## Study plan

## Name of study plan: 06 109 NSTI DLTT 2012 zam ení KV

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch: Program of study: Welcome page

Type of study: unknown Required credits: 432

Elective courses credits: -301 Sum of credits in the plan: 131

Note on the plan:

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 429

The role of the block: P

Code of the group: 12NS\*1P-DLT-KV

Name of the group: 2012 NSTI 1.sem povinné DLTT - KV

Requirement credits in the group: In this group you have to gain 27 credits

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

Credits in the group: 27 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
2142008	Microelectronics	KZ	2	2P+0C+1L	*	Р
2211131	Powertrains of Motor Vehicles 1 Gabriela Achtenová	Z,ZK	5	3P+2C	*	Р
2213018	Principles of Design - Rail Vehicles  Josef Kolá Josef Kolá (Gar.)	Z	2	2P+0C	*	Р

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

Characteristics of	maracteristics of the courses of this group of olddy Flant. Gode=1240 ff -DE1-RV Name=2012 40 ff 1.3em povinie DE11 - RV						
2142008	Microelectronics	KZ	2				
Basic characteristics of	Basic characteristics of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converters, coding, lines and protocols						
of communications, elec	of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.						
2211131	Powertrains of Motor Vehicles 1	Z,ZK	5				
The subject clarifies the	design and basic calculations of aggregates of mechanical powertrains of passenger cars, trucks and motorcycles.						
2213018	Principles of Design - Rail Vehicles	Z	2				
Basic terminology and r	lasic terminology and nomenclature of rail vehicles parts. Principles of railway vehicles components.						

Code of the group: 12NS\*2P-DLT-KV

Name of the group: 2012 NSTI 2.sem povinné DLTT - KV

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

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

Credits in the group: 30 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2311074	Vibrations of Mechanical Systems Václav Bauma, Zbyn k Šika, Michael Valášek, Jan Zav el Václav Bauma Václav Bauma (Gar.)	ZK	4	3P+0C	*	Р
2211132	Powertrains of Motor Vehicles 2 Gabriela Achtenová Gabriela Achtenová (Gar.)	Z,ZK	5	3P+2C	*	Р

2211050	Internal Combustion Engines Fundamentals Vit Dole ek, Libor ervenka, Jan Macek Jan Macek Jan Macek (Gar.)	Z,ZK	6	4P+2C	*	Р
2211054	Theory of Vehicles Ji i Pakosta, Jan Kalivoda Jan Kalivoda (Gar.)	Z,ZK	6	4P+2C	*	Р

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

2311074	Vibrations of Mechanical Systems	ZK	4				
2211132 Powertrains of Motor Vehicles 2		Z,ZK	5				
The subject clarifies the	design and basic calculations of automatic aggregates of powertrains of passenger cars, trucks and motorcycles. 1 - Hydroc	dynamic transmis	sions 2 - Single				
planetary sets (JPS) - ir	ntroduction, graphical method 3 - JPS - kinematics, torques, efficiency 4 - JPS - calculation of JATCO 40 transmission 5 - Ne	sted planetary ge	ar sets (SPS) -				
graphical and analytical	method 6 - Nested planetary gear set (SPS) - matrix method 7 - SPS - example calculation, conditions of assembly 8 - Plan	etary gearboxes -	calculation of				
basic elements 9 - Varia	ttors (CVT) 10 - Powersplit transmissions, IVT 11 - Differential, behavior when driving in a curve, efficiency 12 - Differential w	ith more degree o	of freedom 13 -				
Hydrostatic transmissio	ns 14 - Powertrains of hybrid vehicles						
2211050	Internal Combustion Engines Fundamentals	Z,ZK	6				
Fundamentals of interna	al combustion engines (ICE): principles of performance, combustion processes, flame types, formation of pollutants, gas excl	hange, super- and	turbo-charging;				
description of tools for f	description of tools for fuel injection, mixture formation, valve gears, combustion realization, exhaust aftertreatment, lubrication and cooling. Engine maps and testing						
2211054	2211054 Theory of Vehicles						
Description of theoretics	Description of theoretical sources for longitudinal, vertical and directional dynamics of vehicles. Detailed description of interactions between road (railway) and body. Especially from						

Code of the group: 12NS\*3P-DLT-KV

view point of transmission of longitudinal and lateral forces and stability.

