Study plan

Name of study plan: Fyzikální inženýrství materiál

Faculty/Institute/Others: Department: Branch of study guaranteed by the department: Welcome page Garantor of the study branch: Program of study: Physical Engineering of Materials Type of study: Follow-up master full-time Required credits: 0 Elective courses credits: 120 Sum of credits in the plan: 120 Note on the plan:

Name of the block: Compulsory courses in the program Minimal number of credits of the block: 0 The role of the block: P

Code of the group: NMSPFIM1 Name of the group: MDP P_FIMN 1st year Requirement credits in the group: Requirement courses in the group: In this group you have to complete at least 17 courses Credits in the group: 0 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.) Applied Dynamics of Continuum 14ADYK 2P+0C Z.ZK 2 7 Р Hanuš Seiner Hanuš Seiner Hanuš Seiner (Gar.) Elasticity 2 14EM2 Z,ZK 4 2P+2C Ζ Ρ Vladislav Öliva, Aleš Materna Vladislav Oliva Vladislav Oliva (Gar.) **Experimental Mechanics** 14EXME 5 2P+2C Ζ ΚZ Р Ond ej Ková ík Ond ej Ková ík Ond ej Ková ík (Gar.) Fractography and Microanalysis 14FRAM Z,ZK 2 2P+0C L Р Petr Haušild, Jan Siegl Jan Siegl Jan Siegl (Gar.) **Functional Surface Modifications** 14FPU ΚZ 2 2P+0C L Р Ond ej Ková ík, Radek Mušálek Ond ej Ková ík Ond ej Ková ík (Gar.) Physical Metallurgy 1 Miroslav Karlík Miroslav Karlík Miroslav Karlík (Gar.) 14FM1 4 2P+2C Ζ Z,ZK Р Physical Metallurgy 2 Petr Haušild Petr Haušild Petr Haušild (Gar.) 14FME2 3 2P+0C Z.ZK Р Physical Metallurgy 2 14FM2 Z,ZK 2 2P+0C L Р Petr Haušild Petr Haušild Petr Haušild (Gar.) **Fracture Mechanics 1** 14LM1 Z,ZK 2 2P+0C Ζ Р Ji í Kunz Ji í Kunz Ji í Kunz (Gar.) Fracture Mechanics 2 2 14LM2 Z,ZK 2P+0C L Р Ji í Kunz Ji í Kunz Ji í Kunz (Gar.) **Micromechanical and Indentation Methods** 2 1P+1C 14MMIM ΚZ L Ρ Jaroslav ech **Jaroslav ech** Jaroslav ech (Gar.) Miniprojects 1 14MIP1 ΚZ 3 0P+2C Ζ Р Ond ej Ková ík, Jaroslav ech Jaroslav ech Jaroslav ech (Gar.) Miniprojects 2 0P+2C 14MIP2 ΚZ 3 1 Ρ Ond ej Ková ík, Jaroslav ech Jaroslav ech Jaroslav ech (Gar.) Plasticity 14PLA Z,ZK 3 2P+1C L Р Vladislav Õliva, Aleš Materna **Vladislav Oliva** Vladislav Oliva (Gar.) Computational Mechanics 14PM ΚZ 2 2P+0C L Р Aleš Materna Aleš Materna Aleš Materna (Gar.) **Research Project 1** 14VUSM1 1 Ζ 6 0+6 Ρ Aleš Materna **Aleš Materna** Aleš Materna (Gar.) **Research Project 2** ΚZ 2 14VUSM2 8 0+8 Р Aleš Materna Aleš Materna Aleš Materna (Gar.)

			· · · · · · · · · · · · · · · · · · ·		
14UM Fatigue of Materials 0nd ej Ková ík, Hynek Lauschmann Hynek Lauschmann Hynek Lauschmann (Gar.)	inn KZ	2	2P+0C	L	Р
Characteristics of the courses of this group of Study Plan: Code=NMSPFIM1 Nan	ne=MDP P_FIM	N 1st yea	ar		
14ADYK Applied Dynamics of Continuum			Z	Z,ZK	2
Abstract: Natural, free, transient and forced vibrations of continuous systems (strings, rods, beams, membrane	s, plates, shells), eq	uations of m	otion, metho	d of solution a	and basic
14EM2 Elasticity 2				Z.ZK	4
Abstract: The course deals with an advanced theory of elasticity - buckling of long straight columns, torsion of	ion-circular shafts, v	arious plane	stress and	plane strain p	roblems,
Kirchhoff's plates, shells. The emphasis is made on methods and results relevant to general solid mechanics a	nd materials science	applications	s.	1/7	
Abstract: The course represents an overview of current experimental methods and procedures in the following	ields: - experimenta	analysis of	 the main me	K∠ chanical quar	5 ntities (stress,
displacement, force, torque, pressure, etc.), - experimental dynamics (shakers, vibration transducers, damping,	palancing, vibroanaly	ysis). Every f	our hours lea	cture is equiva	lently divided
into theoretical and experimental. The presented methods are immediately demonstrated in the laboratory in g	oups of maximally the	hree student	s organized	as research t	eams. Each
proper fulfilment of the experimental task and prepares a experimental report at home and hands it back in one	e month time.	ignated a ter			
14FRAM Fractography and Microanalysis			Z	Z,ZK	2
Abstract: Basic and accessible methods of experimental materials characterization in microvolume, their applic	ation in the study of	material pro	perties and	in the domain	of failure
14EPU Functional Surface Modifications				KZ	2
Abstract: Categories of surface modification according to technology and application. Surface modification and o	oating technologies	. Process pa	rameters an	d their influen	ce on surface
and coating properties. Coating materials, deposition technologies and application areas. Additive manufacturin	g and near net shape	e deposition.	Visits to the	rmal spray lab	s. Laboratory
14FM1 Physical Metallurgy 1				7 7K	4
Abstract: Basic principles of metal physics, acquired in preceding courses, are extended to the applications in the	he field of processin	g and therm	o mechanica	al treatment o	f different
structural materials. Furthermore, an introduction to degradation processes as radiation damage, oxidation and	corrosion is given.				
Abstract: The course is based on previously acquired general physical and physical metallurgical knowledge at	nd applies this know	edge to real	svstems su	∠,∠K ch as Fe-C ar	3 Id Fe-X-C
multicomponent Fe and Ni -based alloys, etc., which are the basis of steels and special structural materials. Si	nce the Physical Me	tallurgy 2 bu	ilds on the p	revious, more	theoretically
oriented courses of Metal Physics and Physical Metallurgy 1, added emphasis is placed on applications of real	systems in enginee	ring.			
Abstract: The course is based on previously acquired general physical and physical metallurgical knowledge and	nd applies this know	edge to real	svstems su	∠,∠K	2 Id Fe-X-C.
multicomponent Fe and Ni -based alloys, etc., which are the basis of steels and special structural materials. Si	nce the Physical Met	tallurgy 2 bu	ilds on the p	revious, more	theoretically
oriented courses of Metal Physics and Physical Metallurgy 1, added emphasis is placed on applications of real	systems in enginee	ring.		7 71/	
Abstract: Mechanisms and modes of fracture. Stress and strain field in the vicinity of notch or crack tip. Parame	ers of linear elastic f	racture mec	2 hanics. Total	_,∠n energy balan	∠ ce approach.
Fracture toughness of materials and crack stability examination. Application in research and engineering practi	ce.				
14LM2 Fracture Mechanics 2	the case of general y	violding Eativ	Z Z	Z,ZK	2
crack propagation under various conditions, application of fracture mechanics. Case studies.	The case of general y	neiding. i atiç	Jue of mater		antais, latigue
14MMIM Micromechanical and Indentation Methods				KZ	2
Aim of the course is to present to the students the methods of determination of materials mechanical propertie	s in the micro-volum	e. The cours	e will focus	mainly on the	penetration micropillar
compression, microcantilever bending, etc.) in electron microscopes forms the second topic of the course. The	practical measurem	ents are the	essential pa	rt of the cours	se. At the end
of the course, the students should be able to choose the appropriate technique (taking into account the advant	ages and limitations	of individual	l methods) fo	or characteriza	ation of the
14MIP1 Miniprojects 1				K7	3
Abstract: The course should complete and extend knowledge gained in theoretical courses. The students carry	out two miniprojects	s of a larger	extent on the	e up to date to	pic from the
field of physical metallurgy, fracture mechanics, material preparation, mechanical characterization of materials.	microscopy, non-de	structive tes	ting etc. Und	ler the superv	ision of the
the submitted measurement reports.	ionn a childar analys				e based on
14MIP2 Miniprojects 2				KZ	3
Abstract: The course should complete and extend knowledge gained in theoretical courses. The students carry	out two miniprojects	s of a larger	extent on the	e up to date to	pic from the
lecturer, the students get the theoretical basis on the given topic, they will carry out the measurements and per	form a critical analy	sis of the res	ults. The eva	aluation will be	e based on
the submitted measurement reports.					
14PLA Plasticity Abstract: Introduction to plasticity of materials and structures in terms of classical continuum mechanics. The fi	rst part contains the	general incr	emental the	Z,ZK	3 ria strain
hardening, loading criterion, flow rule and corresponding physical equations including the deformation theory.	Then engineering so	lutions of ela	stic-plastic t	ension, bendi	ng, torsion
and plastic collapse of bars, beams and pressure vessels are presented. The second part is devoted to method	Is and knowledge us	seful for mate	erial science	: stress conce	entration and
between plasticity in plane stress and strain, elastic-plastic response to cyclic load.	mapse, localization o	or plastic dell	ormation bei	ore the fractur	e, dillerences
14PM Computational Mechanics				KZ	2
Abstract: Theory and application of the finite element method in the mechanics of deformable bodies. Lectures basic principles of building the correct pumerical models	are accompanied by	y model exar	mples which	aims to demo	onstrate the
14VUSM1 Research Project 1				Z	6
Abstract: The research project is based on a topic approved by the administrators of the programme, department	nt and by the dean.	The student	is guided by	the project s	upervisor
during common regular meetings and discussions.				K7	0
Abstract: The research project is based on a topic approved by the administrators of the programme. department	nt and by the dean.	The student	is guided by	rv∠ the project s	ö upervisor
during common regular meetings and discussions.	.,		<u> </u>	, ,	

