Recomended pass through the study plan

Name of the pass: Specialization Wireless technology and photonics - Passage through study

Faculty/Institute/Others: Faculty of Electrical Engineering
Department:
Pass through the study plan: Communications and Internet of Things - Wireless Technology and Photonics
Branch of study guranteed by the department: Welcome page
Guarantor of the study branch:
Program of study: Communications and Internet of Things
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
BE2M17VOT	**Fiber Optic Technology** *Matěj Komanec, Stanislav Zvánovec, Jan Šístek* ***Stanislav Zvánovec*** *Stanislav Zvánovec (Gar.)*	Z,ZK	6	2P+2L	Z	P
BE2M37OBFA	**Image Photonics** *Petr Páta, Lukáš Krauz* ***Petr Páta*** *Petr Páta (Gar.)*	Z,ZK	6	2P+2L	Z	P
BE2M17MIOA	**Microwave Circuits** *Přemysl Hudec, Karel Hoffmann* ***Přemysl Hudec*** *Milan Polívka (Gar.)*	Z,ZK	6	2P+2C	Z	P
BEEZM	**Safety in Electrical Engineering for a master´s degree** *Vladimír Kůla, Ivana Nová, Josef Černohous, Radek Havlíček* ***Radek Havlíček*** *Vladimír Kůla (Gar.)*	Z	0	2BP+2BC	Z	P
2026_MKITEPV3A	**Compulsory subjects of the programme - group A** *BE4M36KBE,BE2M37DKM,..... (see the list of groups below)*	Min. cours. 3 Max. cours. 3	Min/Max 18/18			PV

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
BE2M17ANT	**Antennas** *Pavel Hazdra, Miloš Mazánek, Jan Kraček* ***Jan Kraček*** *Miloš Mazánek (Gar.)*	Z,ZK	6	2P+2L	L	P
BE2M17MIMA	**Microwave Measurements** *Přemysl Hudec, Karel Hoffmann* ***Viktor Adler*** *Přemysl Hudec (Gar.)*	Z,ZK	6	2P+2L	L	P
2026_MKITEPV3A	**Compulsory subjects of the programme - group A** *BE4M36KBE,BE2M37DKM,..... (see the list of groups below)*	Min. cours. 3 Max. cours. 3	Min/Max 18/18			PV
2026_MKITEPV3B	**Compulsory subjects of the programme - group B** *BE2M17NKA,BE2M17CADA,..... (see the list of groups below)*	Min. cours. 4 Max. cours. 4	Min/Max 24/24			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
BE2MPROJ8	**Project**	Z	8	8S	Z,L	P
BE2M99VZP	**Research Work**	KZ	4	2P+1S		P
2026_MKITEPV3B	**Compulsory subjects of the programme - group B** *BE2M17NKA,BE2M17CADA,..... (see the list of groups below)*	Min. cours. 4 Max. cours. 4	Min/Max 24/24			PV
2026_MKITEVOL	**Elective subjects**	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
BDIP30	**Diploma Thesis**	Z	30	22s	L	P

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
2026_MKITEPV3A	**Compulsory subjects of the programme - group A**	**Min. cours. 3 Max. cours. 3**	**Min/Max** 18/18			**PV**
BE4M36KBE	Communications Security	BE2M37DKM	Digital Communications	BE2M37AMP	Microprocessor Applications	
BE2M32MKSA	Mobile Networks	BE0M31DSP	Advanced DSP methods	BE2M17SBS	Wave Propagation for Wireless Li ...	
2026_MKITEPV3B	**Compulsory subjects of the programme - group B**	**Min. cours. 4 Max. cours. 4**	**Min/Max** 24/24			**PV**
BE2M17NKA	Antennas Design and Technology	BE2M17CADA	CAD in HF Technique	BEAM17EMC	Introduction to Electromagnetic ...	
BE2M17OPM	Optical Measurements	BEQM32KOS	Quantum optical communications a ...	BE2M99RAD	Radar systems	
BE2M32BTSA	Wireless Technologies					
2026_MKITEVOL	**Elective subjects**	**Min. cours. 0**	**Min/Max** 0/999			**V**

List of courses of this pass:

Code	Name of the course	Completion	Credits
BDIP30	Diploma Thesis	Z	30
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.			
BE0M31DSP	Advanced DSP methods	Z,ZK	6
The course introduces advanced methods of analysis and processing of digital signals such as correlation, spectral, coherence or cepstral analysis, as well as methods of decomposition into principal and independent components, methods for determining the relationship between random signals and basic classification techniques used in signal analysis. Attention is paid to practical applications of the mentioned techniques, e.g. for noise suppression or compression.			
BE2M17ANT	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).			

