# Study plan

# Name of study plan: Electronics and Communications - Electronics

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\_MEKP1

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 Note on the group: Specializace elektronika

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 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
B2M34SST	Solid State Physics Jan Voves Jan Voves (Gar.)	Z,ZK	6	3P+1L	Z	Р
B2M37MAM	Microprocessors Petr Skalický, Stanislav Vítek Stanislav Vítek (Gar.)	Z,ZK	6	2P+2L	Z	Р
B2M34MST	Microsystems Michal Ko í, Miroslav Husák, Adam Bou a, Alexandr Laposa Miroslav Husák Miroslav Husák (Gar.)	Z,ZK	6	2P+2L	L	Р
B2M34NIS	Design of Integrated Circuits Jan Novák, Ji í Jakovenko Jan Novák Ji í Jakovenko (Gar.)	Z,ZK	6	2P+2C	L	Р
B2M34NSV	VLSI System Design Pavel Hazdra, Jakub Jirsa <b>Pavel Hazdra</b> Pavel Hazdra (Gar.)	Z,ZK	6	2P+2L	Z	Р

B2M31DSP	Advanced DSP methods Pavel Sovka, Petr Pollák Pavel Sovka Pavel Sovka (Gar.)	Z,ZK	6	2P+2C	Z,L	Р
B2MPROJ6	Project Ji í Jakovenko, Pavel Máša, Ivan Pravda, František Rund, Jan Šístek, Lubor Jirásek, Tomáš Zeman, Ladislav Oppl <b>František Rund</b> František Rund (Gar.)	Z	6	0p+6s	Z,L	Р
B2M34SIS	Integrated System Structures Ji í Jakovenko, Vladimír Janí ek Vladimír Janí ek Ji í Jakovenko (Gar.)	Z,ZK	6	2P+2C	Z	Р
Characteristics of the	courses of this group of Study Plan: Code=2018_MEKP1 Nam	e=Compulso	ory subje	cts of the	e progra	mme
B2M32BTSA Wir	reless Technologies			Z	,ZK	6
The lectures give overview o	f fundamental principles of wireless networks in various areas of their application. Stud	dents will understa	and archited	cture, princip	les and pro	tocols used in
different wireless technologie	es and learn how these technologies can be exploited in real world applications. The go	al is to teach stud	lents how to	solve proble	ems related	to deployment
of wireless networks, their op	peration or development of wireless networks components.					
B2M34SST Sol	lid State Physics			Z	.ZK	6
The subject is aimed on solid	d state physics including some parts of statistical physics.			I	, 1	-
B2M37MAM Mic	Croprocessors			7	7K	6
The aim is to make students	acquainted with the properties of microprocessor systems, make students familiar with	h on-chip periphe	rals, conne	ct external ci	rcuit to the	processor bus.
and with implementation of th	he memory or I/O space address extension. Next, taught the students to make simple	program in the as	sembly land	uage. C lan	quage and	combination of
both. After completion of this	subject student should be able to design and implement simpler microprocessor syste	em including conn	ection of ne	ecessary per	ipherals an	d software
design.		<u>.</u>		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
B2M34MST Mic	crosystems			7	7K	6
The course deals with system	n integration applied in the design of digital and analog systems. It demonstrates the n	ew possibilities o	f implement	ation and an	plication of	integrated
microelectronic devices base	d on various physical and biochemical principles. It presents primarily MEMS technolog	v that increases r	eliability wi	th all its attrib	outes. The c	ourse presents