Code of the group: NMSPFIM2 Name of the group: MDP P_FIMN 2nd year Requirement credits in the group: Requirement courses in the group: In this group you have to complete at least 9 courses Credits in the group: 0 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
14ANP	Failure Analysis Jan Siegl, Jaroslav ech Jan Siegl Jan Siegl (Gar.)	ZK	3	2P+0C	L	Р
14DPSM1	Diploma Thesis 1 Vladislav Oliva, Petr Haušild Petr Haušild Vladislav Oliva (Gar.)	Z	10	0+10	3	Р
14DPSM2	Diploma Thesis 2 Vladislav Oliva, Petr Haušild Petr Haušild Petr Haušild (Gar.)	Z	20	0+20	4	Р
14NDT	Nondestructive Diagnostics Ond ej Ková ik Ond ej Ková ik Ond ej Ková ik (Gar.)	Z	2	2P+0C	Z	Р
14NEKM	Non-metallic Naterials Miroslav Karlík Miroslav Karlík Miroslav Karlík (Gar.)	Z,ZK	2	2P+0C	Z	Р
14PP	Pre-diploma Experience Petr Haušild Petr Haušild (Gar.)	Z	4	2XT	Z	Р
14SMT	Seminar - New Trends in Materials Engineering Aleš Materna, Ji í Kunz Ji í Kunz Ji í Kunz (Gar.)	Z	3	2P+1C	Z	Р
14SFM	Seminar Physics of materials Hynek Lauschmann, Karel Tesa Hynek Lauschmann Karel Tesa (Gar.)	КZ	5	0P+4C	L	Р
11VDM	Intrinsic Dynamics of Materials Hanuš Seiner Hanuš Seiner Hanuš Seiner (Gar.)	ZK	3	2+0	Z	Р

Characteristics of the courses of this group of Study Plan: Code=NMSPFIM2 Name=MDP P_FIMN 2nd year

14ANP	Failure Analysis	ZK	3				
Abstract: Lectores summarise basic methods of fractographic analysis used both in the research of new materials and technologies and in the failure analysis of machines and structures.							
The first part of lectures deals with historical background of fractography in relation with experimental techniques. The second part deals with detail description of different methodological							
procedures of fractographic analysis. All methods are illustrated by the help of case studies realised in fractographic laboratory of the Department of Materials.							
14DPSM1	Diploma Thesis 1	Z	10				
Abstract: The diploma project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during							
common regular meetir	ngs and discussions.						
14DPSM2	Diploma Thesis 2	Z	20				
Abstract: The diploma p	roject is based on a topic approved by the administrators of the programme, department and by the dean. The student is guide	ed by the project s	supervisor during				
common regular meetir	ngs and discussions.						
14NDT	Nondestructive Diagnostics	Z	2				
Abstract: The course is	devoted to acquaintance with theoretical and practical grounding and applications of nondestructive testing (NDT), evaluation (NDE), and inspe	ction (NDI, SHM)				
of materials and structu	ires. Besides the standard NDT methods, the lectures also deal with the newest NDT/NDE procedures (acoustic emission, no	onlinear ultrasonio	c spectroscopy				
and tomography, etc.).	The education is completed by practical laboratory training in selected methods and also by excursions into industrial compar	nies working on N	DT/NDE.				
14NEKM	Non-metallic Naterials	Z,ZK	2				
Abstract: This course ex	xplains the structure and basic properties of important non-metallic materials, such as ceramics, glass, polymers and compos	ites. These mater	ials can be used				
as single material for co	onstruction, they can form protective coatings or they may be used as components for the functionally graded materials.						
14PP	Pre-diploma Experience	Z	4				
Abstract: Working expe	rience on the given subject in the laboratory.						
14SMT	Seminar - New Trends in Materials Engineering	Z	3				
Abstract: New research	findings in the field of research and development of new materials and technologies, degradation processes, experimental me	thods etc. Preser	ntations of partial				
results of the students r	master theses.						
14SFM	Seminar Physics of materials	KZ	5				
Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies.							
11VDM	Intrinsic Dynamics of Materials	ZK	3				
The course gives an int	The course gives an introductory overview of dynamical phenomena taking place in the materials, with the main focus laid on the elastic wave propagation (and its interaction with the						
microstructure), dynam	microstructure), dynamic plasticity, phase transition fronts kinetics, and dynamic fracture mechanics.						
•							

Name of the block: Compulsory elective courses Minimal number of credits of the block: 0 The role of the block: PV

Code of the group: NMSPFIMPV1 Name of the group: MDP P_FIMN Required optional courses 1st year

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

Credits in the group: 0 Note on the group:

Student si volí alespoň 1 předmět

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
01ASM	Application of Statistical Methods Tomáš Hobza Tomáš Hobza (Gar.)	KZ	2	2+0		PV
01VAMB	Variational Methods B Michal Beneš Michal Beneš (Gar.)	KZ	2	2	Z	PV

Characteristics of the courses of this group of Study Plan: Code=NMSPFIMPV1 Name=MDP P_FIMN Required optional courses 1st year

01ASM	Application of Statistical Methods	KZ	2			
The course focuses on applications of selected methods of statistical data analysis to concrete problems including their solutions using statistical software. Namely we will						
hypotheses tests about	parameters of normal distribution, nonparametric methods, contingency tables, linear regression and correlation, analysis of	variance.				
01VAMB	Variational Methods B	KZ	2			
The course is devoted to the methods of classical variational calculus - functional extrema by Euler equations, second functional derivative, convexity or monotonicity. Further, it contains						
investigation of quadratic functional, generalized solution, Sobolev spaces and variational problem for elliptic PDE's.						

Name of the block: Elective courses Minimal number of credits of the block: 0 The role of the block: V

Code of the group: NMSPFIMV Name of the group: MDP P_FIMN Optional courses Requirement credits in the group: Requirement courses in the group:

Credits in the group: 0

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 members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
Applied Neutron Diffractometry Monika Ku eráková, Stanislav Vratislav Monika Ku eráková Stanislav Vratislav (Gar.)	ZK	2	2	Z	V
Diffraction Analysis of Mechanical Stress Nikolaj Ganev, Ivo Kraus Nikolaj Ganev Nikolaj Ganev (Gar.)	ZK	2	2	Z	V
Physics of Solid State Phase Transitions Ji í Hlinka Ji í Hlinka Ji í Hlinka (Gar.)	ZK	2	2	L	V
Physics of Surfaces and Interfaces Ladislav Kalvoda Ladislav Kalvoda (Gar.)	ZK	2	2P+0C	Z	V
Nanomaterials - Preparation and Characteristics Irena Kratochvílová Irena Kratochvílová Irena Kratochvílová (Gar.)	Z,ZK	2	2+0	L	V
Neutronography in Material Research Monika Ku eráková, Stanislav Vratislav Monika Ku eráková Monika Ku eráková (Gar.)	ZK	2	2	L	V
Smart Materials and Their Applications Zden k Pot ek, Petr Sedlák Zden k Pot ek Zden k Pot ek (Gar.)	ZK	2	2+0	L	V
System Reliability and Clinical Experiments Václav K s Václav K s Václav K s (Gar.)	KZ	3	2+0	L	V
Start-up Project P emysl Rubeš P emysl Rubeš (Gar.)	KZ	2	2P+0C		V
Introduction to image analysis Hynek Lauschmann Hynek Lauschmann Hynek Lauschmann (Gar.)	KZ	2	1P+1C		V
Scientific Programming in Python Jakub Urban, Pavel Váchal Pavel Váchal (Gar.)	Z	2	0+2	L	V
	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.) Applied Neutron Diffractometry Monika Ku eráková, Stanislav Vratislav Monika Ku eráková Stanislav Vratislav (Gar.) Diffraction Analysis of Mechanical Stress Nikolaj Ganev, Ivo Kraus Nikolaj Ganev Nikolaj Ganev (Gar.) Physics of Solid State Phase Transitions Ji í Hlinka Ji í Hlinka Ji í Hlinka (Gar.) Physics of Surfaces and Interfaces Ladislav Kalvoda Ladislav Kalvoda (Gar.) Nanomaterials - Preparation and Characteristics Irena Kratochvílová Irena Kratochvílová Irena Kratochvílová (Gar.) Neutronography in Material Research Monika Ku eráková, Stanislav Vratislav Monika Ku eráková Monika Ku eráková (Gar.) Smart Materials and Their Applications Zden k Pot ek, Petr Sedlák Zden k Pot ek Zden k Pot ek (Gar.) System Reliability and Clinical Experiments Václav K s Václav K s Václav K s (Gar.) Start-up Project P emysl Rubeš P emysl Rubeš P emysl Rubeš (Gar.) Introduction to image analysis Hynek Lauschmann Hynek Lauschmann Hynek Lauschmann (Gar.) Scientific Programming in Python	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members)CompletionTutors, authors and guarantors (gar.)Applied Neutron Diffractometry Monika Ku eráková, Stanislav Vratislav Monika Ku eráková Stanislav Vratislav (Gar.)ZKDiffraction Analysis of Mechanical Stress Nikolaj Ganev, Ivo Kraus Nikolaj Ganev Nikolaj Ganev (Gar.)ZKPhysics of Solid State Phase Transitions Ji / Hlinka Ji f Hlinka Ji f Hlinka (Gar.)ZKPhysics of Surfaces and Interfaces Ladislav Kalvoda Ladislav Kalvoda (Gar.)ZKNanomaterials - Preparation and Characteristics Irena Kratochvilová Irena Kratochvilová Irena Kratochvilová (Gar.)Z,ZKSmart Materials and Their Applications Zden k Pot ek, Petr Sedlák Zden k Pot ek Zden k Pot ek (Gar.)ZKSystem Reliability and Clinical Experiments Václav K s Václav K s Václav K s (Gar.)KZStart-up Project P emysl Rubeš P emysl Rubeš (Gar.)KZScientific Programming in Python Jakub Urban, Pavel Váchal Pavel Váchal Pavel Váchal Pavel Váchal Pavel Váchal Pavel Váchal CGar.)Z	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members)CompletionCreditsTutors, authors and guarantors (gar.)Applied Neutron Diffractometry Monika Ku eráková, Stanislav Vratislav Monika Ku eráková Stanislav Vratislav (Gar.)ZK2Diffraction Analysis of Mechanical Stress Nikolaj Ganev, Ivo Kraus Nikolaj Ganev Nikolaj Ganev (Gar.)ZK2Physics of Solid State Phase Transitions Ji í Hlinka Ji í Hlinka Ji í Hlinka (Gar.)ZK2Physics of Solid State Phase Transitions Ji í Hlinka Ji í Hlinka (Gar.)ZK2Nanomaterials - Preparation and Characteristics Irena Kratochvilová Irena Kratochvilová (Gar.)ZK2Neutronography in Material Research Monika Ku eráková, Stanislav Vratislav Monika Ku eráková Monika Ku eráková (Gar.)ZK2Smart Materials and Their Applications Zdelav K s Václav K s Václav K s (Gar.)KZ3Start-up Project P emysl Rubeš P emysl Rubeš (Gar.)KZ2Introduction to image analysis 	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members)CompletionCreditsScopeTutors, authors and guarantors (gar.)Applied Neutron Diffractometry Monika Ku eráková, Stanislav Vratislav Monika Ku eráková Stanislav Vratislav (Gar.)ZK22Diffraction Analysis of Mechanical Stress Nikolaj Ganev, Ivo Kraus Nikolaj Ganev Nikolaj Ganev (Gar.)ZK22Physics of Solid State Phase Transitions Ji í Hinka Ji í Hinka (Gar.)ZK22Physics of Surfaces and Interfaces Ladislav Kalvoda Ladislav Kalvoda (Gar.)ZK22Nanomaterials - Preparation and Characteristics Irena Kratochvílová Irena Kratochvílová Irena Kratochvílová (Gar.)Z,ZK22Smart Materials and Their Applications Zden k pot ek, Petr Sedlák Zden k Pot ek Zden k Pot ek (Gar.)ZK22Start-up Project P emysl Rubeš P emysl Rubeš (Gar.)KZ22+0Introduction to image analysis Hynek Lauschmann Hynek Lauschmann (Gar.)KZ22+0	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.)CompletionCreditsScopeSemesterApplied Neutron Diffractometry Monika Ku eráková, Stanislav Vratislav (Gar.)ZK22ZDiffraction Analysis of Mechanical Stress Nikolaj Ganev, Ivo Kraus Nikolaj Ganev Nikolaj Ganev (Gar.)ZK22ZPhysics of Solid State Phase Transitions J I Hinka JI i Hlinka (Gar.)ZK22LPhysics of Surfaces and Interfaces Ladislav Kalvoda Ladislav Kalvoda (Gar.)ZK22+0CZNanomaterials - Preparation and Characteristics Irena Kratochvilová Irena Kratochvilová (Gar.)ZK22LNeutronography in Material Research Monika Ku eráková (Gar.)ZK22LSystem Reliability and Clinical Experiments Vactav K s Václav K s Václav K s (Gar.)KZ32+0LSystem Reliability and Clinical Experiments Vactav K s Václav K s Václav K s (Gar.)KZ22LIntroduction to image analysis Hynek Lauschmann Hynek Lauschmann (Gar.)KZ20+2LIntroduction to image analysis Hynek Lauschmann Hynek Lauschmann (Gar.)Z20+2L

