



SZENT ISTVÁN
UNIVERSITY



FACULTY OF MECHANICAL ENGINEERING,
GÖDÖLLŐ

ERASMUS COURSE CATALOGUE

2018/19 – 2ND SEMESTER

LIST OF CORE COURSES

The Faculty of Mechanical Engineering of Szent István University is currently offering the below-listed core courses for the Spring semester of the 2018/19 academic year. Additional courses may be announced before the start of the semester, providing a wider range of courses to choose from.

Subjects from Bsc in Mechanical Engineering course

SUBJECT CODE	TITLE OF SUBJECT	SHORT DESCRIPTION	CREDIT	NAME OF SUBJECT TEACHER
SGMMCX16XXN	Descriptive Geometry	The subject will review and summarize the basic knowledge of the functioning of the food industry as follows. Structure of the food business; food legislation; food safety and quality, quality assurance and control; the materials, products and energies of processing; processing operations, processes, processes and technologies; preservation, packaging and storage of foodstuffs; establishment and operation of a processing plant.	3	Dr. Gyürk István
SGMJHX11XXN	Practical Course for Learning Material and Machinery	Man and machine, machine and environment. Classification of machines. Basic machine elements. Materials of machines. Mechanical basic concepts. Traction, work, performance. Hydrostatic, hydrodynamic, flowmeter machines. Thermodynamic basics. Burn. Engines with internal combustion. Electrotechnical bases and electrical machines. Electronics. Structure of machines and vehicles. Natural resources.	0	Dr. Pillinger György

		Energy management, environmental protection. Ergonomics. Standardization		
SGMGTX03XXN	Materials	Understand the basic laws of materials and metallography. Understand the important material testing procedures used in practice. The theoretical basics of heat treatment of materials and the most commonly used methods. The properties and markings of the most important structural and tool steels, cast iron castings, aluminum castings and copper alloys.	4	Dr. Szakál Zoltán
SGMLGX02XXN	Machines of Material Handling	The basic objectives of the course to introduce students into the theory and practice of material handlings machines and give elementary knowledge to the design of these equipments. The course based on knowledge of Maths, Mechanics, Elements of Machines and Computer Aided Designs. In every topic operation, construction, application and design of the machine will be discussed. A practical assignment for a conveyor design and a laboratory test are included.	3	Dr. Magó László
SGMAVX01XXN	Fluid Mechanics	Properties of fluids, description of flows. The theory of continuity, different motion equations of inviscid fluids, like Bernoulli's equation, momentum equation. Laminar and turbulent flows, boundary layers, hydraulics etc. Viscous fluid motion in fans pumps and ducts. Flow of compressible fluids. Fluid mechanical measurements and measurement devices and techniques.	3	Dr. Török Sándor

SGMKLX08XXN	Fluid Machinery	The subject dealing with water and gas delivering machines like pumps, compressors water turbines reciprocated pumps and motors. I will be shown the main theory of working and basic structures of machines. In the subject will be shown some engineering problems of fluid machinery and some fluid machinery measurements and measurement devices and techniques	2	Dr. Török Sándor
SGMMTX09XXN	Electronics	This course aims at providing an overview of basic electrical quantities and their relationship. Moreover it deals with passive and active components of electronic systems as well as the most often used electronic circuits. Learning material corresponds to ME approach emphasising the user side of the specific area without reaching designer level necessary for EE.	2	Dr. Petróczki Károly
SGMAGX01XXN	Electrotechnics	Basic concepts and definitions: Atoms and electricity, electric power, power and energy, resistance. Ohm's law, Kirchoff's laws. Magnetic Field, Magnetic Field Properties, Magnetic Circle Laws, Magnetic Induction Laws. Single and alternating current, alternating circuit phase and power, alternating current vector representation, inductive reactance, capacitance reactance; Combination of inductance, capacity and resistance; Phase factor correction. Three-phase circuits. Transformers and electric motors: DC motors and generators; Alternating current motors and generators, single-phase motors; Recording of motor characteristics by measuring; Motor protection and control.	3	Dr. Sembery Péter

