Study plan

Name of study plan: 12 131 NSTI PRT 2012 základ

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Welcome page
Type of study: unknown
Required credits: 121
Elective courses credits: 0
Sum of credits in the plan: 121
Note on the plan:

Name of the block: Compulsory courses in the program
Minimal number of credits of the block: 108
The role of the block: P

Code of the group: 12NS*1P-PRT
Name of the group: 2012 NSTI 1.sem povinné PRT
Requirement credits in the group: In this group you have to gain 29 credits
Requirement courses in the group: In this group you have to complete 5 courses
Credits in the group: 29
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2373111	**Project I**	Z	5	0P+5C	*	P
2371519	**Means of Automatic Control I.**	Z,ZK	6	3P+0C+2L	*	P
2181136	**Processing Equipments Design**	Z,ZK	6	3P+2C	*	P
2151026	**Energy Sources and Conversions**	Z,ZK	6	3P+2C	*	P

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

2373111	Project I	Z	5
Projection training; Use of the PLM (Process Life Management) type projection software "COMOS". Preparation of the part of the project for technological process projecting.			
2371519	Means of Automatic Control I.	Z,ZK	6
Various categories of means for automatic control according to the different criterions. Main features in each category.Air and hydraulic fluid as a medium for information transfer. Symbols and descriptions in pneumatic and hydraulic diagrams. Pneumatic control systems design. Pneumatic actuators, valves, special pneumatic, electropneumatic devices. Control valves, categories, dimensioning, design, applications. Inteligent pneumatics as an integration of pneumatic, electronic and control components and systems. Valve islands and terminals, standard, with industrial buses communication, programmable. Pneumatic positioning systems.			
2181136	Processing Equipments Design	Z,ZK	6
PEs classification, their parameters and criteria of their rating. Ways of PEs design according their purpose and utilization. Materials used for PEs, welding, corrosion mechanisms and anticorrosion prevention. Dimension of shafts, beams, supports, pipes, heat exchangers and pressure vessels. Sealing and packing of fix parts (flanges) and moving parts (rotating shafts etc.). Practical examples of proper and improper designs of apparatuses. Example of heat exchanger design (heat transfer area calculation, its arrangement, head loss calculation, thermal dilatation, strength calculation, low cycle fatigue (thermal dilatation)).			
2151026	Energy Sources and Conversions	Z,ZK	6

Code of the group: 12NS*2P-PRT
Name of the group: 2012 NSTI 2.sem povinné PRT
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 8 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
2371526	**Algorithms for Engineering Informatics**	Z,ZK	4	2P+1C	*	P
2371134	**Engineering Informatics**	Z,ZK	4	3P+1C	*	P
2142008	**Microelectronics**	KZ	2	2P+0C+1L	*	P
2371711	**Computer Models**	Z,ZK	4	2P+1C	*	P
2373112	**Project II** ***Milan Hofreiter***	Z	5	0P+5C	*	P
2371509	**Means of Automatic Control**	Z,ZK	4	2P+0C+1L	*	P
2372086	**Simulation programming, Matlab**	KZ	3	1P+1C	*	P

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

2371526	Algorithms for Engineering Informatics	Z,ZK	4

Basic concepts: algorithm, parallel algorithms, reentrance. Difference between program and process. Structuring of data, 4GL, visual programming aids. Structured programming: structured statements, structured data types. Language Pascal (Delphi): block and its properties, program, declaration of function and procedures, parameters (incl. functional). Standard procedures and functions. Abstract data types: table, stack, LIFO, list, tree. Binary tree, AVL tree. Abstract operations: search, sort, interpolation, iteration, recursion, backtracking.

2371134	Engineering Informatics	Z,ZK	4

Meanings of Information. Information theory. Channel capacity. Coding theory. Data coding, markup languages, XML. Cryptography. OSI Reference Model. Transmission media (metallic, optical, wireless). Data link layer. Network layer, communication protocols, TCP/IP suite. Digitization of analog signals. Quantum information. Genetic information.

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.

2371711	Computer Models	Z,ZK	4

The course provides a basic knowledge on formulation and computer implementation of dynamical system models. It starts from theoretical issues of Laplace and Z transform in their application to describing the continuous and discrete linear systems respectively. A particular emphasis is given on the skills in describing the dynamic processes in the state space approach in both linear and non-linear systems.

2373112	Project II	Z	5

Project learning - students work in groups of three, max four students on a given topic. The solution of problem reached by the team of students is presented in the form of pdf document on the Department's intranet and subsequently defended at the final presentation of projects.

