INTERNATIONAL BALKAN UNIVERSITY

EXCELLENCE FOR THE FUTURE!

INTERNATIONAL BALKAN UNIVERSITY

COURSES SUMMARY CATALOG

FACULTY OF ENGINEERING

Skopje, 2017

COMMON COURSES FOR ALL DEPARTMENTS

FIRST YEAR

FIRST SEMESTER

ENG 101 – English Language I; Weekly hours: 2+1, ECTS: 5

The goal of this course is to enrich vocabulary, practicing spoken language, learning the various linguistic, grammatical structures, overcoming the various models of academic writing skills in written forms. The curriculum includes the following themes: Introduction, Finding the Fossils Man-Spare that Spider (reading, discussion, writing), Matterhorn Man;-Seeing Hands (reading, discussion, writing), No Room in the Ark by Alan Moorehead; -From 'Out of the Air' (reading, discussion, writing), The Sporting Spirit;-Education by Lester Smith (reading, discussion, writing).

TUR 101 – Turkish Language I; Weekly hours: 2+1, ECTS: 5

The aim of this course is to introduce the students to elementary Turkish language skills. The course begins with the Turkish alphabet and studies basic Turkish by reading and writing of easy and simple sentences. The curriculum includes the following themes: Dialogs for introductions; "good morning, good evening" night, day and morning introductions, Daily life: "What are you doing?", Where to?, How are you?, What is up? What do you do?, Time; hours and telling the time; Expressions of locations, Family and Friends; possessive pronouns and adjectives; home and neighborhood, Cities: Locations, prepositions, agglutination, vowel harmony, Time Passes by: Simple past tense, from past to now; past perfect tense, Memories: Present Tense; linkings, with, 'ile, Bon Appetite: "What shall we eat?", "Ne Yiyelim?", Imperatives; "What do you order?", "Ne Alirsiniz?"Subjunctive Mood: Comparatives: Adjectives / Adverbs; Superlative Adj / Adv.;, Bureaucracy Everywhere: "Dear Officer / Sir/ Madam"; Present tense; "We are in a trouble!"; "BasimizDertte";, Request for Help: "ki" Diminutives; Dative, Locative suffix; ablative forms of "Nere"., Negative Verb: Interrogative/

MK 101 – Macedonian Language I; Weekly hours: 2+1, ECTS: 5

The goal of this course is to enrich vocabulary, practicing spoken language, learning the various linguistic, grammatical structures, overcoming the various models of academic writing skills in written forms in Macedonian Language. The curriculum includes the following themes:: Let's get know each other. Personal subject pronouns, verbs of A-groups and E-group. The Present Tense, the verb СУМ, numbers What is your profession. Verbs - Present Tense of the И - group, yes – no questions and answers, the gender of nouns, transitivity of verbs. What is this? I want to speak with Maria. The plural of nouns, demonstrative pronouns, modal verbs, Maria is very beautiful. Adjectives, the Future Tense.The possessive pronouns, telling the time in Macedonian, Quantifying Pronouns and Adverbs.

CE 101 – Computer Skills; Weekly hours: 2+1, ECTS: 5

Will focus is on delivering training in more basic core areas: Microsoft Word, Microsoft Excel and Power Point. The student will have the opportunity to acquire the basic skills needed to operate a computer. The curriculum includes the following themes: Microsoft Excel Basics: Getting Started with Excel, Cell Basics, Modifying Columns, Rows, and Cells. Formatting Cells, Saving, Creating Simple Formulas, Worksheet Basics, Printing, Creating Complex Formulas, Working with Basic Functions. Sorting Data, Formatting Tables, Using templates, Working with charts, Applications. Common Tasks in Microsoft Word: Working with Hyperlinks, Working with Shapes. Inserting ClipArt and Pictures. Doing More With Word: Reviewing Documents, Working With Tables, Working With Formulas, SmartArt Graphics, Using a Template, How can you develop your PowerPoint action plan, Common Tasks in PowerPoint, Animating Text and Objects, Inserting Videos, Inserting Audio, Inserting Hyperlinks, Working With Tables, Working With Charts, Reviewing Presentations, Advanced Presentation Options.

PR 101 – Communication Skills; Weekly hours: 2+1, ECTS: 5

The goal of this course is to provide undergraduate students with a conceptual framework and specific tools for communicating in complex environments and accomplishing strategic academic and professional goals. The curriculum includes the following themes: An overview of, and introduction to, different communication skills which are necessary for creating positive relational dynamics, as well as for the management of impression and efficiency in various personal and professional contexts. The course is primarily concerned with the development of three sets of generic skills critical to the students' success in higher education and a successful career afterwards. The three sets of skills covered in this course are to do with 'yourself', 'others' and 'the interactions between yourself and others'. Students are also introduced to the principles of academic writing and to a range of learning skills.

PHYS 101 – Physics I; Weekly hours: 2+1, ECTS: 5

In this course we aim to give an introduction to classical physics. The students will be able to learn about the kinematics of systems, Newton's Laws to describe the dynamics of systems, work and energy, conservation of energy, mechanics of fluids, and the wave motion. The curriculum includes the following themes: Physics and measurement, motion in one dimension, motion in two and three dimension, the Newton laws of motion, Circular motion, Work and kinetic energy, Potential energy and Conservation of energy, Linear momentum and collisions, Rotation of rigid objects, Angular momentum, Static equilibrium, Oscillatory motion, The law of gravity, Fluid Mechanics, Wave motion, and Sound waves.

MATH 101 - Mathematics I; Weekly hours: 2+1, ECTS: 5

The objectives of the course are to give students knowledge related to functions, differentiation, integration and their applications in engineering. The curriculum includes the following themes: Basic Concepts, Limit and Continuity, Derivative Rules, Chain Rule, Implicit Differentiation, L'Hospital's Rule, Applications of Derivative, Maxima and Minima Problems, Indefinite integral, Computing Indefinite Integral Rules: Substitution rule and Integration by parts, The Method of Partial Fractions, Trigonometric Transformations, Definite integral, Integral Application: Area and Volume, Length of Curves.

COMPUTER ENGINEERING

SECOND YEAR

THIRD SEMESTER

MATH 204 – Discreet mathematics; Weekly hours: 2+1, ECTS: 6

The main purpose of the course is to help the students grow in mathematical maturity, and in particular towards an understanding of the basic concepts of discrete mathematics. We will present the underlying foundations of discrete mathematics to develop the ability of the students to think in a more mathematical way, to show how these mathematical concepts can be applied and to encourage the students to apply these skills and knowledge. Final message taken home would be that mathematics exists to make our life easier and one could benefit greatly from its application in the area such as informatics where in particular the discrete mathematics is needed. The curriculum includes the following themes: Introduction to sets: Relations between sets, operations on sets; Propositional logic; Meta-language; Predicate logic; Relations; Operations on relations; Homogeneous relations; Functions; Vectors and matrices; Mathematical models; Graph theory; Combinatorial analysis; Permutations.

MATH 201 – Linear algebra; Weekly hours: 2+1, ECTS: 5

To become familiar with methods of linear algebra and to acquire ability to solve problems related to applications of linear algebra. The curriculum includes the following themes: Analytic geometry (review), line and second order curves; Vectors, operations with vectors, vector spaces and subspaces, Analytic geometry in three dimensions; Matrices and matrix operations, types of matrices, inverse matrices and methods for their computing; Systems of linear equations, Gaussian eliminations, elementary and permutation matrices, LU decomposition; Linear independence, dimension and basis of vector spaces; Determinants and their properties; Singular matrices, rank, cofactors and general formula for inverse matrix, Cramer's rule, geometric interpretation of determinant; Eigenvalues and eigenvectors, computation of maximum eigenvalue, complex matrices and diagonalization, powers of matrices, functions of matrices, Cayley-Hamilton theorem, least squares estimate; Introduction to MATLAB, matrix operations; Introduction to Mathematica, Symbolic operations using computer.

EE 202 – Circuit theory I; Weekly hours: 2+1, ECTS: 5

The course presents the fundamentals of circuit theory, including basic electrotechnics. The aim of the course is to introduce students the general knowledge about the circuit analysis. The curriculum includes the following themes: Beginning with traditional subjects such as defining voltage, current, power, sources, Ohm's and Kirchhoff's laws, it proceeds to develop general procedures (nodal and mesh analyses) used in analyzing electric circuits. Thévenin's and Norton's theorems.Circuits with DC sources. The lectures contain outlines of the theory. The exercises are based on worked examples, as solved problems. A number of laboratory exercises are also included in the course. In addition, WEB educypedia animations and Java applets are used to visualize the electric circuit occurrences. Homework as good practice for encouraging students to learn continuously and to check their understanding is assigned. Introduction.SI Units (a review), basic units, derived units, standard SI units.Electric quantities.Basic electrical measuring instruments.Standard symbols of circuit components. DC Circuit Analysis: Ohm's law. Passive devices – resistors.Voltage and current relations.Independent and dependent sources. Networks and circuits: general definitions. Branch and node, loop and mesh. Kirchhoff's laws: Kirchhoff's current law – KCL, Kirchhoff's voltage law – KVL. Solving procedures of simple circuits. DC circuits: resistors in series, in parallel, series/parallel combinations. Voltage/current division: potentiometer and shunt. Analysis strategy of mixed circuits.Delta–Wye (Δ/Y) and Wye–Delta (Y/Δ) transformations. Network analysis techniques: branch current method – BCM, mesh current method – MCM, node voltage method – NVM. DC circuits theorems: source transformations of independent voltage/current sources. Superposition.Thévenin's theorem.Norton's theorem. Maximum power transfer theorem.

CE 201 – Advanced programming; Weekly hours: 2+1, ECTS: 5

The aim of this course is to teach advanced programming topics as pointers, memory management, recursion, algorithmic analysis and data abstraction using the C++ programming language. Topics focus on software engineering principles of data abstraction and modularity, pointers, references, object oriented paradigm, fundamental data structures (such as stacks, queues, sets), recursion and recursive data structures (linked lists, trees, graphs). The user defined data types; Enumerators; Structures; Arrays; Vectors; Pointers; References; Dynamic memory allocation; Classes; Methods; Libraries; recursion; linked lists; stacks; queues, sets; binary search trees; graphs; hashing; iterators; and function pointers.

