Study plan

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

Faculty/Institute/Others: Faculty of Electrical Engineering
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Electrical Engineering, Power Engineering and Management
Type of study: Follow-up master combined
Required credits: 116
Elective courses credits: 4
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: 61
The role of the block: P

Code of the group: 2018_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)* *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=2018_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.			

Code of the group: 2018_MEEMH-K
Name of the group: Humanities subjects
Requirement credits in the group: In this group you have to gain 5 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 5
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
BD0M16FIL	**Philosophy 2**	Z,ZK	5	14KP+6KS	L	P
BD0M16HVT	**History of science and technology 2**	Z,ZK	5	14KP+6KS	L	P
BD0M16PSM	**Psychology** *Milana Čížek Hrubá, Jaroslav Knápek* ***Jiří Vašíček*** *Jiří Vašíček (Gar.)*	Z,ZK	5	14KP+6KS	Z,L	P
BD0M16TEO	**Theology**	Z,ZK	5	14KP+6KS	L	P

Characteristics of the courses of this group of Study Plan: Code=2018_MEEMH-K Name=Humanities subjects

BD0M16FIL	Philosophy 2	Z,ZK	5
BD0M16HVT	History of science and technology 2	Z,ZK	5
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			

BD0M16PSM	Psychology	Z,ZK	5
BD0M16TEO	Theology	Z,ZK	5

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 graws our civilization up.

Code of the group: 2018_MEEMP-K
Name of the group: Compulsory subjects of the programme
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 6 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)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
BD1M16EKE1	**Economy of Power Industry** *Jiří Vašíček, Oldřich Starý, Tomáš Králík* ***Tomáš Králík*** *Oldřich Starý (Gar.)*	Z,ZK	5	14KP+6KC	L	P
BD1M15IAP	**Engineering Applications** *Jan Kyncl*	Z,ZK	5	14KP+6KC	Z	P
BD1M13JAS1	**Quality and Reliability** *Pavel Mach, Martin Molhanec* ***Pavel Mach*** *Pavel Mach (Gar.)*	Z,ZK	6	14KP+6KC	Z	P
BD1MPROJ	**Individual project** *Jiří Vašíček, Miroslav Vítek, Josef Černohous, Zdeněk Müller, Stanislav Bouček* ***Oldřich Starý*** *Oldřich Starý (Gar.)*	Z	5	0p+4s	Z	P
BD1M15PPE1	**Elements and Operation of Electrical Power Systems** *Stanislav Bouček, Jan Hlaváček*	Z,ZK	5	14KP+6KS	Z	P
BD1M14SSE	**Machinery and Structures of Power Plants** *Petr Kočárník* ***Petr Kočárník*** *Petr Kočárník (Gar.)*	Z,ZK	5	14KP+6KC	Z	P

Characteristics of the courses of this group of Study Plan: Code=2018_MEEMP-K Name=Compulsory subjects of the programme

BD1M16EKE1	Economy of Power Industry	Z,ZK	5

Fundamentals of financing of power companies. Cost structure of power generation and distribution. Prices and tariff systems for power, heat and gas production and distribution. Examples of economic evaluation and investment appraisal of the typical project in power sector. Renewable energy sources, externalities. Energy policy and energy law in CR. Liberalization and power market development.

BD1M15IAP	Engineering Applications	Z,ZK	5
BD1M13JAS1	Quality and Reliability	Z,ZK	6

Terminology and definitions from the area of quality and reliability and their control, philosophy of quality, systems of quality control in the world. Reliability as a part of quality. Basic definitions from the area of reliability, basic distributions used in reliability and their basic characteristics. Back-up using a warm and cold standby, types of warm and cold standbys. Reliability of components and systems, calculation of reliability using composition and decomposition. and using a method of a list. Basic statistical methods and tools joined with quality control, managerial tools for quality control. Techniques FMEA and QFFD, house of quality. Capability of a process. Taguchi loss function. Audits. Statistical inspection.

BD1MPROJ	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.

BD1M15PPE1	Elements and Operation of Electrical Power Systems	Z,ZK	5
BD1M14SSE	Machinery and Structures of Power Plants	Z,ZK	5

The aim of the course is to acquaint students with forms of energy transformation in power plants, describing the function of power facilities, their structure, properties and characteristics.

Name of the block: Povinné předměty zaměření
Minimal number of credits of the block: 45
The role of the block: PZ

Code of the group: 2018_MEEMPPS2-K
Name of the group: Compulsory subjects of the specialization
Requirement credits in the group: In this group you have to gain 15 credits
Requirement courses in the group: In this group you have to complete 3 courses
Credits in the group: 15
Note on the group: Specializace Elektroenergetika

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
BD1M15DEE	**Distribution of Electrical Energy** *Stanislav Bouček*	Z,ZK	5	14KP+6KS	Z	PZ
BD1M15ENY	**Power Plants** *Stanislav Bouček*	Z,ZK	5	14KP+6KS	L	PZ