2371509	Means of Automatic Control	Z,ZK	4

Various categories of means for automatic control according to the different criterions. Main features in each category.Air and hydraulic fluid as a medium for information transfer. Symbols and descriptions in pneumatic and hydraulic diagrams. Pneumatic control systems design. Pneumatic actuators, valves, special pneumatic, electropneumatic devices. Control valves, categories, dimensioning, design, applications. Inteligent pneumatics as an integration of pneumatic, electronic and control components and systems. Valve islands and terminals, standard, with industrial buses communication, programmable. Pneumatic positioning systems.

2372086	Simulation programming, Matlab	KZ	3

The subject is focused on methods for developing mathematical models of engineering applications and on the use of mathematical software Matlab, Simulink for advanced calculus and extensive computations, including visualization of the results.

Code of the group: 12NS*3P-PRT
Name of the group: 2012 NSTI 3.sem povinné PRT
Requirement credits in the group: In this group you have to gain 29 credits
Requirement courses in the group: In this group you have to complete 6 courses
Credits in the group: 29
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2373113	**Project III**	Z	10	0P+10C	*	P
2361016	**Instrumentation technology** ***Jan Hošek***	Z,ZK	3	2P+0C+1L	*	P
2371098	**Automatic Control Theory**	Z,ZK	4	2P+1C	*	P
2371077	**Artificial Intelligence and Neural Networks**	Z,ZK	4	2P+1C	*	P
2141073	**Embedded Systems**	Z,ZK	4	2P+0C+1L	*	P

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

2373113	Project III	Z	10

Project in the specialization of future diploma thesis. One theme solved by two or three students in cooperation. Research, design or application creation from one of following branches: electrical or electronic device design, instrument design, small robot design or control, automatic control (PLC), process control, database application, web application, laboratory device, laboratory experiment control, process, biological process or artificial life simulation. Previous knowledge and/or skills required.The solution of problem reached by the team of students is presented in the form of pdf document on the Department's intranet and subsequently defended at the final presentation of projects, including discussion.

2361016	Instrumentation technology	Z,ZK	3

The course acquaints students with special technologies used in the production of instrumentation focusing on microtechnology and nanotechnology.

2371098	Automatic Control Theory	Z,ZK	4
In technological plants and processes, a desired state or operation sequence is ensured by means of automatic control circuits. Fundamental notions, examples of control problems in continuous, discrete and eventually logical versions of control are the substantial subjects for part 1. A more detailed attention is paid to the role and forms of the mathematical model used in linear theory of continuous and discrete PID control. Methods of control loop synthesis and parameter optimization are dealt with in detail.			
2371077	Artificial Intelligence and Neural Networks	Z,ZK	4
Students will learn about basic problems in the field of artificial intelligence and methods of solving them. The content of the course is: State space, its search methods and their complexity; Genetic algorithms; Basic machine learning algorithms; Clustering; Learning from classified data; Combination of classifiers; Fundamentals of formal propositional and predicate logic as problem solving tools; Automatic theorem proving - resolution method; Neural networks (MLP, CNN, RNN, LSTM), Deep learning.			
2141073	Embedded Systems	Z,ZK	4

Code of the group: 12NS*4P-PRT
Name of the group: 2012 NSTI 4.sem povinné PRT
Requirement credits in the group: In this group you have to gain 20 credits
Requirement courses in the group: In this group you have to complete 3 courses
Credits in the group: 20
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
2373998	**Diploma thesis**	Z	10	0P+10C	*	P
2371089	**Dynamic Systems Identification** ***Milan Hofreiter***	Z,ZK	5	2P+1C	*	P
2371135	**Programmable logic controllers and visualisation**	Z,ZK	5	2P+0C+1L	*	P

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

2373998	Diploma thesis	Z	10
Each student will solve his individual theme under guiding of his individual supervising department specialist. Result is his/her diploma thesis.			
2371089	Dynamic Systems Identification	Z,ZK	5
The subject is aimed to explanation of basic identification methods to obtain mathematical description of deterministic and stochastic systems. Experimental identification methods are explained for linear stochastic and deterministic dynamic systems in greater detail. Analytic identification is applied for several examples and compared to experimental identification. Lectures are concentrated to the most frequent methods which are applied in practice.			
2371135	Programmable logic controllers and visualisation	Z,ZK	5
PCA course suitable prior to this course Application of the SCADA (Supervisory Control and Data Acquisition) system Reliance in PLC control of the technological process models.			