ARCH 204 – Technical Drawing for Engineers; Weekly hours: 0+2, ECTS: 4

Students get skill in presenting of objects with technical drawings, by using of software AUTOCAD.
The curriculum includes the following themes: Introduction in technical drawing, Standardization and standards, Technical drawing – lines and frames, Technical drawing – the basic commands in AUTOCAD, Process schemes (basic), Process schemes (electrical installations), Process schemes (circuits), Projections, Technical drawing – projections (simple objects), Technical drawing – projections (complex objects), Technical drawing – projections (object cuts), Technical drawing – projections (specification of parts), Technical drawing – complex 2D and 3D objects, Preparing of complete technical drawing (final work)

IE 206 – Problem Solving Strategies; Weekly hours: 2+1, ECTS: 5

The purpose of this course is to teach students, how to make identification of the real problem, effectively explore the limitations and to select and implement the optimal solution, and to define procedures for evaluation of the chosen solution. The course will be taught techniques for creative solving of problems.Introduction to Engineering Profession: Strategies for the creative problem solving; defining the problem; generating solutions; decision-making; implementation of the decision; Evaluation; Information Sources; References.

THIRD YEAR

FIFTH SEMESTER

CE 301 – Object oriented programming; Weekly hours: 2+2, ECTS: 6

This course deals with the concept of OOP design and implementation. The content of the course is designed to provide students the fundamentals of designing object diagrams, writing Java codes, using any Integrated Development Environment tool to write, compile, execute, and debug their Java programs. Introduction to Object Oriented Programming - Thinking in Objects; Java Basics: Operators and expressions, Selections, Loops; Objects and Classes , Constructors; Communicating with Objects (Methods); Inheritance, Polymorphism; Abstract classes and interfaces; Exceptions and I/O streams; Object Oriented design; GUI Programming; Event Driven Programming; Creating User Interfaces

CE 302 – Data structures; Weekly hours: 2+1, ECTS: 6

The purpose of this course is to introduce the students to the potential and the power of data structure concept, an issue central to the art of computer programming. The course is structured around a set of computer assignments providing hands-on experience. Our programming language of choice will be C++, although certain Java additions and concepts are also used. In particular, the emphasis of this course is on the organization of information, the implementation of common data structures such as arrays, lists, stacks, queues, trees, sets, heaps and graphs, and techniques of data abstraction, including encapsulation and inheritance. We will also explore recursion and the close relationship between data structures and algorithms Introduction to data structures and algorithms; Basics of object-oriented programming; Arrays, link lists, sorted and unsorted lists; Interfaces, algorithm analysis; Stacks and queues; Linked structures; Circular lists; Doubly linked lists; Recursion; Trees; Binary search trees; Priority queues and heaps; Graphs and sets; Maps, Sets and hash tables; Sorting and searching algorithms.

IE 303 – Introduction to optimization methods; Weekly hours: 2+1, ECTS: 5

The students will be introduced with the techniques and the applications of the methods of optimization. They will learn about the methods commonly applied in engineering practice. During the course, students will learn to define optimization problem, describe the appropriate relationships and solve the problem using the methods of linear programming and the simplex method. Students will also be introduced with the modern, non-traditional optimization techniques, such as genetic algorithms, a colony of ants, swarming insects, neural networks, etc. Initially, through the general classification of the optimization methods, students will learn about the types of optimization methods. They will learn about one dimensional search methods. The multivariable optimization is given with multivariable optimization with no constraints, multivariable optimization with equality constraints and multivariable optimization with inequality constraints. Each method is illustrated with practical problems in different fields of engineering. Convex programming and linear programming are fully covered with the simplex methods, their algorithms and their practical applications. From the stochastic optimization methods, most attention is paid to the genetic algorithms and their application in engineering.

IE 304 - Systems Modeling; Weekly hours: 0+2, ECTS: 4

The aim of the course is to provide knowledge on the development of simulation system models and ability to develop a simulation model for a given problem. This course provides the main concepts of modelling, which are state and state space, models of computation, concurrency, communication, modelling of data and time. The goal is to relate these concepts to applications and show the impact of the fundamental concepts on the potential and limitations of application techniques and tools, such as synthesis, performance analysis, and formal verification. After completing this course, students will be able to: Model a process and design of computer simulation model. Use the random number generator in a simulation model. Use random variable generator in a simulation model.Learn how to analyze simulation output using statistics. Verify and validate a simulation model. Learn how to compare system configurations for statistical analysis purposes. The curriculum includes the following themes: Introduction to Systems Modelling; Event driven models; System characterization and simulation diagrams; Dynamic systems; Stochastic generators; Non-uniform random variables; Characterization of random processes; Discrete systems; Modelling time-driven systems; Markov processes; Probabilistic systems and Discrete time Markov processes.

CE 303 – Information System Design; Weekly hours: 2+1, ECTS: 4

The objectives of the course are: To introduce the concepts and methods of System Analysis and Design (SAD); To describe the systems development life cycle (SDLC); To teach effective methods for gathering essential information during system analysis; To teach effective methods for designing systems; To provide the students with new ways of looking at information . The curriculum includes the following themes: Introduction to Information Systems; System Development Life Cycle; The user Interface; Overview of Analysis Tools; Process-Based Tools; Web User Interface Tools; Design Specification Tools; CASE and Automated Techniques; Object Oriented Technique; Website Design and Architecture; Implementation; Documentation and Acceptance Testing; Security; Operation and Maintenance; Concept of ISO 9000; Project Planning and Project Management.

BA 306 – Law and Ethics; Weekly hours: 2+1, ECTS: 5

This course aims to give understanding to students attitude about position of morals in professional life; to support them in developing a mental capability for decisions in society.To give understanding for viewpoints about rights and responsibilities of the worker of law and administration.To educate students to be able to deal with ethically problematic situations.To develop approach how position, character professional choice are closely connected with their life. To make for students sense about character desired in the profession of public administrator. To inform them with literature of ethics who is in connection with the field of law or their next profession. The curriculum includes the following themes: Introduction to Law and Ethics. General definition of moral and law.Ethics and society, Dignity and older Europeans.Ethics and society, Assisted reproduction and the welfare of the child. Industrial property rights.Intellectual property rights.Copyrights and related rights.Drug testing and use of healthy volunteers. How are drugs developed? Should parents be allowed to choose the sex of their children? Business and professional ethics. What are the limits of vehicle manufacturer responsibility? Business and professional ethics. A crisis of professional Self-regulation: The example of the solicitors' profession. Relationship between lawyers and clients.The Assisted Dying Bill, and European Law. Ethical Issues in the Toy Industry.A responsible role for the media in the toy industry.Ethics law and politics.Political responsibility personal responsibility, Collective responsibility.Ethics law and politics, Personal ethics and political responsibility in government.Collective responsibility in government.

FOURTH YEAR

SEVENTH SEMESTER

CE 401 – Data communications and networks; Weekly hours: 2+2, ECTS: 6

The course develops basic techniques used in communication networks. Protocol layering is introduced. Peer-to-peer protocols and medium access control protocols are discussed. Circuit switching networks and packet switching networks are studied. Evolution of network architectures and services; Introduction to the internet and computer networks; Applications and layered architectures; The OSI reference model and TCP/IP architecture; Peer-to-peer protocols and data link layer; Automatic repeat request protocols; Medium access control; ALOHA and carrier sense multiple access; Scheduling; Circuit switching networks; Packet switching networks; Routing.

CE 409 – Formal languages and automata; Weekly hours: 2+0, ECTS: 4

The course introduces some fundamental concepts in automata theory and formal languages including grammar, finite automaton, regular expression, formal language, pushdown automaton, and Turing machine. Not only do they form basic models of computation, they are also the foundation of many branches of computer science, e.g. compilers, software engineering, concurrent systems, etc. The properties of these models will be studied and various rigorous techniques for analyzing and comparing them will be discussed, by using both formalism and examples. Introduction to Automata; Central concepts of automata theory; Finite automata; Deterministic finite automata; Regular expressions and languages; Context-free grammar and languages; Parse trees; Pushdown automata; Languages of pushdown automata; Deterministic pushdown automata; Introduction to Turing machines; Programming techniques for Turing machines.

CE 408 – Artificial neural networks; Weekly hours: 2+0, ECTS: 4

The course introduces underlying principles of artificial neural networks. Topics covered include simple perceptrons and adalines, linear and multi-layer networks. It describes the backpropagation algorithm, Hebbian learning and the belief propagation algorithm. Recurrent networks and non-supervised networks are studied. Introduction and motivation; Basic concepts; Simple perceptrons and adalines; Linear networks; Linear networks and performance; Multilayer networks; Backpropagation; Recurrent networks; Non-supervised networks; Hebbian learning; Graphs; Belief propagation.

CE 406 – Multimedia web design; Weekly hours: 2+1, ECTS: 5

This course is designed to provide teachers/professionals with the knowledge and skills necessary to create Web pages using Hypertext Markup language (HTML) or Macromedia's Dreamweaver authoring software. The course is specifically designed to develop combined visual layout tools with text-based HTML editing features for the creation, management and maintenance of Web sites. On the large scale, the purpose of the course is to teach teachers to use telecommunications technology for instructional purposes. Topics covered include basic Internet concepts, creating Web pages, working with graphics, creating links, elements of page design, adding user interactivity, managing your site, using libraries, using templates, creating frames,

creating layers, using style sheets, using find and replace, creating forms, animating with timelines and extending Dreamveaver to illustrate and enhance Web page design. In addition, the course will include instruction in the use of Internet services and the fundamentals of Web page design and Web site development. WWW – Design Foundation and Evolution; Variables in the web design environment; Web site design principles; Web site design process; Planning the site/Information Architecture; Accessibility; Colors and Fonts on the web; Site Navigation; Deployment; Usability and Functional Testing.

