

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 combined

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-K

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) <i>Tutors, authors and guarantors (gar.)</i>	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-K 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-K

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
BD1M16EKL	Ecology and economy <i>Jaroslav Knápek Jaroslav Knápek Jaroslav Knápek (Gar.)</i>	Z,ZK	5	21KP+3KS	Z	P
BD1M16FIM	Financial Management <i>Oldřich Starý</i>	Z,ZK	6	14KP+6KC	L	P
BD1M16FIU	Financial accounting <i>Jiří Vašíček Jiří Vašíček Jiří Vašíček (Gar.)</i>	Z,ZK	5	14KP+6KS	Z	P
BD1M16MAR	Marketing <i>Ondřej Pešek Ondřej Pešek (Gar.)</i>	Z,ZK	5	14KP+6KS	L	P
BD1M01MEK	Mathematics for Economy	Z,ZK	6	28KP+6KC	Z	P
BD1M16OVY	Operations Research <i>Jaroslav Šafránek</i>	Z,ZK	5	14KP+6KS	L	P

BD1M16IND	Individual project <i>Jiří Vašíček, Jan Jandera, Jaromír Vastl, Július Bemš, Tomáš Králík, Martin Beneš Jan Jandera Jan Jandera (Gar.)</i>	Z	5	0KP+28KS	Z	P
BD1M16STA	Statistical methods in economics	Z,ZK	5	14KP+6KC	L	P
BD1M16SIR	System Analysis and Decision Making <i>Jaroslav Knápek, Jaroslav Šafránek Jaroslav Šafránek Jaroslav Knápek (Gar.)</i>	Z,ZK	5	14KP+6KC	Z	P

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

BD1M16EKL	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.		
BD1M16FIM	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.		
BD1M16FIU	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.		
BD1M16MAR	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.		
BD1M01MEK	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 and insurance. At the end of the course, basic procedures of cluster analysis will be presented.		
BD1M16OVY	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).		
BD1M16IND	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.		
BD1M16STA	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.		
BD1M16SIR	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-K

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
BD1M16DES	Power Transport Systems <i>Miroslav Vitek Miroslav Vitek Miroslav Vitek (Gar.)</i>	Z,ZK	5	14KP+6KS	Z	PO
BD1M16EUE	Economy of Energy Use	KZ	5	14KP+6KS	L	PO
BD1M14ESZ	Power Machine Equipment	Z,ZK	5	14KP+6KC	Z	PO
BD1M16MES	Management and Economics of Power Systems <i>Jaromír Vastl, Tomáš Králík, Oldřich Starý Tomáš Králík Oldřich Starý (Gar.)</i>	Z,ZK	5	14KP+6KS	Z	PO
BD1M16MEE	Management of Power Production <i>Martin Beneš</i>	Z,ZK	5	14KP+6KS	L	PO
BD1M15PPE	Elements and Operation of Electrical Power Systems	KZ	4	14+6s	Z	PO
BD1M16RES	Development of Energy Systems <i>Rostislav Krejcar Rostislav Krejcar Rostislav Krejcar (Gar.)</i>	Z,ZK	5	14KP+6KS	L	PO
BD1M16VEN	Power and Heat Production <i>Martin Beneš</i>	Z,ZK	5	14KP+6KS	Z	PO

Characteristics of the courses of this group of Study Plan: Code=2015_MEEMPO4-K Name=Compulsory subjects of the branch

BD1M16DES	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 conveyor belt transport for solid fuel and mainly grid for electricity (power) transport.			
BD1M16EUE	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.			
BD1M14ESZ	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.			
BD1M16MES	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.			
BD1M16MEE	Management of Power Production	Z,ZK	5
Management and economic calculations, power production - electricity calculations.			
BD1M15PPE	Elements and Operation of Electrical Power Systems	KZ	4
BD1M16RES	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.			
BD1M16VEN	Power and Heat Production	Z,ZK	5
Power sources overview, energy processes analysis.			

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-K

Name of the group: Humanities subjects

Requirement credits in the group: In this group you have to gain at least 4 credits (at most 42)

Requirement courses in the group: In this group you have to complete at least 1 course (at most 12)

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
BD0M16ET1	Ethic 1	KZ	4	14+6s		v
BD0M16F11	Philosophy 1	KZ	4	14+6s		v
BD0M16F12	Philosophy 2	Z,ZK	4	14KP+6KS	L	v
BD0M16H11	History 1	KZ	4	14+6s		v
BD0M16HTE	History of technology and economic	ZK	2	14+0s		v
BD0M16HT1	History of science and technology 1	KZ	4	14+6s		v
BD0M16HT2	History of science and technology 2	Z,ZK	4	14KP+6KS	L	v
BD0M16HSD	History of economy and social studies	Z,ZK	4	14KP+6KS	L	v
BD0M16MPS	Psychology Jaroslav Knápek, Jan Fiala, Milana Hrubá Jan Fiala Jaroslav Knápek (Gar.)	Z,ZK	4	14KP+6KS	Z	v
BD0M16MPL	Psychology for Managers	ZK	2	14+0s		v
BD0M16TE1	Theology	Z,ZK	4	14KP+6KS	L	v
A003TV	Physical Education	Z	2	0+2	L,Z	v