Characteristics of the courses of this group of Study Plan: Code=NMSPFIMV Name=MDP P_FIMN Optional courses

11AND	Applied Neutron Diffractometry	ZK	2			
This lecture introduces the neutron diffraction method as the method used in solid state physics research and the materials sciences. The basic principles of the nuclear and mag						
neutron scattering are given, as well as the comparative properties to the X-ray method. The basic concept of this method is illustrated by many practical examples.						
11DAN	Diffraction Analysis of Mechanical Stress	ZK	2			
Course description: The course contains the fundamentals of diffraction stress analysis with a strong emphasis on the illustrations of the capability of X-ray diffraction to solve engineering						
problems.						

11FPPL Physics of Solid State Phase Transitions	ZK	2						
A number of interesting properties of crystalline materials are directly related or significantly influenced by occurrence of specific phase transitions. The purpose of this course is to								
provide unifying view on various types phase transitions encountered in solid state physics, with the emphasize on continuous symmetry braking phase transitions.								
11FPOR Physics of Surfaces and Interfaces	ZK	2						
Description is provided of basic thermodynamic properties, atomary and electronic structure of surfaces and interfaces. The physical models valid for	or bulk sysstems a	ire juxtaposed						
with the changes due to introduction of new surface/interface. The theoretical treatment is followed by overview of experimental techniques applied	to preparation of se	urface structures						
and to study of chemical composition and structural arrangement of the latter. In addition, brief overview is given of simulation approaches suitable	for analysis and pr	rediction of						
properties of selected systems. All the subjects are demonstrated on praktical exaples of case studies.								
11NAMA Nanomaterials - Preparation and Characteristics	Z,ZK	2						
The course describes methods of preparation of nanomaterials, their structure, specific properties and applications. The properties of carbon and si	licon nanobodies a	and layers will be						
analyzed in detail. The aim of the subject is to explain the relationships between physical / chemical properties of nanoparticulate materials and the	ir main structural f	eatures.						
11NMV Neutronography in Material Research	ZK	2						
Neutron diffraction is a powerful method for a detailed understanding of the static and dynamic properties on atomic scale of materials in many field	of sciences and i	ndustry. This						
course introduces to the fundamental principles of nuclear and magnetic scattering and penetration of thermal neutrons. From this point of view the for	llowing aspects are	e very important:						
sample size in relation to industrial scaling, neutron penetration though machinable materials (and consequent case of construction of environmental of	chambers), neutror	n atomic contrast						
and magnetic scattering possibilities. Examples of the different neutron scattering techniques are given.								
11SMAM Smart Materials and Their Applications	ZK	2						
Smart or responsive materials have one or more properties, such as shape, conductivity or color, that can be dramatically and reversibly altered by ch	anges in some ext	ernal conditions.						
The properties responding to external stimuli (heat, stress, electric field, light) influences what types of applications the smart material can be used fi	or. The number of t	their applications						
is growing steadily. Passive and active vibration damping, airbag sensors, acoustic transducers, precision positioners, miniature ultrasonic motors, v	/ascular stents, ey	eglass frames,						
cellular phone antennas, light sensitive glasses or photochromic and thermochromic clothes could serve as a few examples. Lectures are focused o	n physical properti	es, experimental						
methods of investigation and possible application of color changing materials, light emitting materials, piezoelectric materials, conducting polymers,	dielectric elastom	ers, ferroelectric						
materials and shape-memory materials. Attention is also paid to the effect of phase transitions on physical properties of smart materials and to the	r numerical simula	tions.						
01SKE System Reliability and Clinical Experiments	KZ	3						
The main goal of the subject is to provide the mathematical principles of reliability theory and techniques of survival data analysis, reliability of compc	nent systems, asy	mptotic methods						
for reliability, concept of experiments under censoring and their processing in clinical trials (life-time models). The techniques are illustrated and test	ed within practical	examples						
originating from lifetime material experiments and clinical trials.								
01SUP Start-up Project	KZ	2						
14UAOB Introduction to image analysis	KZ	2						
The aim of the lecture is an introduction to selected basic methods of image processing and analysis with an emphasis on the applications to material	engineering. Solut	ions of particular						
tasks built in Matlab are presented.								
12PYTHN Scientific Programming in Python	Z	2						
The aim of this course is to learn the fundamentals of the modern Python programming language with a focus on scientific computing. Emphasis is placed on effective solutions to real								
problems. The course is performed in an interactive form of practical exercises, whose topics are tailored to the content of other subjects, study level, and student theses. Students are								
also involved in ongoing research. In the introductory part of the course, students learn the basic features of Python? from basic types to object oriented or functional programming.								
The greater part of the course focuses on specific features of Python for scientific programming. Presented are the main numerical libraries NumPy	, SciPy and the Ma	atplotlib graphics						
library. We show how to generate efficient code, how to combine Python with other languages, what tools are available.								

List of courses of this pass:

Code	Name of the course	Completion	Credits			
01ASM	Application of Statistical Methods	KZ	2			
The course focuse	s on applications of selected methods of statistical data analysis to concrete problems including their solutions using statistical softw	are. Namely we wi	II deal with:			
hypoth	eses tests about parameters of normal distribution, nonparametric methods, contingency tables, linear regression and correlation, an	alysis of variance.				
01SKE	System Reliability and Clinical Experiments	KZ	3			
The main goal of th	e subject is to provide the mathematical principles of reliability theory and techniques of survival data analysis, reliability of component	systems, asympto	tic methods			
for reliability, cor	ncept of experiments under censoring and their processing in clinical trials (life-time models). The techniques are illustrated and teste	d within practical e	examples			
	originating from lifetime material experiments and clinical trials.					
01SUP	Start-up Project	KZ	2			
01VAMB	Variational Methods B	KZ	2			
The course is devo	ed to the methods of classical variational calculus - functional extrema by Euler equations, second functional derivative, convexity or m	onotonicity. Furthe	r, it contains			
	investigation of quadratic functional, generalized solution, Sobolev spaces and variational problem for elliptic PDE's.					
11AND	Applied Neutron Diffractometry	ZK	2			
This lecture introdu	ces the neutron diffraction method as the method used in solid state physics research and the materials sciences. The basic principle	es of the nuclear ar	nd magnetic			
neutron se	cattering are given, as well as the comparative properties to the X-ray method. The basic concept of this method is illustrated by man	y practical example	es.			
11DAN	Diffraction Analysis of Mechanical Stress	ZK	2			
Course description	The course contains the fundamentals of diffraction stress analysis with a strong emphasis on the illustrations of the capability of X-ray	diffraction to solve	engineering			
	problems.					
11FPOR	Physics of Surfaces and Interfaces	ZK	2			
Description is pro	vided of basic thermodynamic properties, atomary and electronic structure of surfaces and interfaces. The physical models valid for t	oulk sysstems are j	uxtaposed			
with the changes d	ue to introduction of new surface/interface. The theoretical treatment is followed by overview of experimental techniques applied to pro-	eparation of surfac	e structures			
and to study of o	hemical composition and structural arrangement of the latter. In addition, brief overview is given of simulation approaches suitable for	or analysis and pre	diction of			
	properties of selected systems. All the subjects are demonstrated on praktical exaples of case studies.					
11FPPL	Physics of Solid State Phase Transitions	ZK	2			
A number of interesting properties of crystalline materials are directly related or significantly influenced by occurrence of specific phase transitions. The purpose of this course is to						
provide unifying view on various types phase transitions encountered in solid state physics, with the emphasize on continuous symmetry braking phase transitions.						

