# Study plan

## Name of study plan: Electronics and Communications - Communication Networks and Internet

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: Electronics and Communications Type of study: Follow-up master full-time Required credits: 109 Elective courses credits: 11 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: 79 The role of the block: P

Code of the group: 2018 MEKDIP 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:

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	Р

#### Characteristics of the courses of this group of Study Plan: Code=2018\_MEKDIP Name=Diploma Thesis

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.							

#### Code of the group: 2018\_MEKP5

Name of the group: Compulsory subjects of the programme Requirement credits in the group: In this group you have to gain 54 credits Requirement courses in the group: In this group you have to complete 9 courses Credits in the group: 54 Specializace komunikační sítě a Internet 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
B2M32BTSA	<b>Wireless Technologies</b> Zden k Be vá , Lukáš Vojt ch, Zbyn k Kocur, Pavel Mach <b>Ján Ku erák</b> Zden k Be vá (Gar.)	Z,ZK	6	2P + 2L	L	Ρ
B2M37DKM	<b>Digital communications</b> Jan Sýkora <b>Jan Sýkora</b> Jan Sýkora (Gar.)	Z,ZK	6	3P+1C	Z	Р
B2M37MAM	Microprocessors Petr Skalický, Stanislav Vítek Stanislav Vítek Stanislav Vítek (Gar.)	Z,ZK	6	2P+2L	Z	Р
B2M32OSS	Optical Systems and Networks Ji í Weiss, Leoš Bohá Michal Lucki Leoš Bohá (Gar.)	Z,ZK	6	2P + 2L	L	Р
B2M31DSP	Advanced DSP methods Pavel Sovka, Petr Pollák <b>Pavel Sovka</b> Pavel Sovka (Gar.)	Z,ZK	6	2P+2C	Z,L	Р

B2M32PST	Advanced Networking Technologies Zbyn k Kocur, Leoš Bohá Leoš Bohá Leoš Bohá (Gar.)	Z,ZK	6	2P + 2C + 4D	Z	Р		
B2MPROJ6	Project Ji í 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	Р		
B2M32PRSA	Access Networks Tomáš Zeman, Ji í Vodrážka, Pavel Lafata Petr Jareš Ji í Vodrážka (Gar.)	Z,ZK	6	2P + 2L	Z	Р		
B2M32RTK	Telephony Communication Control Robert Beš ák, Pavel Troller Robert Beš ák Robert Beš ák (Gar.)	Z,ZK	6	2P + 2L	L	Р		
Characteristics of the	courses of this group of Study Plan: Code=2018_MEKP5 Name	e=Compulso	ry subje	ects of the	e prograr	nme		
B2M32BTSA Win The lectures give overview of different wireless technologies	eless Technologies fundamental principles of wireless networks in various areas of their application. Stud s and learn how these technologies can be exploited in real world applications. The goa	ents will understa al is to teach stud	ind archite	Cture, princip	,ZK	6 ocols used in to deployment		
of wireless networks, their op	eration or development of wireless networks components.			-				
B2M37DKM Dig	ital communications			Z	,ZK	6		
The course provides fundame	entals of digital communications theory: modulation, classical coding, channel models,	and basic princip	les of deco	oding. The ex	position is s	ystematically		
built along the theoretical line	s which allow to reveal all inner connections and principles. This allows students to dev	velop the knowled	lge and us	e it in an acti	ve way in a	design and		
construction of the communic	ation systems. The course provides a necessary fundamental background for subsequ	ent more advanc	ed commu	inications the	ory courses			
B2M37MAM   Mic	roprocessors			Z	,ZK	6		
The aim is to make students a	acquainted with the properties of microprocessor systems, make students familiar with	on-chip peripher	als, conne	ct external ci	rcuit to the p	rocessor bus,		
and with implementation of this	e memory of 1/O space address extension. Next, laught the students to make simple p subject student should be able to design and implement simpler microprocessor system	mincluding conn	oction of n	guage, Cian	juage and c	combination of		
design	subject student should be able to design and implement simpler microprocessor syste	in including conn	ection of n	ecessary per	iprierais and	soliware		
B2M32OSS Ont	ical Systems and Networks			7	7K	6		
The course deals with the use	e of optical radiation for the transmission of information. The aim is to acquaint student	s with the function	ns of impo	rtant compon	, <b>~ı`</b> ents used ir	an advanced		
optical communication system	ns and networks. Students will learn how to design practical optical fiber link and the ne	etwork. Students	will receive	e theoretical l	nowledge f	or the		
implementation of a all-optica	I photonic networks in the future, which will be based on a combination of wavelength	multiplex with an	all-optical	switching.				
B2M31DSP Adv	vanced DSP methods			Z	.ZK	6		
The course follows the basic of	course in signal processing and introduces advanced methods of analysis and digital si	gnal processing.	Graduates	will learn the	methods of	digital signals		
analysis and be able to practi methods of signal decomposi	cally use them. They learn to know the conditions of use of correlation, spectral and co tion and independent component analysis and the time-frequency transformations. Em	pherent analysis on phasis will be pla	of random a	signals. They ability to inte	will became erpret the re	familiar with sults of signal		
analyses.	· · · · · · · · · · · · · · · · · · ·							
B2M32PST Adv	anced 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.								
B2MPROJ6 Pro	ject				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 b	ranch of study, w	hich will be	e specified by	branch dep	artment or		
branch departments. The proj	ject will be defended within the framework of a subject. Project list http://www.fel.cvut.c	z/en/education/se	emestral-p	rojects.html				
B2M32PRSA Acc	ess Networks			Z	,ZK	6		
The course covers the area o	f high-speed transmission of information in the access network level, with emphasis or	n the use of optica	al transmis	sion media a	nd its comb	nation with		
metallic lines (FTTx). In the p	ractical part, students will learn the methods required for the design, modeling, measur	ement and analy	sis of trans	mission med	ia, diagnost	cs of systems		
and whole access networks.								
B2M32RTK   Tele	ephony Communication Control			Z	,ZK	6		
The course is oriented to aud	to or video issues in telecommunication networks, both fixed and mobile. Students will l	earn principles of	switching	systems and	their manag	ement as well		
as the course will provide the	m with an overview of signaling systems in central exchanges and networks. The focus	is on aigital switc	ning syste	ins as circuit	as packet s	vitch oriented,		
I.o. 30-balled Hext generation								

