Study plan

Name of study plan: 16 151 NSTI BLP 2012 základ

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Mechanical Engineering
Type of study: Follow-up master
Required credits: 129
Elective courses credits: -1
Sum of credits in the plan: 128
Note on the plan:

Name of the block: Compulsory courses in the program
Minimal number of credits of the block: 93
The role of the block: P

Code of the group: 12NS*1P-BLP
Name of the group: 2012 NSTI 1.sem povinné BLP
Requirement credits in the group: In this group you have to gain 25 credits
Requirement courses in the group: In this group you have to complete 6 courses
Credits in the group: 25
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* **authors** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2013054	**Mathematics for Mechanics**	Z	4	3P+1C	*	P
2311075	**Mechanics of Mechanisms** *Václav Bauma, Petr Beneš, Zden k Neusser, Zbyn k Šika, Michael Valášek, Jan Zav el* **Michael Valášek** *Michael Valášek (Gar.)*	ZK	4	3P+0C	*	P
2141093	**Microelectronics** *Stanislava Papežová* **Stanislava Papežová** *Stanislava Papežová (Gar.)*	Z,ZK	3	2P+0C+1L	*	P
2361035	**Theory and Construction of Instruments** *Jan Hošek* **Jan Hošek** *Jan Hošek (Gar.)*	Z,ZK	3	2P+1C	*	P

Characteristics of the courses of this group of Study Plan: Code=12NS*1P-BLP Name=2012 NSTI 1.sem povinné BLP

2013054	Mathematics for Mechanics	Z	4

Summary: Tensor calculus. Introduction to functional analysis. Calculus of variations. • Orthogonal transformation of coordinate systems. • Afinne orthogonal tensors and tensor operations. • Tensor as linear operator and bilinear form. • Metrics and metric spaces. Convergence. Completness. • Linear normed space. Banach space. • Linear space with scalar product (unitary space). Hilbert space. • Contractive operators and Banach fixed point theorem. • Function spaces in examples. • Operators and functionals. Linear, continuous and bounded operator/functional. • Derivative of a functional in the given direction. Gateaux differential and derivative. • Necessary and sufficient conditions for extremes of a functional. • Convex set and convex functional. Minimum of convex functional. • Extremes of functional of different types. Euler equation. Necessary and sufficient conditions for extrema. • Discrete methods for approximation of the minima of an functional. Ritz method.

2311075	Mechanics of Mechanisms	ZK	4

2141093	Microelectronics	Z,ZK	3

Basic characteristics of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converters, coding, lines and protocols of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.

2361035	Theory and Construction of Instruments	Z,ZK	3

Subject gives knowledge about basics of instruments design in order student would be able to design different kinds of mechanical instruments.

Code of the group: 12NS*2P-BLP
Name of the group: 2012 NSTI 2.sem povinné BLP
Requirement credits in the group: In this group you have to gain 28 credits
Requirement courses in the group: In this group you have to complete 7 courses
Credits in the group: 28
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2142027	**Electrical Engineering for Applied Mechanics** *Stanislava Papežová **Stanislava Papežová** Stanislava Papežová (Gar.)*	KZ	3	2P+0C+1L	*	P
2313076	**Simulation of Mechatronic Systems** *Michael Valášek*	Z	2	0+2	*	P
2111049	**Theory of elasticity** *Dušan Gabriel **Dušan Gabriel** Dušan Gabriel (Gar.)*	ZK	4	3P+0C	*	P

Characteristics of the courses of this group of Study Plan: Code=12NS*2P-BLP Name=2012 NSTI 2.sem povinné BLP

