



**SZENT ISTVÁN
UNIVERSITY**



**FACULTY OF MECHANICAL ENGINEERING,
GÖDÖLLŐ**

ERASMUS COURSE CATALOGUE

2016/17 – 1ST SEMESTER

LIST OF CORE COURSES

The Faculty of Mechanical Engineering of Szent István University is currently offering the below-listed core courses for the 1st semester of the 2016/17 academic year. **Additional courses may be announced before the start of the semester, providing a wider range of courses to choose from.**

<i>COURSE CODE</i>	<i>COURSE NAME</i>	<i>CREDIT</i>
SGMFFX17XXN	Computer Simulation	4
SGMETX02XXN	Energetics	3
SGMMC3842C	Engineering Ethics	2
SGMKL4011XN	Environmental Engineering Technics	4
SGMMTX24XXN	Food Quality Management	3
SGMIF2A11AN	Informatics	4
SGMGSX14XXN	Introduction to Computer Aided Design	4
SGMGSX15XXN	Introduction to Machine Elements Design	4
SGMGRX13XXN	Machinery and Systems Management	3
SGMMAX28XXN	Ordinary Differential Equations	3
SGMFFX23XXN	Physical Experiments	3
SGMMGX35XXN	Project Management	4
SGMFF4815C	Sensor Physics	3
SGMJTX12XXN	Base of Tribology	3
SGMMGX90XXN	Introduction to Innovation Management	3
<i>Full-time BSc courses (optional for Erasmus students, available in case of the presence of full-time students)</i>		
<i>SMKKB2011XN</i>	<i>Technical Chemistry</i>	3
<i>SGMMAX01XXN</i>	<i>Mathematics I.</i>	6
<i>SGMGTX03XXN</i>	<i>Materials</i>	4
<i>SGMFFX11XXN</i>	<i>Physics I.</i>	4
<i>SGMJHX15XXN</i>	<i>Fundamentals of Engineering</i>	3
<i>SGMETX25XXN</i>	<i>Engineering Thermodynamics</i>	4
<i>SGMMCX02XXN</i>	<i>Statics</i>	4
<i>SG2KG002N</i>	<i>Basic Economics</i>	2
<i>SGMMCX16XXN</i>	<i>Descriptive Geometry</i>	3

COMPUTER SIMULATION

COURSE CODE: SGMFFX17XXN
ECTS CREDITS: 4
TEACHING HOURS PER WEEK: 2+1
TEACHER: Dr. István FARKAS
farkas.istvan@gek.szie.hu

SHORT DESCRIPTION:

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 dynamic systems in interactive graphical simulation environment. Measurement based identification of model parameters and model validation. The topics of the main case studies: The topics of the main case studies: modelling of a free flow tank, modelling and simulation of filling a boiler, modelling of grain flow in dryers.

Subject outline: No.	Date	Lecture	Practical work (in class or home)
1.	1st week	Introduction, basic concepts	Mathematical background
2.	2nd week	Modelling, simulation, identification, control	Modelling and simulating of dynamic systems
3.	3rd week	Mathematical modelling	Black-box modelling technique
4.	4th week	Block-oriented modelling	Block-oriented modelling of Ordinary Differential Equations (ODEs)
5.	5th week	Project week	Project week
6.	6th week	Part exam	Evaluation of part exam

7.	7th week	Derivation of a physically based model	Project work
8.	8th week	Filling a boiler as a modelling example	Project work
9.	9th week	Numerical solutions of ODE 1	Project work
10.	10th week	Numerical solutions of ODE 2	Project work
11.	11th week	Numerical solutions of a control task	Project work
12.	12th week	Part exam substitution	Evaluation of part exam substitution
13.	13th week	Modelling of grain flow in dryers	Case study
14.	14th week	Project work evaluation	Discussion
15.	15th week	Final evaluation	