Name of the group: 2012 NSTI 3.sem povinné DLTT - KV

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

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

Credits in the group: 32 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
2211146	Drives of Railway Vehicles Josef Kolá Josef Kolá Josef Kolá (Gar.)	Z,ZK	4	3P+1C	*	Р
2211145	Railway Rolling Stock Running Gears Tomáš Heptner Tomáš Heptner (Gar.)	Z,ZK	5	4P+1C	*	Р
2311078	Controlled Mechanical Systems Václav Bauma, Zbyn k Šíka, Michael Valášek, Zden k Neusser, Pavel Steinbauer Michael Valášek Michael Valášek (Gar.)	Z,ZK	4	3P+1C	*	Р
2211058	Computational Methods of Transport Machinery  Jan Kalivoda, Ladislav Rus, Radek Tichánek, Michal Vaší ek <b>Jan Kalivoda</b> Jan Kalivoda (Gar.)	Z,ZK	5	3P+2C	*	Р

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

2211146	Drives of Railway Vehicles	Z,ZK	4	
Basic design of driv	asic design of drive concepts for railway vehicles and their influences on adhesion and driving properties			
2211145	2211145 Railway Rolling Stock Running Gears			
Concepts of rail veh	icle running gears. Basic theory, concepts and design of related subsystems	•	'	
2311078	Controlled Mechanical Systems	Z,ZK	4	
2211058	Computational Methods of Transport Machinery	Z,ZK	5	
Methods for both ar	alysis and synthesis of 3D mechanisms. Computation of elastic joining components. Effects of non-linearities. Development of b	oth mechanical a	nd mathematical	
models of vehicles.	Basic usage of FEM. Local and global coordinate system, matrices of mass, stiffness and damping. Both explicit and implicit sol	ver. Models of ma	terials. Torsional	

vibration in combustion engines and transmissions, methods of computation. Measurement of torsional vibration. Engine valve train (both kinematics and dynamics). Engine balancing

Code of the group: 12NS\*4P-DLT-KV

Name of the group: 2012 NSTI 4.sem povinné DLTT - KV

Requirement credits in the group: In this group you have to gain at least 340 credits (at most 34)

Requirement courses in the group: In this group you have to complete 8 courses

Credits in the group: 340

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
2141126	Rail Vehicles Electrical Equipment	Z,ZK	2	2P+0C+1L	*	Р
2211052	Design of Railway Vehicles Josef Kolá, Tomáš Heptner <b>Josef Kolá</b> Josef Kolá (Gar.)	ZK	4	4P+0C	*	Р
2212020	Accesories of Railway Vehicles Josef Kolá Josef Kolá (Gar.)	KZ	2	3P+0C	*	Р

2383062	Budget and Project Economic Assessment František Freiberg, Miroslav Žilka František Freiberg František Freiberg (Gar.)	Z	2	1P+2C	*	Р
2213012	Manufacturing technology of Railway Vehicles Josef Kolá Josef Kolá (Gar.)	Z	2	2P+0C	*	Р
2211043	Computational Methods and Testing of Ralway Vehicles Tomáš Heptner, Ladislay, Rus Jan Kaliyoda, Ladislay, Rus (Gar.)	Z,ZK	4	3P+1C	*	Р

## Characteristics of the courses of this group of Study Plan: Code=12NS\*4P-DLT-KV Name=2012 NSTI 4.sem povinné DLTT - KV

2141126 Rail Vehicles Electrical Equipment Z,ZK 2
Equation of motion and mechanical properties of electrical drive, losses and dimensioning of electrical drive, general properties and control of DC drives, general properties and control of drives with asynchronous and synchronous motors, using of semiconductor converters in electrical drives, choppers, inverters, frequency converters, thyristor rectifiers, feedback control of electrical drive, EMC of electrical drive

