Study plan

Name of study plan: 13 136 NSTI MMT 2012 základ

Faculty/Institute/Others: Department: Branch of study guaranteed by the department: Welcome page Garantor of the study branch: Program of study: Welcome page Type of study: unknown Required credits: 157 Elective courses credits: -28 Sum of credits in the plan: 129 Note on the plan:

Name of the block: Compulsory courses in the program Minimal number of credits of the block: 122 The role of the block: P

Code of the group: 12NS*1P-MMT Name of the group: 2012 NSTI 1.sem povinné MMT Requirement credits in the group: In this group you have to gain 31 credits Requirement courses in the group: In this group you have to complete 8 courses Credits in the group: 31 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 Petr Svá ek	Z	4	3P+1C	*	Р
2311075	Mechanics of Mechanisms Jan Pelikán, Václav Bauma, Petr Beneš, Zden k Neusser, Zbyn k Šika, Michael Valášek, Jan Zav el Zbyn k Šika Zbyn k Šika (Gar.)	ZK	4	3P+0C	*	Р
2141093	Microelectronics Lukáš Novák, Stanislava Papežová Stanislava Papežová Lukáš Novák (Gar.)	Z,ZK	3	2P+0C+1L	*	Р
2012018	Ordinary Differential Equations Tomáš Neustupa, Lud k Beneš Tomáš Neustupa (Gar.)	KZ	3	2P+1C	*	Р
2013111	Project I Lud k Beneš, Jan Valášek, Petr Louda, Vladimír Prokop, Ivana Linkeová, Jan Halama, Ji í Fürst, Jaroslav Fo t, Gejza Dohnal, Ji í Fürst Jan Halama (Gar.)	Z	5	0P+5C	*	Р
2121016	Theoretical Fluid Mechanics Tomáš Hyhlík Tomáš Hyhlík (Gar.)	ZK	4	3P+0C	*	Р

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

2013054 Mathematics for Mechanics 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 7K 4 2141093 Z,ZK 3 Microelectronics 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. 2012018 Ordinary Differential Equations ΚZ 3 The course expect the understanding of the subjects of previous study on "Alpha" level. Outline of concepts and technics of solving differential equations of first order. Autonomous systems. Geometrical aspects of phase plane. Stability of solution. 2013111 Project I 7 5 2121016 **Theoretical Fluid Mechanics** ΖK 4 The study subject aim is to expand the students knowledge gained from the previous subject Thermomechanics Alfa. The attention is focussed namely on fluids characteristics, various description methods of fluid dynamics under low and high Re number values, boundary layer characteristics and its stability and complex flow characteristics for incompressible flow.

Code of the group: 12NS*2P-MMT Name of the group: 2012 NSTI 2.sem povinné MMT Requirement credits in the group: In this group you have to gain 29 credits Requirement courses in the group: In this group you have to complete 9 courses Credits in the group: 29

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
2013030	Numerical Solution of Ordinary and Partial Differential Equations Lud k Beneš, Jan Halama Jan Halama Jan Halama (Gar.)	Z	2	2P+0C	*	Р
2011088	Partial Differential Equations I Stanislav Kra mar Stanislav Kra mar (Gar.)	ZK	5	2P+1C	*	Ρ
2012030	Probability and Statistics Gejza Dohnal	KZ	2	2P+0C	*	Ρ
2013112	Project II Lud k Beneš, Jan Valášek, Vladimír Prokop, Ivana Linkeová, Jan Halama, Ji í Fürst, Jaroslav Fo t, Petr Svá ek, Jan Karel, Ji í Fürst Jan Halama (Gar.)	Z	5	0P+5C	*	Ρ
2123018	Heat and Mass Transfer Pavel Sláma	Z	2	2P+0C	*	Р
2311076	Simulation of Mechatronic Systems Jan Pelikán, Václav Bauma, Zbyn k Šika, Michael Valášek, Jan Zav el Zbyn k Šika Zbyn k Šika (Gar.)	ZK	3	2P+0C	*	Ρ
2111049	Theory of elasticity Dušan Gabriel Dušan Gabriel (Gar.)	ZK	4	3P+0C	*	Ρ
2121055	Thermodynamics Tomáš Hyhlík Tomáš Hyhlík (Gar.)	ZK	4	3P+0C	*	Ρ