11NAMA	Nanomaterials - Preparation and Characteristics	Z,ZK	2
The course describe	es methods of preparation of nanomaterials, their structure, specific properties and applications. The properties of carbon and silicon	nanobodies and la	ayers will be
analyzed in det	ail. The aim of the subject is to explain the relationships between physical / chemical properties of nanoparticulate materials and the	ir main structural fe	eatures.
11NMV	Neutronography in Material Research	ZK	2
Neutron diffraction	n is a powerful method for a detailed understanding of the static and dynamic properties on atomic scale of materials in many field o	f sciences and indu	ustry. This
course introduces to	o the fundamental principles of nuclear and magnetic scattering and penetration of thermal neutrons. From this point of view the followi	ng aspects are very	y important:
sample size in relati	on to industrial scaling, neutron penetration though machinable materials (and consequent case of construction of environmental chan	ibers), neutron ator	mic contrast
11SMAM	and magnetic scattering possibilities. Examples of the different neutron scattering techniques are given.	7K	2
Smart or responsive	e materials have one or more properties, such as shape, conductivity or color, that can be dramatically and reversibly altered by change	es in some externa	conditions.
The properties resp	onding to external stimuli (heat, stress, electric field, light) influences what types of applications the smart material can be used for. The	ne number of their ;	applications
is growing steadily.	Passive and active vibration damping, airbag sensors, acoustic transducers, precision positioners, miniature ultrasonic motors, vaso	cular stents, eyegla	iss frames,
cellular phone anter	nnas, light sensitive glasses or photochromic and thermochromic clothes could serve as a few examples. Lectures are focused on phy	vsical properties, e	xperimental
methods of investig	ation and possible application of color changing materials, light emitting materials, piezoelectric materials, conducting polymers, diel	ectric elastomers, f	terroelectric
	snape-memory materials. Attention is also paid to the effect of phase transitions of physical properties of smart materials and to the		alions.
The course gives ar	n introductory overview of dynamical phenomena taking place in the materials with the main focus laid on the elastic wave propagati	ion (and its interact	ion with the
	microstructure), dynamic plasticity, phase transition fronts kinetics, and dynamic fracture mechanics.		
12PYTHN	Scientific Programming in Python	Z	2
The aim of this cour	se is to learn the fundamentals of the modern Python programming language with a focus on scientific computing. Emphasis is place	d on effective solu	tions to real
problems. The cours	se is performed in an interactive form of practical exercises, whose topics are tailored to the content of other subjects, study level, and	d student theses. S	students are
also involved in on	going research. In the introductory part of the course, students learn the basic features of Python?from basic types to object oriente	d or functional proc	gramming.
The greater part of	the course focuses on specific features of Python for scientific programming. Presented are the main numerical libraries NumPy, Sci library. We show how to generate efficient ends, how to complian Bython with other languages, what tools are cyclichia.	Py and the Matplot	lib graphics
	Indrary. We show now to generate enicient code, now to combine Python with other languages, what tools are available.	774	2
Abstract: Natural	Applieu Dynamics of continuous systems (strings rods beams membranes plates shells) equations of motion r	j ∠,∠n method of solution	∠ and basic
	dynamical characteristics.		
14ANP	Failure Analysis	ZK	3
Abstract: Lectores s	ummarise basic methods of fractographic analysis used both in the research of new materials and technologies and in the failure analysis	sis of machines and	d structures.
The first part of lectu	ares deals with historical background of fractography in relation with experimental techniques. The second part deals with detail descrip	tion of different met	thodological
procedu	res of fractographic analysis. All methods are illustrated by the help of case studies realised in fractographic laboratory of the Depar	tment of Materials.	
14DPSM1	Diploma Thesis 1	Z	10
Abstract: The diplon	na project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided b	y the project super	visor during
4400040	common regular meetings and discussions.	7	00
Abstract: The diplom	DIPIOMA I NESIS 2	L Z	20 visor during
Abstract. The diploin	common regular meetings and discussions.	y the project super	visor during
14EM2	Flasticity 2	Z.7K	4
Abstract: The cou	irse deals with an advanced theory of elasticity - buckling of long straight columns, torsion of non-circular shafts, various plane stress	s and plane strain r	oroblems,
۲. In the second se	Kirchhoff's plates, shells. The emphasis is made on methods and results relevant to general solid mechanics and materials science a	pplications.	
14EXME	Experimental Mechanics	KZ	5
Abstract: The course	e represents an overview of current experimental methods and procedures in the following fields: - experimental analysis of the main	mechanical quanti	ties (stress,
displacement, force	, torque, pressure, etc.), - experimental dynamics (shakers, vibration transducers, damping, balancing, vibroanalysis). Every four hours	3 lecture is equivale	ently divided
team ba a tutor at	i experimental. The presented methods are immediately demonstrated in the laboratory in groups of maximally three students organi	zed as research te	eams. Each
	proper fulfilment of the experimental task and prepares a experimental report at home and hands it back in one month time	3er and is responsi 3.	
14FM1	Physical Metallurgy 1	Z,ZK	4
Abstract: Basic pr	inciples of metal physics, acquired in preceding courses, are extended to the applications in the field of processing and thermo mech	nanical treatment o	of different
	structural materials. Furthermore, an introduction to degradation processes as radiation damage, oxidation and corrosion is gi	ven.	
14FM2	Physical Metallurgy 2	Z,ZK	2
Abstract: The cour	rse is based on previously acquired general physical and physical metallurgical knowledge and applies this knowledge to real system	is such as Fe-C an	nd Fe-X-C,
multicomponent Fe	and Ni -based alloys, etc., which are the basis of steels and special structural materials. Since the Physical Metallurgy 2 builds on the	e previous, more ti	heoretically
	Dhysical Metallurov 2	77 k	2
Abstract: The cour	rse is based on previously acquired general physical and physical metallurgical knowledge and applies this knowledge to real system	is such as Fe-C ar	d Fe-X-C.
multicomponent Fe	and Ni -based alloys, etc., which are the basis of steels and special structural materials. Since the Physical Metallurgy 2 builds on the	ne previous, more t	heoretically
	oriented courses of Metal Physics and Physical Metallurgy 1, added emphasis is placed on applications of real systems in engin	eering.	-
14FPU	Functional Surface Modifications	KZ	2
Abstract: Categories	s of surface modification according to technology and application. Surface modification and coating technologies. Process parameters	and their influence	e on surface
and coating propert	ies. Coating materials, deposition technologies and application areas. Additive manufacturing and near net shape deposition. Visits to	thermal spray labs.	Laboratory
	preparation and characterization of coatings.	7 71/	
Abstract: Basic or	FIBCIOUGRAPHY AND MICROBIAN SIS	$\angle, \angle \hat{\mathbf{N}}$	∠ of failure
	analysis. Relationships between processing technology, mechanical properties and failure processes		
14LM1	Fracture Mechanics 1	7.7K	2
Abstract: Mechanisr	ns and modes of fracture. Stress and strain field in the vicinity of notch or crack tip. Parameters of linear elastic fracture mechanics. T	otal energy balance	e approach.
	Fracture toughness of materials and crack stability examination. Application in research and engineering practice.	-	
14LM2	Fracture Mechanics 2	Z,ZK	2
Abstract: Parameter	s of non-linear elastic-plastic fracture mechanics. Fracture toughness of structural alloys in the case of general yielding. Fatigue of ma	aterials - fundamen	tals, fatigue
	crack propagation under various conditions, application of fracture mechanics. Case studies.		