2142027	Electrical Engineering for Applied Mechanics	KZ	3
	The purpose of the course is to give the student knowledge about different types of electrical drives for mechatronic systems and their practical use. Method for electromagnetic field approximative solution. The theory of linear and rotating drivers. Electromagnets supplied by AC and DC power. Static and dynamics parameters of electromagnets. Drives for rotating motion. DC motors. Mathematical description of their static and dynamic properties. Principle and function of stepper motor. AC induction motors. Mathematical description of their static and dynamic properties. Using MATLAB for drivers behaviour modelling.		
2313076	Simulation of Mechatronic Systems	Z	2
2111049	Theory of elasticity	ZK	4
	The objective of this course is an introduction to the theory and applications of linear elasticity.It also provides the foundation for pursuing other solid mechanics courses such as theory of plasticity, fracture mechanics, composite structures, theory of plates and shells or continuum mechanics. This course introduces the basic definitions of stress and strain tensors used in the linear theory of elasticity, determines the principal stress and strain, derives equilibrium equations, compatibility conditions for strain tensor, postulates the constitutive relations for linear elastic material (generalized Hooke's law).The governing differential equations of elasticity are derived including the Navier's equation expressed in terms of the displacement vector and the Beltrami-Michell's equation expressed in terms of the stress tensor. Next, two-dimensional problems in cartesian and cylindrical coordinate systems is considered andthe Airy stress function is introduced for the solution of these problems. A few useful application are studied such as bending of a beam using the Airy stress function in the form of a polynomial, the stress distibution in a plate with small circular hole submitted to a uniform tension, the stress distibution for a concentrated vertical force action on a horizontal straight boundary, the stress distibution in a wedge due to a concentrated force at its apex. Finally, a brief introduction to the energy principles in solid mechanics is presented including the principles of virtual displacements and virtual forces.		

Code of the group: 12NS*3P-BLP

Name of the group: 2012 NSTI 3.sem povinné BLP

Requirement credits in the group: In this group you have to gain 19 credits

Requirement courses in the group: In this group you have to complete 6 courses

Credits in the group: 19

Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2111083	**Continuum Mechanics** *Miroslav Španiel, Jan ezní ek, Ji í Plešek **Ji í Plešek** Ji í Plešek (Gar.)*	ZK	4	3P+0C	*	P
2313079	**Statistical Mechanics** *Michael Valášek*	Z	3	0P+3C	*	P

Characteristics of the courses of this group of Study Plan: Code=12NS*3P-BLP Name=2012 NSTI 3.sem povinné BLP

2111083	Continuum Mechanics	ZK	4
2313079	Statistical Mechanics	Z	3

Code of the group: 12NS*4P-BLP

Name of the group: 2012 NSTI 4.sem povinné BLP

Requirement credits in the group: In this group you have to gain 21 credits

Requirement courses in the group: In this group you have to complete 6 courses

Credits in the group: 21

Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2323010	**Biomaterials and Biotorelance**	Z	3	2P+0C	*	P
2361196	**Pathophysiology** *Jan Hošek*	Z,ZK	4	2P+2L	*	P
2383062	**Budget and Project Economic Assessment** *Miroslav Žilka Miroslav Žilka (Gar.)*	Z	2	1P+2C	*	P
2311019	**Synthesis and Optimization of Mechanical Systems** *Václav Bauma, Petr Beneš, Zbyn k Šika, Michael Valášek, Jan Zav el **Michael Valášek** Zbyn k Šika (Gar.)*	ZK	3	2P+0C	*	P
2361018	**Fundamentals of Analytical and Measurement Methods in Medicine**	Z,ZK	5	2P+2L	*	P

Characteristics of the courses of this group of Study Plan: Code=12NS*4P-BLP Name=2012 NSTI 4.sem povinné BLP

2323010	Biomaterials and Biotorelance		Z	3
Biocompatibility ? basic terms and definitions. Biometarials ? survey, use in medicine. Properties and structure of materials and their relation with the living human system. Methods of assessment of structure and composition of materials. Mechanical properties of biomaterials : metals, ceramics, plastics, carbon, composites. Immune system, tests of biocompatibility, fundamentals of the bond of the living tissue with the material; sterilization. Morphology, roughness and tribological properties of surfaces of biomaterials; effect of chemical properties of the surfaces of biomaterials and corrosion resistance on biocompatibility. Surface treatment ? creation and application of thin layers and coatings. Examples of the development of a biocompatible material for the shank of an endo replacement (composite PEEK+C fibres), heart pump (TiN layer), preparation and properties of TiNi with plasma spray.				
2361196	Pathophysiology		Z,ZK	4
2383062	Budget and Project Economic Assessment		Z	2
The goal of the course is to improve the knowledge gained within the basic bachelor's degree course Management and Economics of the Enterprise. The course focuses primarily on deepening of basic knowledge and skills in the creation and evaluation of the operational budget, proper preparation and evaluation of costing model for manufactured products and the economic evaluation of an investment project, as it corresponds to contemporary knowledge and the development of management methods and techniques. Students specify a simple fictional industrial or engineering company or its sub-section (preferably inspired by their practical experience, internships or training program in real company). The first student's task is to prepare a detailed plan and budget of a project (e.g. new product development, product or process innovation, etc.) focused on improvement of profitability, competitiveness or effectiveness of the company. The second task is cost calculation for chosen calculation unit. Last task within this course is the evaluation of economical effectiveness of the project described within the first task. The dynamic methods like Net Present Value (NPV), Internal Rate of Return (IRR) or Discounted Payback Period (DPP) are used for this evaluation. The quality of realization and presentation of the task's outputs together with the results of the test decides on granting / denial of credit.				
2311019	Synthesis and Optimization of Mechanical Systems		ZK	3
2361018	Fundamentals of Analytical and Measurement Methods in Medicine		Z,ZK	5