2211052	Design of Railway Vehicles	ZK	4			
Basic concepts of railway vehicles design, design of railway vehicles body, chassis, underframe, running gear, auxiliary equipment, heating, ventilation and ai						
2212020	Accesories of Railway Vehicles	KZ	2			
Deepening the knowled	Deepening the knowledge of designing accesories of Railway Vehiles and interiors of passager coach and dieselelectric oder electrics units, trams and subway cars.					
2383062	Budget and Project Economic Assessment	Z	2			

The goal of the course is to improve the knowledge gained within the basic bachelor's degree course Management and Economics of the Enterprise. The course focuses primarily on deepening of basic knowledge and skills in the creation and evaluation of the operational budget, proper preparation and evaluation of costing model for manufactured products and the economic evaluation of an investment project, as it corresponds to contemporary knowledge and the development of management methods and techniques. Students specify a simple fictional industrial or engineering company or its sub-section (preferably inspired by their practical experience, internships or training program in real company). The first student's task is to prepare a detailed plan and budget of a project (e.g. new product development, product or process innovation, etc.) focused on improvement of profitability, competitiveness or effectiveness of the company. The second task is cost calculation for chosen calculation unit. Last task within this course is the evaluation of economical effectiveness of the project described within the first task. The dynamic methods like Net Present Value (NPV), Internal Rate of Return (IRR) or Discounted Payback Period (DPP) are used for this evaluation. The quality of realization and presentation of the task's outputs together with the results of the test decides on granting / denial of credit.

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2213012 Manufacturing technology of Railway Vehicles Z Getting to know the different stages of the production cycle of Rail Vehicles. Basic understanding of the technology of Rail Vehicles and their components.		2		
	Getting to know the diffe	erent stages of the production cycle of Rail Vehicles. Basic understanding of the technology of Rail Vehicles and their compo	nents.	
	2211043	Computational Methods and Testing of Ralway Vehicles	7.7K	4

Calculation of running stability of a railway vehicle. Optimization of damping and suspension of the vehicle. Calculation of stable areas of lateral oscillation. Construction of mathematical models of railway vehicles with multiple degrees of freedom excited by unevenness of the track of harmonic run. Non-linear parts of suspension and damping. Calculation of force-feedbacks and acceleration, on the bogie and the body of the vehicle, according to harmonic excitation. Random process theory considering the random excitation of railway vehicles. Calculation of correlation functions, cross-correlation functions and power spectral density. Construction of mathematical models of railway vehicles in 3D. Calculation of feedbacks of 3D models on random excitation. Mass-continuum oscillation. Bending oscillation of the body of the vehicle.

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 3

The role of the block: PV

Code of the group: 12N\*\*3Q--JV

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

Requirement credits in the group: In this group you have to gain 2 credits

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

Credits in the group: 2 Note on the group:

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

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

2043081 | English - Preparatory Course / FME | Z | 2 | Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. European level A1 - A2.

2043086	Czech - Preparatory Course	Z	2
Aim: Understanding cle	arly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about the	em. Writing in a sin	nple way about
familiar topics. Reading	and comprehension of simple texts. Improvement of professional language.		
2043083	French - Preparatory Course / FME	Z	2
Aim: Understanding cle	arly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about the	em. Writing in a sin	nple way about
familiar topics. Reading	and comprehension of simple texts. Improvement of professional language.		
2043082	German - Lower Intermediate Course	Z	2
Mapped to the level of 0	Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whic	h a student meets	either at school
or in his/her free time a	nd speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improveme	ent of professional	language.
2043085	Russian - Preparatory Course / FME	Z	2
Aim: Understanding cle	arly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about the	m. Writing in a sin	nple way about
familiar topics. Reading	and comprehension of simple texts. Improvement of professional language.		
2043084	Spanish - Preparatory Course / FME	Z	2
Aim: Understanding cle	arly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about the	m. Writing in a sin	nple way about
familiar topics. Reading	and comprehension of simple texts. Improvement of professional language.		

