

Study plan

Name of study plan: 15 141 NSTI MCH 2012 základ

Faculty/Institute/Others:

Department: Department of Mechanics, Biomechanics and Mechatronics

Branch of study guaranteed by the department: Mechatronics

Garantor of the study branch: prof. Ing. Michael Valášek, DrSc.

Program of study: Mechanical Engineering

Type of study: Follow-up master

Required credits: 124

Elective courses credits: 0

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: 121

The role of the block: P

Code of the group: 12NS*1P-MCH

Name of the group: 2012 NSTI 1.sem povinné MCH

Requirement credits in the group: In this group you have to gain 31 credits

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

Credits in the group: 31

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2013054	Mathematics for Mechanics	Z	4	3P+1C	*	P
2311075	Mechanics of Mechanisms <i>Zden k Neusser, Michael Valášek, Zbyn k Šíka, Václav Bauma, Jan Zav el, Petr Beneš Michael Valášek Michael Valášek (Gar.)</i>	ZK	4	3P+0C	*	P
2141093	Microelectronics <i>Stanislava Papežová Stanislava Papežová Stanislava Papežová (Gar.)</i>	Z,ZK	3	2P+1L	*	P
2121043	Computational Fluid Mechanics <i>Tomáš Hyhlík Tomáš Hyhlík (Gar.)</i>	ZK	4	3P+0C	*	P
2313111	Project I. <i>Zden k Neusser, Michael Valášek, Zbyn k Šíka, Václav Bauma, Jan Zav el Michael Valášek Michael Valášek (Gar.)</i>	Z	5	0P+5C	*	P
2361035	Theory and Construction of Instruments <i>Jan Hošek Jan Hošek Jan Hošek (Gar.)</i>	Z,ZK	3	2P+1C	*	P
2312017	Controlled mechanical systems I. <i>Zden k Neusser, Michael Valášek, Zbyn k Šíka, Václav Bauma, Ivo Bukovský, Pavel Steinbauer Michael Valášek Michael Valášek (Gar.)</i>	KZ	3	3P+0C	*	P

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

2013054	Mathematics for Mechanics Summary: Tensor calculus. Introduction to functional analysis. Calculus of variations. • Orthogonal transformation of coordinate systems. • Afinne orthogonal tensors and tensor operations. • Tensor as linear operator and bilinear form. • Metrics and metric spaces. Convergence. Completeness. • Linear normed space. Banach space. • Linear space with scalar product (unitary space). Hilbert space. • Contractive operators and Banach fixed point theorem. • Function spaces in examples. • Operators and functionals. Linear, continuous and bounded operator/functional. • Derivative of a functional in the given direction. Gateaux differential and derivative. • Necessary and sufficient conditions for extremes of a functional. • Convex set and convex functional. Minimum of convex functional. • Extremes of functional of different types. Euler equation. Necessary and sufficient conditions for extrema. • Discrete methods for approximation of the minima of an functional. Ritz method.	Z	4
2311075	Mechanics of Mechanisms	ZK	4
2141093	Microelectronics Basic characteristics of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converters, coding, lines and protocols of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.	Z,ZK	3
2121043	Computational Fluid Mechanics The aim of the subject is to show basic principles of the numerical solution of the flow of fluid using commercial computer programs.	ZK	4
2313111	Project I.	Z	5
2361035	Theory and Construction of Instruments Subject gives knowledge about basics of instruments design in order student would be able to design different kinds of mechanical instruments.	Z,ZK	3
2312017	Controlled mechanical systems I.	KZ	3

Code of the group: 12NS*2P-MCH

Name of the group: 2012 NSTI 2.sem povinné MCH

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 9 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
2142028	Electrical Engineering for Mechatronics	KZ	3	2P+1L	*	P
2311074	Vibrations of Mechanical Systems Michael Valášek	ZK	4	3P+0C	*	P
2313023	Mechatronics Michael Valášek	Z	2	2P+0C	*	P
2111035	Finite Element Method II.	ZK	3	2P+0C	*	P
2313112	Project II. Michael Valášek	Z	5	0P+5C	*	P
2311076	Simulation of Mechatronic Systems Michael Valášek	ZK	3	2P+0C	*	P
2121055	Thermodynamics	ZK	4	3P+0C	*	P
2312027	Controlled Mechanical Systems II. Michael Valášek	KZ	2	2P+0C	*	P

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

2142028	Electrical Engineering for Mechatronics	KZ	3	The purpose of the course is to give the student knowledge about different types of electrical drives for mechatronic systems and their practical use. Method for electromagnetic field approximative solution. The theory of linear and rotating drivers. Electromagnets supplied by AC and DC power. Static and dynamics parameters of electromagnets. Drives for rotating motion. DC motors. Mathematical description of their static and dynamic properties. Principle and function of stepper motor. AC induction motors. Mathematical description of their static and dynamic properties. Using MATLAB for drivers behaviour modelling.		
2311074	Vibrations of Mechanical Systems	ZK	4			
2313023	Mechatronics	Z	2			
2111035	Finite Element Method II.	ZK	3			
2313112	Project II.	Z	5			
2311076	Simulation of Mechatronic Systems	ZK	3			
2121055	Thermodynamics	ZK	4	The extended course of thermodynamics dealing with the problems of mathematical theory of thermodynamics, non-equilibrium thermodynamics and thermodynamics of multicomponent thermodynamic systems. Mathematical theory of thermodynamics, non-equilibrium thermodynamics, thermodynamics of multicomponent systems.		
2312027	Controlled Mechanical Systems II.	KZ	2			

