Recomended pass through the study plan

Name of the pass: Bachelor specialization, Computer Engineering, 2021

Faculty/Institute/Others:

Department:

Pass through the study plan: Bachelor specialization, Computer Engineering, 2021

Branch of study guranteed by the department: Welcome page

Guarantor of the study branch: Program of study: Informatics Type of study: Bachelor full-time

Note on the pass: In addition to purely elective courses, compulsory courses in neighboring specializations can also be enrolled here as electives. The BIE-ECC course can be recognized for any active semester after the submission of a certificate certificate that demonstrates their proficiency in English comparable to or exceeding the B2 level of the Common European Framework of Reference for Languages.

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
BIE-DML.21	Discrete Mathematics and Logic Eva Pernecká, Jitka Rybní ková, Francesco Dolce Daniel Dombek Eva Pernecká (Gar.)	Z,ZK	5	2P+1R+1C	Z	PP
BIE-LA1.21	Linear Algebra 1 Marzieh Forough Karel Klouda Marzieh Forough (Gar.)	Z,ZK	5	2P+1R+1C	Z	PP
BIE-PA1.21	Programming and Algorithmics 1 Jan Trávní ek, Ladislav Vagner, Radek Hušek, David Bernhauer, Josef Vogel Jan Trávní ek Jan Trávní ek (Gar.)	Z,ZK	7	2P+2R+2C	Z	PP
BIE-GIT.21	SW Development Technologies Petr Pulc Petr Pulc (Gar.)	Z	3	2P	Z	PP
BIE-TZP.21	Technological Fundamentals of Computers Martin Novotný, Kate ina Hyniová Martin Novotný Martin Novotný (Gar.)	Z,ZK	5	2P+2C	Z	PP
BIE-UOS.21	Unix-like Operating Systems Jan Trdli ka, Zden k Muziká , Jakub Žitný Zden k Muziká Zden k Muziká (Gar.)	KZ	5	2P+2C	Z	PP

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
BIE-SAP.21	Computer Structures and Architectures Petr Fišer Petr Fišer Petr Fišer (Gar.)	Z,ZK	5	2P+1R+2C	L	PP
BIE-DBS.21	Database Systems Josef Pavlí ek, Yelena Trofimova Josef Pavlí ek Josef Pavlí ek (Gar.)	Z,ZK	5	2P+2R+1L	L	PP
BIE-MA1.21	Mathematical Analysis 1 Antonella Marchesiello Tomáš Kalvoda Tomáš Kalvoda (Gar.)	Z,ZK	5	2P+1R+1C	L	PP
BIE-PA2.21	Programming and Algorithmics 2 Jan Trávní ek, Ladislav Vagner, Radek Hušek, Josef Vogel Jan Trávní ek Jan Trávní ek (Gar.)	Z,ZK	7	2P+1R+2C	L	PP
BIE-LA2.21	Linear Algebra 2 Marzieh Forough, Karel Klouda Karel Klouda (Gar.)	Z,ZK	5	2P+2C	L	PS
		Min. cours.				
DIE VOA	Purely Elective Bachelor Courses, Version 2021 BIE-ZUM, BIE-ZRS, (see the list of groups below)	0	Min/Max			.,
BIE-V.21		Max. cours.	0/55			V
		15				

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
BIE-AG1.21	Algorithms and Graphs 1 Tomáš Valla, Dušan Knop, Maria Saumell Mendiola Dušan Knop Dušan Knop (Gar.)	Z,ZK	5	2P+2C	Z	PP
BIE-AAG.21	Automata and Grammars Jan Holub Jan Holub Jan Holub (Gar.)	Z,ZK	5	2P+2C	Z	PP
BIE-MA2.21	Mathematical Analysis 2 Antonella Marchesiello Tomáš Kalvoda Antonella Marchesiello (Gar.)	Z,ZK	6	3P+2C	Z	PP
BIE-APS.21	Architectures of Computer Systems Pavel Tvrdík, Michal Štepanovský Pavel Tvrdík Pavel Tvrdík (Gar.)	Z,ZK	5	2P+2C	Z	PS
BIE-ZRS.21	Basics of System Control Kate ina Hyniová Kate ina Hyniová (Gar.)	Z,ZK	5	2P+2C	Z,L	PS
BIE-JPO.21	Computer Units Pavel Kubalík Pavel Kubalík (Gar.)	Z,ZK	5	2P+2C	Z	PS