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

Name of the group: 2012 N 3.sem povinná jazyková zkouška Requirement credits in the group: In this group you have to gain 1 credit Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 1 Note on the group:

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

	Villagornez (Gai.)		
Characteristics of	f the courses of this group of Study Plan: Code=12N**3QJZ Name=2012 N 3.sem povinná	jazyková zko	ouška
2041081	English - Master Exam	ZK	1
Mapped to the level of	Common European Framework of Reference: A2. Aim: Understanding clearly what is spoken about everyday situations whicl	h a student meets	at school or in
his/her free time and sp	peaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement	of professional lar	iguage.
2041086	Czech- Master Exam	ZK	1
2041083	French - Master Exam / FME	ZK	1
Mapped to the level of	Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whic	h a student meets	either at schoo
or in his/her free time a	nd speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement	ent of professional	language.
2041082	German - Master Exam / FME	ZK	1
Mapped to the level of	Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whic	ch a student meets	either at school
or in his/her free time a	nd speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement	ent of professional	language.
2041085	Russian - Master Exam / FME	ZK	1
Mapped to the level of	Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whic	ch a student meets	either at schoo
or in his/her free time a	nd speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement	ent of professional	language.
2041084	Spanish - Master Exam / FME	ZK	1
Mapped to the level of	Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whic	h a student meets	either at schoo
or in his/her free time a	nd speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improveme	ent of professional	language.

