

Study plan

Name of study plan: Electrical Engineering, Power Engineering and Management - Economy and Management of Power Eng.

Faculty/Institute/Others: Faculty of Electrical Engineering

Department: Department of Economics, Management and Humanities

Branch of study guaranteed by the department: Economy and Management of Power Engineering

Garantor of the study branch: prof. Ing. Jaroslav Knápek, CSc.

Program of study: Electrical Engineering, Power Engineering and Management

Type of study: Follow-up master full-time

Required credits: 115

Elective courses credits: 5

Sum of credits in the plan: 120

Note on the plan:

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 72

The role of the block: P

Code of the group: 2015_MEEMDIP

Name of the group: Diploma Thesis

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 1 course

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
BDIP25	Diploma Thesis	Z	25	22s	L	P

Characteristics of the courses of this group of Study Plan: Code=2015_MEEMDIP Name=Diploma Thesis

BDIP25	Diploma Thesis	Z	25	Independent final comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehensive final examination.		
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Code of the group: 2015_MEEMP2

Name of the group: Compulsory subjects of the programme

Requirement credits in the group: In this group you have to gain 47 credits

Requirement courses in the group: In this group you have to complete 9 courses

Credits in the group: 47

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
B1M16EKL	Ecology and economy Jaroslav Knápek Jaroslav Knápek Jaroslav Knápek (Gar.)	Z,ZK	5	3p+1s	Z	P
B1M16FIM	Financial Management Oldřich Starý, Július Bemš, Tomáš Králík Tomáš Králík Oldřich Starý (Gar.)	Z,ZK	6	2p+2s	L	P
B1M16FIU	Financial accounting Július Bemš, Jiří Vašíček Július Bemš Jiří Vašíček (Gar.)	Z,ZK	5	2p+2s	Z	P
B1M16MAR	Marketing Ondřej Pešek Ondřej Pešek (Gar.)	Z,ZK	5	2p+2s	Z	P
B1M01MEK	Mathematics for Economy Kateřina Helisová Kateřina Helisová Kateřina Helisová (Gar.)	Z,ZK	6	4+2	Z	P
B1M16OVY	Operations Research Jaroslav Knápek, Martin Beneš Jaroslav Šafránek Jaroslav Knápek (Gar.)	Z,ZK	5	2p+2c	L	P

B1M16IND	Individual project <i>Jaroslav Knápek, Július Bemš, Jiří Vašíček, Martin Beneš, Martin Dobiáš, Jan Jandera, Jaromír Vastl, Miroslav Vítek Jan Jandera Jan Jandera (Gar.)</i>	Z	5	0p+4s	Z	P
B1M16STA	Statistical methods in economics <i>Sherzod Tashpulatov Sherzod Tashpulatov Sherzod Tashpulatov (Gar.)</i>	Z,ZK	5	2p+2s	Z,L	P
B1M16SIR	System Analysis and Decision Making <i>Jaroslav Knápek, Jaroslav Safránek Jaroslav Safránek Jaroslav Knápek (Gar.)</i>	Z,ZK	5	2p+2c	Z	P

Characteristics of the courses of this group of Study Plan: Code=2015_MEEMP2 Name=Compulsory subjects of the programme

