Study plan

Name of study plan: 04 109 NSTI DLTT 2012 zaměření MV

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: 120
Elective courses credits: 4
Sum of credits in the plan: 124
Note on the plan:

Name of the block: Compulsory courses in the program
Minimal number of credits of the block: 113
The role of the block: P

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

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2142008	**Microelectronics**	KZ	2	2P+0C+1L	*	P
2211131	**Powertrains of Motor Vehicles 1** ***Gabriela Achtenová***	Z,ZK	5	3P+2C	*	P

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

2142008	Microelectronics	KZ	2
Basic characteristics of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converters, coding, lines and protocols of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.			
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.			

Code of the group: 12NS*2P-DLT-MV+SM
Name of the group: 2012 NSTI 2.sem povinné DLTT - MV a SM
Requirement credits in the group: In this group you have to gain 26 credits
Requirement courses in the group: In this group you have to complete 5 courses
Credits in the group: 26
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, Zbyněk Šika, Michael Valášek, Jan Zavřel* ***Václav Bauma*** *Václav Bauma (Gar.)*	ZK	4	3P+0C	*	P
2211132	**Powertrains of Motor Vehicles 2** *Gabriela Achtenová* ***Gabriela Achtenová*** *Gabriela Achtenová (Gar.)*	Z,ZK	5	3P+2C	*	P
2211050	**Internal Combustion Engines Fundamentals** *Vít Doleček, Libor Červenka, Jan Macek* ***Jan Macek*** *Jan Macek (Gar.)*	Z,ZK	6	4P+2C	*	P
2211054	**Theory of Vehicles** *Jiří Pakosta, Jan Kalivoda* ***Jan Kalivoda*** *Jan Kalivoda (Gar.)*	Z,ZK	6	4P+2C	*	P

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

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 - Hydrodynamic transmissions 2 - Single planetary sets (JPS) - introduction, graphical method 3 - JPS - kinematics, torques, efficiency 4 - JPS - calculation of JATCO 40 transmission 5 - Nested planetary gear sets (SPS) - graphical and analytical method 6 - Nested planetary gear set (SPS) - matrix method 7 - SPS - example calculation, conditions of assembly 8 - Planetary gearboxes - calculation of basic elements 9 - Variators (CVT) 10 - Powersplit transmissions, IVT 11 - Differential, behavior when driving in a curve, efficiency 12 - Differential with more degree of freedom 13 - Hydrostatic transmissions 14 - Powertrains of hybrid vehicles			
2211050	Internal Combustion Engines Fundamentals	Z,ZK	6
Fundamentals of internal combustion engines (ICE): principles of performance, combustion processes, flame types, formation of pollutants, gas exchange, super- and turbo-charging; description of tools for fuel injection, mixture formation, valve gears, combustion realization, exhaust aftertreatment, lubrication and cooling. Engine maps and testing			
2211054	Theory of Vehicles	Z,ZK	6
Description of theoretical sources for longitudinal, vertical and directional dynamics of vehicles. Detailed description of interactions between road (railway) and body. Especially from view point of transmission of longitudinal and lateral forces and stability.			

Code of the group: 12NS*3P-DLT-MV
Name of the group: 2012 NSTI 3.sem povinné DLTT - MV
Requirement credits in the group: In this group you have to gain 28 credits
Requirement courses in the group: In this group you have to complete 5 courses
Credits in the group: 28
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2311077	**Dynamics of Vehicles** *Václav Bauma, Zbyněk Šika, Michael Valášek, Jan Pelikán* ***Michael Valášek*** *Michael Valášek (Gar.)*	Z,ZK	5	3P+2C	*	P
2311078	**Controlled Mechanical Systems** *Václav Bauma, Zbyněk Šika, Michael Valášek, Zdeněk Neusser, Pavel Steinbauer* ***Michael Valášek*** *Michael Valášek (Gar.)*	Z,ZK	4	3P+1C	*	P
2211058	**Computational Methods of Transport Machinery** *Jan Kalivoda, Ladislav Rus, Radek Tichánek, Michal Vašíček* ***Jan Kalivoda*** *Jan Kalivoda (Gar.)*	Z,ZK	5	3P+2C	*	P