### Name of the block: Compulsory elective courses Minimal number of credits of the block: 30 The role of the block: PV

Code of the group: 2018\_MEKPV5

Name of the group: Compulsory subjects of the programme 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 5 courses Credits in the group: 30

Note on the group:

Specializace komunikační sítě a Internet

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
B2M32DMT	Diagnostics and Measurement in Telecommunications Zbyn k Kocur, Ji í Vodrážka Petr Jareš Ji í Vodrážka (Gar.)	Z,ZK	6	2P+2L	L	PV
B2M32DSAA	Network Application Diagnostics Radek Ma ík Radek Ma ík Radek Ma ík (Gar.)	Z,ZK	6	2P + 2C	Z	PV

B2M32DSVA	Distributed Computing Peter Macejko Peter Macejko (Gar.)	Z,ZK	6	2P + 2C	Z	PV
B2M32IBEA	Information Security Tomáš Van k Petr Hampl Leoš Bohá (Gar.)	Z,ZK	6	2P + 2C	L	PV
B2M37KASA	Compression of images and signals Stanislav Vitek, František Rund, Karel Fliegel, Václav Vencovský <b>Karel Fliegel</b> Stanislav Vítek (Gar.)	Z,ZK	6	2P+2C	L	PV
B2M32MKSA	Mobile Networks Zden k Be vá, Pavel Mach, Robert Bešák Pavel Mach Zden k Be vá (Gar.)	Z,ZK	6	2P + 2L	Z	PV
B2M32THOA	Queueing Theory Petr Hampl Petr Hampl (Gar.)	Z,ZK	6	3P + 1L	Z	PV
B2M31ZRE	Speech Processing Petr Pollák Petr Pollák Petr Pollák (Gar.)	Z,ZK	6	2P+2C	L	PV
Characteristics of the	courses of this group of Study Plan: Code=2018_MEKPV5 Nai	me=Compuls	sory sub	jects of th	ne progra	amme
B2M32DMT Dia	anostics and Measurement in Telecommunications	•		7	7K	6
The subject builds on knowled	due of basic types of interfaces used in telecommunications (from classic, via a packe	t-oriented and ex	nected fut	re generation	system) F	volains the
importance of key parameters	a procents tools for the menitoring and measurement methodology and fault diagnosi	s Students vorifu		ne generation	oractical tas	ke in the
laboratory to real systems and	d advanced measurement techniques	3. Oludenits verily	acquireur	inowiedge to j		KS III UIG
				7	71/	6
	work Application Diagnostics				, ZN	0
detection The accord part of	ais with complex network structures, their characteristics identification, with recognition	on of both structu	rai static ar	na aynamic pa	atterns, and	anomaly
detection. The second part of	the course is focused on specification methods of static and dynamic behavior and the		e use of the	methods is a	emonstrate	on examples
dealing with network applicati	ion issues. The special treatment is dedicated not only to network and cloud application	ons, but also to po	osidilities of	diagnostic pr	ocess auto	nation. The
students gain sufficient skills	in seminars where they solve practical problems in digital network domain.				71/	
B2M32DSVA  Dist	tributed Computing			Z	,ZK	6
The course is focused on tech	nnologies that support distributed computing: on mechanisms ensuring reliable, efficie	ent and secure co	nnection of	r application p	rocesses, p	rogramming
interfaces of communication of	channels and up-to-date middleware technologies. A significant part of lectures is ded	icated to distribut	ed algorith	ms that assur	e causality,	exclusive