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 36
The role of the block: PV

Code of the group: 12N**3Q--JV
Name of the group: 2012 N 3.sem povinná jazyková výuka
Requirement credits in the group: In this group you have to gain 2 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 2
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2043081	**English - Preparatory Course / FME** *Eliška Vítková, Ilona Šimice, Michaela Schusová, Veronika Kratochvílová, Hana Volejníková, Nina Procházková Ayyub* **Nina Procházková Ayyub**	Z	2	0P+2C	*	PV
2043086	**Czech - Preparatory Course** *Michaela Schusová, Hana Volejníková, Petr Laurich*	Z	2	0P+2C	*	PV
2043083	**French - Preparatory Course / FME** *Michaela Schusová, Dušana Jirovská* **Michaela Schusová** *Michaela Schusová (Gar.)*	Z	2	0P+2C	*	PV
2043082	**German - Lower Intermediate Course** *Eliška Vítková, Michaela Schusová, Petr Laurich, Jaroslava Kommová* **Jaroslava Kommová**	Z	2	0P+2C	*	PV
2043085	**Russian - Preparatory Course / FME** *Eliška Vítková, Michaela Schusová, Hana Volejníková, Dušana Jirovská* **Eliška Vítková**	Z	2	0P+2C	*	PV
2043084	**Spanish - Preparatory Course / FME** *Eliška Vítková, Michaela Schusová, Jaime Andrés Villagómez* **Eliška Vítková**	Z	2	0P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12N**3Q--JV Name=2012 N 3.sem povinná jazyková výuka

2043081	English - Preparatory Course / FME		Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. European level A1 - A2.				
2043086	Czech - Preparatory Course		Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.				
2043083	French - Preparatory Course / FME		Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.				
2043082	German - Lower Intermediate Course		Z	2
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.				
2043085	Russian - Preparatory Course / FME		Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.				

2043084	Spanish - Preparatory Course / FME		Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.				

Code of the group: 12N**3Q--JZ

Name of the group: 2012 N 3.sem povinná jazyková zkouška

Requirement credits in the group: In this group you have to gain 1 credit

Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 1

Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* **authors** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2041081	**English - Master Exam** *Eliška Vítková, Ilona Šimice, Michaela Schusová, Veronika Kratochvílová, Hana Volejníková, Nina Procházková Ayyub* **Nina Procházková Ayyub**	ZK	1	0P+0C	*	PV
2041086	**Czech- Master Exam** *Michaela Schusová, Hana Volejníková, Petr Laurich*	ZK	1	0P+0C	*	PV
2041083	**French - Master Exam / FME** *Eliška Vítková, Michaela Schusová, Dušana Jirovská* **Dušana Jirovská** *Michaela Schusová (Gar.)*	ZK	1	0P+0C	*	PV
2041082	**German - Master Exam / FME** *Eliška Vítková, Michaela Schusová, Petr Laurich, Jaroslava Kommová* **Jaroslava Kommová**	ZK	1	0P+0C	*	PV
2041085	**Russian - Master Exam / FME** *Eliška Vítková, Michaela Schusová, Hana Volejníková, Dušana Jirovská, Petr Zitko* **Eliška Vítková**	ZK	1	0P+0C	*	PV
2041084	**Spanish - Master Exam / FME** *Eliška Vítková, Michaela Schusová, Jaime Andrés Villagómez* **Eliška Vítková**	ZK	1	0P+0C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12N**3Q--JZ Name=2012 N 3.sem povinná jazyková zkouška

2041081	English - Master Exam		ZK	1
Mapped to the level of Common European Framework of Reference: A2. Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.				
2041086	Czech- Master Exam		ZK	1
2041083	French - Master Exam / FME		ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.				
2041082	German - Master Exam / FME		ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.				
2041085	Russian - Master Exam / FME		ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.				
2041084	Spanish - Master Exam / FME		ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.				