BE2M17CADA	CAD in HF Technique	Z,ZK	6
	Introduction into principles and techniques used in modern microwave circuit design.		
BE2M17MIMA	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.		
BE2M17MIOA	Microwave Circuits	Z,ZK	6
	Subject is focused on the design of planar passive and active microwave circuits.		
BE2M17NKA	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.		
BE2M17OPM	Optical Measurements	Z,ZK	6
BE2M17SBS	Wave Propagation for Wireless Links	Z,ZK	6
	The aim of the course is to familiarize the student with a wireless transmission channel in a real environment from the point of view of wave propagation for the needs of planning terrestrial and satellite wireless links. The content includes both deeper theoretical foundations of radio wave propagation in the atmosphere and practical procedures for designing terrestrial and satellite, fixed and mobile links in various frequency bands according to ITU-R recommendations.		
BE2M17VOT	Fiber Optic Technology	Z,ZK	6
	The aim of the course is to introduce mechanisms of propagation of optical waves in optical fibers and fiber components. Furthermore, the optical measuring techniques and measuring methods for the characterization of optical fibers will be presented. Lectures include both the design and methodology of measuring transmission parameters for optical communication systems such as numerical aperture, attenuation, dispersion, and measurement of basic characteristics of active and passive elements of optical communication systems - connectors, splices, couplers, refractive indices etc.		
BE2M32BTSA	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.		
BE2M32MKSA	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.		
BE2M37AMP	Microprocessor Applications	Z,ZK	6
	The aim of the course is to familiarize students with the properties of microprocessor systems, teach them to effectively use the internal peripherals of the processor, connect external circuits to the processor bus, and create a moderately complex microprocessor system. Students will learn to write programs in the C language and possibly combine it with the symbolic address language.		
BE2M37DKM	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.		
BE2M37OBFA	Image Photonics	Z,ZK	6
	The subject offers a detailed overview of applied imaging photonic elements and systems. The subject deals with fundamentals of optics, Fourier optics and optical computing. Fourier optics. Image sensors - tube, CCD, CMOS. Image displays. Image converters and amplifiers. Photography and holography - sensitometry and densitometry. Photonic (optical) computing. Electron optics. Image processing in biosystems. Image processing for photonics.		
BE2M99RAD	Radar systems	Z,ZK	6
BE2M99VZP	Research Work	KZ	4
BE2MPROJ8	Project	Z	8
BE4M36KBE	Communications Security	Z,ZK	6
	The course provides a complete source of information on the field of security of information systems and information technologies. The most of information in today's world is created, transferred, stored in electronic form so information security is very important part of it. On successful completion of this course, students should be able to define the cryptographic primitives symmetric / asymmetric encryption, digital signatures, cryptographic hash function, and message authentication codes. They should be able to explain the security features offered by the latest versions of the most important security protocols operating on the TCP/IP stack (IPsec, TLS, SSH, PGP) and describe known attacks against these security protocols.		
BEAM17EMC	Introduction to Electromagnetic Compatibility	Z,ZK	6
	The course dwells on problems of electromagnetic compatibility. Students obtain the basic knowledges in the field of electromagnetic compatibility - electromagnetic interference, susceptibility and testing methods. The course leads to gain professional skills in the field of electrical engineering.		
BEEZM	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.		
BEQM32KOS	Quantum optical communications and networks	Z,ZK	6
	The goal of this course is to provide a comprehensive engineering insight into optical communications, with a specific focus on Quantum Key Distribution (QKD). The subject breaks down boundaries between traditional disciplines, integrating knowledge of wave optics, hardware architecture, and network security. Students will learn to perceive the communication system as a holistic entity, where the physical layer directly defines the limits and capabilities of digital security. The course prepares students for the real-world challenges associated with deploying quantum technologies into existing telecommunications infrastructure.		

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