B1M16EKL	Ecology and economy	Z,ZK	5	Development of environmental protection. Sustainable development. Global environmental problems and their aspects. Greenhouse effect and climate changes. Fossil fuels, nuclear fuel cycle and environmental impacts. Support schemes for renewable energy sources utilization. Economic effectiveness of renewable energy sources projects. Regulatory and economic instruments for economic activities regulation. Externalities. Environmental indicators.		
B1M16FIM	Financial Management	Z,ZK	6	Principles of finance, present value and alternative cost of capital, net present value, valuation of bonds and stocks, investment decision and net present value, risk and alternative cost of capital, risk and return, lease or buy, taxes, inflation and return, financial and real options, option valuation and application, hedging, short term finance, cash flow management.		
B1M16FIU	Financial accounting	Z,ZK	5	Principles of accounting. Assets, inventory and financial investment book keeping. Debt and equity capital. Cost, revenues and profit. Tax system and accounting. Balance sheet, profit and loss account. Cash flow statement. Analysis of company's financial position. International accounting standards. Auditing, consolidated statements. Hello.		
B1M16MAR	Marketing	Z,ZK	5	The role and functions of the marketing management. Marketing research and marketing information system. Concepts of marketing strategy. The use of product life cycle and portfolio. Marketing-mix. Product and service policy, pricing and contractation policy, communication, distribution. Controlling and audit.		
B1M01MEK	Mathematics for Economy	Z,ZK	6	The aim is to recall the introduction to probability, familiarize students with basic terms properties and methods used in working with random processes, especially with Markov chains, and show applications of these mathematical tools in economics.		
B1M16OVY	Operations Research	Z,ZK	5	Art of modeling and elements of decision models, Linear programming, Transportation problem, Integer linear programming, Introduction to graphs theory, Nonlinear programming, Dynamic programming, Monte Carlo simulation, Project management (CPM, PERT).		
B1M16IND	Individual project	Z	5	Independent work in the form of a project. A student will choose a topic from a list of topics specified by branch department. The project will be defended within the framework of a subject.		
B1M16STA	Statistical methods in economics	Z,ZK	5	Basic Concepts. Statistical series. Assortment. Distributions of frequencies. One-dimensional descriptive characteristics. Measures of variables, coefficient of skewness, coefficient of excess. Points estimates of basic characteristics. Interval estimates of basic characteristics. Hypothesis testing of basic characteristics. Individual index number. Aggregative index. Variable-structure indexes. Multifactor indexes. Correlation and regression, Basic Concepts. Measurement of dependence intensity. Time series, concepts, qualities. Chronological average. Time series - trends and extrapolation.		
B1M16SIR	System Analysis and Decision Making	Z,ZK	5	System approach and decision making, Decision models, Games theory, Decision making under uncertainty and risk, Decisions with multiple objectives, Stochastic programming, Expert systems, Cluster analysis		

Name of the block: Compulsory courses of the specialization

Minimal number of credits of the block: 39

The role of the block: PO

Code of the group: 2015_MEEMPO4

Name of the group: Compulsory subjects of the branch

Requirement credits in the group: In this group you have to gain 39 credits

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

Credits in the group: 39

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
B1M16DES	Power Transport Systems <i>Miroslav Vítek Miroslav Vítek Miroslav Vítek (Gar.)</i>	Z,ZK	5	2p+2s	Z	PO
B1M16EUE	Economy of Energy Use <i>Jiří Beranovský Jiří Beranovský Jiří Beranovský (Gar.)</i>	KZ	5	2p+2s	L	PO
B1M14ESZ	Power Machine Equipment <i>Jiří Štastný, Evžen Thöndel, Petr Kočárník Evžen Thöndel Jiří Štastný (Gar.)</i>	Z,ZK	5	2+2c	Z	PO
B1M16MES	Management and Economics of Power Systems <i>Oldřich Starý, Tomáš Králík, Jaromír Vastl Tomáš Králík Oldřich Starý (Gar.)</i>	Z,ZK	5	2p+2s	Z	PO
B1M16MEE	Management of Power Production <i>Oldřich Starý</i>	Z,ZK	5	2p+2s	L	PO
B1M15PPE	Elements and Operation of Electrical Power Systems <i>Jan Hlaváček Jan Hlaváček (Gar.)</i>	KZ	4	2+2s	Z	PO
B1M16RES	Development of Energy Systems <i>Rostislav Krejcar Rostislav Krejcar Rostislav Krejcar (Gar.)</i>	Z,ZK	5	2p+2s	Z	PO

B1M16VEN	Power and Heat Production <i>Martin Beneš Martin Beneš Martin Beneš (Gar.)</i>	Z,ZK	5	2p+2s	Z	PO
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Characteristics of the courses of this group of Study Plan: Code=2015_MEEMPO4 Name=Compulsory subjects of the branch