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
BIE-PSI.21	Computer Networks Yelena Trofimova, Michal Polák, Diana Prokopisina Yelena Trofimova Yelena Trofimova (Gar.)	Z,ZK	5	2P+1R+1C	L	PP
BIE-KAB.21	Cryptography and Security Róbert Lórencz, Ji í Bu ek, Filip Kodýtek Ji í Bu ek Róbert Lórencz (Gar.)	Z,ZK	5	2P+2C	L	PP
BIE-OSY.21	Operating Systems Jan Trdli ka, Pavel Tvrdík, Michal Štepanovský Pavel Tvrdík Pavel Tvrdík (Gar.)	Z,ZK	5	2P+1R+1L	L	PP
BIE-VES.21	Embedded Systems Miroslav Skrbek Miroslav Skrbek (Gar.)	Z,ZK	5	2P+2C	L	PS
BIE-PV-PI.21	Compulsory elective courses for Specialization Computer Engineering, version 2021 BIE-ZUM.21,BIE-PJP, (see the list of groups below)	Min. cours. 1 Max. cours. 3	Min/Max 5/15			PV
BIE-V.21	Purely Elective Bachelor Courses, Version 2021 BIE-ZUM,BIE-ZRS, (see the list of groups below)	Min. cours. 0 Max. cours. 15	Min/Max 0/55			V

Number of semester: 5

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
BIE-BPR.21	Bachelor Project Zden k Muziká Zden k Muziká (Gar.)	Z	1		Z,L	PP
BIE-PST.21	Probability and Statistics Francesco Dolce, Pavel Hrabák Pavel Hrabák (Gar.)	Z,ZK	5	2P+2C	Z	PP
BIE-MPP.21	Methods of interfacing peripheral devices Miroslav Skrbek Miroslav Skrbek (Gar.)	Z,ZK	5	2P+2C	Z	PS
BIE-PNO.21	Practical Digital Design Martin Novotný Martin Novotný (Gar.)	KZ	5	2P+2C	Z	PS
BIE-SRC.21	Real-time systems Hana Kubátová Hana Kubátová Hana Kubátová (Gar.)	Z,ZK	5	2P+2C	Z	PS
		Min. cours.				
BIE-V.21	Purely Elective Bachelor Courses, Version 2021	0	Min/Max			
	BIE-ZUM,BIE-ZRS, (see the list of groups below)	Max. cours.	0/55			V
		15				

Number of semester: 6

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
BIE-BAP.21	Bachelor Thesis Zden k Muziká Zden k Muziká (Gar.)	Z	14		L,Z	PP
BIE-TDP.21	Documentation and Presentation Dana Vynikarová Dana Vynikarová (Gar.)	KZ	3	2P+2C	Z,L	PP
BIE-EEC	English language external certificate Zden k Muziká Zden k Muziká Zden k Muziká (Gar.)	Z	4		L	PP
		Min. cours.				
BIF-V.21	Purely Elective Bachelor Courses, Version 2021 BIE-ZUM,BIE-ZRS, (see the list of groups below)	0	Min/Max			V
DIL-V.21		Max. cours.	0/55			V
		15				

List of groups of courses of this pass with the complete content of members of individual groups