ENERGETICS

COURSE CODE:	SGMETX02XXN
ECTS CREDITS:	3
TEACHING HOURS PER WEEK:	2+0
TEACHER:	Dr. László TÓTH <i>toth.laszlo@gek.szie.hu</i> Dr. István PATAY <i>patay.istvan@gek.szie.hu</i> <i>mathe.laszlo@gek.szie.hu</i>

SHORT DESCRIPTION:

In the frame of the subject, the technical knowledge in connection with the energy production and supply will be mainly reviewed such as the fundamental concepts of the energy production and supply, the dominant energy kinds and energy carriers (agents), primary and secondary energy carriers, energy transformers, electric drives as well as the main constructional units of the power-plant systems – fuel preparatory plants, energy converters, heat exchangers, electric heaters, boilers etc. – and the basic devices of renewable energy sources – the basic units of renewable-power (biomass, solar, wind, geothermal) plants, their operation and technical properties.

SUBJECT OUTLINE:

Wee k	Lecture
1.	Basic primary and secondary energy carriers and their main properties
2.	Power stations based on conventional energy carriers; main versions according to the energy carriers
3.	Electric energetic – fundamental concepts and knowledge
4.	Electric mains, power-network systems
5.	Production of electric energy and its devices; electric machines and drives, system elements of electric industry; protecting devices
6.	Electric energy management



7.	Energetic-purpose use of the biomass; raw materials (exploitation, transport, storage, preparation), utilization (burning, oil production, estering conversion, alcohol production, biogas)
8.	Utilization of solar energy (thermal, electric); the main systems, advantages, improvement requirements
9.	Utilization of the wind energy – estimation of the energy potential, devices and systems of the generating of electric and mechanical energy
10.	Geothermal energy; power-plant and decentralized heat supply systems
11.	Hydro-energy; special devices of energy utilization
12.	Heat- and electric-energy converters (heat pumps, air conditioning devices)
13.	Storage of energy (facilities of accumulation, main forms, development trends)
14.	Energy management; facilities and systems of energy saving
	Consultation

ENGINEERING ETHICS

COURSE CODE: SGMMC3842C
ECTS CREDITS: 2
TEACHING HOURS PER WEEK: 2
TEACHER: Dr. István GYŰRK
gyurk.istvan@gek.szie.hu

SHORT DESCRIPTION:

Engineers practising their profession often face moral problems. It is our goal to arouse responsible reflection on moral issues and to provide tools to give proper answers on professional ethical problems. The course deals with key ethical concepts, theories, such as consequentialism, deontology etc. Compares ethics, law and etiquette. Some selected chapters: Engineer in the society, Safety and the engineers responsibility, Environmental ethics, Engineer and energy, Moral leadership, The engineer as employee and employer, Computer ethics, Research ethics, Moral issues of publication, etc.

ENVIRONMENTAL ENGINEERING TECHNICS

COURSE CODE: SGMKL4011XN
ECTS CREDITS: 4
TEACHING HOURS PER WEEK: 2+1
TEACHER: Dr. Gábor GÉCZI
geczi.gabor@gek.szie.hu

SHORT DESCRIPTION:

This subject concentrates on introducing the operations and the processes that can be applied in environmental protection with emphasis on their technical background and equipment. The main parts of the subject are: mechanical-, hydrodynamic-, caloric- and mass transport operations and chemical- and biological processes. Environmental protection technologies: air protection, water and sewage management, soil protection, waste management, noise and vibration protection, radiation protection.

SUBJECT OUTLINE:

	Lecture	Practical work (study four two times)
1.	Introduction, basic concepts, requirements	
2.	Mechanical- operations: Milling, Compacting, Sorting	
3.	Mechanical- and hydrodynamic operations: Storage, Mass transport, Fluid flow	
4.	Hydrodynamic operations: Mixing, Settling, Sedimentation	
5.	Hydrodynamic operations: Filtering, Centrifugation spinning	

6.	Caloric- and mass transport operations: Heat transfer, Evaporations, Distillations	
7.	Mass transport operations: Absorption, Stripping, Adsorption Extraction	
8.	Mass transport operations: Drying, Membrane separation	
9.	Chemical process: Burning, Combustion, Oxidation – reduction	
10.	Chemical process: Solidification, Neutralization, Ion exchange, Clarification	
11.	Biological process: Aerobe biological methods	
12.	Biological process: Anaerobe fermentation	
13.	Prevention, Ecotechnology	
14.	Summary	
15.	Written/oral examination	

Reading: [David H.F. Liu](#) (Editor), [Bela G. Liptak](#) (Editor) (1997): Environmental Engineers' Handbook, 1431p.