CE 414 – Visual programming; Weekly hours: 2+1, ECTS: 5

The course aim is to introduce the students with the concepts of window programming, learn how to handle Microsoft Foundation Classes, learn how to do basics of GUI programming, and learn how to develop simple applications using Visual C++. Windows programming (windows environment, windows and messages, displaying window, message loop, message processing, text output, painting, basic drawing, menus); visual C++ programming, Dialog box application, The document and view architecture, ActiveX and Object linking and embossing, and some advanced concepts (Database Management, SQL, Database applications).

INDUSTRIAL ENGINEERING

SECOND YEAR

THIRD SEMESTER

IE 201 – Work study; Weekly hours: 2+1, ECTS: 6

To learn the principles of good motion design.To learn the four methods of setting standards. To gain an understanding of how motion and time study is used in management of an industrial operation. Introduction to motion and time study; History and evaluation of work study. Essentials of motion study; Flow-charts. Time study-Using Chronometer; Performance methods with examples.Using tolerance tales; Work sampling; MTM methods; Process charts; Group Timing Technique; Machining Time Computing; Case study.

MATH 201 – Linear Algebra; Weekly hours: 2+1, ECTS: 5

To become familiar with methods of linear algebra and to acquire ability to solve problems related to applications of linear algebra. Analytic geometry (review), line and second order curves; Vectors, operations with vectors, vector spaces and subspaces, Analytic geometry in three dimensions; Matrices and matrix operations, types of matrices, inverse matrices and methods for their computing; Systems of linear equations, Gaussian eliminations, elementary and permutation matrices, LU decomposition; Linear independence, dimension and basis of vector spaces; Determinants and their properties; Singular matrices, rank, cofactors and general formula for inverse matrix, Cramer's rule, geometric interpretation of determinant; Eigenvalues and eigenvectors, computation of maximum eigenvalue, complex matrices and diagonalization, powers of matrices, functions of matrices, Cayley-Hamilton theorem, least squares estimate; Introduction to MATLAB, matrix operations; Introduction to Mathematica, Symbolic operations using computer.

IE 202 – Engineering Economy; Weekly hours: 2+1, ECTS: 5

This course deals with the application of economic analysis models for decisions between alternatives. The content of the course is designed to provide students with the fundamental concept of engineering economy. Foundations of Engineering Economic; Factors: How Time and Interest Affect Money; Combining Factors; Nominal and Effective Interest; Present Worth Analysis; Annual Worth Analysis; Rate of Return Analysis (ROR): Single Alternative; Rate of Return Analysis (ROR): Multiple Alternatives; Benefit Cost Analysis and Public Sector Economics; Making Choices: the Method, MARR, and Multiple Attributes; Replacement and Retention Decisions; Breakeven Analysis; Cost Estimation and Indirect Cost Allocation; Depreciation Methods.

IE 204 – Introduction to material science; Weekly hours: 2+1, ECTS: 5

The main aim of the course is to give some general knowledge about: 1. Structure of materials (macro-, micro-, crystalline, amorphous, atomic, interatomic and intermolecular bonds, imperfection in solids, phase diagrams and phase transformations); 2. Main classes of materials: a). the generic metals and alloys (metal structure and the range of metal structures that can be altered to get different properties, crystal and glass structure, grain and phase boundaries, equilibrium shapes of grains and phases); b) the generic of ceramics and glasses (glasses, vitreous ceramics, high technology ceramics, cements and concretes, natural ceramics, ceramic composites, structure and properties of ceramics); c) the generic polymers (thermoplastics, thermosets, elastomers, natural polymers, production, structure, properties and processing of polymers); 3. Composite materials; 4.Material properties in physical fields (electrical, thermal, magnetic, optical); 5.Corrosion.
Why to study materials science? Electron configurations in elements and their properties relationship; Fundamental atomic arrangements and bonding forces; Bonding forces and families of materials; Trends in periodic table; Structure of materials (macro-, micro-, crystalline, amorphous); Imperfection in solids; Main classes of materials; Polymer processing; Polymer structures mechanical properties relationship; Biodegradable polymers; Polymer recycling; Composite materials; Nano-composites; Corrosion; Electronic properties; Thermal properties; Magnetic properties; Optical properties; Wood.

ARCH 204 – Technical Drawing for Engineers; Weekly hours: 0+2, ECTS: 4

Students get skill in presenting of objects with technical drawings, by using of software AUTOCAD.
Introduction in technical drawing, Standardization and standards, Technical drawing – lines and frames, Technical drawing – the basic commands in AUTOCAD, Process schemes (basic), Process schemes (electrical installations), Process schemes (circuits), Projections, Technical drawing – projections (simple objects), Technical drawing – projections (complex objects), Technical drawing – projections (object cuts), Technical drawing – projections (specification of parts), Technical drawing – complex 2D and 3D objects, Preparing of complete technical drawing (final work)

IE 206 – Problem Solving Strategies; Weekly hours: 2+1, ECTS: 5

The purpose of this course is to teach students, how to make identification of the real problem, effectively explore the limitations and to select and implement the optimal solution, and to define procedures for evaluation of the chosen solution. The course will be taught techniques for creative solving of problems.Introduction to Engineering Profession: Strategies for the creative problem solving; defining the problem; generating solutions; decision-making; implementation of the decision; Evaluation; Information Sources; References.

THIRD YEAR

FIFTH SEMESTER

IE 301 – Production planning and control I ; Weekly hours: 2+1, ECTS: 6

Describe the importance of operations strategy and how the operations function can be used as a competitive weapon in the global marketplace. Compare and contrast the operations function in manufacturing versus service firms. Understand the aggregate planning process and describe quantitative techniques used to solve aggregate planning problems. Discuss the role of demand forecasting and demonstrate the use of forecasting models in operations management. Distinguish situations appropriate for dependent and independent inventory management. Understand and interpret results of break-even analysis, exponential smoothing, and EOQ models used in operations management. Identify and discuss key issues in product/service and process design.

IE 302 – Simulation; Weekly hours: 2+2, ECTS: 6

Simulation is the practice of designing a model of an actual or theoretical system, executing that model to observe its behavior and then analyzing the results. This course focuses on computer-based simulation, where the model is implemented as part of a computer program, which can then be executed to compute and record the data which describes the simulated system's behavior. Computer simulations may be constructed as stand-alone programs or they may be developed using a variety of simulation environments and toolkits. In case, the theory and process for developing and analyzing the system model is the same. We will focus on the common theory and processes, and survey available implementation environments. When using simulations to study real-world systems, ensuring that the simulation is an accurate representation of the systems is essential. We will look at a number of techniques for comparing the behavior of a simulation with the behavior of the real system, in order to quantify the simulation's accuracy.
Introduction to simulation; Generating random variables; Generating random variables; Monte Carlo Simulation; Tools store simulation, Design Simulation, Production line simulation; Simple Maintenance Simulation, Facility Maintenance Simulation; Maintenance and Repair Simulation; Network Diagram Simulation; Decision Tree Simulation; Particle Simulation, Insurance Simulation; Fire Simulation, Bombing Simulation; Queuing System Simulation; Queuing System Simulation; Queuing System Simulation.

IE 303 – Introduction to Optimization Methods; Weekly hours: 2+1, ECTS: 5

The students will be introduced with the techniques and the applications of the methods of optimization. They will learn about the methods commonly applied in engineering practice. During the course, students will learn to define optimization problem, describe the appropriate relationships and solve the problem using the methods of linear programming and the simplex method. Students will also be introduced with the modern, non-traditional optimization techniques, such as genetic algorithms, a colony of ants, swarming insects, neural networks, etc.
Initially, through the general classification of the optimization methods, students will learn about the types of optimization methods. They will learn about one dimensional search methods. The multivariable optimization is given with multivariable optimization with no constraints, multivariable optimization with equality constraints and multivariable optimization with inequality constraints. Each method is illustrated with practical problems in different fields of engineering. Convex programming and linear programming are fully covered with the simplex methods, their algorithms and their practical applications. From the stochastic optimization methods, most attention is paid to the genetic algorithms and their application in engineering.

IE 304 – System modelling; Weekly hours: 0+2, ECTS: 4

The aim of the course is to provide knowledge on the development of simulation system models and ability to develop a simulation model for a given problem. This course provides the main concepts of modelling, which are state and state space, models of computation, concurrency, communication, modelling of data and time. The goal is to relate these concepts to

applications and show the impact of the fundamental concepts on the potential and limitations of application techniques and tools, such as synthesis, performance analysis, and formal verification. After completing this course, students will be able to: Model a process and design of computer simulation model. Use the random number generator in a simulation model. Use random variable generator in a simulation model.Learn how to analyze simulation output using statistics. Verify and validate a simulation model. Learn how to compare system configurations for statistical analysis purposes. The curriculum includes the following themes: Introduction to Systems Modelling; Event driven models; System characterization and simulation diagrams; Dynamic systems; Stochastic generators; Non-uniform random variables; Characterization of random processes; Discrete systems; Modelling time-driven systems; Markov processes; Probabilistic systems and Discrete time Markov processes.

IE 305 – Maintenance analysis; Weekly hours: 2+0, ECTS: 4

This course covers defects that can occur in process equipment in the industry .Students are introduced to these defects, as well as planning and how to remove the same.
Impact and prevention of equipment maintenance , Design, planning and scheduling of maintenance, Roles and responsibilities of engineers in maintaining, Balancing of rotors and bearings, Portable couples, gears and reducers, Compressors , Control valves, Portable devices , Blowers, fans and fluidizators, Dust separator, Pumps, condensate pots, Performance measurement and management.

BA 306 – Law and ethics; Weekly hours: 2+1, ECTS: 5

Give understanding to students attitude about position of morals in professional life; to support them in developing a mental capability for decisions in society.To give understanding for viewpoints about rights and responsibilities of the worker of law and administration.To educate students to be able to deal with ethically problematic situations.To develop approach how position, character professional choice are closely connected with their life. To make for students sense about character desired in the profession of public administrator. To inform them with literature of ethics who is in connection with the field of law or their next profession.

