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 full-time

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 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	Р

Characteristics of the courses of this group of Study Plan: Code=2018_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.

Code of the group: 2018_MEEMH

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
B0M16FIL	Peter Zamarovský Peter Zamarovský Peter Zamarovský (Gar.)	Z,ZK	5	2P+2S	Z,L	Р
B0M16HVT	History of science and technology 2 Marcela Efmertová Marcela Efmertová (Gar.)	Z,ZK	5	2P+2S	Z,L	Р
B0M16HSD1	History of economy and social studies Marcela Efmertová	Z,ZK	5	2P+2S	Z,L	Р
B0M16PSM	Psychology Jan Fiala Jan Fiala (Gar.)	Z,ZK	5	2P+2S	Z,L	Р
A003TV	Physical Education Jiří Drnek	Z	2	0+2	L,Z	Р
B0M16TEO	Theology Vladimír Slámečka Vladimír Slámečka Vladimír Slámečka (Gar.)	Z,ZK	5	2P+2S	Z,L	Р

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

		_,	1
B0M16HVT	History of science and technology 2	Z,ZK	5
This subject traces hi	storical developments in electrical engineering branches in the world and in the Czech Lands. Its ultimate goal is to stimulate s	students' interest in	the history and
traditions of the subje	ct, while highlighting the developments in technical education and professional organizations, the process of shaping scientific	life and the influe	nce of technical
engineers			
B0M16HSD1	History of economy and social studies	Z,ZK	5
This subject deals wi	h the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its ai	ms and achieved r	esults as well as
the social and cultura	I development and coexistence of the various ethnical groups in the Czech countries.		
B0M16PSM	Psychology	Z,ZK	5
A003TV	Physical Education	Z	2
B0M16TEO	Theology	Z,ZK	5
This subject provides	to students the basic orientation in christian theology and requires no special previous education. After short philosophic lectu	ire the basic theolo	ogic 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 one	s who want to get I	know Christianity
- religion from which	graws our civilization up.		

Code of the group: 2018_MEEMP

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:

B0M16FIL

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
B1M16EKE1	Economy of Power Industry Jiří Vašíček, Oldřich Starý, Tomáš Králík Tomáš Králík Oldřich Starý (Gar.)	Z,ZK	5	2P+2C	L	Р
B1M15IAP	Engineering Applications Jan Kyncl Jan Kyncl (Gar.)	Z,ZK	5	2P+2C	Z	Р
B1M13JAS1	Quality and Reliability Zbyněk Plachý, Pavel Mach, Denis Froš, Martin Molhanec Pavel Mach Pavel Mach (Gar.)	Z,ZK	6	2P+2C	Z	Р
B1MPROJ	Individual project Jiří Vašíček, Oldřich Starý, Jan Kyncl, Jan Jandera, Karel Künzel, Zdeněk Müller, Jaroslav Knápek, Iva Mrkvičková, Josef Černohous, Josef Černohous Jan Jandera (Gar.)	Z	5	0p+4s	Z	Р
B1M15PPE1	Elements and Operation of Electrical Power Systems Zdeněk Müller, Ivo Doležel Zdeněk Müller (Gar.)	Z,ZK	5	2P+2S	Z	Р
B1M14SSE	Machinery and Structures of Power Plants Petr Kočárník, Jiří Šťastný Petr Kočárník Petr Kočárník (Gar.)	Z,ZK	5	2P+2C	Z	Р