14MIPI Minippopeds IV.2 3 Astranct: The course should complete and extend knowledge gained in theoretical courses. The students carry out two miniprojects of a larger extent on the up to date logic from the students is easily that the evaluation will be based on the students of the students extend in the course is the students and perform a citical analysis of the results. The evaluation will be based on the students extended in the students in the inscinction intervolution intervolutin intervolution intervolutin intervolution intervoluti			1/7	
Abstract. The course should complete and extend knowledge ganed in theoretical courses. The students carry out two mapropeds of a student sources is closed to puscal metalizing, fracture metalicity and the students get in theoretical basis on the global folge, they will carry out the insestancements and perform a critical analysis of the results. The exclusion will be based on the students get in theoretical basis on the global folge, they will carry out the messaurements and perform a critical analysis of the results. The exclusion will be based on the students get the theoretical basis on the global folge. They will carry out the messaurement and perform a critical analysis of the results. The exclusion of the students for the students get the theoretical basis on the global folge. They will carry out the messaurement aports. The students estimated in the students on the sub of the supervision of the students get the theoretical basis on the global folge. They will carry out the messaurement aports. The students estimated in theoretical analysis of the results. The evaluation will be based on the submets get the theoretical basis on the global folge. They will carry out the messaurement aports. The students estimated in theoretical analysis of the course kill folges messaurement aports. The students the students the methods of determination of materials microscolum. Theoretical methods the students are the students are noncentrance lates and provide the course kill folges methods the students and the students and the students are students and the students and the students are the students are results. The course will be adde to the down and and that theoretical analysis of the course kill folges and theoretical students and the students and the student and theoretical students and the students and the students and theoretical and prescri	14MIP1	Miniprojects 1	KZ	3
Table or pryscal metaluly; fracture mechanics, material preparation, mechanical characterization of materials, mercodorp, inch duration of the result. Incharacterization of the isolation of materials, mercodorp, inch duration of the results. The evaluation will be based on the submitted measurement reports. 14MIP2 Miniprojects 2 KZ 3 Abstract: The course should complete and extend knowledge gained in theoretical course. The students and reports of materials, mercodorp, non-destructive testing det. Under the supervision of the lecture; the students get the theoretical basis on the given topic, they will carry out the measurements and perform a critical analysis of the results. The evaluation will be based on the students get the theoretical basis on the given topic, they will carry out the measurements and the course. The paratical mechanics, material program to materials, mechanical properties in the micro-volume. The course will focus mainly on the penetration methods (classical hardness tests and nanoid entation, manial punch test, sorath tests, etc.). In-situ methods which enable direct beaveration of micromechanical tests (micropillar compression, micropillar course). The paratical components. 14MDT Nondestructive Diagnostics Z 2 2 14MDT Nondestructive Diagnostics Z 2 2 14MDT Nondestructive Diagnostics Z 2 2 14MDT Nondestructive site will be and the course. The paratical components. Z 2 2 14MEKM	Abstract: The cour	se should complete and extend knowledge gained in theoretical courses. The students carry out two miniprojects of a larger extent or	the up to date top	pic from the
Intervention Description Constraint Cons	field of physical m	letallurgy, fracture mechanics, material preparation, mechanical characterization of materials, microscopy, non-destructive testing etc.	Under the supervi	ision of the
Interstudent reports. KZ 3 Abstract: The course should complete and extend knowledge gained in theoretical course. The students carry out two miniprojects of a larger extent on the up to date topic from the field of physical metalluxy, fracture mechanics, material program in characterization of materials, microscopy, non-destructive testing etc. Under the supervision of the lecture, the students get the theoretical basis on the given topic, they will carry out the measurements and parform a critical analysis of the results. The evaluation will be based on the students to the students the methods of determination of materials, microscopy, non-destructive testing on the perturbation methods (classical hardness tests and nanondentation, mall purch test, scatch tests, etc.). In-stu methods which enable direct observation of micromechanical tests (micropillar course), the students should be able to choose the appropriate technique (taking into account the advantages and limitations of individual methods) for characterization of the portantial of methods which enable direct observation of micromechanical tests (micropillar course), the students should be able to choose the appropriate technique (taking into account the advantages and limitations of individual methods) for characterization of the proteints of individual methods (NDE), and inspection (NDI). SHMJ of intersited a discutry training in selecidal methods and also by excursions into industrial companies working on NDTNEE. 14NDT Nondestructive also deal with the method locating in applications of noninear intersion (specification). NDE: intersion (specification). N	lecturer, the stude	ents get the theoretical basis on the given topic, they will carry out the measurements and perform a critical analysis of the results. In	e evaluation will be	e based on
14MIP2 Miniprojects 2 KZ 3 Abstract: The course should complete and extend knowledge gained in theoretical courses. The students carry out two miniprojects of a larger extent on the up to date topic from the field of physical mealurgy, fracture mechanics, material preparation, mechanical carry out the measurements and perform a critical analysis of the results. The evaluation will be based on the submitted measurement reports. 14MMIM Micromechanical and Information from Methods KZ 2 Aim of the course is to present to the students the methods of determination of materials mechanical properties in the micro-course. The proteical measurements are pole will house. The proteical method (based and nanoindentation, method) topic of the course. The proteical methods (based and nanoindentation, method, the last script (based on the course, the students should be able to choose the appropriate technique (taiking in account the advantages and imitations of individual methods) for characterization of the proteins of nondestructive based on individual methods (based methods) for characterization of the course is dividual methods) for characterization of the proteins and practical grounding and applications of nondestructive based on Individual methods (based methods) and also by excursions into industrial companies working on NDTMDE. 14NDT Nondestructive Disposition Z 2 Abstract. The course is dividual to application is about the advantage and imitations of individual methods) for characterization of the advance in the measurement in providual analysis. These methods with the course is a method and advance and preserve advancounted and avais and thoracterization and based on		the submitted measurement reports.		
Abstract: The course should complete and extend knowledge gained in theoretical courses. The students carry out two miniprotects of a larger extent on the up to data topic from the lecture, the students get the theoretical basis on the given topic, hey will carry out the measurements and perform a critical analysis of the results. The evaluation will be based on the situation is submitted measurement reports. 14MMIM Micromechanical and Indentiation Methods KZ 2 14m of the course is to present to the students were thoredos of determinant on materials memorines in the micro-volum. The course will focus mainly on the parentation methods (classical hardness tests and nanoindentation, small punch test, scrach itess, etc.). In-situ methods which enable dress colles of the course. At the end of the course, the students should be able to choose the appropriate technique (taking into account the advantages and limitations of individual methods) for characterization of the properties of investigated methods and also by excursions into industrial companies withing on the scenario provide investigated methods and also by excursions into industrial companies withing on NDT. Net into a distribution is scherible within the reveals NDT/NDE procedures (ucoute emission, molinear difficuon) is completed by practical laboratory insing in selected methods and also by excursions into industrial companies withing on NDT. Net industrial companies withing on the gradient investigate and interviews and provides and also by excursions into industrial companies withing on NDT. Net industrial companies withing on the second part of adscinction and partial scheribic in the reveals of adscinction of the scheribic from the second part of adscinction in completed by model also adscinction were there with a scheribic in the reveals of the course. Adscin adscinction and partial adscinction in courses a	14MIP2	Miniprojects 2	KZ	3
field of physical metallugy, fracture mechanics, material preparation, mechanical characterization of materials, microscopy, non-destructive testing, etc. Under the supervision of the submitted measurement reports. 14MMIM Micromechanical and Indemixation Methods KZ 2 Arm of the course is to present to the students the methods of determination of materials, microscopy, norden. The course will focus mainly on the penetration methods (dasterial materials inclantation Methods) and anonidentations. Small punch tests, caracter tests, etc.) How the dask which enable direct deservation of microscopers forms the second topic of the course. The practical measurements are the essential part of the course. At the end of the course, the students should be able to choose the appropriate technique (taking into account the advantages and limitations of individual methods) for characterization of the course. The practical measurements are the essential part of the course is dovided to acquaintance with theoretical and practical grounding and applications of nondestructive testing (NDT), evaluation (NDE), and inspection (ND. SHM) of materials and structures. Besides the standard NDT methods, the lecture as about partical al about practical grounding and applications of nondestructive testing (NDT), evaluation (NDE), and inspection (ND. SHM) of materials and structures are basic properties of important companies waveriang on NDTADE. 14NDT Non-metallic Naterials XZK 2 Astract: This course explains the structure and basic properties of importance instanding and basic occurses in the microscopers. ZZK 2 Astract: Theoretical and precisition of the course site of metastructures in a single material is construction, they	Abstract: The cour	se should complete and extend knowledge gained in theoretical courses. The students carry out two miniprojects of a larger extent or	n the up to date top	pic from the
lacturer, the students get the theoretical basis on the given topic, they will carry out the measurements and perform a critical analysis of the results. The evaluation will be based on the submitted measurement reports. 14MMIM Micromechanical and Indentation Methods KZ 2 Aim of the course is to present to the students the embods of determination of materials memories in the micro-volum. The example will cours mainly on the penetation methods (dassical hardmess tests and nanoidentation, small punch test, scritch intest, etc.). In-situ methods which enable due to be essential part of the course. The partical measurements are the essential part of the course. The partical of the course is devoled to acquaintance with theoretical and practical grounding and applications of nondestructive being (NDT), evaluation (NDE), and inspection NDI. SHM of materials and structures. Bioles due to the structures also dark with enevest NDTANED procedures (acoustic reasion, nonlinear utrasonic spectroscopy and tamorgaphy, etc.). The education is completed by practical laboratory training in selected methods and also by excursions into industrial comparies working on NDTANE. 14NEKM Non-destructive Biologies of the practical laboratory training in selected methods, he increasing and applications of samplemes and components. The sem antical practical measurements are selected as a single materials for construction, they can form protechic coalings or they may be used as components for the functionality graded materials. 14NEKM Non-destructive Biologies of they may be used as components for the dunctionality for materials and structure and the excell and application of the size prediction of basical protechies and analytis and structures in the most of asize classical continuum mechanic	field of physical m	etallurgy, fracture mechanics, material preparation, mechanical characterization of materials, microscopy, non-destructive testing etc.	. Under the supervi	ision of the