FOURTH YEAR

SEVENTH SEMESTER

IE 401 – Decision Analysis; Weekly hours: 2+1, ECTS: 6

We live in a fast changing society where analysis is of paramount importance. Our hope is to help students solve pressing problems in our organizations and society. Good decisions based on a systematic consideration of all relevant factors and stakeholder opinions and values lead to good outcomes, both for those involved in the decision making process, and for the customers who are directly impacted by the consequences and effects of such decisions. At the conclusion of the course participants should be able to: Structure decisions; Measure preferences; Quantify uncertainty; Analyze conflict; Generate new options; Build mathematical models of decisions. Students are expected to use subjective opinions of experts to construct analytical models that could help managers make important organizational decisions.Introduction to Decision Analysis; Decision making under uncertainty; Minimax, Maximin, Minimax Regret Criterion, Expected-Value Criterion; Decision tree analysis; Utility Theory; Influence Diagrams; Analytical Hierarchy Process (AHP); TOPSIS Method; ELECTRE Method; Weighted Produce Model (WPM), Weighted Sum Model (WSM); Data Envelopment Analysis (DEA); Group Decision Method with real world application; Goal Programming; Case Studies.

IE 403 – Thermodynamics; Weekly hours: 2+1, ECTS: 4

The objective of this course is to enable the students to develop a good understanding of: Properties of pure substances; Ideal and real gases; Energy, heat, work; Conservation of energy; Application on closed systems and control volumes; Heat engine. Second law of thermodynamics; Carnot principles; Clausius inequality; Entropy; Principle of the increase of entropy; Exergy, second law analysis; Gas power cycles; Vapor power cycles; Refrigeration cycles, heat pump. After completion of this course students will be able to: Apply basic principles and terminology of energy conversions, Design basic thermal engineering systems, Analyze, apply and communicate in this field, Apply thermodynamic laws in concerned area, Define the system in any problem.Basic concepts and definitions; Ideal gas and equation of state; Real gasses; Compressibility factor; Generalized chart for Compressibility factor; Other equations of state; Introduction to the first law of Thermodynamics; 1st law of Thermodynamics (For closed and open systems); Second law of Thermodynamics; Heat engines; Refrigeration systems and heat pumps; Reversible and irreversible processes; Carnot cycles; The thermodynamic temperature scale; Entropy; Third law of Thermodynamics; Entropy change of pure substance; Temperature-Entropy (T-s) diagram; Entropy change of ideal gasses; Reversible steady flow work; Adiabatic efficiency of some engines; Exergy and second law solution; Second law solution of closed and open systems; Power cycles with gas flow; Otto and Diesel and Brayton cycles; Ideal reheat Rankine cycle, Ideal regenerative Rankine cycle;Cogeneration; Refrigeration cycles; Refrigerators and heat pumps; Reversed Carnot cycle; Vapor compression refrigeration cycle; Heat pump systems; Gas refrigeration cycle; Ideal gas mixtures; Air-vapor mixture.

EE 406 – Microprocessors System Design; Weekly hours: 2+1, ECTS: 4

Students are introduced to the basics of microprocessors systems design. Hardware and software considerations in the design of microprocessors systems. Basic concepts and operations of on chip components related to the functionality of microprocessors systems.
Introduction to microprocessors systems.Architectures, instructions, assembler, C compiler.Switches and timers.A/D conversion.MAC (multiply and accumulate) operations.Memory bus interface. Interface with peripheral serial and parallel ports. 8-bit, 16-bit, and 32-bit machines.

CE 414 – Visual programming; Weekly hours: 2+1, ECTS: 5

The course aim is to introduce the students with the concepts of window programming, learn how to handle Microsoft Foundation Classes, learn how to do basics of GUI programming, and learn how to develop simple applications using Visual C++.
Windows programming (windows environment, windows and messages, displaying window, message loop, message processing, text output, painting, basic drawing, menus); visual C++ programming, Dialog box application, The document and view architecture, ActiveX and Object linking and embossing, and some advanced concepts (Database Management, SQL, Database applications).

IE 402 – Manufacturing processing; Weekly hours: 2+1, ECTS: 5

This course aims to give students the information in materials processing of casting, forming, machining, welding, powder metallurgy and non-traditional manufacturing fields; To introduce the principles of basic materials processes; tools and machines used; application fields of different processes in manufacturing; To develop an understanding of the basic calculations in processes in manufacturing. After completion of this course students will be able to:Know the principles and application fields of material processing;Know the advantages and limitations of manufacturing technologies with respect to each other depending on the application fields;Recognize the tools and machines used in manufacturing and familiarize with the selection of proper tools and machines in applications;Know the selection of the best manufacturing method at designing stage of a machine componentUnderstand basic calculations of traditional manufacturing methods and be familiar with using these calculation methods in practice.
Introduction and overview of manufacturing; Solidification processes; Glass working; Shaping processes for plastic; Particulate processing of metals; Bulk deformation processes in metalworking; Sheet metal working; Material removal processes; Property enhancing and surface processing operations; Joining and assembly processes; Brazing, soldering, and adhesive bonding, Mechanical assembly.

ELECTRICAL AND ELECTRONIC ENGINEERING

SECOND YEAR

THIRD SEMESTER

EE 201 - Electrical and Electronic Measurements; Weekly hours: 2+2, ECTS: 6

The aim of the course is to introduce students to the basics of electrical and electronic measurements, Voltage, current, resistance and power measuring instruments, Signal generation and analysis. The curriculum includes the following themes: Introduction to the basics of electrical and electronic measurements,Measurements and measurement systems, Errors in measurements. Instruments: ammeters, voltmeters, ohmmeters, wattmeters, multimeters, Measurement of resistance, inductance, capacitance, Transformers, Signal generation and analysis, Oscilloscopes.

MATH 201- Linear Algebra; Weekly hours: 2+1, ECTS: 5

The aim of the course is to become familiar with methods of linear algebra and to acquire ability to solve problems related to applications of linear algebra. The curriculum includes the following themes: Analytic geometry (review), line and second order curves; Vectors, operations with vectors, vector spaces and subspaces, Analytic geometry in three dimensions; Matrices and matrix operations, types of matrices, inverse matrices and methods for their computing; Systems of linear equations, Gaussian eliminations, elementary and permutation matrices, LU decomposition; Linear independence, dimension and basis of vector spaces; Determinants and their properties; Singular matrices, rank, cofactors and general formula for inverse matrix, Cramer's rule, geometric interpretation of determinant; Eigenvalues and eigenvectors, computation of maximum eigenvalue, complex matrices and diagonalization, powers of matrices, functions of matrices, Cayley-Hamilton theorem, least squares estimate; Introduction to MATLAB, matrix operations; Introduction to Mathematica, Symbolic operations using computer.

EE 202 - Circuit Theory I; Weekly hours: 2+1, ECTS: 5

The course presents the fundamentals of circuit theory, including basic electrotechnics. The aim of the course is to introduce students the general knowledge about the circuit analysis. Beginning with traditional subjects such as defining voltage, current,

power, sources, Ohm's and Kirchhoff's laws, it proceeds to develop general procedures (nodal and mesh analyses) used in analyzing electric circuits. Thévenin's and Norton's theorems.Circuits with DC sources. The lectures contain outlines of the theory. The exercises are based on worked examples, as solved problems. A number of laboratory exercises are also included in the course. In addition, WEB educypedia animations and Java applets are used to visualize the electric circuit occurrences. Homework as good practice for encouraging students to learn continuously and to check their understanding is assigned. Course Contents: Introduction, SI Units (a review), basic units, derived units, standard SI units, Electric quantities, Basic electrical measuring instruments, Standard symbols of circuit components, DC Circuit Analysis: Ohm's law, Passive devices – resistors, Voltage and current relations, Independent and dependent sources. Networks and circuits: general definitions, Branch and node, loop and mesh, Kirchhoff's laws: Kirchhoff's current law – KCL, Kirchhoff's voltage law – KVL, Solving procedures of simple circuits. DC circuits: resistors in series, in parallel, series/parallel combinations. Voltage/current division: potentiometer and shunt, Analysis strategy of mixed circuits. Delta–Wye (Δ/Y) and Wye–Delta (Y/Δ) transformations. Network analysis techniques: branch current method – BCM, mesh current method – MCM, node voltage method – NVM. DC circuits theorems: source transformations of independent voltage/current sources, Superposition,Thévenin's theorem, Norton's theorem. Maximum power transfer theorem.

CE 201 - Advanced Programming; Weekly hours: 2+1, ECTS: 5

The aim of this course is to teach advanced programming topics as pointers, memory management, recursion, algorithmic analysis and data abstraction using the C++ programming language. Topics focus on software engineering principles of data abstraction and modularity, pointers, references, object oriented paradigm, fundamental data structures (such as stacks, queues, sets), recursion and recursive data structures (linked lists, trees, graphs). Course Contents:The user defined data types; Enumerators; Structures; Arrays; Vectors; Pointers; References; Dynamic memory allocation; Classes; Methods; Libraries; recursion; linked lists; stacks; queues, sets; binary search trees; graphs; hashing; iterators; and function pointers.

ARCH 204 – Technical drawing for Engineers; Weekly hours: 2+1, ECTS: 5

Students get skill in presenting of objects with technical drawings, by using of software AUTOCAD. Course Contents: Introduction in technical drawing, Standardization and standards, Technical drawing – lines and frames, Technical drawing – the basic commands in AUTOCAD, Process schemes (basic), Process schemes (electrical instalations), Process schemes (circuits), Projections, Technical drawing – projections (simple objects), Technical drawing – projections (complex objects), Technical drawing – projections (object cuts), Technical drawing – projections (specification of parts), Technical drawing – complex 2D and 3D objects, Preparing of complete technical drawing (final work).

