Study plan

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

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: 56

The role of the block: P

Code of the group: 2018 MEEMEP

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
BE1M16EKE1	Economy of Power Industry Tomáš Králík, Július Bemš Tomáš Králík Tomáš Králík (Gar.)	Z,ZK	5	2P+2S	L	Р
BE1M15PPE1	Elements and Operation of Electrical Power Systems Ghaeth Fandi, Zden k Müller Zden k Müller (Gar.)	Z,ZK	5	2P+2S	Z	Р
BE1M15IAP	Engineering Applications Jan Kyncl, Ladislav Musil	Z,ZK	5	2P+2C	Z	Р
BE1MPROJ	Individual project Ji í Vaší ek, Zden k Müller, Jan Kyncl, Jan Jandera, Josef ernohous Josef ernohous Jan Jandera (Gar.)	Z	5	0p+4s	Z	Р
BE1M14SSE	Machinery and Structures of Power Plants Evžen Thöndel Evžen Thöndel	Z,ZK	5	2P+2C	Z	Р
BE1M13JAS1	Quality and Reliability Pavel Mach, Martin Molhanec Pavel Mach Pavel Mach (Gar.)	Z,ZK	6	2P+2C	Z,L	Р

Characteristics of	f the courses of this group of Study Plan: Code=2018_MEEMEP Name=Compulsory subje	cts of the progr	ramme
BE1M16EKE1	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	gas production and d	listribution.
Examples of economic	c evaluation and investment appraisal of the typical project in power sector. Renewable energy sources, externalities. Energy	policy and energy la	w in CR.
Liberalization and pov	ver market development.		
BE1M15PPE1	Elements and Operation of Electrical Power Systems	Z,ZK	5
The course introduce	s basic technical principles of electricity transmission and distribution. There are explained parameters of power systems key	elements, steady sta	ites, transient
and failure phenomer	a, main principles of dimensioning and protecting, power quality and its control and electrical machines characteristics and u	tilization.	
BE1M15IAP	Engineering Applications	Z,ZK	5
The aim of the course	is to get an overview of solving basic mathematical problems occurring in engineering practice using computer algebra syst	ems	
BE1MPROJ	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 def	ended within the fram	nework of a
subject.			
BE1M14SSE	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 struc	cture, properties and	characteristics
BE1M13JAS1	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. Re	eliability as a part of c	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, t	ypes of warm and co	old standbys.
Reliability of compone	nts and systems, calculation of reliability using composition and decomposition. and using a method of a list. Basic statistical n	nethods and tools joir	ned with quali

control, managerial tools for quality control. Techniques FMEA and QFFD, house of quality. Capability of a process. Taguchi loss function. Audits. Statistical inspection.

Code of the group: 2018_MEEMEDIP 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:

	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_MEEMEDIP Name=Diploma Thesis

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.

Name of the block: Povinné p edm ty zam

Minimal number of credits of the block: 45

The role of the block: PZ

Code of the group: 2018_MEEMEPS

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
BE1M13EKP	Ecology and Materials Pavel Žák, Zuzana Šaršounová, Jan Weinzettel, Eva Horynová, Branislav Dzur ák, Michael Fridrich Jan Weinzettel Ivan Kudlá ek (Gar.)	Z,ZK	5	2P+2L	Z	PZ
BE1M14ESP	Electric Machinery and Apparatus Pavel Mindl, Miroslav Chomát Miroslav Chomát Pavel Mindl (Gar.)	Z,ZK	5	2P+2L	Z	PZ
BE1M15TVN	High Voltage Engineering Jan Hlavá ek	Z,ZK	5	2P+2L	L	PZ
BE1M13ASS	Solar Systems Application Rupendra Kumar Sharma, Jakub Holovský, Vít zslav Benda, Arao Minamau Pambo Jakub Holovský Vít zslav Benda (Gar.)	Z,ZK	5	2P+2L	Z	PZ
BE1M14TVM	Theory and Application of Power Converters Ji í Lettl Ji í Lettl (Gar.)	Z,ZK	5	2P+2L	L	PZ
BE1M15PRE1	Transmission and Distribution of Electricity Ghaeth Fandi, Zden k Müller Zden k Müller Zden k Müller (Gar.)	Z,ZK	5	2P+2S	Z	PZ

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

BE1M13EKP	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.