Intervence Intervence Intervence 14MMIM Micromechanical and Indentation Methods KZ 2 Aim of the course is to present to the students the methods of determination of materials mechanical properties in the micro-volume. The course will focus mainly on the penetration of methods (classical materials scenath otes). Intervencemenhanical tests (interpollate courses. The practical measurements are the assential part of the course. At the end of the course, the students should be able to choose the appropriate testing (nation) and applications of nondestructive testing (NDT), evaluation (NDE), and inspection (NDI. SHM) of materials and structures. Desides the standard NDT methods, the loctures also deal with the newest NDTANDE procedure (acoustic enssion, nonlinear uftasonic spectroacopy and tomography, etc.). The education is completed by practical isotopy training in adepletations of nondestructive (acoustic enssion, nonlinear uftasonic spectroacopy and comography, etc.). The source explains the structure and basic properties of investing test of the structures (acoustic enssion, nonlinear uftasonic spectroacopy and comography, etc.). The education is completed by practical isotopy training in adepletation and also by excursions into industrial organican be used as a single material for construction, they can form protective coalings or they may be used as components for the functionally graded materials. 14PLIA Non-metalic Naterials ZZK 3 Abstract: Introduction to plasticity of materials and structures in thems of the dormation theory. The dormation theory wild criteria, strain hardening, classing in the addormation being the dormation theorg andelescopresented scenase. Seconceentrains and plastic cola	lecturer, the stude	ents get the theoretical basis on the given topic, they will carry out the measurements and perform a critical analysis of the results. Th	e evaluation will be	e based on
14MMIM Micromechanical and Indentation Methods KZ 2 Aim of the course is to present the students the methods of determination of materials in methods which enables incorporties in the micro-volume. The course will be course him entrativation of micromechanical tests (micropillar course) which enables are the essential part of the course. At the end of the course, the students should be able to choose the appropriate technique (taking into account the advantages and limitations of individual methods) for characterization of the properties of invostigated materials/components. Z 2 2 14NDT Nondestructive Diagnostics Z 2 2 2 Abstract: The course is devoted to acquaintance with theoretical and practical grounding and applications of nondestructive testing (NDT), evaluation (NDE), and inspection (NDE). 14NEKM Non-metallic Naterials is and structures at the use and also by excustions into industrial comparises vorking on NDTNDE. 14PLA Non-metallic Naterials and structures in terms of classatid continuum mechanics. The first part ontains the		the submitted measurement reports.		
Am of the course is to present to the students the methods of determination or materials mechanical properties in the micro-volume. The course will focus mainly on the ponetration methods (alsocial hardness tests stat) (micro) methods (alsocial hardness tests stat) (micro) methods (alsocial hardness) (micro) methods (alsocial hardness) (micro) methods) for characterization of the oruse, the students should be able to choose the appropriate technique (aking into account the advantages and limitations of individual methods) for characterization of the properties of investigated materials/components. 14NDT Nondestructive Diagnostics Z 2 Abstract: The course is devoted to acquaintance with theoretical ad providing and applications of nondestructive testing (NDT), evaluation (NDE), and inspection (NDI), and inspection (NDI), environmetian exist, spectroscopy and tomography, etc.). The ductation is completed by practical laboratory training in esclered methods and also by excursions in industrial comparises working on NDT/NDE. 14NEKM Non-metallic Naterials Z.ZK 2 Abstract: The course explains the structure and basic properties of important non-metallic naterials, such as ceramics, glass, polymers and componentials. These metalerials can be used as single material for construction, they can form protective coalings or they may be used as components for the functionally graded materials. 3 14PLA Plasticity Z.ZK 3 14PLA Plasticity Z 2 2 14PLA Operational methods and knowidege usel of neastratia scinces: these contains and plastice defo	14MMIM	Micromechanical and Indentation Methods	KZ	2
methods (classical hardness tests and nanoindentation, small punch test, scratch tests, etc.). In-situ methods which method screams are the essential part of the course. At the end of the course, the students should be able to choose the appropriate technique (taking into account the advantages and ilunitations of individual methods) for characterization of the properties of investigued materials/components. 14NDT Nondestructive Diagnostics Z 2 Abstract. The course is devoted to acquaintance with theoretical and practical grounding and applications of nondestructive testing (NDT), evaluation (NDE), and inspection (ND. SHM) of materials and structures. Boesides the standard NDT methods, the lectures also deal with the newes NDTNDE procedures (acoustic emission, nonlinear ultrasonic spectroscopy and tomography, etc.). The education is completed by practical laboratory training in selected methods and also by exercusions into industral companies working on NDTNDE. 14NEXM Non-metallic materials, such as ceranics, glass, polymers and composites. These materials can be used as single material for construction, they can form protective coatings or they may be used as ceranics, glass, polymers and composites. These materials can be used as single material for construction, they can form protective coatings or they may be used ascince plast ternsion, herein, there are assent and pressure vessels are presented. The second part is devoted to methods and howedge useful for material science; stress concentration and plastic collapse of thars, uset, as and pressure vessels are presented. The second part is devoted to methods and howedge useful for material science; stress concentration and plastic collapse. In theorems and their applications to second part is deviced ascondination of plastid deformation before the frazing. <td>Aim of the course</td> <td>is to present to the students the methods of determination of materials mechanical properties in the micro-volume. The course will for</td> <td>cus mainly on the</td> <td>penetration</td>	Aim of the course	is to present to the students the methods of determination of materials mechanical properties in the micro-volume. The course will for	cus mainly on the	penetration
compression, microcantilever bending, etc.) in electron microscopes forms the second topic of the course. The practical measurements are the essential part of the course, the students should be able to choose the appropriate chrivesigated materials/components. 14NDT Nondestructive Diagnostics Z 2 Abstract: The course is devoted to acquaintance with theoretical and practical grounding and applications of nondestructive testing (NDT), evaluation (NDE), and inspection (NDI. SHM) of materials and structures. Besides the standard NDT methods, the lectures also deal with the newest NDT/NDE procedures (acoustics in ionidustrial concervation) and tomography, etc.). The deviation is completed by practical laboratory training in a selected methods and also by excursions in ionidustrial complexes NDT NDE. 14NEKM Non-metallic Naterials ZZK 2 Abstract: Thirdouction to patient torin-metallic naterials, such as ceramics, glass, polymers and components. These materianis can be used as single material for construction, they can form protective coatings or they may be used as components for the functionally graded materials. 14PLA Plasticity ZZK 3 Nabstract. Threounding or terrion, flow rule and corresponding physical equations including the deformation theory. Then engineering solution of elastic-lastic charge, edual to material science: stress connentration and plast doresponde and regulations to estimation of the basic colopae, claszitatic response to cyclic load. 14PLA Computational Mechanics Z 2 2 14PM Computational Mech	methods (classica	al hardness tests and nanoindentation, small punch test, scratch tests, etc.). In-situ methods which enable direct observation of micro	mechanical tests ((micropillar
of the course, the students should be able to choose the appropriate technique (taking into account the advantages and limitations of individual methods) for characterization of the propriets of investigated materialis.components. Image: Comparise of Investigated materialis.components. 14NDT Nondestructive Diagnostics Z 2 Abstract: The course is devoted to acquaintance with theoretical and practical grounding and applications of nondestructive testing (NDT), evaluation (NDE), and inspection (ND). SHM) of materials and structures. Besides the standard NDT methods, the lectures also deal with the nevest NDT/NDE procedures (acoustic emission, nonlinear uitrasionic spectroscopy and tomography, etc.). The education is completed by practical laboratory training in selected methods and also by accursions into industrial companies working on NDT/NDE. 14NEXM Non-metallic materials ZZK 2 Abstract: This course explains the structure and basic properties of important non-metallic materials. Important and important on-metallic materials. 2 14PLA Plasticity ZZK 3 Abstract: This course explained industrials and structures in terms of classical continuum mechanics. The first part contains the general incremental theory: yield criteria, strain hardening, Loading criterion, flow rule and corresponding physical equations including the deformation theory. Then engineering of subaic deformation before the fracture, differences between plasticity in plane stress and strain, elastic relastic ensort tensor, bedraft, cursor and plastic collapse, to allow rule and corresponding physical equations including the correct numerical m	compression, micro	ocantilever bending, etc.) in electron microscopes forms the second topic of the course. The practical measurements are the essentia	I part of the course	e. At the end
Interview 14NDT Nondestructive Diagnostics Z 2 Abstract: The course is devoted to acquaintance with theoretical and practical grounding and applications of nondestructive testing (NDT), evaluation (NDE), and inspection (ND). SHM) of materials and structures. Besides the standard NDT methods, the lectures also deal with the newest NDT/NDE procedures (acoustic emission, nonlinear ultrasonic spectroscopy and tomography, etc.). The education is completed by practical laboratory training in selected methods and also by excursions into industrial comparies working on NDT/NDE). 14NEKM Non-metallic Naterials, such as coramics, glass, poymers and comparison. These materials can be used as single material for construction, they can form protective coatings or they may be used as components for the functionally graded materials. 14PLA Plasticity Z_ZK 3 Abstract: Includuction to plasticity of materials and structures in terms of classica continuum mechanics. The first part contains the general incremental tecory, vield criteria, strain hardening, loading criterion, flow rule and corresponding physical equations including the deformation theory. Then angineering solutions of elastic obtasic deformation around notches and cracks, limit theorems and their applications to estimation of the plastic collapse, localization of plastic deformation before the facture, differences between plasticity in plane stress and strain, elastic-plastic response to cyclic load. KZ 2 14PM Computational Mechanics KZ 2 4 Abstract: Theory and applica	of the course, the	students should be able to choose the appropriate technique (taking into account the advantages and limitations of individual method	ds) for characteriza	ation of the
14NDT Nondestructive Diagnostics Z 2 Abstract. The course is devoted to acquaintance with theoretical and practical grounding and applications of nondestructure testing (NDT), evaluation (NDE), and inspection (NDL), SHM) of materials and structures. Besides the standard NDT methods, the lectures also deal with the newest NDT/NDE procedures (acoustic emission, nonlinear ultrasonic spectroscopy and tomography, etc.). The education is completed by practical laboratory training in selected methods and also by accursions into industrial companies working on NDT/NDE. 14NEKM Non-metallic Naterials ZZK 2 Abstract. The course explains the structure and basic properties of important non-metallic materials, such as ceramics, glass, polymers and composites. These materials can be used as single material for construction, they can form protective coardings or they may be used as components for the functionally graded materials. 14PLA Plasticity Z,ZK 3 Abstract. Introduction to plasticity of materials and structures in terms of classical continuum mechanics. The first part contains the general incremental theory: yield criteria, strain nardening, locating criterion, flow rule and corresponding physical equations including the deploting classical collapse. Collapse: of basis, beams and pressure vessels are presented. The second part is devoted to methods ach knowledge useful for material science: stress concentration and plastic collapse of bars, beams and pressure vessels are presented. The second part is devoted to methods: collapse. (barcet deformation before the fracture, differences between plasticity in plane stress and strain, elastic		properties of investigated materials/components.		