FOOD QUALITY MANAGEMENT

COURSE CODE:	SGMMTX24XXN
ECTS CREDITS:	3
TEACHING HOURS PER WEEK:	2
TEACHER:	Dr. Péter Korzenszky <i>korzenszky.peter@gek.szie.hu</i>

SHORT DESCRIPTION:

Contemporary food industry produces thousands of foodstuffs. The manufacturing technology is slightly different, but the processing steps are basically common for each of them. The course introduces the main units of operations and the machinery of food processing and preservation. Their effect on food quality and consumer - appeal factors are also discussed.

INFORMATICS

COURSE CODE: SGMIF2A11AN
ECTS CREDITS: 4
TEACHING HOURS PER WEEK: 0+3
TEACHER: Dr. Lászlóné OROVA
orova.laszlone@gek.szie.hu

SUBJECT OUTLINE:

Lectures	Practical Work
	1. Informatics=hardware+software+information system. Operating system, file management.
	2. Computer networks, Internet, WWW
	3. Word processing. Editing, formatting, styles, table of contents.
	4. Graphics. Webpage.
	5. Presentation.
	6. E-test. Test_1 (word processing, graphics, presentation) Spreadsheets. Formatting, calculations, charts
	7. Graphs, Goal-seek, Trendline
	8. Problem solving
	9. Creating complex document - OLE
	10. Database Management System
	11. Query, Form, Report.
	12. Revision.
	13. Test_2 (spreadsheets, database management)

Indicative Reading:

Kurt F. Lauckner, Zenia C. Bahorski (2009): The Computer Continuum
Office 2013 tutorial: <http://www.fgcu.edu/Support/>
Homepage: <http://elearning.szie.hu> GEK – SGMIF1A11AN - Informatics(Orova)

Student Workload:

Staff/Student Contact Time:	1) Lectures	0 hours
	2) Practical Work	39 hours
	3) Field study trip	0 hours
Directed Learning Time	Home Works (Homepage)	20 hours
Individual Learning Time:	Individual study	16 hours
Tests and Exam Time		0 hours
Total Work Time		75 hours

Assessment:

The assessment has two steps, and a five-graded 100 points evaluation system.

The two steps are:

- 1st to get the sign of course-unit teacher, which means the students fulfilled their obligations, and
- 2nd taking the test on the 13th week of the semester.

To achieve the 1st step, students have to score the electronic test (**e-test**) minimum 16 points of the 30 and the **Test_1** minimum 8 points of the 20, and have to attend practical works without absence. If absence occurs, students should ask the permit of the course-unit teacher and compensate with home works. Without the fulfilment of the 1st step the student can not pass to the 2nd step, which is the **Test_2** on the 13th (50 points).

Optional: small lecture on the 2nd, 3rd, 4th weeks for extra 8 points.

The five grades are 1, 2, 3, 4, 5 according to the scored points of the total 100, listed below in the table:

5 (excellent)	86-100 points
4 (good)	76-85 points
3 (satisfactory)	61-75 points
2 (pass)	51-60 points
1 (fail)	50 points and below

The student, who did not score at least 25 points by the Test_2 fails, but can make exam (electronic test + Test_1 + Test_2) twice again.