IE 206 – Problem solving strategies; Weekly hours: 2+1, ECTS: 5

The purpose of this course is to teach students, how to make identification of the real problem, effectively explore the limitations and to select and implement the optimal solution, and to define procedures for evaluation of the chosen solution. The course will be taught techniques for creative solving of problems. Course Contents: Introduction to Engineering Profession: Strategies for the creative problem solving; defining the problem; generating solutions; decision-making; implementation of the decision; Evaluation; Information Sources; References.

THIRD YEAR

FIFTH SEMESTER

EE 301 - Electromagnetic Theory; Weekly hours: 2+2, ECTS: 6

In this course we aim to give an introduction to fundamentals of the electrostatics and magnetostatics and offer a thorough investigation of the electromagnetic theory. The topics in this course include: Electric charges and their properties, Coulomb's law, electric field, motion of charged particles in uniform electric field, electric flux, Gauss's Law, electric potential, capacitance and dielectric, current and resistance, direct current circuits, Magnetic fields, sources of the magnetic field, Faraday's Law, inductance, alternating-current circuits, electromagnetic waves.

EE 302 - Digital Circuits; Weekly hours: 2+2, ECTS: 6

This course introduces students to the basic concepts of digital circuits and systems, including both analysis and design synthesis. The course provides the students with foundations of digital circuits design and teaches them the tools needed to analyze, design, and develop modern digital control circuits and systems. More specifically, they will become familiar with the terminology of digital electronics. The theory and practical applications of combinational and sequential logic will be covered. Students will get acquainted with various levels of various digital systems, starting with the simple logic circuits up to basic hardware description, used in computer architecture. The lectures start with fundamentals of binary arithmetic and systems, learning also other number systems, codes and their mutual conversions. In particular, the student will learn to apply theory to the solution of logic design problems and will become proficient in the use of Boolean algebra to analyze and synthesize digital circuits. Also, the student will be able to design circuits of logic gates with specified relationships between input and output signals, using them in a combination with circuits of logic gates. Exercises are performed in a classroom on solving problems. During the semester, the practical work is performed continuously in a computer laboratory using simulation software, WEB educypedia animations and Java applets for visualization. Contents: Digital circuits and systems introduction, Number Systems,

Codes and mutual conversions, Binary systems and binary arithmetic principles and mathematical operations, Basic Logic Gates: NOT and Buffer Gate, Multi-level Logic Gates: AND&NAND and OR&NOR. Practical work: Development of simulation models for basic and multi-level logic gates, and for given input signals observation of the output signals, Introduction to Boolean algebra; Boolean algebraic identities and properties, Basic operations and simplifications, Digital Logic Functions; Truth tables; Boolean equation; graphical presentation, Introduction to combinational logic functions and techniques; Analysis of combinational logic circuits, Simplification of logic circuits; Canonical forms. Practical work: Development of simulation models for combinational logic functions, and for given input signals observation of the output signals. DeMorgan's Theorems; Practical implementation in digital circuits design, Mapping; Karnaugh K-maps and their application, Minimization of gates number, Synthesis of logic circuits; Simplification and optimization of logic circuits, Introduction to Sequential Circuits; Latches and Flip-Flops; Synchronous Digital Systems, Registers, Counters, Multiplexers, Demultiplexers, Decoders, Comparators etc, Principles of digital computing; Digital Integrated Circuits; Digital storage memory; Memory Units; Other devices and techniques.

IE 303 - Introduction to Optimization Methods; Weekly hours: 2+1, ECTS: 5

The students will be introduced with the techniques and the applications of the methods of optimization. They will learn about the methods commonly applied in engineering practice. During the course, students will learn to define optimization problem, describe the appropriate relationships and solve the problem using the methods of linear programming and the simplex method. Students will also be introduced with the modern, non-traditional optimization techniques, such as genetic algorithms, a colony of ants, swarming insects, neural networks, etc. Contents: Initially, through the general classification of the optimization methods, students will learn about the types of optimization methods. They will learn about one dimensional search methods. The multivariable optimization is given with multivariable optimization with no constraints, multivariable optimization with equality constraints and multivariable optimization with inequality constraints. Each method is illustrated with practical problems in different fields of engineering. Convex programming and linear programming are fully covered with the simplex methods, their algorithms and their practical applications. From the stochastic optimization methods, most attention is paid to the genetic algorithms and their application in engineering.

IE 304 System Modeling; Weekly hours: 0+2, ECTS: 4

The aim of the course is to provide knowledge on the development of simulation system models and ability to develop a simulation model for a given problem. This course provides the main concepts of modeling, which are state and state space, models of computation, concurrency, communication, modeling of data and time. The goal is to relate these concepts to applications and show the impact of the fundamental concepts on the potential and limitations of application techniques and tools, such as synthesis, performance analysis, and formal verification. After completing this course, students will be able to: Model a process and design of computer simulation model, Use the random number generator in a simulation model. Use random variable generator in a simulation model, Learn how to analyze simulation output using statistics, Verify and validate a simulation model. Learn how to compare system configurations for statistical analysis purposes. Contents: Introduction to Systems Modeling.; Event driven models; System characterization and simulation diagrams; Dynamic systems; Stochastic generators; Non-uniform random variables; Characterization of random processes; Discrete systems; Modeling time-driven systems; Markov processes; Probabilistic systems and Discrete time Markov processes.

CE 303 - Information System Design; Weekly hours: 2+1, ECTS: 4

The objectives of the course are: To introduce the concepts and methods of System Analysis and Design (SAD), To describe the systems development life cycle (SDLC), To teach effective methods for gathering essential information during system analysis, To teach effective methods for designing systems, To provide the students with new ways of looking at information. Contents: Introduction to Information Systems; System Development Life Cycle; The user Interface; Overview of Analysis Tools; Process-Based Tools; Web User Interface Tools; Design Specification Tools; CASE and Automated Techniques; Object Oriented Technique; Website Design and Architecture; Implementation; Documentation and Acceptance Testing; Security; Operation and Maintenance; Concept of ISO 9000; Project Planning and Project Management.

BA 306 - Law and Ethics; Weekly hours: 2+1, ECTS: 5

Course Objectives are to give understanding to students attitude about position of morals in professional life; to support them in developing a mental capability for decisions in society, To give understanding for viewpoints about rights and responsibilities of the worker of law and administration, To educate students to be able to deal with ethically problematic situations, To develop approach how position, character professional choice are closely connected with their life. To make for students sense about character desired in the profession of public administrator, Toinform them with literature of ethics who is in connection with the field of law or their next profession. Course Contents: 1. Introduction to Law and Ethics. General definition of moral and law. 2. Ethics and society, Dignity and older Europeans.3. Ethics and society, Assisted reproduction and the welfare of the child. 4. Industrial property rights. 5. Intellectual property rights. 6. Copyrights and related rights.7. Drug testing and use of healthy volunteers. How are drugs developed? 8. Should parents be allowed to choose the sex of their children? 9. Business and professional ethics. What are the limits of vehicle manufacturer responsibility? 10. Business and professional ethics. A crisis of professional Self-regulation: The example of the solicitors' profession. Relationship between lawyers and clients.11. The Assisted Dying Bill, and European Law. 12. Ethical Issues in the Toy Industry. A responsible role for the media in the toy industry 13.Ethics law and politics.Political responsibility personal responsibility, Collective responsibility, 14.Ethics law and politics, Personal ethics and political responsibility in government, Collective responsibility in government.

FOURTH YEAR

SEVENTH SEMESTER

EE 401- Utilization of Electrical Energy; Weekly hours: 2+2, ECTS: 6

Students are introduced to the basics of electric motors. Types of electric motors and their applications.Basic operating characteristics and classification of electrical drives.Solid state DC motor control.Solid state AC motor control.Dynamic behavior of electrical machines.Electric braking.Starting of electrical machines. Intermittent loads. Drive applications. Modern methods of reactive power compensation.

CE 409 - Formal Languages and Automata; Weekly hours: 2+0, ECTS: 4

The course introduces some fundamental concepts in automata theory and formal languages including grammar, finite automaton, regular expression, formal language, pushdown automaton, and Turing machine. Not only do they form basic models of computation, they are also the foundation of many branches of computer science, e.g. compilers, software engineering, concurrent systems, etc. The properties of these models will be studied and various rigorous techniques for analyzing and comparing them will be discussed, by using both formalism and examples. Course Contents: Introduction to Automata; Central concepts of automata theory; Finite automata; Deterministic finite automata; Regular expressions and languages; Context-free grammar and languages; Parse trees; Pushdown automata; Languages of pushdown automata; Deterministic pushdown automata; Introduction to Turing machines; Programming techniques for Turing machines.

CE 408 - Artificial Neural Networks; Weekly hours: 2+0, ECTS: 4

The course introduces underlying principles of artificial neural networks. Topics covered include simple perceptrons and adalines, linear and multi-layer networks. It describes the backpropagation algorithm, Hebbian learning and the belief propagation algorithm. Recurrent networks and non-supervised networks are studied. Course Contents: Introduction and Motivation; Basic Concepts; Simple perceptrons and adalines; Linear Networks; Linear Networks and Performance; Multilayer Networks; Backpropagation; Recurrent Networks; Non-supervised Networks; Hebbian Learning; Graphs; Bilief Propagation.

CE 414 - Visual Programming; Weekly hours: 2+1, ECTS: 5

The course aim is to introduce the students with the concepts of window programming, learn how to handle Microsoft Foundation Classes, learn how to do basics of GUI programming, and learn how to develop simple applications using Visual C++. Course Contents: Windows programming (windows environment, windows and messages, displaying window, message loop, message processing, text output, painting, basic drawing, menus); visual C++ programming, Dialog box application, The document and view architecture, ActiveX and Object linking and embossing, and some advanced concepts (Database Management, SQL, Database applications).