the modern action elements	and microactuators, whose operation is based on fundamental physical and biochemic	cal principles incl	uding basic	applications	in microm	anipulation
microrobots, microdrives, mic	crosurgery, multimedia, medical, industrial control, automotive, etc. In the course are pre	sented the princip	oles of touch	screens. m	icrogenerat	ors of electrical
energy. There are mentioned	basic elements of the use of nanotechnology and nanoelectronic structures and basic	c microsystem teo	hnologies.	,		
B2M34NIS De	sign of Integrated Circuits	· · · · <b>,</b> · · · ·		7	7K	6
Main tasks of integrated circu	uits designer: design abstraction levels - Y chart Definitions of specification feasibility	study criteria for	technology		its selectio	n Integrated
systems design and simulation	on methodologies. Main features of full custom design, gate array standard cells, prog	rammable arrav k	naic Desiar	aspects of	RF and mo	hile low power
systems Verilog-A Verilog-A	MS_VHDL-A_Logic and physical synthesis_Frond End and Back End design. Floornla	nning place and	route lavou	t narasitic e	vtraction ti	me analysis
testbenches design and verif	fication	ning, place and	iouto, iayou		Attaotion, ti	ine analysis,
B2M34NSV VI	SI System Design			7	76	6
Introduction to basic building	blocks architecture and design methodologies of advanced VI SI systems. Structure (	and design of digi	tal and ana		, <b>CIX</b>	U subsystems
Integrated system description	n and synthesis using cell libraries and IP cores. Synchronization, power consumption	and parasitics rec	duction issu	logue integra los Tostina a	and reliabilit	v of integrated
systems. In seminars and lab	is the bardware description language VHDL will be explained and used for practical d	esian synthesis a	and testing	of a system (	on chin	y of integrated
	vanced DSP methods	oolgii, oyinnoolo e	and tooting (	7	71/	6
B2IVISTDSF AU	valiced DSF file filous		Craduates	<u>ک</u>	.,∠n	0 f digital signala
analysis and he able to pract	course in signal processing and introduces advanced methods of analysis and digital s	oboront analysis	of random of	viniteant the	will becom	o fomilior with
analysis and be able to practically use them. They ream to know the containions of use of contention, spectra and content analysis of random signals. They will be cancel and containing with the independence of the signal despendence of the signal despe						
and the second s						
	ie et				7	
B2IVIPROJ6   Pro	Dject 			 	<b>ک</b>	0
Independent work in the form	n of a project. A student will choose a topic from a range of topics related to his of her l	branch of study, w		specified by	/ branch de	partment or
pranch departments. The project will be defended within the framework of a subject. Project list http://www.fel.cvut.cz/en/education/semestral-projects.html						
B2M34SIS  Inte	egrated System Structures			I Z	,ZK	6
Student learn main design m	nethodologies of analog, digital and optoelectronic integrated systems; Detailed descrip	ption of the techno	ological pro	cess for the	IC production	on; CMOS
technologies and its advance	ed sub-micron trends; IC chip topology, layout and design rules; Technology of micro-el	lectro-mechanical	systems M	EMS.		