INTRODUCTION TO COMPUTER AIDED DESIGN

COURSE CODE: SGMGSX14XXN
ECTS CREDITS: 4
**TEACHING HOURS
PER WEEK:** 2+1
TEACHER: Dr. István SZABÓ
szabo.istvan@gek.szie.hu

SHORT DESCRIPTION:

Use of computers and 3D product lifecycle management software packages are of importance in mechanical engineering. The course is aiming at providing basic information on the use of such technologies and enabling student to create their own designs. During the lectures and practical assignments SIEMENS SolidEdge ST software package will be introduced and special laboratory space will be provided. The course includes a design project work. At the end of the course students will be able to complete alone 3d design tasks with medium complexity.



INTRODUCTION TO MACHINE ELEMENTS DESIGN

COURSE CODE: SGMGSX15XXN
ECTS CREDITS: 4
**TEACHING HOURS
PER WEEK:** 2+1
TEACHER: Dr. László KÁTAI
katai.laszlo@gek.szie.hu

SHORT DESCRIPTION:

The course provides a basic knowledge of designing elements of machines. The main objective is to develop (in the junior mechanical engineering student) the ability to analyze operational principles of different machine elements, with special emphasis on their design, using simple mechanical models and formulas.

MACHINERY AND SYSTEMS' MANAGEMENT

COURSE CODE:	SGMGRX13XXN
ECTS CREDITS:	3
TEACHING HOURS PER WEEK:	2+1
TEACHER:	Dr. Zoltán BÁRTFAI <i>bartfai.zoltan@gek.szie.hu</i>

SHORT DESCRIPTION:

Adaptation of machines, technical and technological systems into the production system. Rational and effective operational management of the adopted machines, systems. Detailed topics: basics of the systems engineering, technology planning. Complex evaluation parameter system for machines, energetic and technological units and planning their connection. Aggregate planning. Basics of technology development. Technical serving of the machine operation, basics and application of the reliability theory. Hazard analysis. Maintenance, technical diagnostics, energy supply, fitting supply, conservation. Methods of the complex system analysis and planning. Precision technologies in the agriculture.

ORDINARY DIFFERENTIAL EQUATIONS

COURSE CODE: SGMMA28XXN
ECTS CREDITS: 3
TEACHING HOURS PER WEEK: 2+0
TEACHER: Dr. Zoltán VARGA
varga.zoltan@gek.szie.hu

LIMIT OF ENROLLMENT: max. 4 students

LECTURE TIME: Mondays, 13:30-16:00, Aula building, room nr. 223

SHORT DESCRIPTION:

The course is based on a two-semester introductory course of Differential and Integral Calculus, and includes the basic types of ordinary differential equations: Separable, first and second order linear, and general first order explicit differential equations. Systems of linear differential equations, basics of Mathematical Systems Theory. Applications in physics and engineering.

WEEKLY TEACHING PROGRAM

1. The simplest type of differential equations. Basic concepts.
2. Separable differential equations. Solution of an initial value problem.
3. Applications of separable differential equations.
4. First order explicit differential equations
5. Existence and uniqueness theorem I.
6. Existence and uniqueness theorem II.
7. First order linear differential equations.
8. Variation of constant formula. Applications
9. Second order linear differential equations.
10. Wronski determinant, basic solutions.
11. Solution of the differential equation of the damped linear oscillator.
12. Systems of linear differential equations.
13. Basic concepts of stability theory.
14. Stability analysis of systems of linear differential equations.

PHYSICAL EXPERIMENTS

COURSE CODE:	SGMFFX23XXN
ECTS CREDITS:	3
TEACHING HOURS	2
PER WEEK:	
TEACHER:	Dr. István SERES <i>seres.istvan@gek.szie.hu</i>

SHORT DESCRIPTION:

During the Physics lectures mainly the theory of the different physical phenomenon is exposed, sometime with some demonstration. This makes the subject very unpopular among the students, however the different Physics shows are full of interested people. On the other hand the people use a lot of different equipments, but they have no idea about the working principle of them, so often non scientific rumours are spreading on the net about the advantages or harmfulness of an equipment/method.