CE 406 - Multimedia Web Design; Weekly hours: 2+1, ECTS: 5

This course is designed to provide teachers/professionals with the knowledge and skills necessary to create Web pages using Hypertext Markup language (HTML) or Macromedia's Dreamweaver authoring software. The course is specifically designed to develop combined visual layout tools with text-based HTML editing features for the creation, management and maintenance of Web sites. On the large scale, the purpose of the course is to teach teachers to use telecommunications technology for instructional purposes. Topics covered include basic Internet concepts, creating Web pages, working with graphics, creating links, elements of page design, adding user interactivity, managing your site, using libraries, using templates, creating frames, creating layers, using style sheets, using find and replace, creating forms, animating with timelines and extending Dreamveaver to illustrate and enhance Web page design. In addition, the course will include instruction in the use of Internet services and the fundamentals of Web page design and Web site development. Course Contents: WWW – Design Foundation and Evolution; Variables in the web design environment; Web site design principles; Web site design process; Planning the site/Information Architecture; Accessibility; Colors and Fonts on the web; Site Navigation; Deployment; Usability and Functional Testing.

ARCHITECTURE

FIRST YEAR

FIRST SEMESTER

ARCH 101 - Basic Design;Weekly hours: 2+2, ECTS: 5

The aim of the course Basic Design is to introduce students to the basic principles of design, and the basis of visual culture. The curriculum includes the following themes: basic design concepts of form, pattern, color, composition, texture, and shade, as well as the principles of two and three dimensional design without emphasizing function as a determinant. Problem solving skills in design are developed. The emphasis is given to problems in three dimensional designs. Function is introduced.

SECOND YEAR

THIRD SEMESTER

ARCH 201 - Architectural Design II;Weekly hours: 2+2, ECTS: 6

Students will acquire basic knowledge of the design ideas and how to implement them. Students will learn how to fill the space through the selection and preparation of architectural elements in spatial compositions, their interaction and placement in different areas. Dealing with architectural space by using the draft, and it's understanding. Designing simple but complete architectural design projects; involves analytical thinking in design; response to site constraints; site design; architectural programming; materials; technology; explorations of functional, aesthetic, and structural aspects of buildings; developing a complete a set of graphics for architectural design projects.

ARCH 202 - Design Studio II; Weekly Hours 0+4, ECTS: 5

Completion of the project for more-storey building, using a more complex layout, taking into account the layout and dimensioning, construction technology and design of useful space. The subject of this course is a continuation of Design Studio I. Students will need to complete the project for more-storey building, using more complex layout. Layout and design, technology, construction and design of useful space. The project will be completed with a public presentation and exhibition.

ARCH 203 - History of Architecture and Art II; Weekly Hours 3+0,ECTS: 5

Basic knowledge of the architecture and art of the Middle Ages, Renaissance, Baroque, to the modern era. Understanding of the correlation between different technologies and materials and forms that are found in this period. History and theory of architecture as part of cultural history since Middle Ages, Renaissance, Baroque, to the modern era. Analysis of facilities in terms of structure, form and content, concentrating on the early architecture of the early Christian architecture, Islamic architecture.Development of art and architecture in the Balkans from antiquity to the top of the Ottoman Empire.Architectural Performances from urban conglomerates, simple homes and palaces, the forts, bridges and aqueducts. Romanian architecture, Roman Pantheon, Gothic and Gothic style, with a particular aspect of the Gothic Cathedral, Renaissance and Renaissance palaces, Baroque architectural styles, to modern skyscrapers.

CIV 202 – Statics; Weekly Hours 2+1, ECTS: 5

The objective of the course is the students to understand the concept of the resultant force and momentum, and can solve problems associated with solids in the balance, and the ability to classify the structural systems and idealization of structural systems. Introduction to statics, Preliminary Principles, Forces, Resultant systems of forces, Equilibrium of solid, Structural analysis, Internal forces, Moments of inertia, Center of gravity and centroids, simple beam, Frame system of a simple beam, frame of three joints and a frame with a tightening. Arc with three joints. Supporting line of a Arc with three joints. Arc with a tightening. Intermediate loads; eccentric loads; arbitrary continuous load. Grates.Line bodies.Consequent polygon from rigid rods.Method of distributing momentum.Friction.

ARCH 204 - Technical Drawing for Engineers; Weekly hours 0+2,ECTS: 4

Students get skill in presenting of objects with technical drawings, by using of software AUTOCAD. Introduction in technical drawing; Standardization and standards; Technical drawing – lines and frames; Technical drawing – the basic commands in AUTOCAD; Process schemes (basic); Process schemes (electrical installations); Process schemes (circuits); Projections; Technical drawing – projections (simple objects); Technical drawing – projections (complex objects); Technical drawing – projections (object cuts); Technical drawing – projections (specification of parts); Technical drawing – complex 2D and 3D objects; Preparing of complete technical drawing (final work).

GD 206 – History of modern art; Weekly hours: 2+1, ECTS: 5

The main objective in this context is that the students gain a certain amount of information and knowledge, and ways to explore and classify them. After that the goals can generally be conceptualized in training in order to students recognize the main characteristics of key art movements in the 20th century, the main protagonists and their artwork. Students in the final stages of the program should recognize the specifics of certain artistic directions in the field of painting, sculpture, architecture and other disciplines which are in a common correlation. In that way they also get necessary knowledge of technologies in the creation of artwork, and understand sociological and philosophical aspects directly related to modern and postmodern art. On the other hand, students are trained in developing of their aesthetic skills. The content of the curriculum is conceived chronologically. Chronology primarily relates to modern and postmodern art movements and schools, with consideration of opus work and most representatives artists of this artistic epoch. Items provided by the curriculum are as follows : Individual and transition to subjective - Impressionism and neoimpressionism,Decomposition of the compact composition - postimpressionism , fauvism , Expressionism , Cubism and futurismWorld without form - abstract painting,Russian avant-garde - constructivist art , surrealism, Dadaism Art after 1945 : Informal Art , op art , pop art , new realism, new figuration, conceptualism, HyperrealismPostmodernism - concept and elements: pluralize of 70s, retrospective and appropriation of contested visions, artist and I, artist and We.

THIRD YEAR

FIFTH SEMESTER

ARCH 301 - Architectural Design IV; Weekly hours 2+2,ECTS: 6

Acquiring knowledge about composition of buildings difference between carrier layers and partitions, as well as relations between old and new architecture.Composition of the buildings. Structural experience transformed into architecture. Difference between load bearing partitions and layers. Relations between the buildings and the city; Relation between the new and the old; Relations between buildings and the environment, a model for harmonizing the old and the new.

ARCH 302 - Design Studio IV; Weekly hours 0+4, ECTS: 5

The purpose of the subject of upgrading the knowledge of students in the field of design.Areas of design that are the subject of upgrading Design Studio III. Project task is designed depending on the focus of the studio. The selected mentor guides the student, while working closely with the lecturers of technical subjects. The completed project is presented and exhibited.

CIV 301 - Theory of Structures I; Weekly hours 2+2, ECTS: 6

Awareness of mathematical modeling of the problem. To get theoretical knowledge for the methods of determination of the internal forces (stresses) in the undefined linear structural systems and the surface beams. What is a structure? Loads.Types of structural elements and systems.Model for calculation of the structure. Influence lines, determination and their application. Deformations of the statically determined systems.Principle of virtual work, operation of the external forces, operation of the internal forces.Betti's theorem for mutuality of operations.Maxwell's theorem for the mutuality of the deformations.Analytical determining of deformations.Statically undetermined structures, Characteristic of the statically undetermined structures. Force Method, Degree of static undetermination. Determining of the reactions and the static sizes of the statically undetermined structures. Deformation methods, Defining of the fundamental cinematically determined system. Composition of the conditional equations.Determining of the definitive values of the moments of bending. Theory of surface supports. Basic equations in the theory of elasticity.Types of surface supports.High beams.Slabs.

ARCH 313 - Landscape Architecture; Weekly hours 2+1, ECTS: 4

Students will learn the fundamentals in landscape architecture, the history of landscape architecture and design, as well as the elements and methods of landscape design. Introduction to the fundamentals of landscape architecture.Design of elements of landscape architecture external space and green areas design in respect to the buildings.History of landscape architecture and design.The influence on the environment and microclimates. Elements and methods of landscape design, esthetics and functionality.

CIV 309 - Reinforced Concrete; Weekly hours 2+0, ECTS: 4

The course objective is the students to get knowledge in the field of theory of reinforced concrete and the dimensioning of the reinforced concrete sections and elements. Introduction.Materials for production of reinforced concrete.Concrete, steel, types of reinforcement, reinforcement rules.Methods of calculation of the reinforced steel structures. Aim and flow of the calculation, phases of tensioning, theory of limit states. Reinforced concrete structure systems. Loads and reinforced concrete structure systems, inter-story and roofing AB structural systems, reinforced concrete stairs, beam AB supports, reinforced concrete columns and walls, foundations, reinforced concrete framework supports. Dimensioning of sections in for the limit influences of the normal forces and moments of bending. Centric pressed short elements, centric strained, sections exposed to moments of bending, sections exposed to complex bending, sections exposed to sideways bending, calculation of reinforced concrete slender elements. Calculation of the reinforced concrete sections for the limit state influences of transversal forces and moments of torsion. Sections exposed to transversal forces, sections exposed to moments of torsion. Calculation of reinforced concrete elements according to the limit states of usability. Limit states of cracks, limit states of deformations.

BA 306 – Law and ethics; Weekly hours: 2+1, ECTS: 5

To give understanding to students attitude about position of morals in professional life; to support them in developing a mental capability for decisions in society. To give understanding for viewpoints about rights and responsibilities of the worker of law and administration.To educate students to be able to deal with ethically problematic situations. To develop approach how position, character professional choice are closely connected with their life. To make for students sense about character desired in the profession of public administrator. To inform them with literature of ethics who is in connection with the field of law or their next profession. 1. Introduction to Law and Ethics. General definition of moral and law. 2. Ethics and society, Dignity and older Europeans.3. Ethics and society, Assisted reproduction and the welfare of the child. 4. Industrial property rights. 5. Intellectual property rights. 6. Copyrights and related rights.7. Drug testing and use of healthy volunteers. How are drugs developed? 8. Should parents be allowed to choose the sex of their children? 9. Business and professional ethics. What are the limits of vehicle manufacturer responsibility? 10. Business and professional ethics. A crisis of professional Self-regulation: The example of the solicitors‟ profession. Relationship between lawyers and clients.11. The Assisted Dying Bill, and European Law. 12. Ethical Issues in the Toy Industry. A responsible role for the media in the toy industry13.Ethics law and politics.Political responsibility personal responsibility, Collective responsibility 14.Ethics law and politics, Personal ethics and political responsibility in government.Collective responsibility in government.