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

2311077	Dynamics of Vehicles	Z,ZK	5
2311078	Controlled Mechanical Systems	Z,ZK	4
2211058	Computational Methods of Transport Machinery	Z,ZK	5
Methods for both analysis and synthesis of 3D mechanisms. Computation of elastic joining components. Effects of non-linearities. Development of both mechanical and mathematical models of vehicles. Basic usage of FEM. Local and global coordinate system, matrices of mass, stiffness and damping. Both explicit and implicit solver. Models of materials. 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-MV
Name of the group: 2012 NSTI 4.sem povinné DLTT - MV
Requirement credits in the group: In this group you have to gain 34 credits
Requirement courses in the group: In this group you have to complete 9 courses
Credits in the group: 34
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
2141124	**Electrical Equipment of Vehicles**	Z,ZK	3	2P+0C+1L	*	P
2211150	**Hybrid drives** *Josef Morkus, Pavel Mindl* ***Josef Morkus*** *Josef Morkus (Gar.)*	Z,ZK	4	3P+1C	*	P
2211045	**Desig of Car Bodies and Frames** *Michal Vašíček* ***Michal Vašíček*** *Michal Vašíček (Gar.)*	ZK	2	2P+0C	*	P
2212041	**Passive Safety of Vehicles** *Michal Vašíček* ***Michal Vašíček*** *Michal Vašíček (Gar.)*	KZ	2	2P+0C	*	P
2383062	**Budget and Project Economic Assessment** *František Freiberg, Miroslav Žilka* ***František Freiberg*** *František Freiberg (Gar.)*	Z	2	1P+2C	*	P

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

2141124	Electrical Equipment of Vehicles	Z,ZK	3
El. Source Power System - Dynamo, Control. Alternator, Construction, Theory. Alternator Control - Vibrating, and Electronic Way - Accumulator Battery. Start-Motors Types and Construction. Start - Motor Theory and Characteristics. Ignition Systems. Battery Ignition. Magneto Ignition and Electronic Ignition. Sensors and Converters. Servomotors and Electromagnets. Speed Motors Control and Contactless Switching of Power Load. (For Traffic Engineering Study).			
2211150	Hybrid drives	Z,ZK	4
Introduction to hybrid drives, their components, including electrical machines and energy accumulators, application to different types of vehicles, emissions hybrid drive control.			
2211045	Desig of Car Bodies and Frames	ZK	2
Types of vehicle body, basics of composition, parts of body design, components and accessories. Design and legislative. Methodology of body design. Initial design of body strength and elasticity			
2212041	Passive Safety of Vehicles	KZ	2
Introduction and explanation of basic physics principles used in vehicle crash analysis - kinematics and dynamics of vehicle and occupant. Introduction to injury biomechanics, injury mechanisms and criteria. Overview of safety legislation. Overview and function of nowadays safety restraint system used.			
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.			

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 7
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* ***Nina Procházková Ayyub***	Z	2	0P+2C	*	PV
2043086	**Czech - Preparatory Course** *Michaela Schusová, Hana Volejníková, Petr Laurich*	Z	2	0P+2C	*	PV
2043083	**French - Preparatory Course / FME** *Michaela Schusová, Dušana Jirovská* ***Michaela Schusová*** *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=12N3Q--JV Name=2012 N 3.sem povinná jazyková výuka**

2043081	English - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. European level A1 - A2.			
2043086	Czech - Preparatory Course	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043083	French - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043082	German - Lower Intermediate Course	Z	2
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.			
2043085	Russian - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043084	Spanish - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			

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

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

Characteristics of the courses of this group of Study Plan: Code=12N3Q--JZ Name=2012 N 3.sem povinná jazyková zkouška**

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

Code of the group: 12NS*2Q-DLT-MV+SM
Name of the group: 2012 NSTI 2.sem 1povvol DLTT - MV a SM
Requirement credits in the group: In this group you have to gain 4 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 4
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
2121043	**Computational Fluid Mechanics**	ZK	4	3P+0C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12NS*2Q-DLT-MV+SM Name=2012 NSTI 2.sem 1povvol DLTT - MV a SM