B1M16DES	Power Transport Systems The course is focused on economical aspects of design and operation of various technical systems for various energy forms. That is road, railway and ship transport of solid and liquid fuel, district heating system, cable car and conveyor belt transport for solid fuel and mainly grid for electricity (power) transport.	Z,ZK	5
B1M16EUE	Economy of Energy Use Organization and energy management of company, buildings or energy systems. Energy need and consumption, energy balance. Energy characterization of aggregate, secondary energy sources. Energy audit and feasibility study, optimization of energy management of energy systems. Prices and tariffs, economy and financial analysis.	KZ	5
B1M14ESZ	Power Machine Equipment The course deals with the analysis of the basic functions and characteristics of machinery used in the energy sector, introduces students to quantitative and qualitative energy balances of these devices to an extent, allowing to obtain the technical basis for the economic evaluation, as well as operating system optimization. It also deals with the analysis of the impact of failures of machine elements of the power system to the technical indicators and economical operation and performance of the most important methods of control machinery of power plants in terms of their operational optimization.	Z,ZK	5
B1M16MES	Management and Economics of Power Systems This course will give an overview of the various aspects of power supply with special emphasis on power management. The course characterises energy costs and marginal costs for determination of prices and tariffs. Energy market principles and operational decision making are integral parts of the course as well.	Z,ZK	5
B1M16MEE	Management of Power Production Management and economic calculations, power production - electricity calculations.	Z,ZK	5
B1M15PPE	Elements and Operation of Electrical Power Systems	KZ	4
B1M16RES	Development of Energy Systems In this subject the basic questions of power stations design is solved. This design is discussed from viewpoint of ecology and level of used technology. Special focus is on future importance of classical and renewable energy resources. These kinds of energy resources are considered as the most important factor of future development of appropriate power industry systems. The subject provides overview of practical application of modern technologies to guarantee the development of energetic systems.	Z,ZK	5
B1M16VEN	Power and Heat Production Power sources overview, energy processes analysis.	Z,ZK	5

Name of the block: Elective courses

Minimal number of credits of the block: 4

The role of the block: V

Code of the group: 2015_MEEMH

Name of the group: Humanities subjects

Requirement credits in the group: In this group you have to gain at least 4 credits (at most 22)

Requirement courses in the group: In this group you have to complete at least 1 course (at most 6)

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
B0M16FI2	Philosophy 2 <i>Peter Zamarovský Peter Zamarovský Peter Zamarovský (Gar.)</i>	Z,ZK	4	2p+2s	L	v
B0M16HT2	History of science and technology 2 <i>Marcela Efmertová Marcela Efmertová Marcela Efmertová (Gar.)</i>	Z,ZK	4	2p+2s	L	v
B0M16HSD	History of economy and social studies <i>Marcela Efmertová Marcela Efmertová Marcela Efmertová (Gar.)</i>	Z,ZK	4	2p+2s	L	v
B0M16MPS	Psychology <i>Jan Fiala Jan Fiala Jan Fiala (Gar.)</i>	Z,ZK	4	2p+2s	Z,L	v
A003TV	Physical Education	Z	2	0+2	L,Z	v
B0M16TE1	Theology <i>Vladimír Slámečka Vladimír Slámečka Vladimír Slámečka (Gar.)</i>	Z,ZK	4	2p+2s	L	v

Characteristics of the courses of this group of Study Plan: Code=2015_MEEMH Name=Humanities subjects

B0M16FI2	Philosophy 2 The course is oriented on the transdisciplinary aspects of philosophy, informatics, physics, mathematics and biology.	Z,ZK	4
B0M16HT2	History of science and technology 2 This subject traces historical developments in electrical engineering branches in the world and in the Czech Lands. Its ultimate goal is to stimulate students' interest in the history and traditions of the subject, while highlighting the developments in technical education and professional organizations, the process of shaping scientific life and the influence of technical engineers	Z,ZK	4
B0M16HSD	History of economy and social studies This subject deals with the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its aims and achieved results as well as the social and cultural development and coexistence of the various ethnical groups in the Czech countries.	Z,ZK	4
B0M16MPS	Psychology	Z,ZK	4
A003TV	Physical Education	Z	2

B0M16TE1	Theology	Z,ZK	4
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This subject provides to students the basic orientation in christian theology and requires no special previous education. After short philosophic lecture the basic theologic disciplines are gone through. The subject is determined not only to believer students who want to know the reliable theologic grounding but also above all to ones who want to get know Christianity - religion from which grows our civilization up.