FOURTH YEAR

SEVENTH SEMESTER

ARCH 401 - Architectural Design VI; Weekly hours 2+2, ECTS: 6

Professional approach and systematic analysis solving tasks in the design. Use of software components in developing strategies for complex solutions: Shopping centers, leisure centers, as well as the architecture of transport centers (bus, railway stations, etc.). Genesis.Classification of buildings; aspects that influence on project program. Programming and planning factors: zoning, legislation, planning the location, space organization. Shaping and the factors that influence the shaping (basic spatial systems, the configuration, structure, typological and morphological patterns specific factors, structural, technical and technological concepts, energy and requirements of the environment, spatial norms and standards) . Detailed review specific concepts in design case studies of different programming and contextual situations, like shopping malls and leisure centers, as well as the architecture of transport centers (bus, railway stations, etc.).

ARCH 402 - Design Studio VI (Project I); Weekly hours 0+4, ECTS: 6

The objective of this course is to upgrade the knowledge of students in the field of design, depending on the interest of the studio. Areas of design that are the subject of upgrading Design Studio V. Project task is designed depending on the focus of the studio. The selected mentor guides the student, while working closely with the lecturers of technical subjects. Making a design project student will establish the basis of the final project.

ARCH 403 - Contemporary Issues in Architectural Theory; Weekly hours 2+1, ECTS: 4

The students will be acknowledged to the spectra of ideas and topics, fundamental for postmodern theoretic discourse, facilitating: development of logic skills and responsible attitude in the thinking and communication ways about architecture; to promote open, free, eloquent attitudes between different architectural and urban ideologies in the current theory and practice; to define the status, nature and the system purpose of architectural theory vs. practice in the real context of contemporary architectural production. This course is a critical overview and introduction to contemporary architectural theories in Europe and aims to establish an understanding of the main theories and positions as they have developed over the course of the past five decades. The course examines contemporary architectural theory and criticism through the presentation and study of significant texts and buildings of the present and recent past. The course is structured in three sections. The preliminary observations establish a platform from which we can begin to understand the field of architectural theory and also the historical context just prior to the period we will be focusing on. The chronological overview aims to sketch out both a theoretical and a cultural over view of the decades from 60s of the 20th century until today. The thematic overview delves deeper into a series of recurring themes that have shaped European architectural theories in the past five decades.

ARCH 407 - Interior Design; Weekly hours 2+1,ECTS: 5

Acknowledged to the main nature of the interior architectural space. Housing needs; Construction; Design: Design principles, furniture, accessory, housing decisions; Housekeeping, care, security and safety. Career.

ARCH 408 - Architectural Conservation and Restoration; Weekly hours 2+1, ECTS: 4

The aim of the course is an introduction: to the role of architectural conservators; to the types and methodologies of architectural conservation involving experts from different areas connected to the architectural conservation. Introduction to architectural conservation and definitions; Architectural styles and building technology; Sustaining and conservation philosophy, Determination of age period of old houses / objects; Planning and restoration of houses / objects; Exterior restoration, Interior restoration, Case study / assessment of intermediate conservation project.

ARCH 414 - Industrial Design; Weekly hours 2+1, ECTS: 5

Introduction of fundamentals in industrial design, including the elements and principles of designer language, qualification of their application creating the space compositions; introduction to the inspiration techniques by the historical review of industrial design; introduction to stylish characteristics. Introduction to industrial design; Industrial design: problems and methodology; General and specific principles; Industrial design elements: line, color, form, volume, direction, size; Design principles: contrast, harmony, rhythm, gradation, equilibrium, unity, composition. Designing factors: cultural and economical, and designing criteria: esthetic, morphological, functional, construction – relation between industrial design and architecture and art; Object design; Historical review of industrial design.

CIVIL ENGINEERING

SECOND YEAR

THIRD SEMESTER

CIV 201 – Geology; Weekly hours 2+2, ECTS: 6

The purpose of the course is for students to get acquainted with the geological conditions of the field as well to become acquainted with modern methods and procedures in the research and examination of the pitch. The curriculum includes the following themes: Introduction, General in geology, minerals and rocks. Physical-structural properties of rocks.Geotechnical classifications of rock masses. The rocks like a building material. Methods of engineering-geological research and field trials.Fundamentals of Engineering Geodynamics. Phase research and testing during design, performance and exploitation. Engineering-geological conditions for the performance of Dams, underground structures, roads, bridges, canals and oil pipelines.Methodology of engineering-geological modeling of the terrain.Ships for excavation, drilling and blasting for different types of objects.

CIV 202 – Statics; Weekly Hours 2+1, ECTS: 5

The objective of the course is the students to understand the concept of the resultant force and momentum, and can solve problems associated with solids in the balance, and the ability to classify the structural systems and idealization of structural systems. Introduction to statics, Preliminary Principles, Forces, Resultant systems of forces, Equilibrium of solid, Structural analysis, Internal forces, Moments of inertia, Center of gravity and centroids, simple beam, Frame system of a simple beam, frame of three joints and a frame with a tightening. Arc with three joints. Supporting line of a Arc with three joints. Arc with a tightening. Intermediate loads; eccentric loads; arbitrary continuous load. Grates.Line bodies.Consequent polygon from rigid rods.Method of distributing momentum.Friction.

IE 204 – Introduction to material science; Weekly hours: 2+1, ECTS: 5

The main aim of the course is to give some general knowledge about: 1. Structure of materials (macro-, micro-, crystalline, amorphous, atomic, interatomic and intermolecular bonds, imperfection in solids, phase diagrams and phase transformations); 2. Main classes of materials: a). the generic metals and alloys (metal structure and the range of metal structures that can be altered to get different properties, crystal and glass structure, grain and phase boundaries, equilibrium shapes of grains and phases); b) the generic of ceramics and glasses (glasses, vitreous ceramics, high technology ceramics, cements and concretes, natural ceramics, ceramic composites, structure and properties of ceramics); c) the generic polymers (thermoplastics, thermosets, elastomers, natural polymers, production, structure, properties and processing of polymers); 3. Composite materials; 4.Material properties in physical fields (electrical, thermal, magnetic, optical); 5.Corrosion.
Why to study materials science? Electron configurations in elements and their properties relationship; Fundamental atomic arrangements and bonding forces; Bonding forces and families of materials; Trends in periodic table; Structure of materials (macro-, micro-, crystalline, amorphous); Imperfection in solids; Main classes of materials; Polymer processing; Polymer structures mechanical properties relationship; Biodegradable polymers; Polymer recycling; Composite materials; Nano-composites; Corrosion; Electronic properties; Thermal properties; Magnetic properties; Optical properties; Wood.

ARCH 204 - Technical Drawing for Engineers; Weekly hours 0+2,ECTS: 4

Students get skill in presenting of objects with technical drawings, by using of software AUTOCAD. Introduction in technical drawing; Standardization and standards; Technical drawing – lines and frames; Technical drawing – the basic commands in AUTOCAD; Process schemes (basic); Process schemes (electrical installations); Process schemes (circuits); Projections; Technical drawing – projections (simple objects); Technical drawing – projections (complex objects); Technical drawing – projections (object cuts); Technical drawing – projections (specification of parts); Technical drawing – complex 2D and 3D objects; Preparing of complete technical drawing (final work).

GD 206 – History of modern art; Weekly hours: 2+1, ECTS: 5

The main objective in this context is that the students gain a certain amount of information and knowledge, and ways to explore and classify them. After that the goals can generally be conceptualized in training in order to students recognize the main characteristics of key art movements in the 20th century, the main protagonists and their artwork. Students in the final stages of the program should recognize the specifics of certain artistic directions in the field of painting, sculpture, architecture and other disciplines which are in a common correlation. In that way they also get necessary knowledge of technologies in the creation of artwork, and understand sociological and philosophical aspects directly related to modern and postmodern art. On the other hand, students are trained in developing of their aesthetic skills. The content of the curriculum is conceived chronologically. Chronology primarily relates to modern and postmodern art movements and schools, with consideration of opus work and most representatives artists of this artistic epoch. Items provided by the curriculum are as follows : Individual and transition to subjective - Impressionism and neoimpressionism,Decomposition of the compact composition - postimpressionism , fauvism , Expressionism , Cubism and futurismWorld without form - abstract painting,Russian avant-garde - constructivist art , surrealism, Dadaism Art after 1945 : Informal Art , op art , pop art , new realism, new figuration, conceptualism, HyperrealismPostmodernism - concept and elements: pluralize of 70s, retrospective and appropriation of contested visions, artist and I, artist and We.

CIV 203 – Fluid Mechanics; Weekly hours 2+1, ECTS: 5

The purpose of the course is for students to get acquainted with the properties of fluids and with their behavior in conditions of rest, movement and transfer of forces. Introduction to the basic differential equations of motion and motion and their concepts settling. The curriculum includes the following themes: Physical characteristics of fluids - density, compressibility, elasticity, viscosity, surface voltage. Resting of fluids - definition of pressure, basic differential equations for resting fluids.Measurement of pressure.Forces from pressure.Fluid kinematics - basic concepts of motion, classification of fluids movements, an equation of continuity. Dynamics of fluids - basic differential
Equations for motion, integration of the fundamental differential equations for motion.Application.Kinetic energy coefficient.Basic Equations for QuantityMovement.Coefficient for the amount of movement.Application.Leakage and resistance mode - Laminar and turbulent leaks.Types of resistance.Reynolds's equations.Stationary Leakage in pressure systems - leakage through short and long pipelines, internal Pressure in pipes.Stationary leak in open pit - geometric elements of cross section, dynamic equation for stationary uniform flow, curve flow, calm, violent and critical leakage.Hydraulic similarity - an introduction to methods and physical-hydraulic models, similarity theory, dimensional analysis.