## List of courses of this pass:

	Name of the course	Completion	Credits
2041081	English - Master Exam	ZK	1
	el of Common European Framework of Reference: A2. Aim: Understanding clearly what is spoken about everyday situations which a		
	te and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement		
2041082	German - Master Exam / FME I of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a	ZK	1 or at school
	time and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvemen		
2041083	French - Master Exam / FME	ZK	1
	ا I of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a		er at school
	time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvemen		
2041084	Spanish - Master Exam / FME	ZK	1
Mapped to the leve	of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a	student meets eith	er at school
or in his/her free	time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement	nt of professional la	inguage.
2041085	Russian - Master Exam / FME	ZK	1
	of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a		
or in his/her free	time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvemen	nt of professional la	inguage.
2041086	Czech- Master Exam	ZK	1
2043081	English - Preparatory Course / FME	Z	2
Aim: Understandin	g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them.		way about
	familiar topics. Reading and comprehension of simple texts. Improvement of professional language. European level A1 - A2		
2043082	German - Lower Intermediate Course	Z	2
	l of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a setting and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvemen		
		7	2
2043083	French - Preparatory Course / FME g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them.	_	
Aiii. Onderstandii	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	writing in a simple	way about
2043084	Spanish - Preparatory Course / FME	7	2
	g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them.		_
, and onderedarian	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		ay abbat
2043085	Russian - Preparatory Course / FME	Z	2
Aim: Understandin	g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them.	Writing in a simple	way about
	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		
2043086	Czech - Preparatory Course	Z	2
Aim: Understandin	g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them.	Writing in a simple	way about
	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		
2141126	Rail Vehicles Electrical Equipment	Z.ZK	2
Carretion of metion	, ,	,	
	and mechanical properties of electrical drive, losses and dimensioning of electrical drive, general properties and control of DC drives,	general properties	
	nchronous and synchronous motors, using of semiconductor converters in electrical drives, choppers, inverters, frequency converters	general properties	
of drives with asyr	nchronous and synchronous motors, using of semiconductor converters in electrical drives, choppers, inverters, frequency converters control of electrical drive, EMC of electrical drive	general properties , thyristor rectifiers	s, feedback
of drives with asyr	nchronous and synchronous motors, using of semiconductor converters in electrical drives, choppers, inverters, frequency converters control of electrical drive, EMC of electrical drive  Microelectronics	general properties s, thyristor rectifiers KZ	s, feedback
of drives with asyr	nchronous and synchronous motors, using of semiconductor converters in electrical drives, choppers, inverters, frequency converters control of electrical drive, EMC of electrical drive  Microelectronics  so of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converters.	general properties s, thyristor rectifiers KZ	s, feedback
of drives with asyr 2142008 Basic characteristic	chronous and synchronous motors, using of semiconductor converters in electrical drives, choppers, inverters, frequency converters control of electrical drive, EMC of electrical drive  Microelectronics  so of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converter of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.	general properties s, thyristor rectifiers KZ rs, coding, lines ar	s, feedback 2 nd protocols
of drives with asyr 2142008 Basic characteristic 2211043	nchronous and synchronous motors, using of semiconductor converters in electrical drives, choppers, inverters, frequency converters control of electrical drive, EMC of electrical drive  Microelectronics  as of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converter of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.  Computational Methods and Testing of Ralway Vehicles	general properties thyristor rectifiers KZ rs, coding, lines ar	2 and protocols
2142008 Basic characteristic 2211043 Calculation of runn	nchronous and synchronous motors, using of semiconductor converters in electrical drives, choppers, inverters, frequency converters control of electrical drive, EMC of electrical drive  Microelectronics  cs of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converter of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.  Computational Methods and Testing of Ralway Vehicles  ng stability of a railway vehicle. Optimization of damping and suspension of the vehicle. Calculation of stable areas of lateral oscillation.	general properties thyristor rectifiers KZ rs, coding, lines ar Z,ZK Construction of m	2 ad protocols 4 athematical
2142008 Basic characteristic  2211043 Calculation of runn models of railway ve	nchronous and synchronous motors, using of semiconductor converters in electrical drives, choppers, inverters, frequency converters control of electrical drive, EMC of electrical drive  Microelectronics  as of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converter of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.  Computational Methods and Testing of Ralway Vehicles	general properties thyristor rectifiers KZ rs, coding, lines ar Z,ZK Construction of m	2 ad protocols  4 athematical e-feedbacks
