Recomended pass through the study plan

Name of the pass: Specialization Communication Networks and Internet - Passage through study

Faculty/Institute/Others: Faculty of Electrical Engineering
Department:
Pass through the study plan: Electronics and Communications - Communication Networks and Internet
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
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
B2M31DSP	**Advanced DSP methods** *Pavel Sovka, Petr Pollák* ***Pavel Sovka*** *Pavel Sovka (Gar.)*	Z,ZK	6	2P+2C	Z,L	P
B2M32PST	**Advanced Networking Technologies** *Zbyněk Kocur, Leoš Boháč* ***Leoš Boháč*** *Leoš Boháč (Gar.)*	Z,ZK	6	2P + 2C + 4D	Z	P
B2M32PRSA	**Access Networks** *Jiří Vodrážka, Tomáš Zeman, Pavel Lafata* ***Petr Jareš*** *Jiří Vodrážka (Gar.)*	Z,ZK	6	2P + 2L	Z	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
B2M32BTSA	**Wireless Technologies** *Zbyněk Kocur, Zdeněk Bečvář, Lukáš Vojtěch, Pavel Mach* ***Ján Kučerák*** *Zdeněk Bečvář (Gar.)*	Z,ZK	6	2P + 2L	L	P
B2M32OSS	**Optical Systems and Networks** *Leoš Boháč, Jiří Weiss* ***Michal Lucki*** *Leoš Boháč (Gar.)*	Z,ZK	6	2P + 2L	L	P
B2M32RTK	**Telephony Communication Control** *Robert Bešťák, Pavel Troller* ***Robert Bešťák*** *Robert Bešťák (Gar.)*	Z,ZK	6	2P + 2L	L	P
2018_MEKPV5	**Povinně volitelné předměty programu** *B2M32DMT,B2M32DSAA,..... (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** *Tomáš Zeman, Ivan Pravda, František Rund, Jiří Jakovenko, Pavel Máša, Jan Šístek, Lubor Jirásek, Ladislav Oppl* ***František Rund*** *František Rund (Gar.)*	Z	6	0p+6s	Z,L	P
2018_MEKPV5	**Povinně volitelné předměty programu** *B2M32DMT,B2M32DSAA,..... (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_MEKPV5	**Povinně volitelné předměty programu**	**Min. cours. 5 Max. cours. 5**	**Min/Max** 30/30			**PV**

B2M32DMT	Diagnostics and Measurement in T ...	B2M32DSAA	Network Application Diagnostics	B2M32DSVA	Distributed Computing
B2M32IBEA	Information Security	B2M37KASA	Compression of images and signal ...	B2M32MKSA	Mobile Networks
B2M32THOA	Queueing Theory	B2M31ZRE	Speech Processing		

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
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.

B2M31ZRE	Speech Processing	Z,ZK	6

The subject is devoted to basis of speech processing addressed to students of master program. Discussed speech technology is currently applied in many systems in different fields (e.g. information dialogue systems, voice controlled devices, dictation systems or transcription of audio-video recordings, support for language teaching, etc.). Students will learn basic algorithms for speech analysis (spectral analysis, LPC, cepstral analysis, pitch, formants, etc.), principles of speech recognition (GMM-HMM, ANN-HMM systems, small and large vocabulary recognizers), speaker recognition (based on VQ and GMM), speech synthesis or speech enhancement. Further information can be found at http://noel.feld.cvut.cz/vyu/ae2m31zre. Pro zapsané studenty jsou detailní informace na výukovém portálu Moodle FEL.

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.

B2M32DMT	Diagnostics and Measurement in Telecommunications	Z,ZK	6
The subject builds on knowledge of basic types of interfaces used in telecommunications (from classic, via a packet-oriented and expected future generation system). Explains the importance of key parameters, presents tools for the monitoring and measurement methodology and fault diagnosis. Students verify acquired knowledge to practical tasks in the laboratory to real systems and advanced measurement techniques.			
B2M32DSAA	Network Application Diagnostics	Z,ZK	6
The first part of the course deals with complex network structures, their characteristics identification, with recognition of both structural static and dynamic patterns, and anomaly detection. The second part of the course is focused on specification methods of static and dynamic behavior and their verification. The use of the methods is demonstrated on examples dealing with network application issues. The special treatment is dedicated not only to network and cloud applications, but also to posibilities of diagnostic process automation. The students gain sufficient skills in seminars where they solve practical problems in digital network domain.			
B2M32DSVA	Distributed Computing	Z,ZK	6
The course is focused on technologies that support distributed computing: on mechanisms ensuring reliable, efficient and secure connection of application processes, programming interfaces of communication channels and up-to-date middleware technologies. A significant part of lectures is dedicated to distributed algorithms that assure causality, exclusive access, deadlock detection/avoidance, fault-tolerance, mobile computing, and security.			
B2M32IBEA	Information Security	Z,ZK	6
The Information Security course provides a complete source of information on the field of security of information systems and information technologies. The most of information in today society is created, transferred, stored in electronic form so information security is very important part of it. Technical background for information security is provided by cryptology.			
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.			
B2M32OSS	Optical Systems and Networks	Z,ZK	6
The course deals with the use of optical radiation for the transmission of information. The aim is to acquaint students with the functions of important components used in an advanced optical communication systems and networks. Students will learn how to design practical optical fiber link and the network. Students will receive theoretical knowledge for the implementation of a all-optical photonic networks in the future, which will be based on a combination of wavelength multiplex with an all-optical switching.			
B2M32PRSA	Access Networks	Z,ZK	6
The course covers the area of high-speed transmission of information in the access network level, with emphasis on the use of optical transmission media and its combination with metallic lines (FTTx). In the practical part, students will learn the methods required for the design, modeling, measurement and analysis of transmission media, diagnostics of systems and whole access networks.			
B2M32PST	Advanced Networking Technologies	Z,ZK	6
Subject Advanced Network Technologies expands students' knowledge of modern network technologies. The course is practically oriented and focused on explaining the function of advanced network protocols as used in modern data networks of today and tomorrow. Students will gain practical experience with the issues like Internet routing, software-defined networks, multicast routing, IPv6, and MPLS networks. Part of the course is also devoted to a detailed explanation of transport protocols TCP/UDP and a manner in which software applications can access transportation services of TCP/IP data networks.			
B2M32RTK	Telephony Communication Control	Z,ZK	6
The course is oriented to audio or video issues in telecommunication networks, both fixed and mobile. Students will learn principles of switching systems and their management as well as the course will provide them with an overview of signaling systems in central exchanges and networks. The focus is on digital switching systems as circuit as packet switch oriented, i.e. so-called next generation network (NGN) and voice communication in 4G networks. (VoLTE).			
B2M32THOA	Queueing Theory	Z,ZK	6
The aim of the course is to present an overview of dimensioning of telecommunication networks on the basis of results of the queuing theory (QT) and to introduce possibilities of simulation and modelling of networks, both from the point of view of grade of service (GoS) and quality of service (QoS). Results of the QT are applied on different service systems and telecommunication networks being currently operated and developed. Theoretical knowledge about models of service systems can be applied on dimensioning of different service systems in real life - not only on the telecommunications one.			
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.			
B2M37KASA	Compression of images and signals	Z,ZK	6
The subject deals with compression methods and techniques. Main goal is to introduce basic concepts of lossless and lossy compresion of audiovisual information (entropy, redundancy and irrelevancy). Within the laboratory exercises students will work with implementations of particular algorithms, including objective and subjective methods of quality evaluation.			
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.			
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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