Code of the group: MTV

Name of the group: Tělesná výchova

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
TVV	Physical education	Z	0	0+2	Z,L	v
TV-V1	Physical education	Z	1	0+2	Z,L	v
TVV0	Physical education	Z	0	0+2	Z,L	v
TVKLV	Physical Education Course	Z	0	7dní	L	v
TVKZV	Physical Education Course	Z	0	7dní	Z	v

Characteristics of the courses of this group of Study Plan: Code=MTV Name=Tělesná výchova

TVV	Physical education	Z	0
TV-V1	Physical education	Z	1
TVV0	Physical education	Z	0
TVKLV	Physical Education Course	Z	0
TVKZV	Physical Education Course	Z	0

Code of the group: 2015_MEEMVOL1

Name of the group: Elective subjects

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

~Nabídku volitelných předmětů uspořádaných podle kateder najdete na webových stránkách
<http://www.fel.cvut.cz/cz/education/volitelne-predmety.html>

List of courses of this pass:

Code	Name of the course	Completion	Credits
A003TV	Physical Education	Z	2
B0M16FI2	Philosophy 2 The course is oriented on the transdisciplinary aspects of philosophy, informatics, physics, mathematics and biology.	Z,ZK	4
B0M16HSD	History of economy and social studies This subject deals with the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its aims and achieved results as well as the social and cultural development and coexistence of the various ethnical groups in the Czech countries.	Z,ZK	4
B0M16HT2	History of science and technology 2 This subject traces historical developments in electrical engineering branches in the world and in the Czech Lands. Its ultimate goal is to stimulate students' interest in the history and traditions of the subject, while highlighting the developments in technical education and professional organizations, the process of shaping scientific life and the influence of technical engineers	Z,ZK	4
B0M16MPS	Psychology	Z,ZK	4
B0M16TE1	Theology This subject provides to students the basic orientation in christian theology and requires no special previous education. After short philosophic lecture the basic theologic disciplines are gone through. The subject is determined not only to believer students who want to know the reliable theologic grounding but also above all to ones who want to get know Christianity - religion from which grows our civilization up.	Z,ZK	4
B1M01MEK	Mathematics for Economy The aim is to recall the introduction to probability, familiarize students with basic terms properties and methods used in working with random processes, especially with Markov chains, and show applications of these mathematical tools in economics.	Z,ZK	6