2142008 Basic characteristic  2211043 Calculation of runn models of railway ve and acceleration, o	nchronous and synchronous motors, using of semiconductor converters in electrical drives, choppers, inverters, frequency converters control of electrical drive, EMC of electrical drive  Microelectronics  as of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converter of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.  Computational Methods and Testing of Ralway Vehicles  In g stability of a railway vehicle. Optimization of damping and suspension of the vehicle. Calculation of stable areas of lateral oscillation. Schicles with multiple degrees of freedom excited by unevenness of the track of harmonic run. Non-linear parts of suspension and damping.	general properties thyristor rectifiers KZ rs, coding, lines ar Z,ZK Construction of m Calculation of forcof railway vehicles.	2 ad protocols  4 athematical e-feedbacks Calculation
2142008 Basic characteristic  2211043 Calculation of runn models of railway ve and acceleration, o	control of electrical drive, EMC of electrical drives, choppers, inverters, frequency converters control of electrical drive, EMC of electrical drive  Microelectronics  cs of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converter of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.  Computational Methods and Testing of Ralway Vehicles  In g stability of a railway vehicle. Optimization of damping and suspension of the vehicle. Calculation of stable areas of lateral oscillation, whicles with multiple degrees of freedom excited by unevenness of the track of harmonic run. Non-linear parts of suspension and damping, in the bogie and the body of the vehicle, according to harmonic excitation. Random process theory considering the random excitation of the control of the	general properties thyristor rectifiers KZ rs, coding, lines ar Z,ZK Construction of m Calculation of forc of railway vehicles. on of feedbacks of	2 ad protocols  4 athematical e-feedbacks Calculation
2142008 Basic characteristic  2211043 Calculation of runn models of railway ve and acceleration, o	Achronous and synchronous motors, using of semiconductor converters in electrical drives, choppers, inverters, frequency converters control of electrical drive, EMC of electrical drive  Microelectronics  as of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converter of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.  Computational Methods and Testing of Ralway Vehicles  In g stability of a railway vehicle. Optimization of damping and suspension of the vehicle. Calculation of stable areas of lateral oscillation, whicles with multiple degrees of freedom excited by unevenness of the track of harmonic run. Non-linear parts of suspension and damping, in the bogie and the body of the vehicle, according to harmonic excitation. Random process theory considering the random excitation of ions, cross-correlation functions and power spectral density. Construction of mathematical models of railway vehicles in 3D. Calculation	general properties thyristor rectifiers KZ rs, coding, lines ar Z,ZK Construction of m Calculation of forcof railway vehicles.	2 ad protocols  4 athematical e-feedbacks Calculation
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2211132	Powertrains of Motor Vehicles 2	Z,ZK	5
The subject clarifies the de-	sign and basic calculations of automatic aggregates of powertrains of passenger cars, trucks and motorcycles. 1 - Hyd	rodynamic transmissior	is 2 - Single
planetary sets (JPS) - intro	duction, graphical method 3 - JPS - kinematics, torques, efficiency 4 - JPS - calculation of JATCO 40 transmission 5 - N	Nested planetary gear s	sets (SPS) -
graphical and analytical me	ethod 6 - Nested planetary gear set (SPS) - matrix method 7 - SPS - example calculation, conditions of assembly 8 - P	lanetary gearboxes - ca	alculation of
basic elements 9 - Variator	s (CVT) 10 - Powersplit transmissions, IVT 11 - Differential, behavior when driving in a curve, efficiency 12 - Differentia	I with more degree of fr	eedom 13 -
	Hydrostatic transmissions 14 - Powertrains of hybrid vehicles		
2211145	Railway Rolling Stock Running Gears	Z,ZK	5
,	Concepts of rail vehicle running gears. Basic theory, concepts and design of related subsystems	,	
2211146	Drives of Railway Vehicles	Z,ZK	4
ı	Basic design of drive concepts for railway vehicles and their influences on adhesion and driving properties	,	1
2212020	Accesories of Railway Vehicles	KZ	2
Deepening the know	wledge of designing accesories of Railway Vehiles and interiors of passager coach and dieselelectric oder electrics uni	ts, trams and subway c	ars.
2213012	Manufacturing technology of Railway Vehicles	Z	2
Getting to kno	w the different stages of the production cycle of Rail Vehicles. Basic understanding of the technology of Rail Vehicles a	nd their components.	•
2213018	Principles of Design - Rail Vehicles	Z	2
'	Basic terminology and nomenclature of rail vehicles parts. Principles of railway vehicles components.	'	
2311074	Vibrations of Mechanical Systems	ZK	4
2311078	Controlled Mechanical Systems	Z,ZK	4
2383062	Budget and Project Economic Assessment	Z	2
The goal of the course is to	improve the knowledge gained within the basic bachelor's degree course Management and Economics of the Enterpri	ea. The course focuses	nrimarily o

The goal of the course is to improve the knowledge gained within the basic bachelor's degree course Management and Economics of the Enterprise. The course focuses primarily on deepening of basic knowledge and skills in the creation and evaluation of the operational budget, proper preparation and evaluation of costing model for manufactured products and the economic evaluation of an investment project, as it corresponds to contemporary knowledge and the development of management methods and techniques. Students specify a simple fictional industrial or engineering company or its sub-section (preferably inspired by their practical experience, internships or training program in real company). The first student's task is to prepare a detailed plan and budget of a project (e.g. new product development, product or process innovation, etc.) focused on improvement of profitability, competitiveness or effectiveness of the company. The second task is cost calculation for chosen calculation unit. Last task within this course is the evaluation of economical effectiveness of the project described within the first task. The dynamic methods like Net Present Value (NPV), Internal Rate of Return (IRR) or Discounted Payback Period (DPP) are used for this evaluation.

The quality of realization and presentation of the task's outputs together with the results of the test decides on granting / denial of credit.

For updated information see <a href="http://bilakniha.cvut.cz/en/FF.html">http://bilakniha.cvut.cz/en/FF.html</a> Generated: day 2025-07-10, time 00:04.