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

2013030	Numerical Solution of Ordinary and Partial Differential Equations	Z	2				
Course covers the overview of clasical numerical methods for the solution of evolution problems for ODEs and PDEs. Students get familiar with discretization errors, stability of schemes							
and convergence of solution. Emphasis is put on a practical use of numerical methods (choice of method, discretization,).							
2011088	Partial Differential Equations I	ZK	5				
The course contains the	essential parts of the classical theory of partial differential equations (PDE), first-order equations, the classification of secor	nd-order equations	s, the derivation				
of some important equa	tions of mathematical physics, the method of characteristics, the Fourier method of the series. The theory of elliptical equation	ons, principles of r	naxima, the				
uniqueness of solutions	, potential methods, the concept of a fundamental solution and the method of the Green functions will be discussed in more	detail. Students w	ill be acquainted				
with the apparatus used	in the field of partial differential equations: Fourier transform and its use. Distributions and generalized derivatives. Important	inequalities: Fried	Irich's inequality,				
Poincare's inequality, Mir	nkowsky inequality, Mathematical means used in the so-called modern PDE theory will be discussed, the basis of which will be the	ne subject of PDE	II: Fundamentals				
of functional analysis: H	ilbert spaces, Banach spaces, and their properties, linear operators in these spaces. Riesz's theorem. The concept of the co	ntinuous embeddi	ng and the				
compact embedding. Co	provergent and weakly convergent sequences. Sobolev spaces, the theorem on the equivalence of norms, the theorem on tra	ces of functions fr	om Sobolev's				
space, assertions on co	ntinuous and compact embeddings of Sobolev spaces. Introduction in variational methods of PDE. Using the results of the fu	inctional analysis	to introduce and				
study weak solutions of	elliptic, parabolic and hyperbolic equations.						
2012030	Probability and Statistics	KZ	2				
2013112	Project II	Z	5				
2122010	Heat and Mass Transfer	7	2				
2123010			2				
The course extends the	knowledge gained in the subject Thermomechanics Alfa especially in the area of heat transfer. Attention is paid to more con	ן ∠ nplex cases (non-s	∠ stationary,				
The course extends the multidimensional proble	knowledge gained in the subject Thermomechanics Alfa especially in the area of heat transfer. Attention is paid to more com ms) as well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers).	ן ∠ חplex cases (non-s	Z stationary,				
The course extends the multidimensional proble 2311076	knowledge gained in the subject Thermomechanics Alfa especially in the area of heat transfer. Attention is paid to more comms) as well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers). Simulation of Mechatronic Systems	nplex cases (non-s	z stationary, 3				
The course extends the multidimensional proble 2311076 2111049	knowledge gained in the subject Thermomechanics Alfa especially in the area of heat transfer. Attention is paid to more comms) as well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers). Simulation of Mechatronic Systems Theory of elasticity	Z nplex cases (non-s ZK ZK	z stationary, <u>3</u> 4				
The course extends the multidimensional proble 2311076 2111049 The objective of this cou	knowledge gained in the subject Thermomechanics Alfa especially in the area of heat transfer. Attention is paid to more comms) as well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers). Simulation of Mechatronic Systems Theory of elasticity rse is an introduction to the theory and applications of linear elasticity. It also provides the foundation for pursuing other solid r	z nplex cases (non-s ZK ZK nechanics course:	z stationary, 3 4 s such as theory				
The course extends the multidimensional proble 2311076 2111049 The objective of this cour of plasticity, fracture me	In the area of heat transfer. Attention is paid to more commonly as well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers). Simulation of Mechatronic Systems Theory of elasticity Irse is an introduction to the theory and applications of linear elasticity. It also provides the foundation for pursuing other solid r chanics, composite structures, theory of plates and shells or continuum mechanics. This course introduces the basic definition	ZK ZK ZK nechanics course ons of stress and s	stationary, 3 4 s such as theory strain tensors				
The course extends the multidimensional proble 2311076 2111049 The objective of this cour of plasticity, fracture me used in the linear theory	In the area of heat transfer. Attention is paid to more commonly as well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers). Simulation of Mechatronic Systems Theory of elasticity Irse is an introduction to the theory and applications of linear elasticity. It also provides the foundation for pursuing other solid rechanics, composite structures, theory of plates and shells or continuum mechanics. This course introduces the basic definition of elasticity, determines the principal stress and strain, derives equilibrium equations, compatibility conditions for strain tens	ZK ZK ZK nechanics course ons of stress and s sor, postulates the	stationary, 3 4 s such as theory strain tensors constitutive				
The course extends the multidimensional proble 2311076 2111049 The objective of this cour of plasticity, fracture me used in the linear theory relations for linear elasti	In the area of heat transfer. Attention is paid to more commonly as well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers). Simulation of Mechatronic Systems Theory of elasticity Irse is an introduction to the theory and applications of linear elasticity. It also provides the foundation for pursuing other solid rechanics, composite structures, theory of plates and shells or continuum mechanics. This course introduces the basic definition of elasticity, determines the principal stress and strain, derives equilibrium equations, compatibility conditions for strain tens c material (generalized Hooke's law). The governing differential equations of elasticity are derived including the Navier's equations of the structure including the Na	ZK ZK ZK nechanics course ons of stress and s sor, postulates the ation expressed in	3 3 4 s such as theory strain tensors constitutive terms of the				