Abstract: The course is devoted to acquaintance with theoretical and practical grounding and applications of nondestructive testing (NDT), evaluation (NDE), and inspection (NDL), SHM) of materials and structures. Bedies the standard NDT methods, the lecture also deal with the newest NDTADE proceedings in single materials and structures. Because explains the structure and basic properties of important non-metallic materials, such as ceranics, glass, polymers and composites. These materials can be used as single material for construction, they can form protective coatings or they may be used as components for the functionally graded materials. 14PLA Z,ZK 3 Abstract: This course explains the structure and basic properties of important non-metallic materials, such as ceranics, glass, polymers and composites. These materials can be used as single material for construction, they can form protective coatings or they may be used as components for the functionally graded materials. 14PLA Z,ZK 3 Abstract: This course explains the structures in terms of classical continuum mechanics. The first part contains the general incremental theory: yield citeria, strain hardening, loading citerion, flow rule and corresponding physical equations including the deformation theory. Then engineering solutions of elastic plastic tension, bending, torsion and plastic deformation and corkes, limit theorems and their applications to estimation of the plastic collapse, localization of plastic deformation before the fracture, differences between plasticity in plane stress and strate, elastic-plastic tresponse to cyclic load. 14PM Computational Mechanics 4 Abstract: Wooking experience on the given subject in the laboratory. 14SFM Seminar - New Trends in Materials and technologies, degradation processes, experimental method sci. Persential congineering solutions of partial results of the students mater theses. 14UAD Pre-diplorma Experience Z 4 Abstract: New research findings in the	14NDT	Nondestructive Diagnostics	Z	2
of materials and structures. Besides the standard NDT methods, the lectures also deal with the newest NDTNDE procedures (acoustic emission, nonlinear ultrasonic spectroscopy, and tomography, etc.). The education is completed by practical laboratory training in selected methods and also by excursions into industrial companies working on NDT/NDE. 14NEKM Non-metallic Naterials Z,ZK 2 Abstract: This course explains the structure and basic properties of important non-metallic materials, such as ceramics, glass, polymers and composites. These materials can be used as single material for construction, they can form protective coalings or they may be used as components for the functionally graded materials. 14PLA Plasticity Z,ZK 3 Abstract: Introduction to plasticity of materials and structures in terms of classical continuum mechanics. The first part contains the general incremental theory: yield ortheria, strain and plastic collapse of bars, beams and pressure vessels are presented. The second part is devoted to methods and knowledge useful for material science: stress concentration and plastic deformation and unches and cracks, limit theorems and thria eplications to stimation of the plastic collapse, localization of plastic deformation before the fracture, differences between plasticity in plane stress and strain, elastic-plastic response to cyclic load. 14PP Computational Mechanics KZ 2 14PP Record article in finite element method in the mechanics of deformable bodies. Lectures are accompanied by model examples which aims to demostrate the basic principles of building the correct numerical models. KZ 2 14PP	Abstract: The cours	e is devoted to acquaintance with theoretical and practical grounding and applications of nondestructive testing (NDT), evaluation (ND	E), and inspection	(NDI, SHM)
and tomography, etc.). The education is completed by practical laboratory training in selected methods and also by excursions into industrial companies working on NDT/NDE. 14NEKM Non-metallic Naterials Z,ZK 2 Abstract: This course explains the structure and basic properties of important non-metallic materials, such as ceramics, glass, polymers and composites. These materials can be used as components for the functionally graded materials. Z,ZK 3 Abstract: This course explains the structure and basic properties of important non-metallic materials, such as ceramics, glass, polymers and composites. These materials can be used as components for the functionally graded materials. Vertex 3 14PLA Plasticity Z,ZK 3 Abstract: Introduction to plasticity of materials and structures in terms of classical continuum mechanics. The first part contains the general incremental theory: yield criteria, strain nad plastic classes may and resurve vessels are presented. The second part is devoted to methods and knowledge useful tor material scheres: tess concentration and plastic classic plastic resonance to cyclic load. I/2 2 14PP Computational Mechanics KZ 2 2 14PP Computational Mechanics KZ 2 4 14PP Pre-diploma Experience Z 4 14PP Pre-diploma Experience Z 3 3 14ST Semi	of materials and s	tructures. Besides the standard NDT methods, the lectures also deal with the newest NDT/NDE procedures (acoustic emission, nonl	inear ultrasonic sp	ectroscopy
14NERM Non-metallic Naterials Z,ZK 2 Abstract: This course explains the structure and basic properties of important non-metallic materials, such as ceramics, glass, polymers and composites. These materials can be used as single material for construction, they can form protective coatings or they may be used as components for the functionally graded materials. 3 Abstract: Introduction to plasticity of materials and structures in terms of classical continuum may be used as components for the functionally graded materials. 3 Abstract: Introduction to plasticity of materials and structures in terms of classical continuum mechanics. The first part contains the general incremental theory: yield criteria, strain hardening, loading criterion, flow rule and corresponding physical equations including the deformation theory. Then engineering solutions of elastic close-se transcomeant on around notches and cracks, limit theorems and their applications to estimation of the plastic collapse. (closalization of plastic deformation before the fracture. differences between plasticity in plane stress and strain, elastic-plastic response to cyclic load. KZ 2 14PM Computational Mechanics KZ 2 4 14PP Pe-diploma Experience KZ 3 14SFM Seminar Physics of materials KZ 5 14SFM Seminar Physics of materials KZ 2 3 Abstract: New research findings in the field of research and developmen	and tomograph	y, etc.). The education is completed by practical laboratory training in selected methods and also by excursions into industrial compar	nies working on NE	DT/NDE.
Abstract: This course explains the structure and basic properties of important non-metallic materials, such as caramics, glass, polymers and composites. These materials can be used as single material for construction, they can form protective coatings or they may be used as components for the functionally graded materials. 14PLA Plasticity Z,ZK 3 Abstract: Introduction to plasticity of materials and structures in terms of classical continuum mechanics. The first part contains the general incremental theory: yield criteria, strain hardening, loading criterion, flow rule and corresponding physical equations including the deformation theory. Then engineering solutions of elastic-plastic tension, bending, torsion and plastic collapse of basis, beams and pressure vessels are presented. The second part is devoted to methods and knowledge useful for material science: stress concentration and plastic deformation and nowledge useful for material science: stress concentration and plastic deformation applications to estimation of the plastic response to cyclic load. KZ 2 14PPM Computational Mechanics KZ 2 14PP Pre-diploma Experience Z 4 Abstract: Working experience on the given subject in the laboratory. KZ 5 14SFM Seminar Physics of materials RKZ 5 14SMT Seminar - New Trends in Materials Engineering Z 3 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processe, experimental methods etc. Presentations of part	14NEKM	Non-metallic Naterials	Z,ZK	2
as single material for construction, they can form protective coalings or they may be used as components for the functionally graded materials. 14PLA Plasticity Z,ZK 3 Abstract: Introduction to plasticity of materials and structures in terms of classical continuum mechanics. The first part contains the general incremental theory: yield criterials, strain hardening, loading criterion, flow rule and corresponding physical equations including the deformation theory. Then engineering solutions of elastic-plastic tension, bending, torsion and plastic collapse of bars, beams and pressure vessels are presented. The second part is devoted to methods and knowledge useful for material solence: stress concentration and plastic collapse, localization of plastic celformation before the fracture, differences between plasticity in plane stress and strain, elastic-plastic response to cyclic load. KZ 2 14PM Computational Mechanics KZ 2 Abstract: Theory and application of the finite element method in the mechanics of deformation before the fracture, differences basic principles of building the correct numerical models. KZ 2 14PP Pre-diploma Experience Z 4 Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. KZ 5 14SFM Seminar - New Trends in Materials Engineering Z 3 Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. F 2 2 14UAOB<	Abstract: This cours	se explains the structure and basic properties of important non-metallic materials, such as ceramics, glass, polymers and composites	. These materials	can be used
14PLA Plasticity Z,ZK 3 Abstract: Introduction to plasticity of materials and structures in terms of classical continuum mechanics. The first part contains the general incremental theory: yield criteria, strain hardening, clading criterion, flow rule and corresponding physical equations including the deformation theory. Then engineering solutions of elastic-plastic tension, bending, torsion and plastic collapse of bars, beams and pressure vessels are presented. The second part is devoted to methods and knowledge useful for material science: stress concentration and plastic collapse, localization of plastic deformation before the fracture, differences between plasticity in plane stress and strain, elastic-plastic response to cyclic load. XZ 2 14PM Computational Mechanics KZ 2 Abstract: Theory and application of the finite element method in the mechanics of deformable bodies. Lectures are accompanied by model examples which aims to demonstrate the basic principles of building the correct numerical models. KZ 2 14PP Pre-diploma Experience Z 4 Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. S 3 14SFM Seminar - New Trends in Materials Engineering Z 3 Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. 14UAOB KZ 2 14UMOB Introduction to selected bas		as single material for construction, they can form protective coatings or they may be used as components for the functionally graded	materials.	
Abstract: Introduction to plasticity of materials and structures in terms of classical continuum mechanics. The first part contains the general incremental theory: yield criteria, strain hardening, loading criterion, flow rule and corresponding physical equations including the deformation theory. Then engineering solutions of elastic-plastic tension, bending, torsion and plastic collapse of bars, beams and pressure vessels are presented. The second part is devoted to methods and knowledge useful for material science: stress concentration and plastic deformation around notches and cracks, limit theorems and their applications to estimation of the plastic collapse, localization of plastic deformation before the fracture, differences between plasticity in plane stress and strain, elastic-plastic response to cyclic load. KZ 2 14PM Computational Mecchanics KZ 2 Abstract: Theory and application of the finite element method in the mechanics of deformable bodies. Lectures are accompanied by model examples which aims to demonstrate the basic principles of building the correct numerical models. KZ 2 14PP Pre-diploma Experience on the given subject in the laboratory. KZ 5 14SIMT Seminar Physics of materials Engineering Z 3 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of particular results of the students master theses. 14UAOB Introduction to image anoessity and analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matab are p	14PLA	Plasticity	Z.7K	3
hardening, loading criterion, flow rule and corresponding physical equations including the deformation theory. Then engineering solutions of elastic-plastic tension, bending, torsion and plastic collapses to bars, beams and pressure vessels are presented. The second part is devoted to methods and knowledge useful for material science: stress concentration and plastic collapses, localization of plastic deformation before the fracture, differences between plasticity in plane stress and strain, elastic-plastic response to cyclic load. 14PM Computational Mechanics KZ 2 Abstract: Theory and application of the finite element method in the mechanics of deformable bodies. Lectures are accompanied by model examples which aims to demonstrate the basic principles of building the correct numerical models. KZ 2 14PP Pre-diploma Experience Z 4 Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. KZ 5 14SFM Seminar Physics of materials Engineering Z 3 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of particular tesks built in Matab are presented. Z 2 14UAOB Introduction to image analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matab are presented. KZ 2 14UMOB Introductinto forendimage of experience and resenterials of the	Abstract: Introduc	cition to plasticity of materials and structures in terms of classical continuum mechanics. The first part contains the general increment	al theory: vield crite	eria, strain