SGMETX02XXN	Basics of Energetics	<p>In the framework of the subject, essentially the technical knowledge connected with the energy production and the energy supply is treated and the fundamentals can be acquired. As the first theme, the students learn the basic concepts of the energy production and supply as well as the dominant energy sorts and carriers. The primary and the secondary energy carriers and their roles are treated separately; the energy converters, the power engineering units (systems operated by mechanical or thermal power) and the electric drives connected with the topic (chiefly in terms of mechanics) can be learned. In connection with the energy use, the heating modes, the constructional units of the power-station systems, the fuel dressing plants, the energy converters, the thermal-electric systems, the heat exchangers and the boilers are treated. Chiefly in terms of mechanics, the basic equipment units of the renewable (solar, wind, hydraulic, geo-thermal) energies, the basic units of the power stations and their operation and technical properties as well as the factors influencing them are analysed.</p>	2	Dr. Tóth László
SGMKLX37XXN	Energy management in industry	<p>The subject involves knowledge of the use of energy by industry (purchase, use, transformation). The article provides an overview of traditional and renewable energy sources and energy sources, energy needs and its design, energy and cost analysis of energy use. It discusses in detail the specific energy consumption indicators, the energy value, and the role, possibilities and solutions of energy storage. On the exercises the students take technological</p>	2	Dr. Barótfi István

		and building energy calculations. As part of a project project, energy saving, energy loss exploration and efficient use are underway.		
SGMKLX13XXN	Building Service Engineering	Technical systems required for ensuring the humans? animals? and plants? living conditions: the most important interrelations of water supply, canalization, ventilation, heating, gas supply, function and operation of these systems. Main chapters: Processes of building service engineering, water supply, DHW supply, canalization, water and waste water treatment/purification, fundamental of air-conditioning, ventilation, air purification, building physics, heating, gas supply.	4	Dr. Barótfi István
SGMFFX11XXN	Physics I.	The objective of the Physics I course is to base the subjects on the basis of the natural science approach. The subject describes the major laws of mass points, rigid bodies and deformable bodies mechanics by means of tertiary mathematics. The wavectomy is partly emphasized by the soundtrack. The thermodynamics section is described on the basis of phenomenological and statistical methods, through practical applications.	4	Dr. Seres István
SGMFFX07XXN	Physics II.	Physics II. The aim of the subject is to base the subjects on the basis of the natural science approach. The subject describes the basics and applications of geometric and physical optics. Application centrally describes the	3	Dr. Seres István

		<p>electrodynamics chapters. The atomic physics section describes the basic laws of quantum mechanics and nuclear physics. The physics of quantum and semiconductor devices is mainly described through applications.</p>		
SGMFFX14XXN	Basics of Physics	<p>The subject aims to recap the main topics of the grammar school physics. The main topics are the mechanics of points, point systems and rigid bodies. The thermodynamics chapter deals with the thermal expansion, the calorimetry and ideal gases. The electrodynamics chapter consist of the physics of resting charges, the stationer electrical field and the DC circuits. The geometrical optics is the last chapter of the subject.</p>	0	Dr. Víg Piroska
SGMFFX15XXN	Process Control	<p>The aim of the course is to give basic knowledge usable for describing, analyzing, modeling, simulation and control of dynamic systems from engineering practice. The main chapters of the subject are: process control fundamentals; configuration and hardware of control loop; mathematical model of control system; description of linear systems, analysis of linear systems in time and frequency domain; Laplace transform; signal flow chart reduction; properties of signal transfer elements; change of signal transfer properties with feedback.</p>	4	Dr. Farkas István

SG2JI001N	Business Law	<p>The basic purpose of teaching a subject is to educate technically qualified professionals with legal knowledge on the basis of which they are able to understand the rules defining the operation of the economy, to detect legal problems arising in their work and to solve them in simpler cases. Subject matter: Definition and functions of state and law. The legal system and the jurisdictions. Structure of the law. The legal relationship. Regulation of the Hungarian state organization. The concept of ownership and partial rights. Entrepreneurial forms, legal rules for their creation, operation and termination. Bankruptcy and liquidation proceedings. The legal regulation of the employment relationship, the conclusion of the employment contract, the content, the termination and termination of the employment relationship.</p>	2	Dr. Csákay Zoltán
SGMMGX26XXN	Applied Microeconomics	<p>The main objective of the course is to teach the fundamentals of applied micro-economics related to the management of the enterprises in a systematized form. The main chapters of the course: elements of micro-economics, basic formulas, resource management, finance and accountancy system of enterprises. After completing the course the students will be able to understand and solve the different managerial tasks of enterprises.</p>	4	Dr. Daróczy Miklós
SGMGRX26XXN	Machinery and System Management	<p>The subject will review and summarize the basic knowledge of the functioning of the food industry as follows. Structure of the food business; food legislation; food safety and quality, quality assurance and control; the materials, products and energies of processing; processing operations, processes, processes and</p>	4	Dr. Bártfai Zoltán

