Recomended pass through the study plan

Name of the pass: Specialization Technological Systems - Passage through study

Faculty/Institute/Others: Faculty of Electrical Engineering
Department:
Pass through the study plan: Electrical Engineering, Power Engineering and Management - Technological Systems
Branch of study guranteed by the department: Welcome page
Guarantor of the study branch:
Program of study: Electrical Engineering, Power Engineering and Management
Type of study: Follow-up master combined
Note on the pass:

Coding of roles of courses and groups of courses:
P - compulsory courses of the program, PO - compulsory courses of the branch, Z - compulsory courses, S - compulsory elective courses, PV - compulsory elective courses, F - elective specialized courses, V - elective courses, T - physical training courses

Coding of ways of completion of courses (KZ/Z/ZK) and coding of semesters (Z/L):
KZ - graded assesment, Z - assesment, ZK - examination, L - summer semester, Z - winter semester

Number of semester: 1

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
BEZM	**Safety in Electrical Engineering for a master´s degree** *Vladimír Kůla, Radek Havlíček, Ivana Nová, Josef Černohous, Pavel Mlejnek **Radek Havlíček** Vladimír Kůla (Gar.)*	Z	0	2BP+2BC	Z	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
BD1M15PPE1	**Elements and Operation of Electrical Power Systems** *Jan Hlaváček, Stanislav Bouček*	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
BD1M13EKP	**Ecology and materials** *Ivan Kudláček **Ivan Kudláček** Ivan Kudláček (Gar.)*	Z,ZK	5	14KP+6KC	Z	PZ
BD1M13SVS	**Simulation of Production Sytems** ***Pavel Mach***	Z,ZK	5	14KP+6KC	Z	PZ

Number of semester: 2

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
BD1M14ESP	**Electric Machinery and Apparatus** *Pavel Mindl, Vít Hlinovský **Pavel Mindl***	Z,ZK	5	14KP+6KL	Z	PZ
BD1M13MAD	**Control methods and testing in electrotechnology**	Z,ZK	5	14KP+6KL	L	PZ
BD1M15TVN	**High Voltage Engineering**	Z,ZK	5	14KP+6KL	L	PZ
2018_MEEMPV1-K	**Povinně volitelné předměty specializace** *BD1M16EUE1,BD1M15ELS,..... (see the list of groups below)*	Min. cours. 2 Max. cours. 4	Min/Max 10/20			PV

Number of semester: 3

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
BD1MPROJ	**Individual project** *Josef Černohous, Stanislav Bouček, Jiří Vašíček, Miroslav Vítek, Zdeněk Müller* ***Oldřich Starý*** *Oldřich Starý (Gar.)*	Z	5	0p+4s	Z	P
BD1M13AEZ	**Application of Electrochemical Sources**	Z,ZK	5	14KP+6KL	Z	P
BD1M13ASS	**Solar Systems Applications** *Vítězslav Benda, Ladislava Černá, Jakub Holovský, Pavel Hrzina* ***Vítězslav Benda*** *Vítězslav Benda (Gar.)*	Z,ZK	5	14KP+6KL	Z	PZ
BD1M15PRE1	**Transmission and Distribution of Electricity** *Stanislav Bouček*	Z,ZK	5	14KP+6KS	Z	PZ
BD1M14TVM	**Theory and Application of Power Converters** *Jan Bauer* ***Jan Bauer*** *Jan Bauer (Gar.)*	Z,ZK	5	14KP+6KL	L	PZ
2018_MEEMH-K	**Humanitní předměty** *BD0M16FIL,BD0M16HVT,..... (see the list of groups below)*	Min. cours. 1 Max. cours. 1	Min/Max 5/5			P

Number of semester: 4

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
2018_MEEMVOL-K	**Volitelné odborné předměty**	Min. cours. 0	Min/Max 0/999			V

List of groups of courses of this pass with the complete content of members of individual groups

Kód	Name of the group of courses and codes of members of this group (for specification see here or below the list of courses)	Completion	Credits	Scope	Semester	Role
2018_MEEMH-K	**Humanitní předměty**	**Min. cours. 1 Max. cours. 1**	**Min/Max** 5/5			**P**
BD0M16FIL	Philosophy 2	BD0M16HVT	History of science and technolog ...	BD0M16PSM	Psychology	
BD0M16TEO	Theology					
2018_MEEMPV1-K	**Povinně volitelné předměty specializace**	**Min. cours. 2 Max. cours. 4**	**Min/Max** 10/20			**PV**
BD1M16EUE1	Economy of Energy Use	BD1M15ELS	Electrical Light	BD1M14MDS1	Modeling of Dynamical Systems	
BD1M13VSE	Power components in electrical e ...					
2018_MEEMVOL-K	**Volitelné odborné předměty**	**Min. cours. 0**	**Min/Max** 0/999			**V**

List of courses of this pass:

Code	Name of the course	Completion	Credits
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.			
BD1M13AEZ	Application of Electrochemical Sources	Z,ZK	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.			
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.			
BD1M13MAD	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.			
BD1M13SVS	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.			
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.			
BD1M15ELS	Electrical Light	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.			
BEZM	Safety in Electrical Engineering for a master´s degree	Z	0
The course provides for students of all programs periodic training guidelines for health and occupational safety and gives knowledge of electrical hazard of given branch of study. Students receive indispensable qualification according to the current Directive of the Dean.			

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