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\_MEKPV1 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 elektronika

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
B2M31AEDA	Experimental Data Analysis Jan Rusz Jan Rusz Jan Rusz (Gar.)	Z,ZK	6	2P+2C	Z	PV
B2M17CADA	<b>CAD in HF Technique</b> Zbyn k Škvor <b>Zbyn k Škvor</b> Zbyn k Škvor (Gar.)	Z,ZK	6	2P+2C	L	PV
B2M34EZSA	Electronic Security Systems Miroslav Husák, Adam Bou a, Jan Novák, Tomáš Teplý Adam Bou a Miroslav Husák (Gar.)	Z,ZK	6	2P+2C	Z	PV

B2M31IASA	Implementation of analog systems Ji í Hospodka, Ond ej Šubrt, Josef Dobeš, Ji í Náhlík Radoslav Bortel Radoslav Bortel (Gar.)	Z,ZK	6	2P+2C	Z	PV	
B2M34NANA	Nanoelectronics and Nanotechnology Jan Voves Jan Voves (Gar.)	Z,ZK	6	2P+2C	L	PV	
B2M34ZETA	Custom Electronics Design Vít Záhlava Vít Záhlava Vít Záhlava (Gar.)	KZ	6	2P+2L	Z	PV	
B2M34PIOA	<b>Planar integrated optics</b> Tomáš Martan, Václav Prajzler, Vít zslav Je ábek <b>Václav Prajzler</b> Václav Prajzler (Gar.)	Z,ZK	6	2P+2C	Z	PV	
B2M34PNIS	Advanced Integrated System Design Ji í Jakovenko, Vladimír Janí ek Vladimír Janí ek Ji í Jakovenko (Gar.)	Z,ZK	6	2P+2C	Z	PV	
B2M34VKEA	Power Electronics Jan Novák, Pavel Hazdra, Vít Záhlava Vít Záhlava Pavel Hazdra (Gar.)	Z,ZK	6	2P+2L	L	PV	
B2M31ZASA	Analog Signal Processing Ji í Hospodka <b>Ji í Hospodka</b> Ji í Hospodka (Gar.)	Z,ZK	6	2P+2L	L	PV	
Characteristics of the	courses of this group of Study Plan: Code=2018_MEKPV1 Na	me=Compuls	sory sub	jects of t	he progra	amme	
B2M31AEDA Exp	perimental Data Analysis			Z	,ZK	6	
In the course of subject "Exp	erimental Data Analysis", students will acquire knowledge regarding fundamental met	hods for data ana	lysis and m	achine learr	ing for evalu	ation and	
interpretation of data. In the c	ourse of practical lectures, students will solve individual tasks using real data from sig	nal processing in	neuroscien	ce research.	In the cours	e of semestral	
project, student will solve con	nplex task and present obtained results. The aim of the subject is to introduce practica	al application of fu	ndamental	statistical me	ethods as we	ell as to teach	
students to use critical thinkir	ng and to acquire additional knowledge in solution of practical tasks.						
				7	71/	6	
	D III TF Technique			2	.,∠n	0	
Introduction into principles an	a techniques used in modern microwave circuit design.						
B2M34EZSA Ele	ctronic Security Systems			Z	.,ZK	6	
The subject describes the sys	stem design, electronic solutions, conception characteristics, reliability and its increas	ing of electronic s	ecurity and	safety syste	ms. It report	s solutions of	
electronic sensor systems an	d methods of security system design, usage of modern electronic components and m	nicroprocessors. It	offers prac	tical applicat	ions suitable	e for safety	
systems of houses, cars, indu	ustry companies.						
B2M31IASA Imp	elementation of analog systems			Z	"ZK	6	
The goal of the subject is to r	nake students familiar with the new trends and concepts in analog circuits with an em	phasis on the app	lications in	the digital s	stem periph	nerals. Here,	
the stress is placed on the de	esign and implementation procedures of Application Specific Integrated Circuits (ASIC	s). Current desigr	n trends are	discussed,	including the	analysis and	
test of analog and mixed sign	al circuits. The course provides knowledge for the development and design of electror	nic systems taking	into accou	nt the aspect	s of current	manufacturing	
technology of integrated circu	uits.						
B2M34NANA Nar	noelectronics and Nanotechnology			Z	"ZK	6	
The subject is oriented on the	e present nanotechnologies in the connection with their electronic, photonic and spint	rinic applications.	Quantum th	neory basics	are used to	explain the	
effects observed in nanostruc	ctures. Basic nanoelectronic structures are described with their possible applications.	Modern computer	methods a	nd models, v	which are ab	le to simulate	
the operation of nanoelectron	ic structures and which are the important tools for their design and optimalisation, are	e studied.					