		technologies; preservation, packaging and storage of foodstuffs; establishment and operation of a processing plant.		
SGMG SX15XXN	Introduction to Machine Elements Design	The course provides basic knowledge on designing elements of machines. The main objective is to develop in the junior mechanical engineering student the ability to analyse operational principles of different machine elements with special emphasis on their	3	Dr. Szendrő Péter
SGMG SX16XXN	Machine Elements II.	The course provides basic knowledge on designing elements of machines. Based on preliminary studies in the field of basic engineering subjects, the main objective is to develop in the mechanical engineering student the ability to analyse operational principles of different machine elements with special emphasis on their design using simple mechanical models and formulas. The basic topics of Machine Elements II. course are: design and calculation of bearing systems, belt power transmission (flat belts and V-belts), spur gears, gearboxes.	3	Dr. Kátai László
SGMG TX13XXN	Mechanical Engineering Technology	The general laws of cutting. The theoretical and practical issues of the most important cutting technologies. Cutting tools. Construction, operation and control of machine tools. Devices' Functions and Design Basics. Designing Machining Technology for Typical Component Types. Action Planning. Brief description of integrated manufacturing systems. Programming numerical controlled machine tools, industrial robots. Structure of flexible manufacturing cells and manufacturing systems. Designing production processes. Individual, Type and Group Technologies.	5	Dr. Kári-Horváth Attila

		Computer-aided process planning. Design of tool movements. Human-machine connection tools. Data and knowledge base. The economy of machine manufacturing. Computer-integrated production.		
SGMMCX24XXN	Basics of Machine Design	Geometric construction. Multiview projection. Views, sections. Sheet layouts. Lettering. Alphabet of lines. Dimensioning. Standardized representation. Drawing symbols. Threads, bolts and miscellaneous fasteners. Keys. Pins. Gears, gearings and gear drives. Rivets, riveting. Springs. Welded joints. Welding. Bearings. Bearing units. Shafts. Tolerances. Surface metrology.	3	Dr. Gyürk István
SGMJTX03XXN	Maintenance of Machinery	Understanding the technical and economic criteria of rebuildability of defective machines and components, and determining the optimal machine life. Technical, economical knowledge of major repair technologies, planning of repair processes and definition of resources, and planning of machine maintenance workshops.	2	Dr. Kalácska Gábor
SGMMHX23XXN	Fluid Power	The subject discusses the most important details of fluid technology in a hydrostatic approach. review the elements used and the details of building, operating, and examining circles. In the field of hydraulics, it deals with the most important solutions and practical aspects of vehicle technology, agriculture and industrial applications. summarizes the automation bases available in hydraulics.	2	Dr. Jánosi László

SGMIFX30XXN	Informatics I.	<p>This subject introduces the basic concepts of informatics and computer science. Topics include basics of the computer hardware; operating systems and file-management; essential knowledge of networks, the Internet and the WEB. This subject provides students with a hands-on introduction to the use of computers for word processing, computer graphics, presentation, surfing on the Internet, communicating via Internet, WEB-page design and spreadsheets. Students learn the usage of built-in functions of spreadsheet-editors, their application to matrix calculus and how to solve systems of linear equations and linear programming problems using spreadsheets.</p>	3	Dr. Molnár Sándor
SGMIFX28XXN	Informatics II.	<p>The aims of this subject are to assist students in founding their programming skills and to introduce application of numerical methods of mathematics. Topics include algorithms, program languages, compilers-interpreters, syntax, data types, coding, controlling. Programs are written not only for basic algorithms but for several numerical methods like finding roots, fitting functions, integration, solving differential equations and finding eigenvalues and eigenvectors of matrixes. The numerical methods are demonstrated in spreadsheets as well.</p>	3	Dr. Molnár Sándor
SGMKLX20XXN	Environmental Management	<p>This module focuses on the technical-, economic-, and ecological foundations of relationship. For the mechanical engineers this subject presents the basically of ecology and the relationships between of ecological nature and social environment are discussed. The course, students learn about the global and regional</p>	2	Dr. Gécsi Gábor