access, deadlock detection/av	voidance, fault-tolerance, mobile computing, and security.					
B2M32IBEA   Info	rmation Security			Z,	,ZK	6
The Information Security cour	se provides a complete source of information on the field of security of information sys	tems and informa	ition techno	logies. The m	ost of inforr	nation in today
society is created, transferred	i, stored in electronic form so information security is very important part of it. Iechnica	I background for	information	security is pr		ryptology.
B2M3/KASA  Cor	npression of images and signals		<i>.</i>	Z,	,ZK	6
The subject deals with compre	ession methods and techniques. Main goal is to introduce basic concepts of lossless an	Id lossy compresi	on of audio	visual informa	ation (entrop	y, redundancy
and irrelevancy). Within the la	boratory exercises students will work with implementations of particular algorithms, in	icluding objective	and subje	ctive methods	of quality e	valuation.
B2M32MKSA   Mol	bile Networks				,ZK	6
The lectures introduce princip	oles and functionalities of mobile networks with special focus on currently deployed tec	chnologies and fu	iture mobile	e networks. Fu	irthermore,	architecture
and fundamental principles of	FGSM, UMTS, LTE/LTE-A, and 5G will be explained. Then, selected key technologies	for future mobile	networks (	6G) will be ex	plained.	
B2M32THOA Que	eueing Theory			Z	,ZK	6
The aim of the course is to pr	esent an overview of dimensioning of telecommunication networks on the basis of res	sults of the queui	ng theory (	QT) and to int	roduce pos	sibilities of
simulation and modelling of n	etworks, both from the point of view of grade of service (GoS) and quality of service (	QoS). Results of	the QT are	applied on di	fferent serv	ce systems
and telecommunication netwo	orks being currently operated and developed. Theoretical knowledge about models of s	service systems of	an be appl	ied on dimens	sioning of di	fferent service
systems in real life - not only	on the telecommunications one.					
B2M31ZRE Spe	eech Processing			Z	,ZK	6
The subject is devoted to bas	is of speech processing addressed to students of master program. Discussed speech	technology is cu	rrently app	lied in many s	systems in c	ifferent fields
(e.g. information dialogue sys	tems, voice controlled devices, dictation systems or transcription of audio-video record	dings, support for	language t	eaching, etc.)	. Students	vill learn basic
algorithms for speech analysi	s (spectral analysis, LPC, cepstral analysis, pitch, formants, etc.), principles of speech	n recognition (GM	1M-HMM, A	NN-HMM sys	stems, smal	l and large
vocabulary recognizers), speaker recognition (based on VQ and GMM), speech synthesis or speech enhancement. Further information can be found at <a< td=""></a<>						
href=http://noel.feld.cvut.cz/vy	yu/ae2m31zre>http://noel.feld.cvut.cz/vyu/ae2m31zre. Pro zapsané stude	nty jsou detailní i	nformace r	a výukovém p	portálu <a< td=""><td></td></a<>	
href=https://moodle.fel.cvut.cz	z>Moodle FEL.					
Name of the block	c Elective courses					