The course extends the multidimensional proble 2311076 2111049 The objective of this cour of plasticity, fracture me used in the linear theory relations for linear elastii displacement vector and	In the area of heat transfer. Attention is paid to more commonly a well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers). Simulation of Mechatronic Systems Theory of elasticity Irse is an introduction to the theory and applications of linear elasticity. It also provides the foundation for pursuing other solid rechanics, composite structures, theory of plates and shells or continuum mechanics. This course introduces the basic definition of elasticity, determines the principal stress and strain, derives equilibrium equations, compatibility conditions for strain tenses c material (generalized Hooke's law). The governing differential equations of elasticity are derived including the Navier's equation the Beltrami-Michell's equation expressed in terms of the stress tensor. Next, two-dimensional problems in cartesian and contents.	ZK ZK ZK nechanics course ons of stress and s sor, postulates the ation expressed in ylindrical coordina	3 3 4 s such as theory strain tensors constitutive terms of the te systems is				
The course extends the multidimensional proble 2311076 2111049 The objective of this cour of plasticity, fracture me used in the linear theory relations for linear elasti displacement vector and considered andthe Airy	In the area of heat transfer. Attention is paid to more commonly as well as to processes where heat transfer is accompanied by simultaneous mass transfer. Attention is paid to more commonly as well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers). Simulation of Mechatronic Systems Theory of elasticity rise is an introduction to the theory and applications of linear elasticity. It also provides the foundation for pursuing other solid in the chanics, composite structures, theory of plates and shells or continuum mechanics. This course introduces the basic definition of elasticity, determines the principal stress and strain, derives equilibrium equations, compatibility conditions for strain tenses common and the Beltrami-Michell's equation expressed in terms of the stress tensor. Next, two-dimensional problems in cartesian and construction is introduced for the solution of these problems. A few useful application are studied such as bending of a basic	ZK ZK ZK nechanics course ons of stress and s sor, postulates the ation expressed in ylindrical coordina am using the Airy	3 3 4 s such as theory strain tensors constitutive terms of the te systems is stress function				
The course extends the multidimensional proble 2311076 2111049 The objective of this cour of plasticity, fracture me- used in the linear theory relations for linear elasti displacement vector and considered andthe Airy in the form of a polynom	In the area of heat transfer. Attention is paid to more commonly as well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers). Simulation of Mechatronic Systems Theory of elasticity Irse is an introduction to the theory and applications of linear elasticity. It also provides the foundation for pursuing other solid rechanics, composite structures, theory of plates and shells or continuum mechanics. This course introduces the basic definition of elasticity, determines the principal stress and strain, derives equilibrium equations, compatibility conditions for strain tenses c material (generalized Hooke's law). The governing differential equations of elasticity are derived including the Navier's equation the Beltrami-Michell's equation expressed in terms of the stress tensor. Next, two-dimensional problems in cartesian and construction is introduced for the solution of these problems. A few useful application are studied such as bending of a bear that is the stress distibution in a plate with small circular hole submitted to a uniform tension, the stress distibution for a concern	ZK ZK ZK nechanics courses ons of stress and s sor, postulates the ation expressed in ylindrical coordina am using the Airy trated vertical force	3 3 4 s such as theory strain tensors constitutive terms of the te systems is stress function te action on a				
The course extends the multidimensional proble 2311076 2111049 The objective of this cour of plasticity, fracture me- used in the linear theory relations for linear elasti displacement vector and considered andthe Airy in the form of a polynom horizontal straight bound	In the stress distibution in a wedge due to a concentrated force at its apex. Finally, a brief introduction to the energy principle	ZK ZK ZK nechanics courses ons of stress and s sor, postulates the ation expressed in ylindrical coordina am using the Airy trated vertical force es in solid mechar	3 3 4 s such as theory strain tensors constitutive terms of the te systems is stress function te action on a nics is presented				
The course extends the multidimensional proble 2311076 2111049 The objective of this cour of plasticity, fracture me- used in the linear theory relations for linear elasti displacement vector and considered andthe Airy in the form of a polynom horizontal straight bound including the principles	In the stress distibution in a wedge due to a concentrated force at its apex. Finally, a brief introduction to the energy principle of virtual displacements and virtual forces.	ZK ZK ZK nechanics courses ons of stress and s sor, postulates the ation expressed in ylindrical coordina am using the Airy trated vertical force es in solid mechar	3 4 s such as theory strain tensors constitutive terms of the te systems is stress function the action on a hics is presented				
The course extends the multidimensional proble 2311076 2111049 The objective of this course of plasticity, fracture me- used in the linear theory relations for linear elasti displacement vector and considered andthe Airy in the form of a polynom horizontal straight bound including the principles 2121055	Inext and Mass Transfer knowledge gained in the subject Thermomechanics Alfa especially in the area of heat transfer. Attention is paid to more com- ms) as well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers). Simulation of Mechatronic Systems Theory of elasticity Irse is an introduction to the theory and applications of linear elasticity. It also provides the foundation for pursuing other solid r chanics, composite structures, theory of plates and shells or continuum mechanics. This course introduces the basic definition of elasticity, determines the principal stress and strain, derives equilibrium equations, compatibility conditions for strain tense c material (generalized Hooke's law). The governing differential equations of elasticity are derived including the Navier's equa the Beltrami-Michell's equation expressed in terms of the stress tensor. Next, two-dimensional problems in cartesian and cy stress function is introduced for the solution of these problems. A few useful application are studied such as bending of a ber iaial, the stress distibution in a plate with small circular hole submitted to a uniform tension, the stress distibution for a concent dary, the stress distibution in a wedge due to a concentrated force at its apex. Finally, a brief introduction to the energy principle of virtual displacements and virtual forces. Thermodynamics	ZK Paper Cases (non-standing of stress and standing of stress and s	3 4 s such as theory strain tensors constitutive terms of the te systems is stress function te action on a hics is presented 4				

