differential Equations**	**Compulsory Course**	**3**	**0**	**3**	**5**

Language of Instruction: English

Objectives of the Course: The main aims of this course are provide the student general knowledge about the usage of natural languace of mathematics as a toll for modeling, formulating and solving of engineering problems.

Course Content: Classification of differential equations, obtaining of differential equations, first order differential equations, higher order linear differantial equations, Laplace transform.

Resource: Differential Equations, S.L.Ross, Wiley publishers, 1984.

Additional Resources:

- H. Hacısalihoğlu, Schaum Serisinden, Diferansiyel Denklemler, 2. Baskıdan Çeviri, Nobel Yayın Dağıtım, 1994.
- Diferansiyel denklemler, M.Başarır, E.S.Tüker, Değişim.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2121	**Probability and Statistics**	**Compulsory Course**	**3**	**0**	**3**	**5**

Language of Instruction: English

Objectives of the Course: This course aims to introduce the students to the theory of probability and statistics, and its applications in order to provide some fundamental knowledge for the analysis of data in engineering systems.

Course Content: In this course, data presentation and analysis, probability concepts, axioms of probability, random variables, mathematical expectations, discrete and continuous probability distributions, joint distributions, conditional probability, concepts of confidence interval and hypothesis testing, and applications related to probability and statistics are introduced.

Resource: Introduction to Probability Models, Sheldon M. Ross.

Additional Resources:

- Mühendisler ve Fen Bilimciler İçin Olasılık ve İstatistik , Ronald Walpole , Raymond Myers , Sharon Myers , Keying Ye, Palme Yayınevi,2016.
- Olasılık ve İstatistik, Fikri Akdeniz, Nobel Kitabevi-Adana.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2122	**Electronics**	**Compulsory Course**	**3**	**2**	**4**	**5**

Language of Instruction: English

Objectives of the Course: Discoverin the electronic circuit elements. Learning p-n junction diods and its applications. Understandin the bypolar (BJT) and field effect (FET) transistors and utilizing them in electronic circuit design. Undestandin the basics of OPAMPS.

Course Content: p and n type semiconductor materials. Construction and characteristic of various diods.Diode circuit appalications. Construction and characteristics of BJT tranzistors.DC an AC (small signal) BJT tranzistor circuits and design of BJT amplifiers. Construction an characteristics of Field Effect Transistors (FET). DC and AC analysis of JFET and MOSFET circuits. Design of JFET and MOSFET amplifiers. Introduction to OPAMPs.

Resource: Electronic Circuit Analysis and Design, D. A. Neamen.

Additional Resources:

- Elektronik 1,Doç. Dr. Hüseyin Demirel, Birsen Yayınevi
- Elektronik Devreler, S. Türköz.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2123	**Data Structures**	**Compulsory Course**	**4**	**0**	**4**	**5**

Language of Instruction: English

Objectives of the Course: With C + + programming language to teach programming. To teach data structures and use.

Course Content: Basic data structures, Stack, Queues, Trees, Lists. Sorting and search algorithms and applications. Recursion.

Resource: Fundamentals of Data Structures in C++, Horowitz E., Sahni S., Mehta D.

Additional Resources:

- Data Structures and Algorithm Analysis in C++. , Mark Allen Weiss.
- C/C++ İle Veri Yapıları Ve Çözümlü Uygulamalar, Prof. Dr. Nejat Yumuşak, Muhammed Fatih Adak, Seçkin Yayıncılık

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2124	**Advanced Programming**	**Compulsory Course**	**3**	**2**	**4**	**6**

Language of Instruction: English

Objectives of the Course: Object oriented programming concept, implementation of advanced programming techniques with object oriented programming languages and application development.

Course Content: Introduction to advanced programming. General information about object-oriented programming, Object-oriented program design. Procedural, functional and data abstraction, definition of DLL (dynamic link library), properties usage places, application development with DLL, DLL examples, description of Windows messaging, features, usage places, sample applications, components, features, sample component coding, threads, mutex , features, serialization, application development with Thread and Mutex structures, OLE-COM (Object linking and embedding-Component object model), Socket programming, TCP-UDP applications, features example encoding, Windows services, Linux deams, Database connections (native, ODBC, ADO, JDBC), Code optimization and testing

Resource: Advanced C Programming by Example / John W. Perry / PWS Publishing

Additional Resources:

- İleri C Programlama / Murat Taşbaşı / Altaş Yayınla
- İleri Programlama Uygulamaları / Fahri Vatansever / Seçkin Yayıncılık

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2132	**Patent and Industrial Design**	**Elective Course**	**3**	**0**	**3**	**4**

Language of Instruction: English

Objectives of the Course: Knowing the rights of the intellectual property, understanding the difference between the patent right and other rights, and getting information about the preparation of the patent application file.