Kód		Name of the group ogroup (for specification)	f courses an	d codes of members of this or below the list of courses)	Con	pletion	Credi	ts Scope	Semester	Role		
BIE-PV-				r Specialization Computer	Min.	cours. 1 . cours. 3	Min/M 5/15	ax		PV		
BIE-ZUM.21	Artificial Int	elligence Fundamen	BIE-PJP	Programming Languages and Com	pil	BIE-BEK		Secure Code				
BIE-V.	21	Purely Elective	e Bachelor C	ourses, Version 2021		. cours. 0 . cours. 15	Min/M 0/55			V		
BIE-ZUM	Artificial Int	elligence Fundamen	BIE-ZRS	Basics of Systems Control		BIE-CCN		Compiler Con	struction			
BIE-SCE1	Computer I	Engineering Seminar I	BIE-SCE2	Computer Engineering Seminar II		BIE-CZ0		Czech Language for Foreigners		ers		
BIE-CZ1.21	Czech Lan	guage for Foreigners II	UKCJP	Czech language for advanced	BIE-EPR		Economic project					
BIE-FTR.1	Financial M	larkets	BIE-HAS	Human Factors in Cryptography an	ny an BIE-CS		BIE-CSI		CSI Introduction to Compute		Computer Sci	ence
BIE-EHD	Introduction	to European Economi BIE-IMA Introduction to Mathematics		Introduction to Mathematics	BIE-IMA2		2	Introduction to Mathematics		2		
BIE-ST1	Network Te	chnology 1	BIE-OOP	Object-Oriented Programming	BIE-PKM		Preparatory N	1athematics				
BIE-PJV	Programmi	ng in Java	BIE-PS2	Programming in shell 2		BIE-PRR	.21	Project mana	gement			
BIE-SKJ.21	Scripting La	anguages	BIE-VAK.21	Selected Combinatorics Applicati		BI-SCE1		Computer En	gineering Semi	nar I		
BIE-SEG	Systems E	ngineering	TVV	Physical education		TVV0		Physical educ	ation			
TV2K1	Physical Education 2 TVKLV Physical Education Course		Physical Education Course		BIE-TUR	.21	User Interface	Design				
BIE-VR1.21	Virtual real	ity I	BIE-ADW.1	Windows Administration		BIE-SEP		World Econor	ny and Busines	s		

List of courses of this pass:

Code	Name of the course	Completion	Credits
BI-SCE1	Computer Engineering Seminar I	Z	4
The Seminar of Cor	nputer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to	failures and attac	ks. Students
are approached in	dividually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the	subject is work wi	th scientific
articles and other p	rofessional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teacher	s. The topics are n	ew for each
	semester.		
BIE-3DT.1	3D Printing	KZ	4
Students learn to d	esign three-dimensional objects optimized for printing on a RepRap printer and the printing itself. They will be able to design objects	, prepare for printir	ng and print
	in 3D.		
BIE-AAG.21	Automata and Grammars	Z,ZK	5
Students are introd	uced to basic theoretical and implementation principles of the following topics: construction, use and mutual transformations of finite	automata, regular	expressions
and regular gramma	ars, translation finite automata, construction and use of pushdown automata, hierarchy of formal languages, relationships between foi	mal languages an	d automata.
Knowledge acquir	ed through the module is applicable in designs of algorithms for searching in text, data compression, simple parsing and translation,	and design of digi	tal circuits.