thermodynamics, multiphase- and multicomponent system characteristics and thermodynamics cycles of the real heat engines and machines also.

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

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

Requirement credits in the group: In this group you have to gain 30 credits Requirement courses in the group: In this group you have to complete 5 courses

Credits in the group: 30 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
2011098	Dynamic Systems	ZK	5	3P+0C	*	Р
2011083	Mathematical Modeling of Flow Problems Jan Halama, Ji í Fürst Ji í Fürst Ji í Fürst (Gar.)	ZK	6	3P+1C	*	Р
2111019	Continuum Mechanics	ZK	5	3P+0C	*	Р
2121043	Computational Fluid Mechanics Tomáš Hyhlík	ZK	4	3P+0C	*	Р
2013113	Project III Lud k Beneš, Jan Valášek, Vladimír Prokop, Ivana Linkeová, Jan Halama, Ji í Fürst, Petr Svá ek, Jan Karel, Ji í Holman, Ji í Fürst Jan Halama (Gar.)	Z	10	0P+10C	*	Ρ

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

2011098	Dynamic Systems	ZK	5			
2011083	Mathematical Modeling of Flow Problems	ZK	6			
2111019	Continuum Mechanics	ZK	5			
2121043	Computational Fluid Mechanics	ZK	4			
This course extends the knowledge gained in the course of Fluid Mechanics about the knowledge of computational fluid dynamics. Emphasis is placed on understanding the basic						
principles of computational fluid dynamics based on using commercial codes. Selected problems of internal and external aerodynamics are solved.						
2013113	Project III	Z	10			
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Code of the group: 12NS*4P-MMT