2121043	Computational Fluid Mechanics	ZK	4
This course extends the knowledge gained in the course of Fluid Mechanics about the knowledge of computational fluid dynamics. Emphasis is placed on understanding the basic principles of computational fluid dynamics based on using commercial codes. Selected problems of internal and external aerodynamics are solved.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
2041081	English - Master Exam	ZK	1
Mapped to the level of Common European Framework of Reference: A2. Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2041082	German - Master Exam / FME	ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.			
2041083	French - Master Exam / FME	ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.			
2041084	Spanish - Master Exam / FME	ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.			
2041085	Russian - Master Exam / FME	ZK	1
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.			
2041086	Czech- Master Exam	ZK	1
2043081	English - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. European level A1 - A2.			
2043082	German - Lower Intermediate Course	Z	2
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement of professional language.			
2043083	French - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043084	Spanish - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043085	Russian - Preparatory Course / FME	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2043086	Czech - Preparatory Course	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2121043	Computational Fluid Mechanics	ZK	4
This course extends the knowledge gained in the course of Fluid Mechanics about the knowledge of computational fluid dynamics. Emphasis is placed on understanding the basic principles of computational fluid dynamics based on using commercial codes. Selected problems of internal and external aerodynamics are solved.			
2141124	Electrical Equipment of Vehicles	Z,ZK	3
El. Source Power System - Dynamo, Control. Alternator, Construction, Theory. Alternator Control - Vibrating, and Electronic Way - Accumulator Battery. Start-Motors Types and Construction. Start - Motor Theory and Characteristics. Ignition Systems. Battery Ignition. Magneto Ignition and Electronic Ignition. Sensors and Converters. Servomotors and Electromagnets. Speed Motors Control and Contactless Switching of Power Load. (For Traffic Engineering Study).			
2142008	Microelectronics	KZ	2
Basic characteristics of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converters, coding, lines and protocols of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.			
2211045	Desig of Car Bodies and Frames	ZK	2
Types of vehicle body, basics of composition, parts of body design, components and accessories. Design and legislative. Methodology of body design. Initial design of body strength and elasticity			
2211050	Internal Combustion Engines Fundamentals	Z,ZK	6
Fundamentals of internal combustion engines (ICE): principles of performance, combustion processes, flame types, formation of pollutants, gas exchange, super- and turbo-charging; description of tools for fuel injection, mixture formation, valve gears, combustion realization, exhaust aftertreatment, lubrication and cooling. Engine maps and testing			
2211054	Theory of Vehicles	Z,ZK	6
Description of theoretical sources for longitudinal, vertical and directional dynamics of vehicles. Detailed description of interactions between road (railway) and body. Especially from view point of transmission of longitudinal and lateral forces and stability.			
2211058	Computational Methods of Transport Machinery	Z,ZK	5
Methods for both analysis and synthesis of 3D mechanisms. Computation of elastic joining components. Effects of non-linearities. Development of both mechanical and mathematical models of vehicles. Basic usage of FEM. Local and global coordinate system, matrices of mass, stiffness and damping. Both explicit and implicit solver. Models of materials. Torsional vibration in combustion engines and transmissions, methods of computation. Measurement of torsional vibration. Engine valve train (both kinematics and dynamics). Engine balancing			
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.			
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 - Hydrodynamic transmissions 2 - Single planetary sets (JPS) - introduction, graphical method 3 - JPS - kinematics, torques, efficiency 4 - JPS - calculation of JATCO 40 transmission 5 - Nested planetary gear sets (SPS) - graphical and analytical method 6 - Nested planetary gear set (SPS) - matrix method 7 - SPS - example calculation, conditions of assembly 8 - Planetary gearboxes - calculation of			

	basic elements 9 - Variators (CVT) 10 - Powersplit transmissions, IVT 11 - Differential, behavior when driving in a curve, efficiency 12 - Differential with more degree of freedom 13 - Hydrostatic transmissions 14 - Powertrains of hybrid vehicles		
2211150	Hybrid drives	Z,ZK	4
	Introduction to hybrid drives, their components, including electrical machines and energy accumulators, application to different types of vehicles, emissions hybrid drive control.		
2212041	Passive Safety of Vehicles	KZ	2
	Introduction and explanation of basic physics principles used in vehicle crash analysis - kinematics and dynamics of vehicle and occupant. Introduction to injury biomechanics, injury mechanisms and criteria. Overview of safety legislation. Overview and function of nowadays safety restraint system used.		
2311074	Vibrations of Mechanical Systems	ZK	4
2311077	Dynamics of Vehicles	Z,ZK	5
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 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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