		economic development and growth problems, environmental impact, and their possible regulatory responsibilities to ensure harmony.		
SGMKLX24XXN	Environmental Engineering	One major source of environmental damage is human activity itself. The extent of this has multiplied by the use of technical tools in the industry or industry. industrial activity has been the main cause of environmental pollution. The most effective way to protect our environment is to prevent damage to the environment by using all the techniques of doing this. In order to protect the environment, environmental technology in industry, agriculture, trade, service, etc. is an organically related issue in the field of activity. The objective of environmental engineering education is to demonstrate the possibilities of reducing environmental damage, its technical and technological means, and the technical-economic calculations related to their application.	4	Dr. Géczi Gábor
SG2KG002N	Basic Economics	The teaching of Economics is important because the economic viewpoint is an essential part of the general culture of modern man. The subject of the Economics (Micro and Macroeconomics) course is also a theoretical undergraduate of BSc in sectoral and business economics.	2	Dr. Hustiné Dr. Béres Klára
SGMLGX04XXN	Logistics	Due to the changes in the production and business the material flows and inventory are in the focus of efficient production. Solution of the problem requires complex technological and economical thinking and approach. The objectives of the subject are to	2	Dr. Magó László

		make logistical systems and processes known and to strengthen the complex thinking of students. The main chapters of the subject: material handlings, storage, packaging, transportation, acquisition, production logistics, physical distribution		
SGMMAX01XXN	Mathematics I.	The aim of the subject is to provide the knowledge needed by other subjects, in the frame of mathematical logic. Namely: Sets, relations, functions, functions on sets. Elements of mathematical logic. The set of real numbers; axioms and their consequences. Real-real functions. Continuity, limit, differentiation of real-real functions. Discussion of functions. Elementary real functions. Integration of real-real functions: definite and indefinite integral, integration methods.	6	Dr. Sebestyén Zoltán
SGMMAX12XXN	Mathematics II.	The goal of the course is to widen and complement the material of Mathematics I in preparation for Mathematics III. Students will be introduced to the basics of differential equations, eg. some elementary methods of solving equations, direction fields, some of their applications and the Laplace transform. The study of infinite series will include tests for convergence of the various types of series, leading to power series and Taylor series. By introducing differentiation of functions of several variables, students will also learn about parametric curves, polar coordinates and their applications to calculus.	6	Dr. Veres Antal

SGMMAX17XXN	Basic Mathematics	<p>The aim of the subject is to provide the knowledge needed by Mathematics I, in the frame of mathematical logic. Namely: Sets, polynomials. Linear equations and inequalities of one variable. Basic algebraic calculations, fractions. Quadratic equations and inequalities. Identities of exponentiation. Calculating with square roots. Systems of equations and inequalities of higher ranks. Vectors, operations on vectors. Linear functions, power functions. Plotting functions and transformation of functions. Trigonometric functions. Fundamental trigonometric equations.</p>	0	Dékány Kornélia Éva
SGMMAX14XXN	Mathematical Statistics	<p>The subject includes the basic concepts and results of probability theory which are necessary for studying statistical inferences, as well as some useful statistical methods applied in different fields of industry and agriculture. Main topics: Probability fields; random variables; expectation, variance and standard deviation; particular probability distributions; random vectors; limit theorems; statistical sample; point and interval estimations; parametric and nonparametric hypothesis tests. Correlation</p>	2	Dr. Székely László
SGMMCX12XXN	Mechanics	<p>The aim of the exam is to get to know student's ability of the curriculum he studied in four terms (statics, stress analysis, dynamics). The student has to repeat the most important topics of the whole material. The student can give an account at his knowledge in statics in the form of stress analysis example. The student has to given an account also on his knowledge in kinematics and kinetics.</p>	0	Dr. M. Csizmadia Béla