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

Requirement credits in the group: In this group you have to gain 32 credits

Requirement courses in the group: In this group you have to complete 7 courses

Credits in the group: 32

Note on the group:

není sepsán 2013998 DP

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
2013998	Diploma Thesis Lud k Beneš, Jan Valášek, Vladimír Prokop, Ivana Linkeová, Jan Halama, Ji í Fürst, Jaroslav Fo t, Petr Svá ek, Jan Karel, Jan Halama (Gar.)	Z	10	0P+10C		Р
2121056	Gas Dynamics Michal Schmirler Michal Schmirler (Gar.)	ZK	4	3P+0C	*	Ρ
2011069	Finite Element Method in Applications Petr Svá ek Petr Svá ek Petr Svá ek (Gar.)	ZK	4	2P+0C	*	Ρ
2013055	Numerical Methods in Engineering Tomáš Bodnár	Z	3	3P+0C	*	Ρ
2011084	Numerical Simulations of Flow in Engineering Applications <i>Petr Louda</i>	ZK	4	2P+0C	*	Ρ
2011089	Partial Differential Equations II	ZK	4	2P+0C	*	Р
2311019	Synthesis and Optimization of Mechanical Systems Václav Bauma, Petr Beneš, Zbyn k Šika, Michael Valášek, Jan Zav el Zbyn k Šika Zbyn k Šika (Gar.)	ZK	3	2P+0C	*	Р

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

2013998	Diploma Thesis	Z	10
2121056	Gas Dynamics	ZK	4
The study subjects aim	is to expand the students' knowledge gained from the previous Alfa versions of the bachelors subjects Fluid Mechanics and	Thermomechanic	s. It generalizes
the findings in the scope	e of compressible fluid flow; the attention is focussed on the several non-isentropic cycles as well as fundaments of non-station	onary and multidir	mensional flows.
2011069	Finite Element Method in Applications	ZK	4
Mathematical backgrou	nd of the finite element method. Banach and Hilbert spaces. Linear forms, bilinear forms, scalar product. Hölder and Cauchy	inequality. Lax-Mi	lgram theorem.
Lebesgue and Sobolev	spaces. Sobolev imbeddings theorem and the trace theorem. Green theorem. Substitution theorem. Poincare-Friedrichs inec	uality. Basic princ	iple of the finite
element method. Exam	ole of application for 1D problem, classical and weak solution, error estimates. Abstract variational formulation, Ritz and Gale	rkin problem. Exis	stence and
uniquness of the solution	n. Discrete Ritz and Galerkin problems. Cea's lemma (error estimate).		
2013055	Numerical Methods in Engineering	Z	3
2011084	Numerical Simulations of Flow in Engineering Applications	ZK	4
2011089	Partial Differential Equations II	ZK	4
2311019	Synthesis and Optimization of Mechanical Systems	ZK	3

Name of the block: Compulsory elective courses Minimal number of credits of the block: 35

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:

Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their Code Completion Credits Scope Semester Role members) Tutors, authors and guarantors (gar.) English - Preparatory Course / FME * 2043081 7 2 0P+2C ΡV Veronika Kratochvílová, Eliška Vítková, Ilona Šimice, Michaela Schusová, Hana Volejníková Nina Procházková Ayyub **Czech - Preparatory Course** 2043086 Ζ 2 0P+2C * ΡV Michaela Schusová, Hana Volejníková, Petr Laurich French - Preparatory Course / FME * Ζ 2 2043083 0P+2C ΡV Michaela Schusová, Dušana Jirovská Michaela Schusová Dušana Jirovská (Gar.) **German - Lower Intermediate Course** * 2043082 Ζ 2 0P+2C ΡV Eliška Vítková, Michaela Schusová, Petr Laurich, Jaroslava Kommová Jaroslava Kommová Jaroslava Kommová (Gar.) **Russian - Preparatory Course / FME** 2043085 Ζ 2 0P+2C ΡV Michaela Schusová, Hana Volejníková, Dušana Jirovská Eliška Vítková Spanish - Preparatory Course / FME 2 * 2043084 Ζ 0P+2C ΡV Michaela Schusová, Jaime Andrés Villagómez Eliška Vítková

