Recomended pass through the study plan

Name of the pass: Specialization Radio Communications and Systems - Passage through study

Faculty/Institute/Others: Faculty of Electrical Engineering
Department:
Pass through the study plan: Electronics and Communications - Radio Communications and Systems
Branch of study guranteed by the department: Welcome page
Guarantor of the study branch:
Program of study: Electronics and Communications
Type of study: Follow-up master full-time
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
B2M37ART	**Architecture of radio receivers and transmitters** *Josef Dobeš, Pavel Kovář* ***Karel Ulovec*** *Pavel Kovář (Gar.)*	Z,ZK	6	2P+2L	Z	P
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
B2M37DKM	**Digital communications** *Jan Sýkora* ***Jan Sýkora*** *Jan Sýkora (Gar.)*	Z,ZK	6	3P+1C	Z	P
B2M37MAM	**Microprocessors** *Petr Skalický, Stanislav Vítek* ***Stanislav Vítek*** *Stanislav Vítek (Gar.)*	Z,ZK	6	2P+2L	Z	P
B2M17MIOA	**Microwave Circuits** *Karel Hoffmann, Přemysl Hudec* ***Přemysl Hudec*** *Milan Polívka (Gar.)*	Z,ZK	6	2P+2C	Z	P
B2M31DSP	**Advanced DSP methods** *Pavel Sovka, Petr Pollák* ***Pavel Sovka*** *Pavel Sovka (Gar.)*	Z,ZK	6	2P+2C	Z,L	P

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
B2M17ANT	**Antennas** *Pavel Hazdra, Miloš Mazánek, Jan Kraček* ***Jan Kraček*** *Pavel Hazdra (Gar.)*	Z,ZK	6	2P+2L	L	P
B2M32BTSA	**Wireless Technologies** *Zdeněk Bečvář, Lukáš Vojtěch, Zbyněk Kocur, Pavel Mach* ***Ján Kučerák*** *Zdeněk Bečvář (Gar.)*	Z,ZK	6	2P + 2L	L	P
B2M17SBS	**Wave Propagation for Wireless Links** *Pavel Pechač* ***Pavel Pechač*** *Pavel Pechač (Gar.)*	Z,ZK	6	2P+2C	L	P
2018_MEKPV7	**Povinně volitelné předměty programu** *B2M31AEDA,B2M17CADA,..... (see the list of groups below)*	Min. cours. 5 Max. cours. 5	Min/Max 30/30			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
B2MPROJ6	**Project** *Jiří Jakovenko, Pavel Máša, Ivan Pravda, František Rund, Jan Šístek, Lubor Jirásek, Tomáš Zeman, Ladislav Oppl* ***František Rund*** *František Rund (Gar.)*	Z	6	0p+6s	Z,L	P

2018_MEKPV7	**Povinně volitelné předměty programu** *B2M31AEDA,B2M17CADA,..... (see the list of groups below)*	Min. cours. 5 Max. cours. 5	Min/Max 30/30			PV
2018_MEKVOL	**Volitelné odborné předměty2018**	Min. cours. 0	Min/Max 0/999			V

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_MEKVOL	**Volitelné odborné předměty2018**	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_MEKPV7	**Povinně volitelné předměty programu**	**Min. cours. 5** **Max. cours. 5**	**Min/Max** 30/30			**PV**

B2M31AEDA	Experimental Data Analysis	B2M17CADA	CAD in HF Technique	B2M37DTRA	Digital Video and Audio Broadcas ...
B2M37KDKA	Coding in digital communications	B2M17MIMA	Microwave Measurements	B2M32MKSA	Mobile Networks
B2M17NKA	Antennas Design and Technology	B2M34NSV	VLSI System Design	B2M99RAD	Radar systems
B2M37RNVA	Radio Navigation				

2018_MEKVOL	**Volitelné odborné předměty2018**	**Min. cours. 0**	**Min/Max** 0/999			**V**

List of courses of this pass:

Code	Name of the course	Completion	Credits
B2M17ANT	Antennas	Z,ZK	6
Student will get strong knowledge about theory of electromagnetic field radiation and basic principles of antenna design. Methods of analysis are demonstrated on various types of antennas and their arrays. Seminars are both theoretical (analytical and numerical calculation using MATLAB and EM simulators CST) and practical (measurement of antenna parameters).			
B2M17CADA	CAD in HF Technique	Z,ZK	6
Introduction into principles and techniques used in modern microwave circuit design.			
B2M17MIMA	Microwave Measurements	Z,ZK	6
Fast development of wireless radio data communications (both mobile and stationary) also results in requirements for measurement of numerous related electrical parameters in frequency band ranging from hundreds of MHz to tens of GHz. The "Microwave measurements" subject brings description of all important measurement instruments and measurement methods used in this field. Instructions devoted to measurement devices also cover detailed inner structures, principles of operation, common measurement setups and optimum setting. Even relatively complex measurement instruments and setups are discussed, for example those used for measurement of noise and non-linear parameters. Exercises are focused on practical measurements commonly performed in the wireless communication field. Besides modern measurement instruments, students also learn a number of typical RF and microwave components, circuits, subsystems and digitally modulated signals.			
B2M17MIOA	Microwave Circuits	Z,ZK	6
Subject is focused on the design of planar passive and active microwave circuits.			
B2M17NKA	Antennas Design and Technology	Z,ZK	6
Basics of practical antenna design for selected frequency bands and communication, identification and radar services. Modelling (full-wave analysis), design relationships and specifics of antenna construction using professional software tools. Design and manufacture of antenna sample. Practical measurements.			
B2M17SBS	Wave Propagation for Wireless Links	Z,ZK	6
The aim of the course is to study the wireless transmission channel in real environments focusing on wave propagation for planning of terrestrial and satellite wireless links. The syllabus includes both deeper theoretical foundations of radio wave propagation in the atmosphere as well as ITU-R design procedures for terrestrial and satellite, fixed and mobile communications in various frequency bands.			