The aim of the course is to do a lot of experiments from the different fields of Physics. Some of the planned experiments are just for fun – there are some very surprising among them -, but there are a lot about the demonstration of working the different equipments (e.g. microwave oven), or to highlight the working of the different physical rules. All of the experiments are discussed, what was exactly happened and why.

Further information: Seres.Istvan@gek.szie.hu

Topics of the course

1. Experiments about the inertia (static and dynamic load)
2. Rotation (stroboscope, gyroscope, rotating table, Foucault pendulum)
3. Vibrations and waves (vibration of a string, tuning fork, sound speed measurement, vibration patterns in 2D and 3D)

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4. Sound (whispering mirrors, Doppler effect, interference, dB measurements of an earphone, He balloon)
 5. Aero and Hydrostatics (air pressure, Torricelli, vacuum pump)
 6. Hydrodynamics (experiments based on Bernoulli law)
 7. Viscosity and surface tension (Non-newtonian liquid, bubbles, minimal surfaces)
 8. Thermodynamics (heat expansion – bimetal) , extreme low temperatures (experiments with liquid nitrogen)
 9. Electrostatics (contact electrification, balloon on the wall, Van de Graaf generator, lightning, piezo)
 10. Electric current (black-lead flash, current in gases, measuring water conductivity)
 11. Magnetic field (neodymium magnets, ferro-fluid, EM induction, induction cooking)
 12. Optical experiments (fog machine, lasers, lenses and mirrors)
 13. Optical illusions, 3D imaging

PROJECT MANAGEMENT

COURSE CODE:	SGMMGX35XXN
ECTS CREDITS:	4
TEACHING HOURS PER WEEK:	3+0
TEACHER:	Dr. Miklós DARÓCZI daroczi.miklos@gek.szie.hu

SHORT DESCRIPTION:

The main chapters of the course: fundamentals of project management, the process and participants of project accomplishment, developing the contract strategy, planning of projects, controlling work in progress, economic evaluation of projects.

Schedule:

- Class 1. Course introduction, schedule, assignment, requirements, material.
- Class 2. Fundamentals of Project Management.
- Class 3. Project manager's skills and responsibilities.
- Class 4. Project life cycle, defining the project.
- Class 5. Planning the three project parameters, quality dimensions.
- Class 6. Planning the time dimension, Gantt charts.
- Class 7. Planning the time dimension, CPM / PERT charts.
- Class 8. Planning the cost dimension.
- Class 9. The implementation phase.
- Class 10. Summary, presentations.

Course Material:

- Lecture notes and course handouts
- J. R. Meredith – S.J. Mantel, Jr.: Project Management a Managerial Approach. John Wiley & Sons, New York, 2011.

Course Requirements: (Max.: 100 points)

- Active participation: **20 points**
- Assignment: **30 points** (min.: 10 points)
- Test: **50 points** (min.: 25 points)

- **Active participation** is important. Please come to class prepared to take part in the activities.
- **Assignment:** Student teams will prepare a report and give a presentation on a special project. The purpose of this assignment is to deepen your knowledge on planning projects and to share that knowledge with the rest of the class. The topic of the project will be selected by the students.
There are two components to this assignment:
 - a 8-10 page report to be handed in to the instructor
 - a 10 minute class presentation.

The outline of the assignment:

- Introduction: a brief presentation of the idea, enterprise, surrounding and project parameters (result, time, cost)
- Break the project down into sub-units or steps, please describe them if necessary
- Decide the proper sequence for completing the sub-units
- Decide how much time and human resource is required to complete each sub-unit
- Draw the Gantt-chart and human resource chart
- Design the cost of each sub-unit and aggregate costs into the project budget
- Summary: describe the weak points, the critical chains of the project

Due dates:

- Class 10.
 - Provide report and make presentation to class
-
- **Test:** Multiple choice and/or true-false. Tasks of time planning techniques.