BD1M15ETT	**Electrical Heat** *Jan Kyncl*	Z,ZK	5	14KP+6KS	Z	PZ

Characteristics of the courses of this group of Study Plan: Code=2018_MEEMPPS2-K Name=Compulsory subjects of the specialization

BD1M15DEE	Distribution of Electrical Energy	Z,ZK	5
BD1M15ENY	Power Plants	Z,ZK	5
BD1M15ETT	Electrical Heat	Z,ZK	5

Code of the group: 2018_MEEMPS-K
Name of the group: Compulsory subjects of the specialization
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 6 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
BD1M13ASS	**Solar Systems Applications** *Vítězslav Benda, Ladislava Černá, Jakub Holovský, Pavel Hrzina* ***Vítězslav Benda*** *Vítězslav Benda (Gar.)*	Z,ZK	5	14KP+6KL	Z	PZ
BD1M13EKP	**Ecology and materials** *Ivan Kudláček* ***Ivan Kudláček*** *Ivan Kudláček (Gar.)*	Z,ZK	5	14KP+6KC	Z	PZ
BD1M14ESP	**Electric Machinery and Apparatus** *Pavel Mindl, Vít Hlinovský* ***Pavel Mindl***	Z,ZK	5	14KP+6KL	Z	PZ
BD1M15PRE1	**Transmission and Distribution of Electricity** *Stanislav Bouček*	Z,ZK	5	14KP+6KS	Z	PZ
BD1M15TVN	**High Voltage Engineering** *Jan Hlaváček*	Z,ZK	5	14KP+6KL	L	PZ
BD1M14TVM	**Theory and Application of Power Converters** *Jan Bauer* ***Jan Bauer*** *Jan Bauer (Gar.)*	Z,ZK	5	14KP+6KL	L	PZ

Characteristics of the courses of this group of Study Plan: Code=2018_MEEMPS-K Name=Compulsory subjects of the specialization

BD1M13ASS	Solar Systems Applications	Z,ZK	5
The aim of the course is to deepen the knowledge of the properties of semiconductor materials and structures that are important for a deeper understanding of the semiconductor components technology .			
BD1M13EKP	Ecology and materials	Z,ZK	5
Electrical Technology from the perspective of ecology. Environmental assessment of the various types of surface protection. Environmental aspects of protective systems used in electronics. Environmental impacts of electrical production. Ekodesign proposal of the electrical product. Principles of the proposal product for a difficult operating environment. Disposal of electrical waste.			
BD1M14ESP	Electric Machinery and Apparatus	Z,ZK	5
The course is focused on contact and solid-state switching devices in LV networks. Basic topologies AC switches and stress of their components, systems with modern semiconductor devices and their protection circuits, testing electrical devices. The course also deals with the general theory of electrical machines. Magnetic field. Fundamentals of commutation. The transformer efficiency, voltage drop. Transients - switch to the network, a short circuit. Mathematical model of synchronous and asynchronous machines. A rotating magnetic field. Induction machine, starting and speed control. Influence of harmonic magnetic field. Single-phase induction motor. Work synchronous machine on a network. Torque, stability, overload capacity.			
BD1M15PRE1	Transmission and Distribution of Electricity	Z,ZK	5
BD1M15TVN	High Voltage Engineering	Z,ZK	5
BD1M14TVM	Theory and Application of Power Converters	Z,ZK	5
The course focuses on typical applications of power semiconductor converters on their sizing, switching and protection of power semiconductor converters. It also summarizes the basics of modulation and control strategies of power semiconductor converters and modern trends in their application in electric drives and other applications.			

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 10
The role of the block: PV

Code of the group: 2018_MEEMPV1-K
Name of the group: Compulsory elective subjects of the specialization
Requirement credits in the group: In this group you have to gain at least 10 credits (at most 20)
Requirement courses in the group: In this group you have to complete at least 2 courses (at most 4)
Credits in the group: 10
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
BD1M16EUE1	**Economy of Energy Use** *Jiří Beranovský* ***Jiří Beranovský*** *Jiří Beranovský (Gar.)*	Z,ZK	5	14KP+6KS	L	PV
BD1M15ELS	**Electrical Light** *Marek Bálský, Petr Žák*	Z,ZK	5	14KP+6KL	L	PV
BD1M14MDS1	**Modeling of Dynamical Systems**	Z,ZK	5	14KP+6KC	L	PV
BD1M13VSE	**Power components in electrical engineering** *Václav Papež* ***Václav Papež*** *Václav Papež (Gar.)*	Z,ZK	5	14KP+6KL	L	PV

Characteristics of the courses of this group of Study Plan: Code=2018_MEEMPV1-K Name=Compulsory elective subjects of the specialization

BD1M16EUE1	Economy of Energy Use	Z,ZK	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.			
BD1M15ELS	Electrical Light	Z,ZK	5
BD1M14MDS1	Modeling of Dynamical Systems	Z,ZK	5
The course deals with combining knowledge of the dynamics of rigid bodies, fluid mechanics, aerodynamics, gas dynamics and thermodynamics in the compilation of nonlinear models of dynamic systems. Seminars are focused on assembling of numeric models in Matlab / Simulink.			
BD1M13VSE	Power components in electrical engineering	Z,ZK	5
Power semiconductor device (diodes, BJTs, thyristors, MOSFETs and IGBTs) and integraed structures (modules). Structures, function, characteristics and parameters, Passive components of powet electronic. Connection of devices in parallel and in series.			