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	n. Writing in a sin	nple 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 then	n. Writing in a sin	nple 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	t 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 then	n. Writing in a sin	nple 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 Veronika Kratochvílová, Eliška Vítková, Ilona Šimice, Michaela Schusová, Hana Volejníková, Michele Le Blanc, Nina Procházková Ayyub Nina Procházková Ayyub Ilona Šimice (Gar.)	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 Michaela Schusová, Dušana Jirovská Dušana Jirovská Dušana Jirovská (Gar.)	ZK	1	0P+0C	*	PV

2041082	German - Master Exam / FME Eliška Vítková, Michaela Schusová, Petr Laurich, Jaroslava Kommová Jaroslava Kommová Jaroslava Kommová (Gar.)	ZK	1	0P+0C	*	PV
2041085	Russian - Master Exam / FME Michaela Schusová, Hana Volejníková, Dušana Jirovská Eliška Vítková	ZK	1	0P+0C	*	PV
2041084	Spanish - Master Exam / FME Michaela Schusová, Jaime Andrés Villagómez Eliška Vítková Jaime Andrés Villagómez (Gar.)	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 C	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 sp	eaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of	of professional lar	nguage.		
2041086	Czech- Master Exam	ZK	1		
2041083	French - Master Exam / FME	ZK	1		
Mapped to the level of C	common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whic	h a student meets	s either at school		
or in his/her free time ar	nd speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improveme	nt of professional	language.		
2041082	German - Master Exam / FME	ZK	1		
Mapped to the level of C	common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whic	h a student meets	s either at school		
or in his/her free time ar	nd speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improveme	nt of professional	language.		
2041085	Russian - Master Exam / FME	ZK	1		
Mapped to the level of C	common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whic	h a student meets	s 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*4Q-MMT Name of the group: 2012 NSTI 4.sem 1povvol MMT Requirement credits in the group: In this group you have to gain 32 credits Requirement courses in the group: In this group you have to complete 7 courses Credits in the group: 32 Note on the group:

List of courses of this pass:

Code	Name of the course	Completion	Credits				
2011069	Finite Element Method in Applications	ZK	4				
Mathematical back	ground of the finite element method. Banach and Hilbert spaces. Linear forms, bilinear forms, scalar product. Hölder and Cauchy ine	quality. Lax-Milgra	m theorem.				
Lebesgue and Sol	polev spaces. Sobolev imbeddings theorem and the trace theorem. Green theorem. Substitution theorem. Poincare-Friedrichs inequal	lity. Basic principle	of the finite				
element method	I. Example of application for 1D problem, classical and weak solution, error estimates. Abstract variational formulation, Ritz and Galer	rkin problem. Exist	ence and				
	uniquness of the solution. Discrete Ritz and Galerkin problems. Cea's lemma (error estimate).						
2011083	Mathematical Modeling of Flow Problems	ZK	6				
2011084	Numerical Simulations of Flow in Engineering Applications	ZK	4				
2011088	Partial Differential Equations I	ZK	5				
The course contain	s the essential parts of the classical theory of partial differential equations (PDE), first-order equations, the classification of second-	order equations, th	e derivation				
of some importa	nt equations of mathematical physics, the method of characteristics, the Fourier method of the series. The theory of elliptical equation	ns, principles of ma	axima, the				
uniqueness of solu	tions, potential methods, the concept of a fundamental solution and the method of the Green functions will be discussed in more deta	ail. Students will be	acquainted				
with the apparatus	used in the field of partial differential equations: Fourier transform and its use. Distributions and generalized derivatives. Important ine	qualities: Friedrich	's inequality,				
Poincare's inequalit	y, Minkowsky inequality, Mathematical means used in the so-called modern PDE theory will be discussed, the basis of which will be the s	ubject of PDE II: Fu	undamentals				
of functional ana	lysis: Hilbert spaces, Banach spaces, and their properties, linear operators in these spaces. Riesz's theorem. The concept of the con	tinuous embeddin	g and the				
compact embedd	ing. Convergent and weakly convergent sequences. Sobolev spaces, the theorem on the equivalence of norms, the theorem on trace	s of functions from	I Sobolev's				
space, assertions of	on continuous and compact embeddings of Sobolev spaces. Introduction in variational methods of PDE. Using the results of the functi	ional analysis to in	troduce and				
	study weak solutions of elliptic, parabolic and hyperbolic equations.						
2011089	Partial Differential Equations II	ZK	4				
2011098	Dynamic Systems	ZK	5				
2012018	Ordinary Differential Equations	KZ	3				
The course expect	t the understanding of the subjects of previous study on "Alpha" level. Outline of concepts and technics of solving differential equatio	ns of first order. Au	utonomous				
	systems. Geometrical aspects of phase plane. Stability of solution.						
2012030	Probability and Statistics	KZ	2				
2013030	Numerical Solution of Ordinary and Partial Differential Equations	Z	2				
Course covers the	Course covers the overview of clasical numerical methods for the solution of evolution problems for ODEs and PDEs. Students get familiar with discretization errors, stability of schemes						