SENSOR PHYSICS

COURSE CODE: SGMFF4815C
ECTS CREDITS: 3
TEACHING HOURS PER WEEK: 2+0
TEACHER: Dr. István SERES
seres.istvan@gek.szie.hu

SHORT DESCRIPTION:

The aim of the course is to describe the physical processes and the physical background of the operation of different sensors. The physical processes are described together with their governing equations from which important factors can be deduced. Parallel with the usability of a given sensor, different purposes for different conditions is also discussed. As the sensor is generally an energy converting equipment, the sorting of sensors is based on the type of energy conversion, e.g. thermal to electrical. As general data processing is based on electrical signals the conversion to electrical energy is discussed in great detail.



BASE OF TRIBOLOGY

COURSE CODE: SGMJTX12XXN
ECTS CREDITS: 3
TEACHING HOURS PER WEEK: 1+1
TEACHER: Dr. Gábor KALÁCSKA
kalacska.gabor@gek.szie.hu

SHORT DESCRIPTION:

The friction and wear is dominant failure process of working surfaces. Review of the basic mechanism of friction and wear of structural materials.

The course is Intergrated into Maintenance of Machinery course .



INTRODUCTION TO INNOVATION MANAGEMENT

COURSE CODE:	SGMMGX90XXN
ECTS CREDITS:	3
TEACHING HOURS	2+0
PER WEEK:	
TEACHER:	Dr. Árpád BAK bak.arpad@gek.szie.hu

SHORT DESCRIPTION:

This subject aims to provide students a fundamental knowledge of the innovation and innovation processes. Students will learn about the principles innovation theory and practice, after completing this unit students will understand the importance of innovation, describe the nature of innovation and its evolution as a major force in business competitive strategy, explain and describe the key aspects of the innovation process, understand the relationship between marketing and innovation,

Schedule:

- Class 1. Course introduction, schedule, assignment, requirements, material.
- Class 2. The role of innovation in the modern economy, innovations from Hungary
- Class 3. The basic concepts of innovation management
- Class 4. The basic models of the innovative process
- Class 5. The role of strategy in innovation activity
- Class 5. Nature of product innovations
- Class 6. The role of the marketing in the innovation ability
- Class 8. Nature of national innovation systems, Innovation and Society
- Class 9. Knowledge management, basics of intellectual property
- Class 10. Summary, presentations.

Course Material:

- Lecture notes and course handouts

Course Requirements: (Max.: 100 points)

- Presentation: **50 points** (min.: 25 points)
- Test: **50 points** (min.: 25 points)
- **Presentation:** Student teams will give a presentation (10 min), the topic of the innovation case study will be selected by the students.
- **Test:** Multiple choice and/or true-false.

Full-time BSc Courses

(Optional for Erasmus students, available in case of the presence of full-time students)

TECHNICAL CHEMISTRY

COURSE CODE: SMKKB2011XN
ECTS CREDITS: 3
TEACHING HOURS PER WEEK:
TEACHER: Dr. Györgyi KAMPFL
kampfl.gyorgyi@mkk.szie.hu

SHORT DESCRIPTION:

The course summarizes the essential basic knowledge of general-, organic-, inorganic-, applied- and polymer chemistry for an engineer working in practice. Particular emphasis is placed on the material science in practice. This subject is a primer course. The gained knowledge can be utilized in physics, material sciences, etc.

MATHEMATICS I.

COURSE CODE: SGMMAX01XXN
ECTS CREDITS: 6
**TEACHING HOURS
PER WEEK:**
TEACHER: Dr. Antal VERES
veres.antal@gek.szie.hu

SHORT DESCRIPTION:

The aim of the subject is to provide the knowledge needed by other subjects, embedded in the logical system of mathematics. Namely: Sets, relations, functions, set-related functions. The set of real numbers. Continuity, limit, differential calculus of real-real functions. Discussion of functions. Elementary real functions. Integral calculus of real-real functions. Application of integral calculus in physics and geometry.