Name of the block: Elective courses
Minimal number of credits of the block: 0
The role of the block: V

Code of the group: MTV
Name of the group: Physical education
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
A003TV	**Physical Education**	Z	2	0+2	L,Z	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=Physical education

TVV	Physical education	Z	0
A003TV	Physical Education	Z	2
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: 2018_MEEMVOL-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
BD0M16FIL	Philosophy 2	Z,ZK	5
BD0M16HVT	History of science and technology 2	Z,ZK	5
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			
BD0M16PSM	Psychology	Z,ZK	5
BD0M16TEO	Theology	Z,ZK	5
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 graws our civilization up.			
BD1M13ASS	Solar Systems Applications	Z,ZK	5
The aim of the course is to deepen the knowledge of the properties of semiconductor materials and structures that are important for a deeper understanding of the semiconductor components technology .			
BD1M13EKP	Ecology and materials	Z,ZK	5
Electrical Technology from the perspective of ecology. Environmental assessment of the various types of surface protection. Environmental aspects of protective systems used in electronics. Environmental impacts of electrical production. Ekodesign proposal of the electrical product. Principles of the proposal product for a difficult operating environment. Disposal of electrical waste.			
BD1M13JAS1	Quality and Reliability	Z,ZK	6
Terminology and definitions from the area of quality and reliability and their control, philosophy of quality, systems of quality control in the world. Reliability as a part of quality. Basic definitions from the area of reliability, basic distributions used in reliability and their basic characteristics. Back-up using a warm and cold standby, types of warm and cold standbys. Reliability of components and systems, calculation of reliability using composition and decomposition. and using a method of a list. Basic statistical methods and tools joined with quality control, managerial tools for quality control. Techniques FMEA and QFFD, house of quality. Capability of a process. Taguchi loss function. Audits. Statistical inspection.			
BD1M13VSE	Power components in electrical engineering	Z,ZK	5
Power semiconductor device (diodes, BJTs, thyristors, MOSFETs and IGBTs) and integraed structures (modules). Structures, function, characteristics and parameters, Passive components of powet electronic. Connection of devices in parallel and in series.			
BD1M14ESP	Electric Machinery and Apparatus	Z,ZK	5
The course is focused on contact and solid-state switching devices in LV networks. Basic topologies AC switches and stress of their components, systems with modern semiconductor devices and their protection circuits, testing electrical devices. The course also deals with the general theory of electrical machines. Magnetic field. Fundamentals of commutation. The transformer efficiency, voltage drop. Transients - switch to the network, a short circuit. Mathematical model of synchronous and asynchronous machines. A rotating magnetic field. Induction machine, starting and speed control. Influence of harmonic magnetic field. Single-phase induction motor. Work synchronous machine on a network. Torque, stability, overload capacity.			
BD1M14MDS1	Modeling of Dynamical Systems	Z,ZK	5
The course deals with combining knowledge of the dynamics of rigid bodies, fluid mechanics, aerodynamics, gas dynamics and thermodynamics in the compilation of nonlinear models of dynamic systems. Seminars are focused on assembling of numeric models in Matlab / Simulink.			
BD1M14SSE	Machinery and Structures of Power Plants	Z,ZK	5
The aim of the course is to acquaint students with forms of energy transformation in power plants, describing the function of power facilities, their structure, properties and characteristics.			
BD1M14TVM	Theory and Application of Power Converters	Z,ZK	5
The course focuses on typical applications of power semiconductor converters on their sizing, switching and protection of power semiconductor converters. It also summarizes the basics of modulation and control strategies of power semiconductor converters and modern trends in their application in electric drives and other applications.			
BD1M15DEE	Distribution of Electrical Energy	Z,ZK	5
BD1M15ELS	Electrical Light	Z,ZK	5
BD1M15ENY	Power Plants	Z,ZK	5
BD1M15ETT	Electrical Heat	Z,ZK	5
BD1M15IAP	Engineering Applications	Z,ZK	5
BD1M15PPE1	Elements and Operation of Electrical Power Systems	Z,ZK	5
BD1M15PRE1	Transmission and Distribution of Electricity	Z,ZK	5
BD1M15TVN	High Voltage Engineering	Z,ZK	5
BD1M16EKE1	Economy of Power Industry	Z,ZK	5
Fundamentals of financing of power companies. Cost structure of power generation and distribution. Prices and tariff systems for power, heat and gas production and distribution. Examples of economic evaluation and investment appraisal of the typical project in power sector. Renewable energy sources, externalities. Energy policy and energy law in CR. Liberalization and power market development.			
BD1M16EUE1	Economy of Energy Use	Z,ZK	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.			
BD1MPROJ	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.			
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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