Course Content: This course covers the invention and prospect, Intellectual property rights, Intellectual property rights history and approach of our country, patent, patentability criteria, preparation of patent file, patent examination process, utility model, industrial design, criteria and process, international patent, international patent treaties systems), elements affecting system choice are examined.

Resource: Türk Patent Enstitüsü-Endüstriyel Tasarım Başvuru Kılavuzu

Additional Resources:

- Öğretim Üyelerinin Ders Notları.

V. SEMESTER:

Course Code	Course Name	C/E	T	P	C	ECTS
BMI3120	**Summer Practice I**	**Compulsory Course**	**0**	**0**	**0**	**2**

Language of Instruction: English

Objectives of the Course: Depending on the computer engineering education, to help students discover their area of interests, to prepare students to business life and to provides them with a chance of applying their theoretical knowledge.

Course Content: To use and apply students´ knowledge and experiences gained during periods of learning; workplace training their staff in line with agency officials and the business is about working with clients or other agencies to gain the habit of good communication skills; increase familiarity following the technological developments in the sector; the workplace hierarchy will perform their duties responsibilities, relationships, organizational structure, observing and applying work discipline.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI3121	**Microprocessor Systems**	**Compulsory Course**	**3**	**2**	**4**	**5**

Language of Instruction: English

Objectives of the Course: Learning microprocessor and microcontroller architecture, Writing assembly language programs and performing I/O operations, designing microcontroller based applications and programming

Course Content: x86 microprocessor architecture, x86 assembly language and programming, Writing and compiling assembly program, Using debug, Addressing modes, Data transfer, arithmetic and logic instructions in assembly language, Program control instructions, Calling subroutines, Using stack, Interrupts, Keyboard and display processes. Microcontroller architecture, Microcontroller addressing mode, Instruction set, Machine language and programming, Interrupts and Timer/Counter applications, Using high level languages for microcontroller, Sample applications.

Resource: Mikroişlemciler, M. Kaya. Yazgan, Nobel Yayın Dağıtım,2015.

Additional Resources:

- The Intel Microprocessors,Maxwell Macmillan, B.B. Brey, New York, 1994.
- 8 bit mikrobilgisayar tasarımı ve programlanması, M. Kuntalp, Beta yayınları, İstanbul, 1993.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI3122	**Numerical Analysis**	**Compulsory Course**	**3**	**0**	**3**	**5**

Language of Instruction: English

Objectives of the Course: To have students gain the ability of

1. Computing errors in numerical methods,
2. Solving non-linear equation systems,
3. Solving linear equation systems,
4. Computing diveded differences tables,
5. Solving interpolation problems,
6. Solving derivation and integration problems with numerical analysis methods.

Course Content: The representation of number in computer system. Error concept, Taylor and Mclauren Series, Convergency methods to nonlinear equation system Lineer equation systems, Diveded difference, interpolation,Backward interpolation, Numerical derivative, Numerical integration, Euler, Taylor ve Runge-Kutta methods.

Resource: Sayısal Çözümleme - Prof.Dr.Sefa Apınar, Prof.Dr.Hasan Kürüm.

Additional Resources:

- Sayısal Çözümleme - Ziya Aktaş, O.D.T.Ü.
- Numerical Analysis, Fifth ed., Richard L. Burden, J. Douglas Faires, Plus Publishing company, Boston, 1993 F.B. Hildebrand.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI3122	**Numerical Analysis**	**Compulsory Course**	**3**	**0**	**3**	**5**

Language of Instruction: English

Objectives of the Course: The objective of this course is to introduce algorithms by looking at the realworld problems motivating them. Students will be taught a range of design and analysis techniques for problems that arise in computing applications. Greedy algorithms, divideandconquer type of algorithms, and dynamic programming will be discussed within the context of different example applications. Furthermore, the objective of the course is to introduce students to a number of highly efficient algorithms and data structures with a special emphasis on graphs.