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

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

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 8 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
2111083	Continuum Mechanics Jiří Plešek Jiří Plešek Jiří Plešek (Gar.)	ZK	4	3P+0C	*	P
2313113	Project III. Zdeněk Neusser, Zbyněk Šíka, Václav Bauma, Jan Zavel, Petr Beneš, Pavel Steinbauer, Tomáš Vampola, Martin Nečas, Jan Pelikán Michael Valášek	Z	10	0P+10C	*	P
2313005	Signal Processing and Processors Michael Valášek, Zbyněk Šíka, Václav Bauma, Ivo Bukovský, Jan Pelikán Michael Valášek	Z	1	1P+0C	*	P
2311079	Statistical Mechanics Michael Valášek, Zbyněk Šíka, Václav Bauma, Ivo Bukovský Michael Valášek Michael Valášek (Gar.)	ZK	4	3P+0C	*	P
2313027	Artificial Intelligence Michael Valášek	Z	1	1P+0C	*	P
2312021	Controlled Active Structures Michael Valášek	KZ	2	2P+0C	*	P

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

2111083	Continuum Mechanics	ZK	4
2313113	Project III. Individual assignment	Z	10
2313005	Signal Processing and Processors	Z	1
2311079	Statistical Mechanics	ZK	4
2313027	Artificial Intelligence	Z	1
2312021	Controlled Active Structures	KZ	2

Code of the group: 12NS*4P-MCH

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

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 9 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
2313998	Diploma project Michael Valášek, Zbyněk Šika, Václav Bauma Michael Valášek Michael Valášek (Gar.)	Z	10	0P+10C	*	P
2311091	System Identification Michael Valášek	ZK	3	2P+0C	*	P
2351087	Industrial Robots and Manipulators Vladimír Andrlík, Jiří Švéda Vladimír Andrlík (Gar.)	Z,ZK	3	2P+1L	*	P
2383062	Budget and Project Economic Assessment Miroslav Žilka Miroslav Žilka	Z	2	1P+2C	*	P
2311081	Software Engineering Michael Valášek	ZK	3	2P+0C	*	P
2311019	Synthesis and Optimization of Mechanical Systems Michael Valášek	ZK	3	2P+0C	*	P
2313031	Real Time Systems and Processors Michael Valášek	Z	2	2P+0C	*	P
2311084	Advanced Dynamics Tomáš Vampola	ZK	3	2P+0C	*	P
2113017	Basic of Engineering Experimentals Pavel Steinbauer, Karel Doubrava, Václav Uruba Karel Doubrava Karel Doubrava (Gar.)	Z	3	2P+1C	*	P

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

2313998	Diploma project individual assignment	Z	10
2311091	System Identification	ZK	3
2351087	Industrial Robots and Manipulators Construction of industrial robots and manipulators, kinematic structures, various types of driving units, moving units, end effectors.	Z,ZK	3
2383062	Budget and Project Economic Assessment 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.	Z	2
2311081	Software Engineering	ZK	3
2311019	Synthesis and Optimization of Mechanical Systems	ZK	3
2313031	Real Time Systems and Processors	Z	2
2311084	Advanced Dynamics	ZK	3
2113017	Basic of Engineering Experimentals	Z	3