B2M34ZETA Cus	stom Electronics Design				KZ	6	
The course deals with the de	sign methodology of advanced custom electronics. The aim is to convert theoretical k	nowledge of previ	ous studies	into specific	proposals f	or practical	
applications. Student are getti	ing familiar with the problems encountered in the professional electronic design and ma	anufacturing. This	course is ba	ised on real (	experience i	n development	
and production, showing the	latest technological trends and component base.	Ū.			•		
B2M34PIOA Pla	nar integrated ontics			7	7K	6	
be subject describes theoretic	al and technological principles and design of planar integrated optics and optoelectroni	cs as optical divide	ers The stu	dents det ac	uainted with	the principles	
of the light propagation in play	nar waveguide and with basic devices and structures of integrated optics and optoelec	tronics as coupling	a elements	optical micr	oresonators	planar optical	
transmitters an receivers with	SS-LD, WG-PD. In the course are integrated devices and structures for telecommun	ication for multiple	exing and s	ignal proces	sing. There	are optical	
elements for physical and che	emical sensor application and basic important measurement and diagnostic methods.		<b>J</b>	5 1	J		
B2M34PNIS Adv	anced Integrated System Design			7	7K	6	
Students will gain advanced l	knowledge in analog and digital integrated circuit design. The subject itself deals with	the hierarchical d	esian of inte	- Arated circu	its in BCD te	chnologies	
compared to CMOS technolo	dies. The subject further emphasizes good design practices, advanced building blocks	in BCD technolog	nies advan	red IP blocks	and their d		
An integral part of the subject	t are topics focused on the design of power MOSEETs. Linear voltage regulators (LD	<ol> <li>a) electronic fuse</li> </ol>	s eFUSE	witching no	ver sunnlies	on a chin	
(SMPS) digital Front-end (FE	) and digital Back-end (BE) design and detailed analysis of lavouts. The subject is deal	alt with further adv	anced erro	r analysis m	ethods usin	a analytical	
methods such as optical and	electron microscopy (Ontical Beam Induced Resistance Change - Obirch and Emiss	ion Microscopy Fr	nMi)	r analysis m		ganaytioa	
B2M34\/KEA	wer Electronics		,.	7	7K	6	
	e problematic of power electronics. First part of lectures deals with principles and stru	ictures of contem	norary com	conductor p	wer device	S The impact	
of novel semiconductor mater	rials is discussed as well. Circuit models of particular devices will be then evolutioned	driving circuite en	vitching of t	he resistive	inductive an	d capacitive	
or nover semiconductor materials is discussed, as well. Oncore models of particular devices will be then explained, divide prototion reliability will be thereighby discussed. Second part of lectures is dedicated to the problematic of power term their termination of the problematic of power termination of power terminating termination of power terminating termination of power terminati							
techniques and circuits Elect	romagnetic compatibility and PCR design for power converters will be discussed, as y		and of pow		s, area topol	Sgies, control	
BZINISTZASA   Analog Signal Processing   Z,ZK   6							
and monouroment Students	imput-output blocks for signal transmission and processing. They discussed circuit solution the circuit concerns and people liting for eaching the contemportant and people it is the contemportant of the circuit solution.	uon or amplifiers a	nu niters, in		uesign proce	boign and	
and measurement. Students learn the circuit concepts and possibilities for solving the contemporary analogue structures. The second part of the course describes the design and implementation of analog filters, including discrete-time circuits. The conclusion is deviated to the possibilities of computer entimization of electronic circuits and filters.							
	implementation or analog filters, including discrete-time circuits. The conclusion is devoted to the possibilities of computer optimization of electronic circuits and filters.						
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:

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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 Ji í Drnek	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

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 s	tudents' 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 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

# List of courses of this pass:

Code	Name of the course	Completion	Credits
A003TV	Physical Education	Z	2
B0M16FIL		Z,ZK	5
B0M16HSD1 This subject deals v	History of economy and social studies vith the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its aims a	Z,ZK Ind achieved result	5 s 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 history and
traditions of the sub	oject, 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 are gone through. T	les to students the basic orientation in christian theology and requires no special previous education. After short philosophic lecture 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 know the reliable theologic grounding but also above all to ones who want to know the reliable theologic grounding but also above all to ones who want to know the reliable theologic grounding but also above all to ones who want to know the reliable theologic grounding but also above all to ones who want to know the reliable theologic grounding but also above all to ones who want to know the reliable theologic grounding but also	he basic theologic o want to get know	disciplines Christianity
	- religion from which graws our civilization up.	<u>j</u>	,
B2M17CADA	CAD in HF Technique	Z,ZK	6
B2M31AEDA	Experimental Data Analysis	7.7K	6
In the course of s	ubject "Experimental Data Analysis", students will acquire knowledge regarding fundamental methods for data analysis and machine	e learning for evalu	ation and
interpretation of dat	a. In the course of practical lectures, students will solve individual tasks using real data from signal processing in neuroscience resea	rch. In the course of	of semestral
project, student will	solve complex task and present obtained results. The aim of the subject is to introduce practical application of fundamental statistica students to use critical thinking and to acquire additional knowledge in solution of practical tasks.	al methods as well	as to teach
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 di	gital signals
analysis and be ab methods of signal of	le to practically use them. They learn to know the conditions of use of correlation, spectral and coherent analysis of random signals. decomposition and independent component analysis and the time-frequency transformations. Emphasis will be placed on an ability to	They will became f p interpret the resu	amiliar with Its of signal
B2M21IAGA	analyses.	7 7K	6
The goal of the su	bject is to make students familiar with the new trends and concepts in analog systems	ital system periphe	erals. Here,
the stress is placed test of analog and n	on the design and implementation procedures of Application Specific Integrated Circuits (ASICs). Current design trends are discuss nixed signal circuits. The course provides knowledge for the development and design of electronic systems taking into account the as technology of integrated circuits.	ed, including the a pects of current ma	nalysis and anufacturing
B2M31ZASA	Analog Signal Processing	Z,ZK	6
The course deals w	ith analog input-output blocks for signal transmission and processing. They discussed circuit solution of amplifiers and filters, including t	heir design process	s, simulation
and measuremen implementa	t. Students learn the circuit concepts and possibilities for solving the contemporary analogue structures. The second part of the cour tion of analog filters, including discrete-time circuits. The conclusion is devoted to the possibilities of computer optimization of electro	se describes the d onic circuits and filt	esign and ers.
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	ols used in
different wireless te	chnologies and learn how these technologies can be exploited in real world applications. The goal is to teach students how to solve p of wireless networks, their operation or development of wireless networks components.	roblems related to	deployment
B2M34EZSA	Electronic Security Systems	Z,ZK	6
The subject describ	bes the system design, electronic solutions, conception characteristics, reliability and its increasing of electronic security and safety s	systems. It reports	solutions of
electronic sensor	systems and methods of security system design, usage of modern electronic components and microprocessors. It offers practical ap systems of houses, cars, industry companies.	oplications suitable	tor safety
B2M34MST	Microsystems	Z,ZK	6
The course deals	with system integration applied in the design of digital and analog systems. It demonstrates the new possibilities of implementation	and application of i	ntegrated
microelectronic dev	ices based on various physical and biochemical principles. It presents primarily MEMS technology that increases reliability with all its a elements and microactuators, whose operation is based on fundamental physical and biochemical principles, including basic applic	attributes. The cour	se presents
microrobots, microc	Irives, microsurgery, multimedia, medical, industrial control, automotive, etc. In the course are presented the principles of touch screen	s, microgenerators	of electrical
	energy. There are mentioned basic elements of the use of nanotechnology and nanoelectronic structures and basic microsystem tec	hnologies.	
B2M34NANA	Nanoelectronics and Nanotechnology	Z,ZK	6
The subject is orie	ented on the present nanotechnologies in the connection with their electronic, photonic and spintrinic applications. Quantum theory b	asics are used to e	explain the
ellects observed in	the operation of nanoelectronic structures and which are the important tools for their design and optimalisation, are studied	l.	to simulate
B2M34NIS	Design of Integrated Circuits	Z,ZK	6
Main tasks of integ	grated circuits designer; design abstraction levels - Y chart. Definitions of specification, feasibility study, criteria for technology and de	sign kits selection.	Integrated
systems design an systems. Verilog-A	u simulation methodologies, ivian reatures of fun custom design, gate array, standard cells, programmable array logic. Design aspect I, Verilog-AMS, VHDL-A. Logic and physical synthesis. Frond End and Back End design. Floorplanning, place and route, layout, para	s of RF and mobile sitic extraction, tim	e analysis,
	testbenches design and verification.		