MATERIALS

COURSE CODE: SGMGTX03XXN
ECTS CREDITS: 4
**TEACHING HOURS
PER WEEK:**
TEACHER: Dr. László ZSIDAI
zsidai.laszlo@gek.szie.hu

SHORT DESCRIPTION:

To get to know the basic regularity of material – structures and metallography. To get to know the important material testing processes used in practice. The theoretical basis of heat treatment of materials and the most often used processes. The properties and the standard symbols of the most important constructional and tool – steels, aluminium and copper alloys.

PHYSICS I.

COURSE CODE: SGMFFX11XXN
ECTS CREDITS: 4
**TEACHING HOURS
PER WEEK:**
TEACHER: Dr. István SERES
seres.istvan@gek.szie.hu

SHORT DESCRIPTION:

The aim of the subject is to give a basic physics knowledge for the special subjects of the technical higher education. This first course of the two semesters subject introduces the mechanics of points, rigid bodies and stationary bodies with the help of the uniform method of mass and impulse balance equations. By giving the similarity conditions for fluid dynamics chapter it can based the further education during the engineering study. In the chapter about the waves the acoustic is stressed. At the end of the semester the thermodynamics is introduced.

FUNDAMENTALS OF ENGINEERING

COURSE CODE: SGMJHX15XXN
ECTS CREDITS: 3
**TEACHING HOURS
PER WEEK:**
TEACHER: Dr. Peter KISS
kiss.peter@gek.szie.hu

SHORT DESCRIPTION:

The connection of the humanity, machine and environment. Classification of the machines. Basic machine tools. Materials of the machines. Basics of mechanics. Drawbar pull, work, performance. Hydrostatics and hydrodynamics. Basic of thermodynamics. Burning. Internal combustion engines. Basics of electrical engineering. Electronics. Synthesis of machines and vehicles. Energy resources. Energy systems, environmental protection. Ergonomics. Standardization.

ENGINEERING THERMODYNAMICS

COURSE CODE: SGMETX25XXN
ECTS CREDITS: 4
**TEACHING HOURS
PER WEEK:**
TEACHER: Dr. János BEKE
beke.janos@gek.szie.hu

SHORT DESCRIPTION:

Mechanical Engineering, Mechanical Engineering for Agriculture and Food Industry. On the bases of relevant chapters of Mathematics, Physics and Hydraulics the subject gives comprehensive information for the connecting special subjects and the general engineering intelligence Main chapters: Principal Basics of Thermodynamics, Active Heat Transport (theory of energy conversion processes), Typical Thermodynamic Processes of Gas Engines, Bases of Passiv Heat Transport I. (heat trans-missions forms).

STATICS

COURSE CODE: SGMMCX02XXN
ECTS CREDITS: 4
**TEACHING HOURS
PER WEEK:**
TEACHER: Dr. Gábor KATONA
katona.gabor@gek.szie.hu

SHORT DESCRIPTION:

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.

BASIC ECONOMICS

COURSE CODE: SG2KG002N
ECTS CREDITS: 2
**TEACHING HOURS
PER WEEK:**
TEACHER: Dr. Mária FARKASNÉ FEKETE
farkasne.fekete.maria@gtk.szie.hu

SHORT DESCRIPTION:

The two main branches of economics are microeconomics and macroeconomics. This course examines both branches. Microeconomics looks at the behaviour of individuals, homes, businesses or even groups of these. Microeconomics looks at prices of things and of services. It wants to help people decide how to divide society's resources. To do this, microeconomics wants to understand how decisions are made and how these small decisions affect bigger things. Macroeconomics looks at all the economy. It tries to explain the causes of numbers like national income, equilibrium, economic crisis, employment rates, and inflation.

DESCRIPTIVE GEOMETRY

COURSE CODE: SGMMCX16XXN
ECTS CREDITS: 3
TEACHING HOURS:
PER WEEK:
TEACHER: János BAKK
bakk.janos@gek.szie.hu

SHORT DESCRIPTION:

Summarising basic geometrics. Demonstration of common and different characteristics of depiction. Geometrical depiction of points and elements in engineering practice. Graphic solutions of space geometric problems. Developing graphic skills, drawing and understanding developing space visualising skills.