SGMGTX04XXN	Mechanical Technology	To get to know the general regularities and theoretical questions of technologies of welding and metal working. Engineering metrology and the theory of welding technologies, their equipment and practices. Weldability of metal alloys and polymers. General regularities of casting and sheet metal cutting, rolling. To show an overview about modern technologies, like EDM, ECM and laser cutting.	3	Dr. Fledrich Gellért
SGMMGX02XXN	Management	The main objective of the course is to teach the theoretical background of management tasks in a systematized form. The main chapters of the course: explanation of management, development of management science, planning, decision making process, organization, structure of organizations, leadership, leadership models, communication, motivation, monitoring and controlling. After completing the course the students will be able to gain their general and functional management knowledge.	2	Dr. Husti István
SGMMTX31XXN	Measurements in Mechanical Engineering	The aim of the course is to provide the theoretical and practical foundation of the students' measurement technology knowledge and to develop and develop their measurement technique and way of thinking so that the mechanic engineer and mechatronics engineer can provide the knowledge that can be used effectively in the various fields of expertise. During the course we will review the basics of metrology, the measurement methods, the methods of measuring basic quantities and important derivative quantities, the most important questions of measurement evaluation and error	3	Dr. Petróczki Károly

		estimation.		
SGMJHX15XXN	Fundamentals of Engineering	Institute of Process Engineering, Department of Veh	3	Dr. Máthé László
SGMMGX32XXN	Quality Management	The main objective is to teach the basic elements and connections of quality management scope to development of quality-culture and to build up a quality-philosophy. Topics: Means and importance of quality ? Cost of quality ? Designing for quality ? Cont	2	Dr. Husti István
SGMJHX38XXN	Internal Combustion Engines and Vehicles	The aim of the course is to describe the theory, structure, adjustment of internal combustion engines and the methods and instruments of the tests. The purpose of the course is to define the technical parameters of vehicles moving on public roads and on the terrain, describing the most important structural elements of the known vehicle types and the technical parameters of the type selection. The aim of the course is to summarize the current environmental and other requirements for vehicles in the European Union.	4	Dr. Kiss Péter
SGMMCX27XXN	Dynamics	Purpose of this subject is to present the mechanics of moving solids. It discusses kinematics and kinetics of material points, rigid solids and structures using knowledge of physics. During examining the structures it gives some knowledge in fundamental theories of mechanisms. Theory of vibrations is discussed apart chapter showed basic elements of	5	Dr. Keppler István

		that. Engineering practicing is enhanced.		
SGMGCX09XXN	Labour Safety	Aim, subject, and basic terminology of occupational protection. Control and supervisory system of occupational protection. Tasks of the employer and the employee. Personal issues of work activity. Procedure in the case of personal harm. Characterization and requirements of the main types of hazard, possibility of their preventions. Safety requirements of the work equipments, work processes and technology. Radiation protection. Fire protection.	2	Dr. Walz Géza
SGMETX25XXN	Engineering Thermodynamics	Methods and techniques of temperature measurement. Calculus of thermodynamic state parameters. Structure of the thermodynamic system. The main laws of the thermodynamics. State parameters. State changes of ideal gases. Active heat transport. Heat energy conservation into work through cycles. Carnot-cycle. Technical cycles I. Caloric state parameters. State-changes of ideal gases. Carnot cycle. Homework output < Technical cycles II. External combustion Engines, Compressors. Multiphase systems. Vapour diagrams and typical state changes of steams. Energy of moving gases. Calculus of theoretical technical cycles and compressors. Thermodynamics of steam machines. Theory and balance equations of burning. Using of vapour diagrams. Calculus of typical state changes of vapour. Thermodynamics of heat transport I. Conductivity, ra-	4	Dr. Beke János



		<p>diation. Calculus of steam engine cycles. Using of balance equations of burning. Thermodynamics of heat transport II. Convective and combined heat transport. Thermodynamic bases of heat exchangers. Calculus of heat transport and heat exchangers. Psychometric chart. Typical state changes of wet air. Drying kinetics. Cooling cycles. Energetic analysis of cooling cycles. Calculus of typical state ex-changes of wet air and drying process. Homework input. Project week. Calculus of cooling cycles.</p>		
SMKKB2011XN	Technical Chemistry	<p>The aim of the course is to acquire the chemical knowledge of the primer and to develop a technical chemical approach. During the course, students will learn about the chemical theory of inorganic and organic chemistry as well as applied and industrial processes in addition to general chemical knowledge. The subject prepares the necessary chemical knowledge of a number of applied subjects alongside the mother structure without the need for completeness. Radioactivity, nuclear energy. Properties of gases, properties of dilute solutions, solution concentrations, equilibrium systems, industrial gases. Electrochemistry, corrosion, electroplating</p>	3	Dr. Horváth Márk Kálmán