B2M34NSV	VLSI System Design	Z,ZK	6			
Introduction to ba	o 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. Test	ing and reliability of	f integrated			
systems.	n seminars and labs, the hardware description language VHDL will be explained and used for practical design, synthesis and testing	of a system on chi	ip.			
B2M34PIOA	Planar integrated optics	Z,ZK	6			
he subject describe	s theoretical and technological principles and design of planar integrated optics and optoelectronics as optical dividers, The students ge	t acquainted with th	ne principles			
of the light propaga	tion in planar waveguide and with basic devices and structures of integrated optics and optoelectronics as coupling elements, optical r	nicroresonators, pla	anar optical			
transmitters an re	aceivers with SS-LD, WG-PD. In the course are integrated devices and structures for telecommunication for multiplexing and signal p	rocessing. There a	re optical			
	elements for physical and chemical sensor application and basic important measurement and diagnostic methods.					
B2M34PNIS	Advanced Integrated System Design	Z,ZK	6			
Students will gain	advanced knowledge in analog and digital integrated circuit design. The subject itself deals with the hierarchical design of integrated	circuits in BCD tec	chnologies			
compared to CMOS	S technologies. The subject further emphasizes good design practices, advanced building blocks in BCD technologies, advanced IP bl	ocks and their desig	gn process.			
An integral part of	f the subject are topics focused on the design of power MOSFETs, Linear voltage regulators (LDO), electronic fuses eFUSE, switchi	ng power supplies	on a chip			
(SMPS) digital Fro	ont-end (FE) and digital Back-end (BE) design and detailed analysis of layouts. The subject is dealt with further advanced error analy	sis methods, using	analytical			
	methods such as optical and electron microscopy, (Optical Beam Induced Resistance Change - Obirch and Emission Microscopy	EmMi).				
B2M34SIS	Integrated System Structures	Z,ZK	6			
Student learn ma	ain design methodologies of analog, digital and optoelectronic integrated systems; Detailed description of the technological process f	or the IC production	n; CMOS			
tec	hnologies and its advanced sub-micron trends; IC chip topology, layout and design rules; Technology of micro-electro-mechanical system	stems MEMS.				
B2M34SST	Solid State Physics	Z,ZK	6			
	The subject is aimed on solid state physics including some parts of statistical physics.					
B2M34VKEA	Power Electronics	Z,ZK	6			
The course introdu	ices into the problematic of power electronics. First part of lectures deals with principles and structures of contemporary semiconduct	or power devices.	The impact			
of novel semicond	uctor materials is discussed, as well. Circuit models of particular devices will be then explained, driving circuits, switching of the resis	tive, inductive and	capacitive			
loads, power losse	s and device operation reliability will be thoroughly discussed. Second part of lectures is dedicated to the problematic of power conve	rters, their topolog	ies, control			
	techniques and circuits. Electromagnetic compatibility and PCB design for power converters will be discussed, as well.					
B2M34ZETA	Custom Electronics Design	KZ	6			
The course deals	with the design methodology of advanced custom electronics. The aim is to convert theoretical knowledge of previous studies into sp	pecific proposals fo	r practical			
applications. Stude	nt are getting familiar with the problems encountered in the professional electronic design and manufacturing. This course is based on r	eal experience in d	evelopment			
	and production, showing the latest technological trends and component base.	·				
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 extern	al circuit to the pro-	cessor bus,			
and with implement	tation of the memory or I/O space address extension. Next, taught the students to make simple program in the assembly language, C	; language and con	nbination of			
both. After compl	etion of this subject student should be able to design and implement simpler microprocessor system including connection of necessa	iry 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 specific to his or her branch of study, which will be specific to his or her branch of study.	ied by branch depa	artment or			
branc	h departments. The project will be defended within the framework of a subject. Project list http://www.fel.cvut.cz/en/education/semesi	ral-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 h	er branch of study	, which will			
be specified b	by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the compreh	ensive final examin	nation.			
TV-V1	Physical education	Z	1			
TVKLV	Physical Education Course	Z	0			
TVKZV	Physical Education Course	Z	0			
TVV	Physical education	Z	0			
TVV0	Physical education	Z	0			
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For updated information see <u>http://bilakniha.cvut.cz/en/f3.html</u> Generated: day 2025-06-08, time 05:53.