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

B1M16EKE1	Economy of Power Industry	Z,ZK	5
Fundamentals of fina	ncing of power companies. Cost structure of power generation and distribution. Prices and tariff systems for power, heat and ga	as production and o	distribution.
Examples of econom	c evaluation and investment appraisal of the typical project in power sector. Renewable energy sources, externalities. Energy p	olicy and energy la	aw in CR.
Liberalization and pov	ver market development.		
B1M15IAP	Engineering Applications	Z,ZK	5
B1M13JAS1	Quality and Reliability	Z,ZK	6
Terminology and defin	itions from the area of quality and reliability and their control, philosophy of quality, systems of quality control in the world. Reli	ability as a part of	quality. Basic
definitions from the a	ea of reliability, basic distributions used in reliability and their basic characteristics. Back-up using a warm and cold standby, ty	pes of warm and co	old standbys.
Reliability of compone	ents and systems, calculation of reliability using composition and decomposition. and using a method of a list. Basic statistical me	ethods and tools joi	ned with qual
control, managerial to	ols for quality control. Techniques FMEA and QFFD, house of quality. Capability of a process. Taguchi loss function. Audits. Sta	itistical inspection.	
B1MPROJ	Individual project	Z	5
Independent work in	he form of a project. A student will choose a topic from a list of topics specified by branch department. The project will be defer	nded within the fran	nework of a
subject.			
B1M15PPE1	Elements and Operation of Electrical Power Systems	Z,ZK	5
B1M14SSE	Machines, and Churchines of Device Plants	7 71/	
D11011455E	Machinery and Structures of Power Plants	Z,ZK	5

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

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
B1M15DEE	Distribution of Electrical Energy Zdeněk Müller, Martin Čerňan, Josef Tlustý, Jiří Vodrážka Zdeněk Müller (Gar.)	Z,ZK	5	2P+2S	Z	PZ
B1M15ENY	Power Plants Zdeněk Müller, Jan Špetlík	Z,ZK	5	2P+2S	L	PZ
B1M15ETT	Electrical Heat Jan Kyncl Jan Kyncl (Gar.)	Z,ZK	5	2P+2S	Z	PZ

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

B1M15DEE	Distribution of Electrical Energy	Z,ZK	5
B1M15ENY	Power Plants	Z,ZK	5
B1M15ETT	Electrical Heat	Z,ZK	5

Code of the group: 2018_MEEMPS

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
B1M13ASS	Solar Systems Application Vítězslav Benda, Jakub Holovský Jakub Holovský Vítězslav Benda (Gar.)	Z,ZK	5	2P+2L	Z	PZ
B1M13EKP	Ecology and materials Ivan Kudláček, Eva Horynová, Jan Weinzettel, Branislav Dzurňák Ivan Kudláček Ivan Kudláček (Gar.)	Z,ZK	5	2P+2L	Z	PZ
B1M14ESP	Electric Machinery and Apparatus Ondřej Lipčák, Pavel Mindl Pavel Mindl Pavel Mindl (Gar.)	Z,ZK	5	2P+2L	Z	PZ
B1M15PRE1	Transmission and Distribution of Electricity Zdeněk Müller, Ivo Doležel, Ladislav Musil Zdeněk Müller (Gar.)	Z,ZK	5	2P+2S	Z	PZ
B1M15TVN	High Voltage Engineering Jan Koller, Jan Hlaváček	Z,ZK	5	2P+2L	L	PZ
B1M14TVM	Theory and Application of Power Converters Jiří Lettl Jiří Lettl (Gar.)	Z,ZK	5	2P+2L	L	PZ

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

B1M13ASS	Solar Systems Application	Z,ZK	5	ı
Solar energy. Photovolta	iic phenomena. Photovoltaic cells and modules and their characteristics. Photovoltaic systems and their applications. Photo-ti	nermal phenomen	na Photo-thermal	1
power stations. Significa	nce, economic and environmental aspects of solar energy exploitation.			ı

B1M13FKP Ecology and materials

7.7K 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

B1M14FSP Electric Machinery and Apparatus

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.