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.

BE1M15TVN High Voltage Engineering

Z,ZK The course contains the fundamental theories of high voltage engineering with respect to application in electrical power engineering. The knowledge of high voltage generators, measurement technique of high voltages and currents, properties of insulation systems, diagnostics methods and electrical discharges and their elimination. The practical laboratory exercises in high voltage laboratory are included.

BE1M13ASS Solar Systems Application

Solar energy, Photovoltaic phenomena, Photovoltaic cells and modules and their characteristics, Photovoltaic systems and their applications, Photo-thermal phenomena, Photo-thermal power stations. Significance, economic and environmental aspects of solar energy exploitation.

Z.ZK

5

Theory and Application of Power Converters

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.

BE1M15PRE1 Transmission and Distribution of Electricity

Z.ZK

5

The course introduces particular topics concerning transmission and distribution systems, mainly load flow solutions, specific aspects of system steady states and possibilities to control these states. The course also deals with synchronous generators characteristics in different operational states.

Code of the group: 2018_MEEMEPPS3

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 Technologické systémy

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
BE1M13AEZ	Application of Electrochemical Sources	Z,ZK	5	2P+2L	Z	PZ
BE1M13MAD	Control methods and testing in electrotechnology	Z,ZK	5	2P+2L	L	PZ
BE1M13SVS	Simulation of Production Sytems Pavel Mach	Z,ZK	5	2P+2C	Z	PZ

Characteristics of the courses of this group of Study Plan: Code=2018_MEEMEPPS3 Name=Compulsory subjects of the specialization

BE1M13AEZ Application of Electrochemical Sources

7.7K

5

After a brief introduction to chemical reactions commonly present in electrochemical sources, the technologies and manufacturing of commonplace accumulator batteries and primary cells are discussed in detail. In the course, there is presented the current state of the field of batteries for different types of applications - electromobility, stationary backup systems and energetics. Emphasis is also placed on the trends in simultaneously using of battery storage for balancing network characteristics, especially in combination with the RES.

BE1M13MAD Control methods and testing in electrotechnology

Z.ZK

5

The course follows the needs of electrical production and research. It discussed diagnostic of materials and measurements of material properties, including measurement of important parameters of production and work environment. The subject also includes testing safe function of products and evaluating the obtained data.

BE1M13SVS Simulation of Production Sytems

z,zk

5

The course is focused at methods of static and dynamic models of processes and systems forming. Basic types of models are described and characterized. Models are built up using an analytical way on the basis of knowledge of relationships between parameters, or using an experimental way. Factorial experiments for qualitative variables are presented. Computer aided generation of mathematical models and simulation of dynamic behavior of processes and systems are described. Basic methods of component models compilation, assembly of a complete model are presented. The application on computer modeling and simulation of electrical, thermal and mechanical systems in power electrical engineering completes the lectures.

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 15

The role of the block: PV

Code of the group: 2018 MEEMEPV1

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
BE1M16EUE1	Economy of Energy Use Ji í Beranovský, Michaela Valentová Michaela Valentová Ji í Beranovský (Gar.)	Z,ZK	5	2P+2S		PV
BE1M15ELS	Electrical Light Marek Bálský	Z,ZK	5	2P+2L	L	PV
BE1M14MDS1	Modeling of Dynamical Systems	Z,ZK	5	2P+2C	L	PV
BE1M13VSE	Power components in electrical engineering Ji í Hájek Ji í Hájek Ji í Hájek (Gar.)	Z,ZK	5	2P+2L	L	PV

Characteristics of the courses of this group of Study Plan: Code=2018_MEEMEPV1 Name=Compulsory elective subjects of the specialization

BE1M16EUE1	Economy of Energy Use	Z,ZK	5
Organization and ene	gy management of company, buildings or energy systems. Energy need and consumption, energy balance. Energy characteri	zation of aggrega	te, secondary
energy sources. Energy	ly audit and feasibility study, optimization of energy management of energy systems. Prices and tariffs, economy and financial	analysis.	
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The aim of the course is to make students acquainted with most frequent applications of optical radiation and with theoretical and practical principles of resolving lighting systems for indoor and outdoor areas, respecting necessary visual performance with emphasis on energy efficiency solutions and aspects of health and safety.