SGMMHX24XXN	Pneumatic Energy Transmission	<p>The aim of the course is to familiarize students with the operation, control and application of pneumatic workers in the industry on the following topics: Physical and flow properties of compressed air; Compressed air production, forming of air compressors; Operation of pneumatic workers; Pneumatic control units, pneumatic controls; Timers, counters, pressure switches; Automatic cycles, unlock terminals, cascade method, step-by-step application; Electropneumatic elements, sensor operation, electrical control of pneumatic workers; Proportional pneumatics; Vacuum systems; Low pressure & uacute; pneumatics; Operation and maintenance of pneumatic control systems; Systematic debugging.</p>	2	Dr. Jánosi László
SGMMCX02XXN	Statics	<p>Purpose of this subject is examining rigid solids and giving a technical approach. Equilibrium of material point, static of rigid solids and static of plane and general structures is foreshown. It gives theoretical knowledge and helps practicing of the application methods. It discusses internal forces of beams and beam diagrams. At the end of semester frictional constraining contacts is discussed.</p>	4	Dr. M. Csizmadia Béla
SGMGET05XXN	Diploma Work [BSc.]	<p>The preparation of the thesis is an engineering task that is appropriate to the qualification, which can be drawn up with the guidance of the consultants based on the student's studies in a semester. The purpose of the dissertation is to prove that the candidate has one of the professional skills in the field of his / her field of expertise, knows and uses the professional sources of information and tools, and has the</p>	15	Dr. Kári-Horváth Attila

		tools and complex approach required to handle the professional problems and tasks that arise.		
SGMMEG05XXN	Diploma Work [BSc.]	The subject will review and summarize the basic knowledge of the functioning of the food industry as follows. Structure of the food business; food legislation; food safety and quality, quality assurance and control; the materials, products and energies of processing; processing operations, processes, processes and technologies; preservation, packaging and storage of foodstuffs; establishment and operation of a processing plant.	15	Dr. Szabó István
SGMG SX14XXN	Introduction to Computer Aided Design	The objective of the subject is to acquaint students with computer aided 3 dimensional modelling techniques with the help of SolidEdge parametric design software. Beside the 3D model creation the students learn the methods of assembly techniques and to generate 2D technical drawings from the 3 dimensional models.	4	Dr. Szabó István
SGMMCX07XXN	Strength of Materials	Purpose of this subject is the examination of solids behaviour based on empirical strength of materials and practicing engineering mechanics. After the concept and demonstration of state of stress and presenting of failure theories it discusses combined loadings. It deals with computing strains and strength of beam with a few special shape and cross-sections.	4	Dr. Katona Gábor

SGMJTX05XXN	Workshop practices I.	Learn the generalities and practical questions of casting, welding and chipless shaping technologies. Tools and methods of various casting technologies. Equipment and Practice of Welding Procedures. Soldering. Cold-formed and hot forming of metals. Forging, rolling, punching, deep drawing and precision forming processes. Forming polymeric materials.	1	Dr. Kári-Horváth Attila
SGMJTX06XXN	Workshop practices II.	The aim of the practice is to involve students in the most common cutting processes. Practical issues of key cutting technologies. Cutting tools. Construction, operation and control of machine tools. Devices' Functions and Design Basics. Presentation of the cutting technology of typical types of parts.	1	Dr. Kári-Horváth Attila
SGMJTX11XXN	Workshop practices III.	Basic concepts of assembly technology. Assembly of machine parts. Mounting sealing joints and rolling bearings. Cleaning machines and machine parts. Renewal of parts by mechanical and welding methods. Renewal of machine parts by spraying, galvanizing and plastics. Surface latency enhancing technologies. Improvement of structural units.	1	Dr. Keresztes Róbert Zsolt
SGMGTX24XXN	CAE Practice III.	The aim of the course is to acquire the correct design basics for different molding tools and to familiarize the practical application of different tooling structures, and to apply design knowledge in the CAD / CAE system. From the product model, virtual design, optimization (eg injection molding simulation) of the complete molding tool, as well as the utilization of the widely used tool normalities in practice. Generate models for rapid prototype production.	2	Dr. Pataki Tamás István