Course Content: Introduction to algorithms. Analyzes concepts in algorithm design, problem solving strategies, complexity analysis. Dynamic programming (matrix-chain multiplication, longest common subsequence). Basic graph algorithms (BFS, DFS, Topological sort). Greedy algorithms, minimum spanning trees (kruskal algorithm, prim algorithm), shortest path (bellman-ford algorithm, dijkstra algorithm). Compression algorithm (Huffman algorithm).

Resource: Algoritmalara Giriş, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Çeviri Editörleri : Urfat Nuriyev, Efendi Nasiboğlu, Tahsin Öner

Additional Resources:

- Algoritmalar, Robert Sedgewick , Kevin Wayne, Nobel Akademik Yayıncılık,
- Discrete Mathematical Structures with applications to Computer Science, J.P. Tremblay & R. Manohar, McGraw Hill.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2225	**Internet Based Programming**	**Compulsory Course**	**3**	**0**	**3**	**5**

Language of Instruction: English

Objectives of the Course: The aim of the course is to teach design and programming fundamentals of internet based applications. More clearly, to train the students on web design and client-server based programming in basic level, by using some of technologies, languages and tools.

Course Content: Client and server side programming concept. http, Internet browsers, HTML tags, Styles in HTML, Lists, Tables, Frames, Colors, Image adding, Link adding, CSS applications, Divisions, Web design editors. Introduction to the ASP technology, Fundamentals of programming, Flowcharts, VBScript language: Loops, Conditional Statements, Variables, Arrays, Dynamic Arrays, Functions, Web form elements, Databases and Advantages, Basic SQL queries, Database connection and operations, Session and security operations, Overview the other web based Technologies.

Resource: Advanced Internet Programming: Technologies & Applications, Sergei Dunaev.

Additional Resources:

- A Web-Based Introduction to Programming: Essential Algorithms, Syntax, and Control Structures Using PHP, HTML, and MariaDB/MySQL, Mike O'Kane.
- Web Tabanlı Programlama, Doç. Dr. Turgay Tugay Bilgin, Papatya Bilim

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2232	**Engineering Management and Human Relations**	**Elective Course**	**3**	**0**	**3**	**4**

Language of Instruction: English

Objectives of the Course: The purpose of the course is to informate students about the project management, human resources management and marketing management, ethics, business ethics besides the points to be considered during presentations.

Course Content: Project management, human resources management, marketing management, successful management techniques, decisive and ordering techniques in management, public relations in management, ethics, business ethics, the concept of presentation and presentation techniques.

Resource: Yönetimde İnsan İlişkileri, İ.E. Başaran, Nobel Yayıncılık, Ankara, 2004

Additional Resources:

- Yönetim ve Organizasyon El Kitabı, S. Güney, Nobel Yayıncılık, Ankara, 2000

IV. SEMESTER:

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2221	**Logic Circuits**	**Compulsory Course**	**3**	**0**	**3**	**4**

Language of Instruction: English

Objectives of the Course: Understand the main concept logic circuits. Learn logic gates and their applicatinlon in realising logic functions. Learn simplification of complex logic functions for optimum logic circuit design. Learn how to design various sequential circuits and design simple memory circuits and be preapred for undestanding the basics of large scale integrated logic circuits and computers.

Course Content: Number systems and codes, complement arithmetic, Boole algebra, logic gates, combinational circuits, decoders, encoders, multiplexers, flip-flops, sequential circuit design,counters, registers, memory circuirs.

Resource: Digital Fundamentals, 8th edition, Thomas L. FLOYD.

Additional Resources:

- Mantık Devreleri, Hüseyin Ekiz, Değişim Yayınları, 2005.
- Sayısal Devrelerde Mantıksal Tasarım, Yarımağan Ü.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2222	**Programming Languages Concepts**	**Compulsory Course**	**3**	**2**	**4**	**6**

Language of Instruction: English

Objectives of the Course: Studying the common concepts of programming languages. Studying the different paradigms and approaches. What is the measure of quality in a programming language? Construct a basis for other topics like compiler design, software engineering, object oriented design, human computer interaction.

Course Content: History and evolution of languages, Language definition, Language conversion, Basic programming elements, Basic programming concepts, Data types and data structures, Structured programming concepts, Subprograms, Modulation in programming languages, Concurrency, logical, object-oriented and functional programming concepts.

Resource: Concepts of Programming Languages, Robert W. Sebesta.