BE1M14MDS1 Modeling of Dynamical Systems

Z.ZK 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.

BE1M13VSE Power components in electrical engineering

Z,ZK

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.

Code of the group: 2018_MEEMEH 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
BE0M16HSD1	History of economy and social studies	Z,ZK	5	2P+2S	Z,L	PV
BE0M16HVT	History of science and technology 2	Z,ZK	5	2P+2S	Z,L	PV
BE0M16FIL	Philosophy 2 Peter Zamarovský Peter Zamarovský (Gar.)	Z,ZK	5	2P+2S	Z,L	PV
BE0M16PSM	Psychology	Z,ZK	5	2P+2S	Z,L	PV
BE0M16TEO	Theology	Z,ZK	4	2P+2S	L	PV

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

BE0M16HSD1	History of economy and social studies	∠,∠K	5
This subject deals with	he history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its air	ns and achieved r	results as well as
the social and cultural d	evelopment and coexistence of the various ethnical groups in the Czech countries.		

BE0M16HVT 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

BE0M16FIL	Philosophy 2	Z,ZK	5
BE0M16PSM	Psychology	Z,ZK	5
BE0M16TEO	Theology	Z,ZK	4

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.

Name of the block: Elective courses Minimal number of credits of the block: 0

The role of the block: V

Code of the group: 2018 MEEMEVOL 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: ~Student can choose arbitrary subject of themagister's program (EEM - Electrical Engineering, Power

Engineering and Management, EK - Electronics and Communications, KYR - Cybernetics and Robotics, OI - Open Informatics, OES - Open Electronics Systems) which is not part of his curriculum. Student can choose with consideration of recommendation of the branch guarantee. You can find a selection of optional

courses organized by the departments on the web site http://www.fel.cvut.cz/cz/education/volitelne-predmety.html

List of courses of this pass:

	Name of the course	Completion	Credits
BDIP25	Diploma Thesis	Z	25
Independent final	sendent 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 stee 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 of the programment of the	ner branch of study	, which wi
be specified b	by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehenses	ensive final examir	nation.
BE0M16FIL	Philosophy 2	Z,ZK	5
BE0M16HSD1	History of economy and social studies	Z,ZK	5
This subject deals v	ı	nd achieved result	ts as well a
	the social and cultural development and coexistence of the various ethnical groups in the Czech countries.		
BE0M16HVT	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 stude	ents' interest in the	history an
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BE1M13JAS1	Quality and Reliability	Z.ZK	6
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BE1M15PPE1	Elements and Operation of Electrical Power Systems	Z,ZK	5
The course introdu	ces basic technical principles of electricity transmission and distribution. There are explained parameters of power systems key elem	nents, steady state	s, transient
and fa	illure phenomena, main principles of dimensioning and protecting, power quality and its control and electrical machines characteristic	cs and utilization.	
BE1M15PRE1	Transmission and Distribution of Electricity	Z,ZK	5
The course introduc	es particular topics concerning transmission and distribution systems, mainly load flow solutions, specific aspects of system steady st	ates and possibiliti	es to contro
	these states. The course also deals with synchronous generators characteristics in different operational states.		
BE1M15TVN	High Voltage Engineering	Z,ZK	5
The course cont	ains the fundamental theories of high voltage engineering with respect to application in electrical power engineering. The knowledge	of high voltage ge	nerators,
measurement tech	nique of high voltages and currents, properties of insulation systems, diagnostics methods and electrical discharges and their elimin	ation. The practica	l laboratory
	exercises in high voltage laboratory are included.		
BE1M16EKE1	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 di	stribution.
Examples of eco	promic evaluation and investment appraisal of the typical project in power sector. Renewable energy sources, externalities. Energy po	olicy and energy la	w in CR.
	Liberalization and power market development.		
BE1M16EUE1	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.	
BE1MPROJ	Individual project	Z	5
Independent work	k 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 defend	ed within the frame	ework of a
	subject.		

For updated information see http://bilakniha.cvut.cz/en/f3.html Generated: day 2025-06-21, time 20:29.