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 13
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*4Q-PRT-HEM
Name of the group: 2012 NSTI 4.sem 1povvol PRT H+E+M
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
2363022	**History of exploring the universe** *Jan Hošek, Jiří Čáp* ***Jan Hošek*** *Jan Hošek (Gar.)*	Z	2	1P+1C	*	PV
2383062	**Budget and Project Economic Assessment** *František Freiberg, Miroslav Žilka* ***František Freiberg*** *František Freiberg (Gar.)*	Z	2	1P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12NS*4Q-PRT-HEM Name=2012 NSTI 4.sem 1povvol PRT H+E+M

2363022	History of exploring the universe	Z	2
The course introduces students to the history of the universe and exploring the evolution of technology used for astronomical observations from prehistoric times to the present. The course also deals with the development of people's knowledge about the universe and the impact of this knowledge on humanity and his understanding of planet Earth.			
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.			

Code of the group: 12NS*4Q-PRT
Name of the group: 2012 NSTI 4.sem 2povvol PRT
Requirement credits in the group: In this group you have to gain 8 credits
Requirement courses in the group: In this group you have to complete 2 courses
Credits in the group: 8
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
2141519	**Electrical Measurement and Diagnostics**	Z,ZK	4	2P+0C+1L	*	PV
2361006	**Design of optomechanical instruments** *Šárka Němcová* ***Šárka Němcová*** *Šárka Němcová (Gar.)*	Z,ZK	4	2P+1C	*	PV
2141055	**Controlled Electrical Drives** *Jaroslav Novák* ***Jaroslav Novák*** *Jaroslav Novák (Gar.)*	Z,ZK	4	2P+0C+2L	*	PV

Characteristics of the courses of this group of Study Plan: Code=12NS*4Q-PRT Name=2012 NSTI 4.sem 2povvol PRT

2141519	Electrical Measurement and Diagnostics	Z,ZK	4
The transmission of signals in measure systems. Electromagnetic compatibility. Electronics measurements circuits and a conversion of signal for the transmission.			
2361006	Design of optomechanical instruments	Z,ZK	4
The course acquaints students with optomechanical devices of various types, their optical principles and mechanical construction. It shows practical applications of these devices in industry and medicine. Excursions are part of the lessons.			
2141055	Controlled Electrical Drives	Z,ZK	4
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			

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.			
2141055	Controlled Electrical Drives	Z,ZK	4
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			
2141073	Embedded Systems	Z,ZK	4
2141519	Electrical Measurement and Diagnostics	Z,ZK	4
The transmission of signals in measure systems. Electromagnetic compatibility. Electronics measurements circuits and a conversion of signal for the transmission.			
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.			
2151026	Energy Sources and Conversions	Z,ZK	6
2181136	Processing Equipments Design	Z,ZK	6
PEs classification, their parameters and criteria of their rating. Ways of PEs design according their purpose and utilization. Materials used for PEs, welding, corrosion mechanisms and anticorrosion prevention. Dimension of shafts, beams, supports, pipes, heat exchangers and pressure vessels. Sealing and packing of fix parts (flanges) and moving parts (rotating shafts etc.). Practical examples of proper and improper designs of apparatuses. Example of heat exchanger design (heat transfer area calculation, its arrangement, head loss calculation, thermal dilatation, strength calculation, low cycle fatigue (thermal dilatation)).			
2361006	Design of optomechanical instruments	Z,ZK	4
The course acquaints students with optomechanical devices of various types, their optical principles and mechanical construction. It shows practical applications of these devices in industry and medicine. Excursions are part of the lessons.			
2361016	Instrumentation technology	Z,ZK	3
The course acquaints students with special technologies used in the production of instrumentation focusing on microtechnology and nanotechnology.			
2363022	History of exploring the universe	Z	2
The course introduces students to the history of the universe and exploring the evolution of technology used for astronomical observations from prehistoric times to the present. The course also deals with the development of people's knowledge about the universe and the impact of this knowledge on humanity and his understanding of planet Earth.			
2371077	Artificial Intelligence and Neural Networks	Z,ZK	4
Students will learn about basic problems in the field of artificial intelligence and methods of solving them. The content of the course is: State space, its search methods and their complexity; Genetic algorithms; Basic machine learning algorithms; Clustering; Learning from classified data; Combination of classifiers; Fundamentals of formal propositional and predicate logic as problem solving tools; Automatic theorem proving - resolution method; Neural networks (MLP, CNN, RNN, LSTM), Deep learning.			
2371089	Dynamic Systems Identification	Z,ZK	5
The subject is aimed to explanation of basic identification methods to obtain mathematical description of deterministic and stochastic systems. Experimental identification methods are explained for linear stochastic and deterministic dynamic systems in greater detail. Analytic identification is applied for several examples and compared to experimental identification. Lectures are concentrated to the most frequent methods which are applied in practice.			
2371098	Automatic Control Theory	Z,ZK	4
In technological plants and processes, a desired state or operation sequence is ensured by means of automatic control circuits. Fundamental notions, examples of control problems in continuous, discrete and eventually logical versions of control are the substantial subjects for part 1. A more detailed attention is paid to the role and forms of the mathematical model used in linear theory of continuous and discrete PID control. Methods of control loop synthesis and parameter optimization are dealt with in detail.			
2371134	Engineering Informatics	Z,ZK	4
Meanings of Information. Information theory. Channel capacity. Coding theory. Data coding, markup languages, XML. Cryptography. OSI Reference Model. Transmission media (metallic, optical, wireless). Data link layer. Network layer, communication protocols, TCP/IP suite. Digitization of analog signals. Quantum information. Genetic information.			
2371135	Programmable logic controllers and visualisation	Z,ZK	5
PCA course suitable prior to this course Application of the SCADA (Supervisory Control and Data Acquisition) system Reliance in PLC control of the technological process models.			