and convergence of solution. Emphasis is put on a practical use of numerical methods (choice of method, discretization, ...).

	Mathematics for Mechanics	~	4
Summary: Tensor c	Ilculus. Introduction to functional analysis. Calculus of variations. Orthogonal transformation of coordinate systems. Afinne orthogonal t	tensors and tensor	operations.
snace) Hilbert snac	perator and bilinear form. Metrics and metric spaces. Convergence, Completiness, Linear formed space, Banach space, Linear space	d bounded operato	r/functional
Derivative of a func	ional in the given direction. Gateaux differential and derivative. Necessary and sufficient conditions for extremes of a functional. Conv	vex set and convex	functional.
Minimum of conve	x functional. Extremes of functional of different types. Euler equation. Necessary and sufficient conditions for extrema. Discrete meth	ods for approxima	tion of the
	minima of an functional. Ritz method.		
2013055	Numerical Methods in Engineering	Z	3
2013111	Project I	Z	5
2013112	Project II	7	5
2013113	Project III	7	10
2013998	Dinloma Thesis	7	10
2041081	English - Master Exam	 7K	1
Mapped to the leve	I of Common European Framework of Reference: A2. Aim: Understanding clearly what is spoken about everyday situations which a	student meets at s	chool or in
his/her free tim	e and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement	of professional lar	guage.
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 s	student meets eith	er 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. Improvemen	t of professional la	anguage.
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 s	student meets eith	er 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. Improvemen	it of professional la	inguage.
2041084	Spanish - Master Exam / FME	ZK	1
or in his/her free	or Common European Framework or Reference AZ AIm: Understanding clearly spoken language about everyday situations which a state and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvement	student meets eith	er at school
2041085	Pussion - Master Exam / EME	7K	1
Mapped to the level	of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which as	student meets eith	er 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. Improvemen	it of professional la	inguage.
2041086	Czech- Master Exam	ZK	1
2043081	English - Preparatory Course / FME	Z	2
Aim: Understandin	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 s	student meets eith	er 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, improvemen		inguage.
2043083	FIGHTCH - PICEARATORY COURSE / FIME	ک Writing in a simple	Z way about
	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	writing in a simple	way about
2043084	Spanish - Preparatory Course / FME	Z	2
Aim: Understandin	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.		way about
0040005	Russian - Preparatory Course / FME		way about
2043085	· · ·	Z	2
Aim: Understandin	clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them.	Z Writing in a simple	2 way about
Aim: Understandin	g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z Writing in a simple	2 way about
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2043085 Aim: Understandin 2043086 Aim: Understandin	g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. I familiar topics. Reading and comprehension of simple texts. Improvement of professional language. Czech - Preparatory Course g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. I familiar topics. Reading and comprehension of simple texts. Improvement of professional language	Z Writing in a simple Z Writing in a simple	2 way about 2 way about
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2123018	Heat and Mass Transfer	Z	2		
The course extends the knowledge gained in the subject Thermomechanics Alfa especially in the area of heat transfer. Attention is paid to more complex cases (non-stationary,					
multidimensional problems) as well as to processes where heat transfer is accompanied by simultaneous mass transfer (mixing exchangers).					
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.					
2311019	Synthesis and Optimization of Mechanical Systems	ZK	3		
2311075	Mechanics of Mechanisms	ZK	4		
2311076	Simulation of Mechatronic Systems	ZK	3		

For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2025-04-08, time 08:49.