B1M14ESZ	Power Machine Equipment	Z,ZK	5
The course deals with the analysis of the basic functions and characteristics of machinery used in the energy sector, introduces students to quantitative and qualitative energy balances of these devices to an extent, allowing to obtain the technical basis for the economic evaluation, as well as operating system optimization. It also deals with the analysis of the impact of failures of machine elements of the power system to the technical indicators and economical operation and performance of the most important methods of control machinery of power plants in terms of their operational optimization.			
B1M15PPE	Elements and Operation of Electrical Power Systems	KZ	4
B1M16DES	Power Transport Systems	Z,ZK	5
The course is focused on economical aspects of design and operation of various technical systems for various energy forms. That is road, railway and ship transport of solid and liquid fuel, district heating system, cable car and conveyer belt transport for solid fuel and mainly grid for electricity (power) transport.			
B1M16EKL	Ecology and economy	Z,ZK	5
Development of environmental protection. Sustainable development. Global environmental problems and their aspects. Greenhouse effect and climate changes. Fossil fuels, nuclear fuel cycle and environmental impacts. Support schemes for renewable energy sources utilization. Economic effectiveness of renewable energy sources projects. Regulatory and economic instruments for economic activities regulation. Externalities. Environmental indicators.			
B1M16EUE	Economy of Energy Use	KZ	5
Organization and energy management of company, buildings or energy systems. Energy need and consumption, energy balance. Energy characterization of aggregate, secondary energy sources. Energy audit and feasibility study, optimization of energy management of energy systems. Prices and tariffs, economy and financial analysis.			
B1M16FIM	Financial Management	Z,ZK	6
Principles of finance, present value and alternative cost of capital, net present value, valuation of bonds and stocks, investment decision and net present value, risk and alternative cost of capital, risk and return, lease or buy, taxes, inflation and return, financial and real options, option valuation and application, hedging, short term finance, cash flow management.			
B1M16FIU	Financial accounting	Z,ZK	5
Principles of accounting. Assets, inventory and financial investment book keeping. Debt and equity capital. Cost, revenues and profit. Tax system and accounting. Balance sheet, profit and loss account. Cash flow statement. Analysis of company's financial position. International accounting standards. Auditing, consolidated statements. Hello.			
B1M16IND	Individual project	Z	5
Independent work in the form of a project. A student will choose a topic from a list of topics specified by branch department. The project will be defended within the framework of a subject.			
B1M16MAR	Marketing	Z,ZK	5
The role and functions of the marketing management. Marketing research and marketing information system. Concepts of marketing strategy. The use of product life cycle and portfolio. Marketing-mix. Product and service policy, pricing and contractation policy, communication, distribution. Controlling and audit.			
B1M16MEE	Management of Power Production	Z,ZK	5
Management and economic calculations, power production - electricity calculations.			
B1M16MES	Management and Economics of Power Systems	Z,ZK	5
This course will give an overview of the various aspects of power supply with special emphasis on power management. The course characterises energy costs and marginal costs for determination of prices and tariffs. Energy market principles and operational decision making are integral parts of the course as well.			
B1M16OVY	Operations Research	Z,ZK	5
Art of modeling and elements of decision models, Linear programming, Transportation problem, Integer linear programming, Introduction to graphs theory, Nonlinear programming, Dynamic programming, Monte Carlo simulation, Project management (CPM, PERT).			
B1M16RES	Development of Energy Systems	Z,ZK	5
In this subject the basic questions of power stations design is solved. This design is discussed from viewpoint of ecology and level of used technology. Special focus is on future importance of classical and renewable energy resources. These kinds of energy resources are considered as the most important factor of future development of appropriate power industry systems. The subject provides overview of practical application of modern technologies to guarantee the development of energetic systems.			
B1M16SIR	System Analysis and Decision Making	Z,ZK	5
System approach and decision making, Decision models, Games theory, Decision making under uncertainty and risk, Decisions with multiple objectives, Stochastic programming, Expert systems, Cluster analysis			
B1M16STA	Statistical methods in economics	Z,ZK	5
Basic Concepts. Statistical series. Assortment. Distributions of frequencies. One-dimensional descriptive characteristics. Measures of variables, coefficient of skewness, coefficient of excess. Points estimates of basic characteristics. Interval estimates of basic characteristics. Hypothesis testing of basic characteristics. Individual indexes number. Aggregative indexes. Variable-structure indexes. Multifactor indexes. Correlation and regression, Basic Concepts. Measurement of dependence intensity. Time series, concepts, qualities. Chronological average. Time series - trends and extrapolation.			
B1M16VEN	Power and Heat Production	Z,ZK	5
Power sources overview, energy processes analysis.			
BDIP25	Diploma Thesis	Z	25
Independent final comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehensive final examination.			
TV-V1	Physical education	Z	1
TVKLV	Physical Education Course	Z	0
TVKZV	Physical Education Course	Z	0
TVV	Physical education	Z	0
TVV0	Physical education	Z	0

For updated information see <http://bilakniha.cvut.cz/en/f3.html>

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