BIE-ADW.1 Windows Administration Z,ZK Students understand the architecture and internals of the Windows OS and acquire the skills to administrate the Windows OS. They are able use the standard administration and security tools and apply advanced ActiveDirectory administration methods. They are able to solve problems by applying appropriate troubleshooting methods and administrate heterogeneous systems. Students are able to effectively configure centralised administration of a computer network. BIE-AG1.21 Algorithms and Graphs 1 Z,ZK The course covers the basics from the efficient algorithm design, data structures, and graph theory, belonging to the core knowledge of every computing curriculum. It is interlinked with the concurrent BIE-AAG and BIE-ZDM courses in which the students gain the basic skills and knowledge needed for time and space complexity of algorithms and learn to handle practically the asymptotic mathematics. BIE-APS.21 Architectures of Computer Systems Z,ZK Students will learn the construction principles of internal architecture of computers with universal processors at the level of machine instructions. Special emphasis is given on the pipelined instruction processing and on the memory hierarchy. Students will understand the basic concepts of RISC and CISC architectures and the principles of instruction processing not only in scalar processors, but also in superscalar processors that can execute multiple instructions in one cycle, while ensuring the correctness of the sequential model of the program. The course further elaborates the principles and architectures of shared memory multiprocessor and multicore systems and the memory coherence and consistency in such systems. BIE-BAP.21 **Bachelor Thesis** 14 **BIE-BEK** Z.ZK 5 Secure Code The students will learn how to assess security risks and how to take them into account in the design phase of their own code and solutions. After getting familiar with the threat modeling theory, students gain practical experience with running programs with reduced privileges and methods of specifying these privileges, since not every program needs to run with administrator privileges. Dangers inherent in buffer overflows will be practically demonstrated. Students will be introduced to the principles of securing data and the relationships of security and database systems, web, remote procedure calls, and sockets in general. The module concludes with Denial of Service attacks and the defense against them. BIE-BPR.21 **Bachelor Project** Ζ At the beginning of the semester the student will contact the supervisor of the bachelor thesis he has booked. They will discuss the partial tasks that student will perform during the semester. If he fulfill these tasks, the supervisor will award him / her at the end of the semester with the BI-BPR course. **BIE-CCN** Compiler Construction 5 Z.ZK This is an introductory class on compiler construction for bachelor students in computer science. The goal of the class is to introduce basic principles of compilers for students to understand the design and implementation of programming languages. Seeing and actually understanding self-compilation is the overarching theme of the class. BIE-CSI Introduction to Computer Science This is an introductory class on Elementary Computer Science for broad audiences: bachelor students in computer science, students majoring in other fields but interested in computer science, high-school students, anybody with a background in basic math and the desire to understand the absolute basics of computer science. The goal of the class is to introduce and relate basic principles of computer science for students to understand, early on, what computer science is, why things such as high-level programming languages and tools are done the way they are, and even how, on a basic yet representative and practically relevant level. After taking the class, students are able to answer not just basic computer science questions but also questions about themselves such as which courses to take next and which books to follow up with, ideally realizing if they are interested in computer science more than expected, or even less than before. BIE-CZ0 ΚZ Czech Language for Foreigners 2 Course Czech for foreigners offers the basic topics of conversation: Introductions, Orientation, Shopping, Work / Study, Travel, Time, Family. BIE-CZ1.21 Czech Language for Foreigners II 2 ΚZ The course is intended for Students of English programmes who have completed BIE-CZ0 course or have basic knowledge of the Czech language. The course further expands the basic vocabulary and clarifies the structure of the Czech language structure with regard to the practical needs of Students residing in the Czech Republic. BIE-DBS.21 **Database Systems** 7.7K Students get acquainted with the architecture of the database engine and typical user roles. They learn to design the structure of a smaller data store (including integrity constraints) using a conceptual model and then implement them in a relational database engine. They get acquainted with the SQL language and also with its theoretical basis - relational database model. They will get acquainted with the principles of relational database schema normalization. They understand the basic concepts of transaction processing and control of parallel user access to a single data source. At the end of the course, students will be introduced to alternative nonrelational database models. BIE-DML.21 Discrete Mathematics and Logic Students will get acquainted with the basic concepts of propositional logic and predicate logic and learn to work with their laws. Necessary concepts from set theory will be explained. Special attention is paid to relations, their general properties, and their types, especially functional relations, equivalences, and partial orders. The course also lays down the basics of combinatorics and number theory, with emphasis on modular arithmetics. Ζ **BIE-EEC** English language external certificate 4 The BIE-ECC course can be recognized for any active semester after the submission of a certificate certificate that demonstrates their proficiency in English comparable to or exceeding the B2 level of the Common European Framework of Reference for Languages. Introduction to European Economic History The course introduces a selection of themes from the European economic history. It gives the student basic knowledge about forming of the global economy through the description of the key periods in history. As European countries have been dominant actors in this process it focuses predominantly on their roles in the economic history. From large economic area of Roman Empire to fragmentation of the Middle Ages, from destruction of WWII to the current affairs, the development of modern financial institutions is deciphered. The course does not cover detailed economic history of particular European countries but rather the impact of trade and role of particular events, institutions and organizations in history. Class meetings will consist of a mixture of lecture and discussion. Economic project This course is an extension of the course Introduction to European Economic History (BIE-EHD). There is no fixed schedule for BIE-EPR. A teacher will contact you before the start of the semester. BIE-FTR.1 **Financial Markets** Z,ZK 5 Financial sector has been deeply transformed in the recent years, which led to a development of structured financial products, a new point of view on the issue of credit risk, and globalization of market activities. The need to use and properly apply mathematical and technical tools is emphasized. To manage their financial activities, many firms need graduates from technical schools who have sufficient knowledge ICT and mathematics, and who have at the same time an understanding of the functioning of financial markets. The Financial Markets course thus englobes both a description of financial markets and related economic theories, and an overview of mathematical and statistical tools used in this field. BIE-GIT.21 SW Development Technologies 7 3 This course is aimed at one of the rudimental team software development technology - version control. To be more specific, we will introduce students to Git, the information manager from hell, as Linus Torvalds nicknamed it, and provide a comprehensive guide into its depths, as well as for day-to-day use. Z,ZK **BIE-HAS** Human Factors in Cryptography and Security This course is for students interested not only in technical scope of computer science, but also in making products usable - for users and for developers. Students of this course can use their gained knowledge to design, plan and analyse their own projects in the context of human-centered security.