SGMJTX25XXN	CAM practice	Students learn about the principles and methods of computer modeling of mechanical systems that are of primary importance to practice. During the exercises, the fundamental features of modeling tools and models are studied. The subject is based on computer-based NC technology design based on modeling, tool design and other engineering design based on modeling methods, computer-led manufacturing, and model analysis. With the knowledge gained, the student will be able to know and apply without any difficulties during later studies and professional practice of the student modern modeling tool.	2	Dr. Keresztes Róbert Zsolt
SGMGTX16XXN	Measurements and Quality Assurance in Machine Industry	The subject gives students a solid foundation of knowledge and skill in performing measurements and calculations. Students learn to use precision measurement tools, such as steel rule, tape measure, protractor, micrometer, height gauge, various calipers and dial indicators. Students learn how to collect data on a sample and calculate the mean, median and standard deviation. They also learn how these concepts relate to statistical sampling, tolerance and quality control.	2	Dr. Fledrich Gellért
SGMJTX26XXN	Programming of modern machine tools	Students will learn concepts of modern software development, including version control, configuration management, build tools.	2	Dr. Keresztes Róbert Zsolt
SGMJTX22XXN	Polymer technology	The course covers the following aspects of polymer physics and chemistry: Nomenclature, and fundamental concepts, Polymerization, Polymer stereochemistry, Polymers in solution, Characterization, Crystallinity and the glass transition, Rheological and	2	Dr. Kalácska Gábor

		mechanical properties including viscoelasticity, Copolymers, polymer blends and alloys, Processing		
SGMJTX23XXN	Mending and servicetechnologies		2	Dr. Keresztes Róbert Zsolt
SGMMHX31XXN	Tribology	It includes the study and application of the principles of friction, lubrication and wear.	2	Dr. Zsidai László
SGMMCX30XXN	FEM Technologies		2	Dr. Oldal István

Subjects from Msc in Mechanical Engineering course

Name	Short description	Credit
Engineering Economics	The main goal of the subject is to teach the microeconomic knowledge of the business management in a systematic way. The main chapters of the thesis are: basic concepts, basics, business resource management, financial and accounting systems. With this knowledge, students are able to see the most important business management tasks of companies.	3
Ergonomics	The concept of ergonomics, the main stages of development / development. Basic Requirements for Ergonomic Design Physical and Social Environment Ergonomic Principles: The physiological effects of physical environments (illumination, noise, vibration, climate, air quality) on humans and the resulting design guidelines, norms and standards. Ember body sizes and range of motion. Static and dynamic anthropometry. Validating anthropometric aspects during ergonomic analysis and planning.	3
Mechanical vibrations	Objective: The higher chapters of kinetics and the introduction of the basics of swinging on creative, design, research engineers. The theoretical beyond the methods of their engineering application We also intend to describe the audience in a specific way through tasks.	3
Eco technology	It is essential to development, improvement or in extreme cases ignore of existing technologies, manufacturing practices and devices approach to environmental protection. It is very important to design new technologies and equipment, which has been avoiding previous mistakes and do not cause environmental loads. This course presents the results and examples of technical solutions and developments in the field of "prevention" through a specific technology (food, construction, trans- portation, etc.).	3