B2M31AEDA	Experimental Data Analysis	Z,ZK	6
In the course of subject "Experimental Data Analysis", students will acquire knowledge regarding fundamental methods for data analysis and machine learning for evaluation and interpretation of data. In the course of practical lectures, students will solve individual tasks using real data from signal processing in neuroscience research. In the course of semestral project, student will solve complex task and present obtained results. The aim of the subject is to introduce practical application of fundamental statistical methods as well as to teach students to use critical thinking and to acquire additional knowledge in solution of practical tasks.			
B2M31DSP	Advanced DSP methods	Z,ZK	6
The course follows the basic course in signal processing and introduces advanced methods of analysis and digital signal processing. Graduates will learn the methods of digital signals analysis and be able to practically use them. They learn to know the conditions of use of correlation, spectral and coherent analysis of random signals. They will became familiar with methods of signal decomposition and independent component analysis and the time-frequency transformations. Emphasis will be placed on an ability to interpret the results of signal analyses.			
B2M32BTSA	Wireless Technologies	Z,ZK	6
The lectures give overview of fundamental principles of wireless networks in various areas of their application. Students will understand architecture, principles and protocols used in different wireless technologies and learn how these technologies can be exploited in real world applications. The goal is to teach students how to solve problems related to deployment of wireless networks, their operation or development of wireless networks components.			
B2M32MKSA	Mobile Networks	Z,ZK	6
The lectures introduce principles and functionalities of mobile networks with special focus on currently deployed technologies and future mobile networks. Furthermore, architecture and fundamental principles of GSM, UMTS, LTE/LTE-A, and 5G will be explained. Then, selected key technologies for future mobile networks (6G) will be explained.			
B2M34NSV	VLSI System Design	Z,ZK	6
Introduction to basic building blocks, architecture and design methodologies of advanced VLSI systems. Structure and design of digital and analogue integrated circuit subsystems. Integrated system description and synthesis using cell libraries and IP cores. Synchronization, power consumption and parasitics reduction issues. Testing and reliability of integrated systems. In seminars and labs, the hardware description language VHDL will be explained and used for practical design, synthesis and testing of a system on chip.			
B2M37ART	Architecture of radio receivers and transmitters	Z,ZK	6
The subject deals with the architecture of the radio receivers and transmitters and software radio. The student s familiarize with the design and the modern methods of optimization of the radio receivers and transmitters' functional blocks and with the phenomena related with frequency conversion, noise sources and noise analyses. They learn conceptual radio receiver and transmitter design, including the level and frequency plans and their optimization. The course also deals with the digital signal processing blocks of the modern radio receivers and their practical implementation.			
B2M37DKM	Digital communications	Z,ZK	6
The course provides fundamentals of digital communications theory: modulation, classical coding, channel models, and basic principles of decoding. The exposition is systematically built along the theoretical lines which allow to reveal all inner connections and principles. This allows students to develop the knowledge and use it in an active way in a design and construction of the communication systems. The course provides a necessary fundamental background for subsequent more advanced communications theory courses.			
B2M37DTRA	Digital Video and Audio Broadcasting	Z,ZK	6
The subject makes students familiar with topics related to video and audio transmission. Described are methods of data stream creation, methods of source and channel coding, error correction principles and modulation formats. Attention is paid to transmission systems standards with regard to transmission channel properties. The subject also deals with multimedia data services and with measurement in transmission systems.			
B2M37KDKA	Coding in digital communications	Z,ZK	6
This course extends and deepens the topics of the basic communication theory courses in the following main areas. 1) Advanced information theory in coding and Network Information Theory develop a framework for understanding the principles of the channel coding in single-user and multi-node/multi-user scenarios. 2) The algebraic coding presents classical topics of block and convolutional codes. 3) Advanced coding technique focuses on turbo, LDPC, Space-Time codes and Wireless Network Coding. 4) Advanced decoding technique, namely iterative and multi-user decoding is a fundamental tool for decoding capacity approaching channel codes.			
B2M37MAM	Microprocessors	Z,ZK	6
The aim is to make students acquainted with the properties of microprocessor systems, make students familiar with on-chip peripherals, connect external circuit to the processor bus, and with implementation of the memory or I/O space address extension. Next, taught the students to make simple program in the assembly language, C language and combination of both. After completion of this subject student should be able to design and implement simpler microprocessor system including connection of necessary peripherals and software design.			
B2M37RNVA	Radio Navigation	Z,ZK	6
The course introduces students to the terrestrial and satellite radio navigation and radar systems. Students get knowledge of the radio navigation systems, and of the structure of navigation and radar signals and methods of their processing. They become familiar with coordinate systems, fundamentals of celestial mechanics, and methods of position estimation. Students get knowledge of practical applications and the integration of navigation systems.			
B2M99RAD	Radar systems	Z,ZK	6
B2MPROJ6	Project	Z	6
Independent work in the form of a project. 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 project will be defended within the framework of a subject. Project list http://www.fel.cvut.cz/en/education/semestral-projects.html			
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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