Additional Resources:

- Deitel, C How To Program, 4th Ed., 2004
- C ve C++, Harvey M. Deitel , Paul J. Deitel.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2223	**Database Management Systems**	**Compulsory Course**	**3**	**2**	**4**	**6**

Language of Instruction: English

Objectives of the Course: To provide a solid understanding of RDBMS (Relational Database Management Systems). The students will be able to carry out analysis, design, and implementation in the development of a RDBMS.

Course Content: Database management systems and IT data modeling E-R diagrams conceptual, logical and physical database design constraint modeling database architectures and the relational database model SQL: selection, DML, DCL, DDL operations stored procedures/functions, and triggers fundamentals of application development.

Resource: Database System Concepts, Silberschatz, A. et al.

Additional Resources:

- Veritabanı Yönetim Sistemleri, Yaşar Daşdemir, Türkmen Kitabevi
- Veri Tabanı Sistemleri, Yarımağan, Ü.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2224	**Algorithms**	**Compulsory Course**	**4**	**0**	**4**	**5**

Language of Instruction: English

Objectives of the Course: The objective of this course is to introduce algorithms by looking at the realworld problems motivating them. Students will be taught a range of design and analysis techniques for problems that arise in computing applications. Greedy algorithms, divideandconquer type of algorithms, and dynamic programming will be discussed within the context of different example applications. Furthermore, the objective of the course is to introduce students to a number of highly efficient algorithms and data structures with a special emphasis on graphs.

Course Content: Introduction to algorithms. Analyzes concepts in algorithm design, problem solving strategies, complexity analysis. Dynamic programming (matrix-chain multiplication, longest common subsequence). Basic graph algorithms (BFS, DFS, Topological sort). Greedy algorithms, minimum spanning trees (kruskal algorithm, prim algorithm), shortest path (bellman-ford algorithm, dijkstra algorithm). Compression algorithm (Huffman algorithm).

Resource: Algoritmalara Giriş, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Çeviri Editörleri : Urfat Nuriyev, Efendi Nasiboğlu, Tahsin Öner

Additional Resources:

- Algoritmalar, Robert Sedgewick , Kevin Wayne, Nobel Akademik Yayıncılık,
- Discrete Mathematical Structures with applications to Computer Science, J.P. Tremblay & R. Manohar, McGraw Hill.

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2225	**Internet Based Programming**	**Compulsory Course**	**3**	**0**	**3**	**5**

Language of Instruction: English

Objectives of the Course: The aim of the course is to teach design and programming fundamentals of internet based applications. More clearly, to train the students on web design and client-server based programming in basic level, by using some of technologies, languages and tools.

Course Content: Client and server side programming concept. http, Internet browsers, HTML tags, Styles in HTML, Lists, Tables, Frames, Colors, Image adding, Link adding, CSS applications, Divisions, Web design editors. Introduction to the ASP technology, Fundamentals of programming, Flowcharts, VBScript language: Loops, Conditional Statements, Variables, Arrays, Dynamic Arrays, Functions, Web form elements, Databases and Advantages, Basic SQL queries, Database connection and operations, Session and security operations, Overview the other web based Technologies.

Resource: Advanced Internet Programming: Technologies & Applications, Sergei Dunaev.

Additional Resources:

- A Web-Based Introduction to Programming: Essential Algorithms, Syntax, and Control Structures Using PHP, HTML, and MariaDB/MySQL, Mike O'Kane.
- Web Tabanlı Programlama, Doç. Dr. Turgay Tugay Bilgin, Papatya Bilim

Course Code	Course Name	C/E	T	P	C	ECTS
BMI2232	**Engineering Management and Human Relations**	**Elective Course**	**3**	**0**	**3**	**4**

Language of Instruction: English

Objectives of the Course: The purpose of the course is to informate students about the project management, human resources management and marketing management, ethics, business ethics besides the points to be considered during presentations.

Course Content: Project management, human resources management, marketing management, successful management techniques, decisive and ordering techniques in management, public relations in management, ethics, business ethics, the concept of presentation and presentation techniques.

Resource: Yönetimde İnsan İlişkileri, İ.E. Başaran, Nobel Yayıncılık, Ankara, 2004

Additional Resources:

- Yönetim ve Organizasyon El Kitabı, S. Güney, Nobel Yayıncılık, Ankara, 2000