and plastic collapse of bars, beams and pressure vessels are presented. The second part is devoted to methods and knowledge useful for material science: stress concentration and plastic deformation of the plastic collapse, localization of plastic deformation before the fracture, differences between plasticity in plane stress and strain, elastic-plastic response to cyclic load. 14PM Computational Mechanics KZ 2 Abstract: Theory and application of the finite element method in the mechanics of deformable bodies. Lectures are accompanied by model examples which aims to demonstrate the basic principles of building the correct numerical models. Z 4 14PP Pre-diploma Experience Z 4 Abstract: Working experience on the given subject in the laboratory. KZ 5 14SFM Seminar Physics of materials KZ 5 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of partial results of the students master theses. S 14UAOB Introduction to image processing and analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matterials KZ 2 14UM Fatigue of Materials KZ 2 6 Abstract: New research findings in the field or conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and c	hardening, loadin	g criterion, flow rule and corresponding physical equations including the deformation theory. Then engineering solutions of elastic-pla	stic tension, bendi	ing, torsion
plastic deformation around notches and cracks, limit theorems and their applications to estimation of the plastic collapse, localization of plastic deformation before the fracture, differences between plasticity in plane stress and strain, elastic-plastic response to cyclic load. 14PM Computational Mechanics KZ 2 Abstract: Theory and application of the finite element method in the mechanics of deformable bodies. Lectures are accompanied by model examples which aims to demonstrate the basic principles of building the correct numerical models. KZ 4 14PP Pre-diploma Experience on the given subject in the laboratory. KZ 5 Abstract: Working experience on the given subject in the laboratory. KZ 5 Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. KZ 3 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of particular tasks built in Matlab are presented. Z 2 14UAOB Introduction to image analysis KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. Z 4 14UM Fatigue of Materials Z 2 Abstract: Lectures are concerned with explanation of conditions, causes	and plastic collaps	e of bars, beams and pressure vessels are presented. The second part is devoted to methods and knowledge useful for material scie	ence: stress concer	ntration and
between plasticity in plane stress and strain, elastic-plastic response to cyclic load. 14PM Computational Mechanics KZ 2 Abstract: Theory and application of the finite element method in the mechanics of deformable bodies. Lectures are accompanied by model examples which aims to demonstrate the basic principles of building the correct numerical models. XZ 2 14PP Pre-diploma Experience Z 4 Abstract: Working experience on the given subject in the laboratory. XZ 5 14SFM Seminar Physics of materials KZ 5 Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. 3 14SMT Seminar - New Trends in Materials Engineering Z 3 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of partial results of the students master theses. KZ 2 14UAOB Introduction to image processing and analysis with an emphasis on the applications to material engineering. Solutions of partial results of the students master theses. KZ 2 14UAOB Introduction to image processing and analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matab are presented. KZ	plastic deformation	around notches and cracks, limit theorems and their applications to estimation of the plastic collapse, localization of plastic deformation	before the fracture	, differences
14PM Computational Mechanics KZ 2 Abstract: Theory and application of the finite element method in the mechanics of deformable bodies. Lectures are accompanied by model examples which aims to demonstrate the basic principles of building the correct numerical models. Image: Computational Mechanics KZ 2 14PP Pre-diploma Experience on the given subject in the laboratory. Z 4 14SFM Seminar Physics of materials KZ 5 Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. XZ 5 14SMT Seminar - New Trends in Materials Engineering Z 3 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of particular results of the students master theses. Improvementations of particular tasks built in Materials and processing and analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matab are presented. KZ 2 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. KZ 2 14UM Fatigue of Materials KZ 2		between plasticity in plane stress and strain, elastic-plastic response to cyclic load.		
Abstract: Theory and application of the finite element method in the mechanics of deformable bodies. Lectures are accompanied by model examples which aims to demonstrate the basic principles of building the correct numerical models. 14PP Pre-diploma Experience Z 4 Abstract: Working experience on the given subject in the laboratory. KZ 5 14SFM Seminar Physics of materials KZ 5 Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. 3 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of partial results of the students master theses. 2 3 14UAOB Introduction to image analysis KZ 2 14UM Fatigue of Materials KZ 2 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. KZ 2 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussi	14PM	Computational Mechanics	KZ	2
basic principles of building the correct numerical models. 14PP Pre-diploma Experience Abstract: Working experience on the given subject in the laboratory. Z 4 14SFM Seminar Physics of materials Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. KZ 5 14SMT Seminar - New Trends in Materials Engineering Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of partial results of the students master theses. XZ 3 14UAOB Introduction to image analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Mattab are presented. KZ 2 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. KZ 2 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 Abstract: The research project is based on a topic approved by the admininistrators of the programme, department and by the dea	Abstract: Theory a	and application of the finite element method in the mechanics of deformable bodies. Lectures are accompanied by model examples w	hich aims to demo	onstrate the
14PP Pre-diploma Experience Z 4 Abstract: Working experience on the given subject in the laboratory. 14SFM Seminar Physics of materials KZ 5 14SFM Seminar Physics of materials KZ 5 Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. Z 3 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of partial results of the students master theses. Z 2 14UAOB Introduction to image analysis KZ 2 14UM Fatigue of Materials KZ 2 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. Z 6 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 Abstract: Lectures are concerned project is based on a topic approved by the administrators of the programme, de	, , ,	basic principles of building the correct numerical models.		
Abstract: Working experience on the given subject in the laboratory. L	14PP	Pre-diploma Experience	7	4
14SFM Seminar Physics of materials Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. KZ 5 14SMT Seminar - New Trends in Materials Engineering Z 3 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of partial results of the students master theses. KZ 2 14UAOB Introduction to image analysis KZ 2 The aim of the lecture is an introduction to selected basic methods of image processing and analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matlab are presented. KZ 2 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. Z 6 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor		Abstract: Working experience on the given subject in the laboratory	· ~	
Abstract: Reiteration and replenishment of knowledge from the main profile subjects. Case studies. Integration Integration <thintegraticanon< th=""> Integration Integrati</thintegraticanon<>	149EM	Sominar Dhysics of materials	K7	5
Abstract: Netlefation and reprenention and reprenentiation of notive transport of provide subjects. Case studies. Z 3 14SMT Seminar - New Trends in Materials Engineering Z 3 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of partial results of the students master theses. 14UAOB KZ 2 14UAOB Introduction to image analysis KZ 2 The aim of the lecture is an introduction to selected basic methods of image processing and analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matlab are presented. KZ 2 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. I 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings	143510	Abstract: Polyaritian and replanishment of knowledge from the main profile subjects. Case studies		5
14SM1 Seminar - New refers in Materials Engineering Z 3 Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of partial results of the students master theses. 14UAOB KZ 2 14UAOB Introduction to image analysis KZ 2 The aim of the lecture is an introduction to selected basic methods of image processing and analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matab are presented. KZ 2 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. 14VUSM1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8 14VUSM2 Research Project 2 KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8	4 4 C M T	Abstract. Referation and representation of the in Movienge non-unit provide subjects. Case studies.	7	
Abstract: New research findings in the field of research and development of new materials and technologies, degradation processes, experimental methods etc. Presentations of partial results of the students master theses. 14UAOB Introduction to image analysis KZ 2 The aim of the lecture is an introduction to selected basic methods of image processing and analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matlab are presented. KZ 2 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 14VUSM2 Research Project 2 KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8	1451/11	Seminar - New Trends in Materials Engineering		
14UAOB Introduction to image analysis KZ 2 The aim of the lecture is an introduction to selected basic methods of image processing and analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matlab are presented. KZ 2 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. XZ 6 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8	Abstract: New rese	arch findings in the field of research and development of new materials and technologies, degradation processes, experimental metho	ds etc. Presentatio	ons of partial
14UAOB Introduction to image analysis KZ 2 The aim of the lecture is an introduction to selected basic methods of image processing and analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matlab are presented. 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. XZ 6 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8		results of the students master theses.		
The aim of the lecture is an introduction to selected basic methods of image processing and analysis with an emphasis on the applications to material engineering. Solutions of particular tasks built in Matlab are presented. 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. Z 6 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8	14UAOB	Introduction to image analysis	KZ	2
tasks built in Matlab are presented. 14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. KZ 2 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 14VUSM2 KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8	The aim of the lectu	rre is an introduction to selected basic methods of image processing and analysis with an emphasis on the applications to material engi	neering. Solutions	of particular
14UM Fatigue of Materials KZ 2 Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. Computational algorithms. Computational algorithms. 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. XZ 8 14VUSM2 Research Project 2 KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8		tasks built in Matlab are presented.		
Abstract: Lectures are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristics, diagrams, equations and computational algorithms. 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 14VUSM2 KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8	14UM	Fatigue of Materials	KZ	2
computational algorithms. 14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. X 8 14VUSM2 Research Project 2 KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8	Abstract: Lecture	es are concerned with explanation of conditions, causes and mechanisms of fatigue damage, as well as material fatigue characteristic	cs, diagrams, equa	ations and
14VUSM1 Research Project 1 Z 6 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. The research Project 2 KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8		computational algorithms.		
Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 14VUSM2 Research Project 2 KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. KZ 8	14VUSM1	Research Project 1	Z	6
during common regular meetings and discussions. 14VUSM2 Research Project 2 KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions.	Abstract: The res	earch project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guid	ed by the project s	supervisor
14VUSM2 Research Project 2 KZ 8 Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions. 8		during common regular meetings and discussions.		
Abstract: The research project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common regular meetings and discussions.	14VUSM2	Research Proiect 2	KZ	8
during common regular meetings and discussions.	Abstract: The res	earch project is based on a topic approved by the administrators of the programme, department and by the dean. The student is quid	led by the project s	supervisor
		during common regular meetings and discussions.		

For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2025-07-21, time 22:55.