Code of the group: 12NS*1Q-BLP

Name of the group: 2012 NSTI 1.sem 1povvol BLP Projekt I.

Requirement credits in the group: In this group you have to gain 5 credits

Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 5

Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* **authors** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2363111	**Project I.** *Jan Hošek*	Z	5	0P+5C	*	PV
2113111	**Project I.** *Jan Zav el, Miroslav Španiel, Milan R ži ka* **Miroslav Španiel** *Miroslav Španiel (Gar.)*	Z	5	0P+5C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12NS*1Q-BLP Name=2012 NSTI 1.sem 1povvol BLP Projekt I.

2363111	Project I.		Z	5
2113111	Project I.		Z	5

Code of the group: 12NS*2Q-BLP
Name of the group: 2012 NSTI 2.sem 1povvol BLP Projekt II.
Requirement credits in the group: In this group you have to gain 5 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 5
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* **authors** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2363112	**Project II.** *Jan Hošek*	Z	5	0P+5C	*	PV
2113112	**Project II.** *Miroslav Španiel, Jan ezní ek, Milan R ži ka, Michal Bartošák, Karel Doubrava, Karel Vítek, Martin Nesládek, Ji í Kuželka, Zden k Padovec, ...* **Ctirad Novotný** *Miroslav Španiel (Gar.)*	Z	5	0P+5C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12NS*2Q-BLP Name=2012 NSTI 2.sem 1povvol BLP Projekt II.

2363112	Project II.		Z	5
2113112	Project II.		Z	5

Code of the group: 12NS*3Q-BLP
Name of the group: 2012 NSTI 3.sem 1povvol BLP Projekt III.
Requirement credits in the group: In this group you have to gain 10 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 10
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* **authors** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2363113	**Project III.** *Jan Hošek*	Z	10	0P+10C	*	PV
2113113	**Project III.** *Dušan Gabriel, Miroslav Španiel, Jan ezní ek, Milan R ži ka, Michal Bartošák, Karel Doubrava, Karel Vítek, Martin Nesládek, Ji í Kuželka, ...* **Miroslav Španiel** *Miroslav Španiel (Gar.)*	Z	10	0P+10C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12NS*3Q-BLP Name=2012 NSTI 3.sem 1povvol BLP Projekt III.

2363113	Project III.		Z	10
	The project for precision mechanics and optics, including presentation. It develops the student´s capabilities to go through all stages of the engineering problem solution: in particular the formulation of the problem under research, conceptual design of the solution, its optimization and bringing to design solutions. Projects will be awarded on specified topics from industry or research projects.			
2113113	Project III.		Z	10

Code of the group: 12NS*4Q-BLP
Name of the group: 2012 NSTI 4.sem 1povvol BLP
Requirement credits in the group: In this group you have to gain 3 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 3
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* **authors** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2363030	**Nanotechnology** *Jan Hošek*	Z	3	2P+0C+1L	*	PV
2113017	**Basic of Engineering Experimentals** *Karel Doubrava, Pavel Steinbauer, Václav Uruba* **Karel Doubrava** *Karel Doubrava (Gar.)*	Z	3	2P+1C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12NS*4Q-BLP Name=2012 NSTI 4.sem 1povvol BLP

2363030	Nanotechnology		Z	3
	Introduction to physics and chemistry of nanomaterials, the foundations of crystallography, surface properties, phenomena expected for nanocrystals and their applications, stabilization of nanoparticles, formation of nucleuse and the crystal growth, nanowires, thin films, fullerenes, nanotubes, nanodiamand, polymer nanocomposites, nanofluids, application of the most common nanomaterials, photo and X-ray lithography, electron and ionic machining, nanomanipulation, STM microscope, AFM microscope, micromechanical structures, nanotechnology applications in engineering, health risks of nanotechnology.			