THIRD YEAR

FIFTH SEMESTER

CIV 301 - Theory of Structures I; Weekly hours 2+2, ECTS: 6

Awareness of mathematical modeling of the problem. To get theoretical knowledge for the methods of determination of the internal forces (stresses) in the undefined linear structural systems and the surface beams. What is a structure? Loads.Types of structural elements and systems.Model for calculation of the structure. Influence lines, determination and their application. Deformations of the statically determined systems.Principle of virtual work, operation of the external forces, operation of the internal forces.Betti's theorem for mutuality of operations.Maxwell's theorem for the mutuality of the deformations.Analytical determining of deformations.Statically undetermined structures, Characteristic of the statically undetermined structures. Force Method, Degree of static undetermination. Determining of the reactions and the static sizes of the statically undetermined structures. Deformation methods, Defining of the fundamental cinematically determined system. Composition of the conditional equations.Determining of the definitive values of the moments of bending. Theory of surface supports. Basic equations in the theory of elasticity.Types of surface supports.High beams.Slabs.

CIV 302 – Construction Materials; Weekly hours 2+2, ECTS: 6

Students gain knowledge about experimental and analytical determination of the quantitative parameters of the properties of materials, the method of obtaining the basic raw materials, the technological schemes for the production of various construction materials of organic and inorganic origin, as well as the way of examining their basic properties. The curricula includes the following themes: Characteristics of building materials: classification, composition and structure. Physically properties of the materials.Hydrophysical properties.Behavior of materials on heat action. Other important physical properties: viscosity, constant ice, acoustic properties. Mechanical properties of the materials.Constructive, technological, Rheological, chemical and exploitative properties.Examination of materials.Construction Stone.Ceramic products. Mineral inorganic binders, building plaster, Building lime. Building mortars.Building Glass.Polymers and plastic masses.Metals and metal products.Wood and wood products. Special purpose materials: Waterproofing materials, thermal protection materials, soundproofing materials protection, fire protection materials, anti-corrosion protection materials.

CIV 303 – Soil Mechanics; Weekly hours 2+1, ECTS: 5

The purpose of the case is to get acquainted with the physical and mechanical characteristics of the judges The soils and phenomena. Introducing in laboratory examination and field researchOn the soils. To get knowledge of the impact of soils on the built objects. The curricula includes the following themes: Components and structure. Physical-mechanical characteristics.Basic Laboratory examinations.Classification.Soil water and porous filtration Environments.Consolidation.Strength of shear.Principle of effective strain.Loads and distribution of stresses on different loads.Dilations and sequences.Voltage dilatation relations.Soil load. Earth pressure and support Constructions. Stability of slopes and landslides.Research & Testing Soils.

CIV 304 - Geodesy and Geo Informatics Systems; Weekly hours 0+2, ECTS: 4

Understating of geodesy and its application in solving of engineering problems from the field of civil engineering and geotechnics.Introduction to the measurement techniques in the geodesy.Getting knowledge about WEB GIS and its application as well as GIS Software.Introduction, basic definitions, objectives.Basic parameters of Earth's ellipsoid.Gauss-Kringer's projection.Measures for lengths, areas and angles.Scales.Measurement errors.Triangulation.Principles, division, stabilization and signalization of the trigonometric points.Calculating directional angles and lengths. Calculation coordinates of trigonometric points. Theodolite.Methods for measuring horizontal angles.Measuring of horizontal angles and lengths in a polygon net. Calculation coordinates of points in a polygonal net. Determining joint angles of inaccessible trigonometric points.Measuring of lengths using optic and electronic distance-gauges.Measuring using GPS systems.Methods for surveying of the field.Taximetric method.Orthogonal method.Photogrammetric method.GPS and satellitesurveying of the field.Nivelman.Introduction to Web

GIS.Client/server calculations Client/server Computing.Distributed geographic information services.Geographic Markup Language.Functions of Web GIS.Design of User Graphic Interface. Web GIS Software. Web GIS Data. Applications of WEB GIS.

CIV 309 - Reinforced Concrete; Weekly hours 2+0, ECTS: 4

The course objective is the students to get knowledge in the field of theory of reinforced concrete and the dimensioning of the reinforced concrete sections and elements. Introduction.Materials for production of reinforced concrete.Concrete, steel, types of reinforcement, reinforcement rules.Methods of calculation of the reinforced steel structures. Aim and flow of the calculation, phases of tensioning, theory of limit states. Reinforced concrete structure systems. Loads and reinforced concrete structure systems, inter-story and roofing AB structural systems, reinforced concrete stairs, beam AB supports, reinforced concrete columns and walls, foundations, reinforced concrete framework supports. Dimensioning of sections in for the limit influences of the normal forces and moments of bending. Centric pressed short elements, centric strained, sections exposed to moments of bending, sections exposed to complex bending, sections exposed to sideways bending, calculation of reinforced concrete slender elements. Calculation of the reinforced concrete sections for the limit state influences of transversal forces and moments of torsion. Sections exposed to transversal forces, sections exposed to moments of torsion. Calculation of reinforced concrete elements according to the limit states of usability. Limit states of cracks, limit states of deformations.

BA 306 – Law and ethics; Weekly hours: 2+1, ECTS: 5

To give understanding to students attitude about position of morals in professional life; to support them in developing a mental capability for decisions in society. To give understanding for viewpoints about rights and responsibilities of the worker of law and administration.To educate students to be able to deal with ethically problematic situations. To develop approach how position, character professional choice are closely connected with their life. To make for students sense about character desired in the profession of public administrator. To inform them with literature of ethics who is in connection with the field of law or their next profession. 1. Introduction to Law and Ethics. General definition of moral and law. 2. Ethics and society, Dignity and older Europeans.3. Ethics and society, Assisted reproduction and the welfare of the child. 4. Industrial property rights. 5. Intellectual property rights. 6. Copyrights and related rights.7. Drug testing and use of healthy volunteers. How are drugs developed? 8. Should parents be allowed to choose the sex of their children? 9. Business and professional ethics. What are the limits of vehicle manufacturer responsibility? 10. Business and professional ethics. A crisis of professional Self-regulation: The example of the solicitors‟ profession. Relationship between lawyers and clients.11. The Assisted Dying Bill, and European Law. 12. Ethical Issues in the Toy Industry. A responsible role for the media in the toy industry13.Ethics law and politics.Political responsibility personal responsibility, Collective responsibility 14.Ethics law and politics, Personal ethics and political responsibility in government.Collective responsibility in government.

FOURTH YEAR

SEVENTH SEMESTER

CIV 401 – Roads; Weekly hours 2+2, ECTS: 6

The purpose of the course program is to provide the student with knowledge in the area of analysis of Project documentation for the construction and maintenance of roads and road nodes. The curricula includes the following themes: Introduction. Road network.Basic elements and parameters in design.Classification and Characteristics of public roads, account speed, traffic load, Anti-slip resistance coefficient.Road elements and objects. Road on the road. Geometric representation in horizontal and vertical projection and cross-sectional profile.The trunk of the road and its elements. Geometric constructive elements of Cross road profile. Mapping.Designing.Lower structure on the road.Drainage.Column construction.Structure.Materials.Road maintenance. Travel nodes. Classification.City Roads.Classification.Features.Traffic.Technical equipment.Technology of road construction.

ARCH 403 - Contemporary Issues in Architectural Theory; Weekly hours 2+1, ECTS: 4

The students will be acknowledged to the spectra of ideas and topics, fundamental for postmodern theoretic discourse, facilitating: development of logic skills and responsible attitude in the thinking and communication ways about architecture; to promote open, free, eloquent attitudes between different architectural and urban ideologies in the current theory and practice; to define the status, nature and the system purpose of architectural theory vs. practice in the real context of contemporary architectural production. This course is a critical overview and introduction to contemporary architectural theories in Europe and aims to establish an understanding of the main theories and positions as they have developed over the course of the past five decades. The course examines contemporary architectural theory and criticism through the presentation and study of significant texts and buildings of the present and recent past. The course is structured in three sections. The preliminary observations establish a platform from which we can begin to understand the field of architectural theory and also the historical context just prior to the period we will be focusing on. The chronological overview aims to sketch out both a theoretical and a cultural over view of the decades from 60s of the 20th century until today. The thematic overview delves deeper into a series of recurring themes that have shaped European architectural theories in the past five decades.

ARCH 407 - Interior Design; Weekly hours 2+1,ECTS: 5

Acknowledged to the main nature of the interior architectural space. Housing needs; Construction; Design: Design principles, furniture, accessory, housing decisions; Housekeeping, care, security and safety. Career.

ARCH 408 - Architectural Conservation and Restoration; Weekly hours 2+1, ECTS: 4

The aim of the course is an introduction: to the role of architectural conservators; to the types and methodologies of architectural conservation involving experts from different areas connected to the architectural conservation. Introduction to architectural conservation and definitions; Architectural styles and building technology; Sustaining and conservation philosophy, Determination of age period of old houses / objects; Planning and restoration of houses / objects; Exterior restoration, Interior restoration, Case study / assessment of intermediate conservation project.

ARCH 414 - Industrial Design; Weekly hours 2+1, ECTS: 5

Introduction of fundamentals in industrial design, including the elements and principles of designer language, qualification of their application creating the space compositions; introduction to the inspiration techniques by the historical review of industrial design; introduction to stylish characteristics. Introduction to industrial design; Industrial design: problems and methodology; General and specific principles; Industrial design elements: line, color, form, volume, direction, size; Design principles: contrast, harmony, rhythm, gradation, equilibrium, unity, composition. Designing factors: cultural and economical, and designing criteria: esthetic, morphological, functional, construction – relation between industrial design and architecture and art; Object design; Historical review of industrial design.