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2043081	English - Preparatory Course / FME <i>Eliška Vítková, Ilona Šimice, Zuzana Kalinová, Michaela Schusová, Veronika Kratochvílová Nina Procházková Ayyub</i>	Z	2	0P+2C	*	PV
2043083	French - Preparatory Course / FME <i>Eliška Vítková Eliška Vítková (Gar.)</i>	Z	2	0P+2C	*	PV
2043082	German - Preparatory Course / FME <i>Eliška Vítková Jaroslava Kommová</i>	Z	2	0P+2C	*	PV
2043085	Russian - Preparatory Course / FME <i>Eliška Vítková, Hana Volejníková Eliška Vítková</i>	Z	2	0P+2C	*	PV
2043086	Czech - Preparatory Course <i>Petr Laurich Jaroslava Kommová</i>	Z	2	0P+2C	*	PV
2043084	Spanish - Preparatory Course / FME <i>Eliška Vítková Jaime Andrés Villagómez</i>	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.		
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 - 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			
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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2041081	English - Master Exam <i>Eva Pavlincová, Eliška Vítková, Ilona Šimice, Eva Kon elíková, Zuzana Kalinová, Michaela Schusová, Veronika Kratochvílová, Hana Volejníková, Nina Procházková Ayyub Nina Procházková Ayyub</i>	ZK	1	0P+0C	*	PV
2041083	French - Master Exam / FME <i>Eliška Vítková, Dušana Jirovská Eliška Vítková Eliška Vítková (Gar.)</i>	ZK	1	0P+0C	*	PV
2041082	German - Master Exam / FME <i>Eliška Vítková, Petr Laurich, Jaroslava Kommová Jaroslava Kommová</i>	ZK	1	0P+0C	*	PV
2041085	Russian - Master Exam / FME <i>Eliška Vítková, Dušana Jirovská, Hana Volejníková, Petr Zitko Eliška Vítková</i>	ZK	1	0P+0C	*	PV
2041086	Czech- Master Exam <i>Petr Laurich Jaroslava Kommová</i>	ZK	1	0P+0C	*	PV
2041084	Spanish - Master Exam / FME <i>Eliška Vítková, Jaime Andrés Villagómez Jaime Andrés Villagómez</i>	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.		
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 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 comprehension 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 comprehension of simple texts. Improvement of professional language.			
2041086	Czech- Master Exam	ZK	1
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 comprehension of simple texts. Improvement of professional language.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
2013054	Mathematics for Mechanics	Z	4
Summary: Tensor calculus. Introduction to functional analysis. Calculus of variations. • Orthogonal transformation of coordinate systems. • Affine orthogonal tensors and tensor operations. • Tensor as linear operator and bilinear form. • Metrics and metric spaces. Convergence. Completeness. • Linear normed space. Banach space. • Linear space with scalar product (unitary space). Hilbert space. • Contractive operators and Banach fixed point theorem. • Function spaces in examples. • Operators and functionals. Linear, continuous and bounded operator/functional. • Derivative of a functional in the given direction. Gateaux differential and derivative. • Necessary and sufficient conditions for extremes of a functional. • Convex set and convex functional. Minimum of convex functional. • Extremes of functional of different types. Euler equation. Necessary and sufficient conditions for extrema. • Discrete methods for approximation of the minima of a functional. Ritz method.			
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 comprehension 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 comprehension 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 comprehension 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 comprehension 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 - 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.			
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
2111035	Finite Element Method II.	ZK	3
2111083	Continuum Mechanics	ZK	4
2113017	Basic of Engineering Experimentals	Z	3
2121043	Computational Fluid Mechanics	ZK	4
The aim of the subject is to show basic principles of the numerical solution of the flow of fluid using commercial computer programs.			
2121055	Thermodynamics	ZK	4
The extended course of thermodynamics dealing with the problems of mathematical theory of thermodynamics, non-equilibrium thermodynamics and thermodynamics of multicomponent thermodynamic systems. Mathematical theory of thermodynamics, non-equilibrium thermodynamics, thermodynamics of multicomponent systems.			
2141093	Microelectronics	Z,ZK	3
Basic characteristics of logic circuits and programmable logical systems, input and output circuits - voltage and current matching, D/A and A/D converters, coding, lines and protocols of communications, electronic and optoelectronic parts for microelectronics, microprocessor system applications.			

2142028	Electrical Engineering for Mechatronics	KZ	3
The purpose of the course is to give the student knowledge about different types of electrical drives for mechatronic systems and their practical use. Method for electromagnetic field approximative solution. The theory of linear and rotating drivers. Electromagnets supplied by AC and DC power. Static and dynamics parameters of electromagnets. Drives for rotating motion. DC motors. Mathematical description of their static and dynamic properties. Principle and function of stepper motor. AC induction motors. Mathematical description of their static and dynamic properties. Using MATLAB for drivers behaviour modelling.			
2311019	Synthesis and Optimization of Mechanical Systems	ZK	3
2311074	Vibrations of Mechanical Systems	ZK	4
2311075	Mechanics of Mechanisms	ZK	4
2311076	Simulation of Mechatronic Systems	ZK	3
2311079	Statistical Mechanics	ZK	4
2311081	Software Engineering	ZK	3
2311084	Advanced Dynamics	ZK	3
2311091	System Identification	ZK	3
2312017	Controlled mechanical systems I.	KZ	3
2312021	Controlled Active Structures	KZ	2
2312027	Controlled Mechanical Systems II.	KZ	2
2313005	Signal Processing and Processors	Z	1
2313023	Mechatronics	Z	2
2313027	Artificial Intelligence	Z	1
2313031	Real Time Systems and Processors	Z	2
2313111	Project I.	Z	5
2313112	Project II.	Z	5
2313113	Project III. Individual assignment	Z	10
2313998	Diploma project individual assignment	Z	10
2351087	Industrial Robots and Manipulators Construction of industrial robots and manipulators, kinematic structures, various types of driving units, moving units, end effectors.	Z,ZK	3
2361035	Theory and Construction of Instruments Subject gives knowledge about basics of instruments design in order student would be able to design different kinds of mechanical instruments.	Z,ZK	3
2383062	Budget and Project Economic Assessment 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.	Z	2

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