2113017	Basic of Engineering Experimentals	Z	3

Code of the group: 12NS*4Q-BLP-DP

Name of the group: 2012 NSTI 4.sem 1povvol BLP - Diplomová práce

Requirement credits in the group: In this group you have to gain 10 credits

Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 10

Note on the group: 2363998 není sepsán

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* **authors** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2363998	**Diploma Thesis** Jan Hošek	Z	10	0P+10C		PV
2113998	**Diploma Project** *Miroslav Španiel, Jan ezní ek, Milan R ži ka, Michal Bartošák, Karel Doubrava, Karel Vítek, Martin Nesládek, Ji í Kuželka, Zden k Padovec, ...* **Tomáš Mareš** *Miroslav Španiel (Gar.)*	Z	10	0P+10C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12NS*4Q-BLP-DP Name=2012 NSTI 4.sem 1povvol BLP - Diplomová práce

2363998	Diploma Thesis	Z	10
2113998	Diploma Project	Z	10

List of courses of this pass:

Code	Name of the course	Completion	Credits
2013054	Mathematics for Mechanics	Z	4
	Summary: Tensor calculus. Introduction to functional analysis. Calculus of variations. • Orthogonal transformation of coordinate systems. • Afinne orthogonal tensors and tensor operations. • Tensor as linear operator and bilinear form. • Metrics and metric spaces. Convergence. Completeness. • Linear normed space. Banach space. • Linear space with scalar product (unitary space). Hilbert space. • Contractive operators and Banach fixed point theorem. • Function spaces in examples. • Operators and functionals. Linear, continuous and bounded operator/functional. • Derivative of a functional in the given direction. Gateaux differential and derivative. • Necessary and sufficient conditions for extremes of a functional. • Convex set and convex functional. Minimum of convex functional. • Extremes of functional of different types. Euler equation. Necessary and sufficient conditions for extrema. • Discrete methods for approximation of the minima of a functional. Ritz method.		
2041081	English - Master Exam	ZK	1
	Mapped to the level of Common European Framework of Reference: A2. Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		
2041082	German - Master Exam / FME	ZK	1
	Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.		
2041083	French - Master Exam / FME	ZK	1
	Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.		
2041084	Spanish - Master Exam / FME	ZK	1
	Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.		
2041085	Russian - Master Exam / FME	ZK	1
	Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.		
2041086	Czech- Master Exam	ZK	1
2043081	English - Preparatory Course / FME	Z	2
	Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. European level A1 - A2.		
2043082	German - Lower Intermediate Course	Z	2
	Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.		
2043083	French - Preparatory Course / FME	Z	2
	Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		
2043084	Spanish - Preparatory Course / FME	Z	2
	Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		