B1M15PRE1	Transmission and Distribution of Electricity	Z,ZK	5
B1M15TVN	High Voltage Engineering	Z,ZK	5
B1M14TVM	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

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
B1M16EUE1	Economy of Energy Use Jiří Beranovský Jiří Beranovský (Gar.)	Z,ZK	5	2P+2S	L	PV
B1M15ELS	Electrical Light Petr Žák	Z,ZK	5	2P+2L	L	PV
B1M14MDS1	Modeling of Dynamical Systems Petr Kočárník Petr Kočárník (Gar.)	Z,ZK	5	2P+2C	L	PV
B1M13VSE	Power components in electrical engineering Václav Papež Václav Papež Václav Papež (Gar.)	Z,ZK	5	2P+2L	L	PV

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

specialization								
B1M16EUE1	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. Energ	y audit and feasibility study, optimization of energy management of energy systems. Prices and tariffs, economy and financial	analysis.						
B1M15ELS	Electrical Light	Z,ZK	5					
B1M14MDS1	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	e compilation of r	nonlinear models					
of dynamic systems. S	eminars are focused on assembling of numeric models in Matlab / Simulink.							
B1M13VSE	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.								
components of power	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	٧
TV-V1	Physical education	Z	1	0+2	Z,L	٧
TVV0	Physical education	Z	0	0+2	Z,L	٧
TVKZV	Physical Education Course	Z	0	7dní	Z	V
TVKLV	Physical Education Course	Z	0	7dní	L	V

Characteristics of the courses of this group of Study Plan: Code=MTV Name=Physical education

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

Code of the group: 2018_MEEMVOL 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

 $http://www.fel.cvut.cz/cz/education/volitelne-predmety.html \verb|\| |$

List of courses of this pass:

	Name of the course C	Completion	Credits
A003TV	Physical Education	Z	2
B0M16FIL		Z,ZK	5
B0M16HSD1	History of economy and social studies	Z,ZK	5
his 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	l achieved result	s as well a
	the social and cultural development and coexistence of the various ethnical groups in the Czech countries.		
B0M16HVT	History of science and technology 2	Z,ZK	5
·=	s historical developments in electrical engineering branches in the world and in the Czech Lands. Its ultimate goal is to stimulate students		-
raditions of the su	ubject, while highlighting the developments in technical education and professional organizations, the process of shaping scientific life an engineers	id the initidence	or recrimica
B0M16PSM	Psychology	Z,ZK	5
B0M16TEO	Theology	Z,ZK	5
	des to students the basic orientation in christian theology and requires no special previous education. After short philosophic lecture the	,	
re 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 w	vant to get know	Christian
	- religion from which graws our civilization up.		
B1M13ASS	Solar Systems Application	Z,ZK	5
Solar energy. Photo	ovoltaic phenomena. Photovoltaic cells and modules and their characteristics. Photovoltaic systems and their applications. Photo-thermal	phenomena.Ph	oto-therm
DAMAGEICE	power stations. Significance, economic and environmental aspects of solar energy exploitation.	7 71/	
B1M13EKP	Ecology and materials clogy from the perspective of ecology. Environmental assessment of the various types of surface protection. Environmental aspects of pr	Z,ZK	5
	onegy from the perspective of ecology. Environmental assessment of the various types of surface protection. Environmental assessment of the various types of surface protection. Environmental assessment of the electrical product. Principles of the proposal product for a difficult oper	' -	
	of electrical waste.	g	
B1M13JAS1	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	y as a part of qu	ality. Basi
	ne area of reliability, basic distributions used in reliability and their basic characteristics. Back-up using a warm and cold standby, types o		
	onents and systems, calculation of reliability using composition and decomposition. and using a method of a list. Basic statistical methods	=	-
	anagerial tools for quality control. Techniques FMEA and QFFD, house of quality. Capability of a process. Taguchi loss function. Audits. S		
B1M13VSE	Power components in electrical engineering	Z,ZK	5
Power semicon	ductor device (diodes, BJTs, thyristors, MOSFETs and IGBTs) and integraed structures (modules). Structures, function, characteristics a components of powet electronic. Connection of devices in parallel and in series.	and parameters,	, Passive
B1M14ESP			
	Flectric Machinery and Apparatus	7 7K	5
	Electric Machinery and Apparatus sed on contact and solid-state switching devices in LV networks. Basic topologies AC switches and stress of their components, systems to be components.	Z,ZK with modern ser	5 miconduct
The course is focus	Electric Machinery and Apparatus sed on contact and solid-state switching devices in LV networks. Basic topologies AC switches and stress of their components, systems or otection circuits, testing electrical devices. The course also deals with the general theory of electrical machines. Magnetic field. Fundam	with modern ser	miconduct
The course is focus devices and their p	sed on contact and solid-state switching devices in LV networks. Basic topologies AC switches and stress of their components, systems	with modern ser nentals of comm	niconduct utation. Th
The course is focus devices and their p transformer effic	sed on contact and solid-state switching devices in LV networks. Basic topologies AC switches and stress of their components, systems or protection circuits, testing electrical devices. The course also deals with the general theory of electrical machines. Magnetic field. Fundam iency, voltage drop. Transients - switch to the network, a short circuit. Mathematical model of synchronous and asynchronous machines. , starting and speed control. Influence of harmonic magnetic field. Single-phase induction motor. Work synchronous machine on a networ	with modern ser nentals of comm A rotating magr	niconduct autation. The netic field.
The course is focus levices and their p transformer effic nduction machine,	sed on contact and solid-state switching devices in LV networks. Basic topologies AC switches and stress of their components, systems or ordection circuits, testing electrical devices. The course also deals with the general theory of electrical machines. Magnetic field. Fundam iency, voltage drop. Transients - switch to the network, a short circuit. Mathematical model of synchronous and asynchronous machines., starting and speed control. Influence of harmonic magnetic field. Single-phase induction motor. Work synchronous machine on a networ capacity.	with modern ser nentals of comm A rotating magr k. Torque, stabil	miconduct utation. The netic field. ity, overloa
The course is focus levices and their p transformer effic induction machine, B1M14MDS1	sed on contact and solid-state switching devices in LV networks. Basic topologies AC switches and stress of their components, systems or ordection circuits, testing electrical devices. The course also deals with the general theory of electrical machines. Magnetic field. Fundam iency, voltage drop. Transients - switch to the network, a short circuit. Mathematical model of synchronous and asynchronous machines., starting and speed control. Influence of harmonic magnetic field. Single-phase induction motor. Work synchronous machine on a networ capacity. Modeling of Dynamical Systems	with modern ser nentals of comm A rotating magr k. Torque, stabil	miconduct outation. The netic field. ity, overload
The course is focus devices and their p transformer effic induction machine, B1M14MDS1	sed on contact and solid-state switching devices in LV networks. Basic topologies AC switches and stress of their components, systems or ordection circuits, testing electrical devices. The course also deals with the general theory of electrical machines. Magnetic field. Fundam iency, voltage drop. Transients - switch to the network, a short circuit. Mathematical model of synchronous and asynchronous machines., starting and speed control. Influence of harmonic magnetic field. Single-phase induction motor. Work synchronous machine on a networ capacity. Modeling of Dynamical Systems with combining knowledge of the dynamics of rigid bodies, fluid mechanics, aerodynamics, gas dynamics and thermodynamics in the com	with modern ser nentals of comm A rotating magr k. Torque, stabil	miconduct outation. The netic field. ity, overload
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he course is focusevices and their patransformer efficinduction machine, B1M14MDS1 he course deals v B1M14SSE he aim of the course B1M14TVM	sed on contact and solid-state switching devices in LV networks. Basic topologies AC switches and stress of their components, systems of protection circuits, testing electrical devices. The course also deals with the general theory of electrical machines. Magnetic field. Fundamiency, voltage drop. Transients - switch to the network, a short circuit. Mathematical model of synchronous and asynchronous machines. It is starting and speed control. Influence of harmonic magnetic field. Single-phase induction motor. Work synchronous machine on a networ capacity. Modeling of Dynamical Systems	with modern ser nentals of comm A rotating magr k. Torque, stabil Z,ZK ppilation of nonlir Z,ZK pperties and cha Z,ZK	miconduciutation. Thetic field. ity, overlo 5 near mode 5 aracteristic 5
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BDIP25	Diploma Thesis	Z	25		
Independent final	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		

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