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\_MEKH Name of the group: Humanities subjects Requirement credits in the group: Requirement courses in the group: Credits in the group: 0 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
B0M16FIL	Peter Zamarovský Peter Zamarovský Peter Zamarovský (Gar.)	Z,ZK	5	2P+2S	Z,L	V
B0M16HVT	History of science and technology 2 Marcela Efmertová, Jan Mikeš Marcela Efmertová Marcela Efmertová (Gar.)	Z,ZK	5	2P+2S	Z,L	V

B0M16HSD1	History of economy and social studies Marcela Efmertová	Z,ZK	5	2P+2S	Z,L	V
B0M16PSM	<b>Psychology</b> Jan Fiala <b>Jan Fiala</b> Jan Fiala (Gar.)	Z,ZK	5	2P+2S	Z,L	V
A003TV	Physical Education <i>Ji í Drnek</i>	Z	2	0+2	L,Z	V
B0M16TEO	<b>Theology</b> Vladimír Sláme ka <b>Vladimír Sláme ka</b> Vladimír Sláme ka (Gar.)	Z,ZK	5	2P+2S	Z,L	V

#### Characteristics of the courses of this group of Study Plan: Code=2018\_MEKH Name=Humanities subjects

B0M16FIL		Z,ZK	5			
B0M16HVT	History of science and technology 2	Z,ZK	5			
This subject traces histo	rical developments in electrical engineering branches in the world and in the Czech Lands. Its ultimate goal is to stimulate si	udents' interest in	n 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 influe	nce of technical			
engineers						
B0M16HSD1	History of economy and social studies	Z,ZK	5			
This subject deals with	the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its ain	ns and achieved r	esults as well as			
the social and cultural d	evelopment and coexistence of the various ethnical groups in the Czech countries.					
B0M16PSM	Psychology	Z,ZK	5			
A003TV	Physical Education	Z	2			
B0M16TEO	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.

## Code of the group: MTV Name of the group: Physical education Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

#### 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
TVV	Physical education	Z	0	0+2	Z,L	V
A003TV	Physical Education Ji í Drnek	Z	2	0+2	L,Z	V
TV-V1	Physical education	Z	1	0+2	Z,L	V
TVV0	Physical education	Z	0	0+2	Z,L	V
TVKLV	Physical Education Course	Z	0	7dní	L	V
TVKZV	Physical Education Course	Z	0	7dní	Z	V

#### Characteristics of the courses of this group of Study Plan: Code=MTV Name=Physical education

A003TV	Physical Education	Z	2
TVV	Physical education	Z	0
TV-V1	Physical education	Z	1
TVV0	Physical education	Z	0
TVKLV	Physical Education Course	Z	0
TVKZV	Physical Education Course	Z	0

Code of the group: 2018\_MEKVOL 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:

~Nabídku volitelných předmětů uspořádaných podle kateder najdete na webových stránkách http://www.fel.cvut.cz/cz/education/volitelne-predmety.html\\