2043085	Russian - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043086	Czech - Preparatory Course	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2111049	Theory of elasticity	ZK	4
The objective of this course is an introduction to the theory and applications of linear elasticity.It also provides the foundation for pursuing other solid mechanics courses such as theory of plasticity, fracture mechanics, composite structures, theory of plates and shells or continuum mechanics. This course introduces the basic definitions of stress and strain tensors used in the linear theory of elasticity, determines the principal stress and strain, derives equilibrium equations, compatibility conditions for strain tensor, postulates the constitutive relations for linear elastic material (generalized Hooke's law).The governing differential equations of elasticity are derived including the Navier's equation expressed in terms of the displacement vector and the Beltrami-Michell's equation expressed in terms of the stress tensor. Next, two-dimensional problems in cartesian and cylindrical coordinate systems is considered andthe Airy stress function is introduced for the solution of these problems. A few useful application are studied such as bending of a beam using the Airy stress function in the form of a polynomial, the stress distibution in a plate with small circular hole submitted to a uniform tension, the stress distibution for a concentrated vertical force action on a horizontal straight boundary, the stress distibution in a wedge due to a concentrated force at its apex. Finally, a brief introduction to the energy principles in solid mechanics is presented including the principles of virtual displacements and virtual forces.			
2111083	Continuum Mechanics	ZK	4
2113017	Basic of Engineering Experimentals	Z	3
2113111	Project I.	Z	5
2113112	Project II.	Z	5
2113113	Project III.	Z	10
2113998	Diploma Project	Z	10
2141093	Microelectronics	Z,ZK	3
Basic characteristics of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converters, coding, lines and protocols of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.			
2142027	Electrical Engineering for Applied Mechanics	KZ	3
The purpose of the course is to give the student knowledge about different types of electrical drives for mechatronic systems and their practical use. Method for electromagnetic field approximative solution. The theory of linear and rotating drivers. Electromagnets supplied by AC and DC power. Static and dynamics parameters of electromagnets. Drives for rotating motion. DC motors. Mathematical description of their static and dynamic properties. Principle and function of stepper motor. AC induction motors. Mathematical description of their static and dynamic properties. Using MATLAB for drivers behaviour modelling.			
2311019	Synthesis and Optimization of Mechanical Systems	ZK	3
2311075	Mechanics of Mechanisms	ZK	4
2313076	Simulation of Mechatronic Systems	Z	2
2313079	Statistical Mechanics	Z	3
2323010	Biomaterials and Biotorelance	Z	3
Biocompatibility ? basic terms and definitions. Biometarials ? survey, use in medicine. Properties and structure of materials and their relation with the living human system. Methods of assessment of structure and composition of materials. Mechanical properties of biomaterials : metals, ceramics, plastics, carbon, composites. Immune system, tests of biocompatibility, fundamentals of the bond of the living tissue with the material; sterilization. Morphology, roughness and tribological properties of surfaces of biomaterials; effect of chemical properties of the surfaces of biomaterials and corrosion resistance on biocompatibility. Surface treatment ? creation and application of thin layers and coatings. Examples of the development of a biocompatible material for the shank of an endo replacement (composite PEEK+C fibres), heart pump (TiN layer), preparation and properties of TiNi with plasma spray.			
2361018	Fundamentals of Analytical and Measurement Methods in Medicine	Z,ZK	5
2361035	Theory and Construction of Instruments	Z,ZK	3
Subject gives knowledge about basics of instruments design in order student would be able to design different kinds of mechanical instruments.			
2361196	Pathophysiology	Z,ZK	4
2363030	Nanotechnology	Z	3
Introduction to physics and chemistry of nanomaterials, the foundations of crystallography, surface properties, phenomena expected for nanocrystals and their applications, stabilization of nanoparticles, formation of nucleuse and the crystal growth, nanowires, thin films, fullerenes, nanotubes, nanodiamand, polymer nanocomposites, nanofluids, application of the most common nanomaterials, photo and X-ray lithography, electron and ionic machining, nanomanipulation, STM microscope, AFM microscope, micromechanical structures, nanotechnology applications in engineering, health risks of nanotechnology.			
2363111	Project I.	Z	5
2363112	Project II.	Z	5
2363113	Project III.	Z	10
The project for precision mechanics and optics, including presentation. It develops the student´s capabilities to go through all stages of the engineering problem solution: in particular the formulation of the problem under research, conceptual design of the solution, its optimization and bringing to design solutions. Projects will be awarded on specified topics from industry or research projects.			
2363998	Diploma Thesis	Z	10
2383062	Budget and Project Economic Assessment	Z	2
The goal of the course is to improve the knowledge gained within the basic bachelor's degree course Management and Economics of the Enterprise. The course focuses primarily on deepening of basic knowledge and skills in the creation and evaluation of the operational budget, proper preparation and evaluation of costing model for manufactured products and the economic evaluation of an investment project, as it corresponds to contemporary knowledge and the development of management methods and techniques. Students specify a simple fictional industrial or engineering company or its sub-section (preferably inspired by their practical experience, internships or training program in real company). The first student's task is to prepare a detailed plan and budget of a project (e.g. new product development, product or process innovation, etc.) focused on improvement of profitability, competitiveness or effectiveness of the company. The second task is cost calculation for chosen calculation unit. Last task within this course is the evaluation of economical effectiveness of the project described within the first task. The dynamic methods like Net Present Value (NPV), Internal Rate of Return (IRR) or Discounted Payback Period (DPP) are used for this evaluation. The quality of realization and presentation of the task's outputs together with the results of the test decides on granting / denial of credit.			

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