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

BD0M16ET1	Ethic 1	KZ	4
Aim of this subject is to provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various situations of human life. Essential parts of the subject are discussions in which students can react to lectures but also to actual questions coming with news and look for the communal answers.			
BD0M16F11	Philosophy 1	KZ	4
We deal with the most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philosophy and connection of old philosophical thoughts with recent problems of science, technology, economics and politics.			
BD0M16F12	Philosophy 2	Z,ZK	4
The course is oriented on the transdisciplinary aspects of philosophy, informatics, physics, mathematics and biology.			
BD0M16H11	History 1	KZ	4
The main purpose of this subject is to provide a historical overview and explanation of rises and developments of mass movements and totalitarian states in 20th century. The course is based on political and econom-social history with attention to philosophic and psychologic connections.			

BD0M16HTE	History of technology and economic The course introduces the scientific branch of the history of technology as the economic and social context of the Czech lands and Czechoslovakia in comparison with the development of the European region 19th to 21st century.	ZK	2
BD0M16HT1	History of science and technology 1 This subject provides basic information on the development of science and technology in the world and at home from the earliest times to the present. The course is aimed primarily at explaining the significance of key levels of technology development, industrial revolutions and their impact on society.	KZ	4
BD0M16HT2	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
BD0M16HSD	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
BD0M16MPS	Psychology	Z,ZK	4
BD0M16MPL	Psychology for Managers Psychology of personality. Industrial and organizational psychology. Psychology in human resources management. Workgroups and teams, roles and competencies. Psychology in sales, consumer behavior analysis, psychology in marketing. Personality of a manager and leader. Time management, planning, delegation. Corporate culture.	ZK	2
BD0M16TE1	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
A003TV	Physical Education	Z	2

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
TVV0	Physical education	Z	0	0+2	Z,L	v
TV-V1	Physical education	Z	1	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
TVV0	Physical education	Z	0
TV-V1	Physical education	Z	1
TVKLV	Physical Education Course	Z	0
TVKZV	Physical Education Course	Z	0

Code of the group: 2015_MEEMVOL1-K

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
BD0M16ET1	Ethic 1 Aim of this subject is to provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various situations of human life. Essential parts of the subject are discussions in which students can react to lectures but also to actual questions coming with news and look for the communal answers.	KZ	4
BD0M16FI1	Philosophy 1 We deal with the most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philosophy and connection of old philosophical thoughts with recent problems of science, technology, economics and politics.	KZ	4
BD0M16FI2	Philosophy 2 The course is oriented on the transdisciplinary aspects of philosophy, informatics, physics, mathematics and biology.	Z,ZK	4
BD0M16HI1	History 1 The main purpose of this subject is to provide a historical overview and explanation of rises and developments of mass movements and totalitarian states in 20th century. The course is based on political and econom-social history with attention to philosophic and psychologic connections.	KZ	4
BD0M16HSD	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
BD0M16HT1	History of science and technology 1 This subject provides basic information on the development of science and technology in the world and at home from the earliest times to the present. The course is aimed primarily at explaining the significance of key levels of technology development, industrial revolutions and their impact on society.	KZ	4
BD0M16HT2	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
BD0M16HTE	History of technology and economic The course introduces the scientific branch of the history of technology as the economic and social context of the Czech lands and Czechoslovakia in comparison with the development of the European region 19th to 21st century.	ZK	2
BD0M16MPL	Psychology for Managers Psychology of personality. Industrial and organizational psychology. Psychology in human resources management. Workgroups and teams, roles and competencies. Psychology in sales, consumer behavior analysis, psychology in marketing. Personality of a manager and leader. Time management, planning, delegation. Corporate culture.	ZK	2
BD0M16MPS	Psychology	Z,ZK	4
BD0M16TE1	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
BD1M01MEK	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 and insurance. At the end of the course, basic procedures of cluster analysis will be presented.	Z,ZK	6
BD1M14ESZ	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
BD1M15PPE	Elements and Operation of Electrical Power Systems	KZ	4
BD1M16DES	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
BD1M16EKL	Ecology and economy 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.	Z,ZK	5
BD1M16EUE	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
BD1M16FIM	Financial Management 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.	Z,ZK	6
BD1M16FIU	Financial accounting 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.	Z,ZK	5
BD1M16IND	Individual project 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.	Z	5

BD1M16MAR	Marketing 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.	Z,ZK	5
BD1M16MEE	Management of Power Production Management and economic calculations, power production - electricity calculations.	Z,ZK	5
BD1M16MES	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
BD1M16OVY	Operations Research 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).	Z,ZK	5
BD1M16RES	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
BD1M16SIR	System Analysis and Decision Making 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	Z,ZK	5
BD1M16STA	Statistical methods in economics 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.	Z,ZK	5
BD1M16VEN	Power and Heat Production Power sources overview, energy processes analysis.	Z,ZK	5
BDIP25	Diploma Thesis 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.	Z	25
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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