# List of courses of this pass:

Code	Name of the course	Completion	Credits				
A003TV	Physical Education	Z	2				
B0M16FIL		Z,ZK	5				
B0M16HSD1	History of economy and social studies	Z,ZK	5				
This subject deals with the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its aims and achieved results as well as the social and cultural development and coexistence of the various ethnical groups in the Czech countries.							
B0M16HVT	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 and				
traditions of the sub	ject, while highlighting the developments in technical education and professional organizations, the process of shaping scientific life engineers	and the influence	of technical				
B0M16PSM	Psychology	Z,ZK	5				
B0M16TEO	Theology	Z,ZK	5				
This subject provid	es to students the basic orientation in christian theology and requires no special previous education. After short philosophic lecture t	he basic theologic	disciplines				
are gone through. I	re subject is determined not only to believer students who want to know the reliable theologic grounding but also above all to ones who - religion from which graws our civilization up.	o want to get know	Christianity				
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	n the methods of di	gital signals				
analysis and be ab	le to practically use them. I hey learn to know the conditions of use of correlation, spectral and concrent analysis of random signals.	I ney will became t	amiliar with				
	analyses.						
B2M31ZRE	Speech Processing	Z,ZK	6				
I ne subject is devo	ted to basis of speech processing addressed to students of master program. Discussed speech technology is currently applied in master program. Discussed speech technology is currently applied in master program.	any systems in din etc.) Students will	learn basic				
algorithms for spe	ech analysis (spectral analysis LPC, censtral analysis, pitch formants, etc.), principles of speech recognition (GMM-HMM, ANN-HM	AM systems small	and large				
vocabu	lary recognizers), speaker recognition (based on VQ and GMM), speech synthesis or speech enhancement. Further information can	be found at <a< td=""><td>an a sa ga</td></a<>	an a sa ga				
href=http://ne	pel.feld.cvut.cz/vyu/ae2m31zre>http://noel.feld.cvut.cz/vyu/ae2m31zre. Pro zapsané studenty jsou detailní informace na	výukovém portálu	<a< td=""></a<>				
	href=https://moodle.fel.cvut.cz>Moodle FEL.						
B2M32BTSA	Wireless Technologies	Z,ZK	6				
The lectures give o	verview of fundamental principles of wireless networks in various areas of their application. Students will understand architecture, pr	inciples and protoc	cols used in				
different wireless te	chnologies and learn now these technologies can be exploited in real world applications. The goal is to teach students now to solve p of wireless networks, their operation or development of wireless networks components.	roblems related to	deployment				
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 gene	eration system). Ex	plains the				
importance of ke	y parameters, presents tools for the monitoring and measurement methodology and fault diagnosis. Students verity acquired knowle laboratory to real systems and advanced measurement techniques.	dge to practical tas	sks in the				
B2M32DSAA	Network Application Diagnostics	Z,ZK	6				
The first part of the	ne course deals with complex network structures, their characteristics identification, with recognition of both structural static and dyna	amic patterns, and	anomaly				
detection. The seco	nd part of the course is focused on specification methods of static and dynamic behavior and their verification. The use of the methods	s is demonstrated o	on examples				
	students gain sufficient skills in semicars where they solve practical problems in digital network domain.						
B2M32DSVA	Distributed Computing	Z,ZK	6				
The course is focu	sed on technologies that support distributed computing: on mechanisms ensuring reliable, efficient and secure connection of applica	tion processes, pro	oyclusivo				
	access, deadlock detection/avoidance, fault-tolerance, mobile computing, and security.	l assure causality,	exclusive				
B2M32IBEA	Information Security	Z,ZK	6				
The Information Sec	curity course provides a complete source of information on the field of security of information systems and information technologies. The security of the secu	he most of informa	tion in today				
BOM22NKCA	, transieneu, stored in electronic form so information security is very important part of it. Technical background for information security		rypiology.				
The lectures introc	INDURE INCLINE	∣ ∠,∠r∖ ks Furthermore a	rchitecture				
and fundar	nental principles of GSM, UMTS, LTE/LTE-A, and 5G will be explained. Then, selected key technologies for future mobile networks (t	6G) will be explain	ed.				
B2M32OSS	Optical Systems and Networks	Z,ZK	6				
The course deals w	ith the use of optical radiation for the transmission of information. The aim is to acquaint students with the functions of important com	ponents used in a	n advanced				
optical commun	nication systems and networks. Students will learn how to design practical optical fiber link and the network. Students will receive the	oretical knowledge	e for the				
			6				
The course covers	s the area of high-speed transmission of information in the access network level with emphasis on the use of optical transmission me	∣ ∠,∠n edia and its combi	o nation with				
metallic lines (FTTx	). In the practical part, students will learn the methods required for the design, modeling, measurement and analysis of transmission and whole access networks	media, diagnostics	of systems				
B2M32PST	Advanced Networking Technologies	7 7K	6				
Subject Advanced	Network Technologies expands students' knowledge of modern network technologies. The course is practically oriented and focused	ا مرجع المرجع المرجع المرجع المرجع	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	net routing, softwa	re-defined				
networks, multicas	t routing, IPv6, and MPLS networks. Part of the course is also devoted to a detailed explanation of transport protocols TCP/UDP and	d a manner in whic	h software				
	applications can access transportation services of TCP/IP data networks.						

DOMOODTIC			
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 provide	s fundamentals of digital communications theory: modulation, classical coding, channel models, and basic principles of decoding. Th	ne exposition is sys	tematically
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 compression 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			
•···•		language and cor	nbination of
both. After compl	etion of this subject student should be able to design and implement simpler microprocessor system including connection of necessa	ary peripherals and	nbination of software
both. After compl	etion of this subject student should be able to design and implement simpler microprocessor system including connection of necessa design.	anguage and cor	nbination of software
both. After compl B2MPROJ6	etion of this subject student should be able to design and implement simpler microprocessor system including connection of necessa design. Project	ary peripherals and cor	nbination of software 6
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