2371509	Means of Automatic Control	Z,ZK	4
Various categories of means for automatic control according to the different criterions. Main features in each category.Air and hydraulic fluid as a medium for information transfer. Symbols and descriptions in pneumatic and hydraulic diagrams. Pneumatic control systems design. Pneumatic actuators, valves, special pneumatic, electropneumatic devices. Control valves, categories, dimensioning, design, applications. Inteligent pneumatics as an integration of pneumatic, electronic and control components and systems. Valve islands and terminals, standard, with industrial buses communication, programmable. Pneumatic positioning systems.			
2371519	Means of Automatic Control I.	Z,ZK	6
Various categories of means for automatic control according to the different criterions. Main features in each category.Air and hydraulic fluid as a medium for information transfer. Symbols and descriptions in pneumatic and hydraulic diagrams. Pneumatic control systems design. Pneumatic actuators, valves, special pneumatic, electropneumatic devices. Control valves, categories, dimensioning, design, applications. Inteligent pneumatics as an integration of pneumatic, electronic and control components and systems. Valve islands and terminals, standard, with industrial buses communication, programmable. Pneumatic positioning systems.			
2371526	Algorithms for Engineering Informatics	Z,ZK	4
Basic concepts: algorithm, parallel algorithms, reentrance. Difference between program and process. Structuring of data, 4GL, visual programming aids. Structured programming: structured statements, structured data types. Language Pascal (Delphi): block and its properties, program, declaration of function and procedures, parameters (incl. functional). Standard procedures and functions. Abstract data types: table, stack, LIFO, list, tree. Binary tree, AVL tree. Abstract operations: search, sort, interpolation, iteration, recursion, backtracking.			
2371711	Computer Models	Z,ZK	4
The course provides a basic knowledge on formulation and computer implementation of dynamical system models. It starts from theoretical issues of Laplace and Z transform in their application to describing the continuous and discrete linear systems respectively. A particular emphasis is given on the skills in describing the dynamic processes in the state space approach in both linear and non-linear systems.			
2372086	Simulation programming, Matlab	KZ	3
The subject is focused on methods for developing mathematical models of engineering applications and on the use of mathematical software Matlab, Simulink for advanced calculus and extensive computations, including visualization of the results.			
2373111	Project I	Z	5
Projection training; Use of the PLM (Process Life Management) type projection software "COMOS". Preparation of the part of the project for technological process projecting.			
2373112	Project II	Z	5
Project learning - students work in groups of three, max four students on a given topic. The solution of problem reached by the team of students is presented in the form of pdf document on the Department's intranet and subsequently defended at the final presentation of projects.			
2373113	Project III	Z	10
Project in the specialization of future diploma thesis. One theme solved by two or three students in cooperation. Research, design or application creation from one of following branches: electrical or electronic device design, instrument design, small robot design or control, automatic control (PLC), process control, database application, web application, laboratory device, laboratory experiment control, process, biological process or artificial life simulation. Previous knowledge and/or skills required.The solution of problem reached by the team of students is presented in the form of pdf document on the Department's intranet and subsequently defended at the final presentation of projects, including discussion.			
2373998	Diploma thesis	Z	10
Each student will solve his individual theme under guiding of his individual supervising department specialist. Result is his/her diploma thesis.			
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.			

For updated information see http://bilakniha.cvut.cz/en/FF.html
Generated: day 2025-07-12, time 05:14.