<p>Manufacturing process and systems</p>	<p>The aim of the course is to present the entire production process - from preparation to final product verification - to the production process and system categories and headline characteristics. The most important topics are the integrated manufacturing systems (FMS, CÍM) and presentation of its important technical (CNC, industrial robots, additive process...) and organizational elements (structure, JIT, KANBAN...). The types of manufacturer systems (single and mass production systems), his structure, his planning, his technological, organizational and methodological bases. Optimising and simulation in the planning of the production processes and systems. We put special emphasis on presenting the LEAN manufacturing philosophy and system (TPM, KAIZEN, 5S...)</p>	<p>4</p>
<p>Fluid Mechanics</p>	<p>Mathematical introduction: the elements of tensor algebra and vector analysis calculus. Basic conservation laws of mechanics: energy-, impulse and moment of impulse with examples. Introduction: some basic results from the static fluid systems with examples with applications of Torriceli's law. Some simple examples of applications of the Bernoulli's and continuity equations. Basic mathematical features of general balance equations. The concept of local-, and substantial balances with some simple examples. The Navier-Stokes equation, as the most important general equation of motion of hydrodynamics in the case of the viscous fluid flow with some simple applications. Elements of particle dynamics, including detailed analysis of the problem of harmonic oscillations, and relevance of the dissipative forces with examples with emphasis on the classical problem of the damped harmonic oscillator. Foundations of the mechanics of dissipative continua (including both fluid dynamics and elasticity theory). The Stokes' law with some simple applications. The motion of a spherical particle in viscous fluids at rest. The Hagen-Poiseuille's law with applications. A concise presentation of the boundary layer phenomena relevant for engineering applications. Relevance of the heat expansion phenomena in solids and fluid systems with some simple applications. Instability mechanisms and role of control parameters: relevance of the Reynolds' and Rayleigh's numbers at turbulent and convective flow instability phenomena. Foundations of the theory of coupled transport processes taking place in macroscopic dissipative continua, with some simple applications. Relevance of the Onsager's reciprocity relations. Manifestation of the Duffour-, and Soret-effects at drying processes.</p>	<p>3</p>

Engineering Thermodynamics	<p>The Engineering Thermodynamics deals with such concepts of thermodynamics that are used to solve engineering problems. Engineers use thermodynamics to calculate and to find ways to make more efficient caloric systems. Engineering thermodynamics develops the theory and techniques required to use empirical thermodynamic data effectively. There are even applications which are tailored to specific areas which give answers for common design situations. But thorough understanding only comes with knowledge of underlying principles, and the ability to judge the limitations of empirical data.</p> <p>The Advanced Engineering Thermodynamics is the extension of the topics in thermodynamics that ones learned during the BSc courses. Since there is a close connection between the BSc and MSc thermodynamics hence it will be frequently made reference to the relevant BSc topics.</p>	3
Computer Simulation	<p>The aim of the course is to introduce the development of physical based mathematical models using examples from engineering practice. Then computational realization and solution of mathematical models of dynamical systems in interactive graphical simulation environment. Measurement based identification of model parameters and model validation. The topics of the main case studies: thermal behavior of electrical engines, modeling and simulation of environmental meteorological parameters, modeling and simulation of flat plate collector and a solar hot water system.</p>	4
Elective Subjects		6
Optional Subjects		3
Project Work I. (design, reconstruction)	<p>With the help of a technical construction you can master the planning and reconstruction tasks. Design drafting (mechanical and geometric modeling), computer modeling. Define operational parameters (environment, motion and load characteristics). Create and test a virtual prototype (model). Definition and evaluation of function-specific functions. Development and optimization of the design according to specific criteria.</p>	2
Complex Engineering Activity	<p>Learn the complex engineering design approach. Presentation of the career path of the technical products, description of the most important phases of design tasks (possibilities for finding solutions, design process). In the context of a comprehensive approach, product compliance and product liability are described. The basis for reverse engineer activity is described, and engineering and design task solutions are presented through case studies.</p>	3
Thesis work for full degree students	<p>Elaboration of the Diploma thesis is to be carried out upon individual plan, individual preparation, literature review, adjusted with the supervisor. Preparation of special tasks for</p>	30



	the given deadline, preparation of the schedule of the diploma thesis and milestones.	
Industrial exercise for full degree students	The purpose of the industrial exercise is to provide the student with a concrete job of realizing the university education, to get acquainted with the work done there and to prepare for the preparation of the Thoughts. In this context, you must carry out an activity in which you can gain experience in a part of the mechanical engineering, agricultural and food engineering mechanical engineer and mechatronics engineering that will help you find it in your future profession, while meeting your learned knowledge with practical requirements and allowing you to become an active participant in practical place work. In the workplace corresponding to the qualification, in the job of combining the theoretical and practical knowledge, in the work processes of the employee competences required to practice the profession, in the material-device technology knowledge and practical skills, in the work processes, in personal relationships and cooperation, in task solutions, evaluation and self- the development of innovation skills.	0
Modeling with the computer II.	During the exercises, students learn about the operation, use and finishing of a finite element program by solving practical tasks. Occupations are part of the day-time class at 3 hours per week in class and place. Communication of the curriculum in lectures on compulsory consultations on lectures is done by lectures and optional consultations within the time and place of the timetable.	3