BIE-MAZ BIE-MAZ Introduction to Mathematics 2 Computer Units Computer Unit	BIE-IMA	Introduction to Mathematics	Z	4
BIE-LPO.21 Computer Units Sudents superiorise Students understand basic mathematical principles and they are able to apply them in particular and provided to the program (BIE-SAP), get acquainted in death with the internal structure and grantization of computer units and processors and their interactions with the environment, including accelerating attrimatic loops units and using appropriate code for implement membrases and their interactions with the environment, including accelerating attrimatic loops units and using appropriate code for implement memorics (advisorable, UPC, PFP and AGM) with obscasses in detail, including accelerating attrimatic loops under a detail including accelerating attrimatic loops under a detail including accelerating and the processors of the environment and the acceleration of the processors of the environment and the acceleration of the processors of the environment and the acceleration of the processors of the environment and the acceleration of the processors of the environment and the acceleration of the processors of the environment and the acceleration of the processors of the environment and the acceleration of the processors of the environment and the acceleration of the processors of the environment and the processors of the environment and the processors of the pr		nd knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are abl		in particula
ucents enteresh and extend invokedge of elementary functions and their properties. Students understand basic mathematical principles and they are able to apply them in particular properties. Students deepen interest and according to the program (BIE-SAP), get accounted in detail with in interest all students are application of corroduce understand processors and their interactions with the environment, including accolerating airthmetic-logic units and using approximation does be improved and the programmatic handles. In CP, RFD and CRAW, with the disconsideration details with interest all students and according airthmetic-logic units and using approximation of the improving and their interims are understanded to considerate and the programmatic handles. In CP, RFD and CRAW, with the principles of communication of this processor in the programmatic handles. In CP, RFD and CRAW, with the principles of communication of the programmatic handles and the programmat	BIE-IMA2	Introduction to Mathematics 2	Z	2
BIELPO21 Computer Units Com		nd knowledge of elementary functions and their properties. Students understand basic mathematical principles and they are abl		1
inducents despen their basic knowledge of digital computer units acquired in the edition of control of the program (BE-SAP), gas acquained in detail with the internal advantage approach of the program of the program (BE-SAP), gas acquained in detail with the internal advantage approach (SAP), and control of the program of commissions. They will also gas acquainted with the network place of the program (BE-SAP), gas acquainted with the restriction program of the processor or devotors are received from the processor of the programmatic or devotors are received from the processor of the processor or devotors are received from the processor of the processor or devotors are received from the processor of the processor or devotors are received from the processor of the processor or devotors are received from the processor of the processor or devotors are received from the processor of the processor or devotors are received from the processor of the processor or devotors are received from the processor or devotors are received from the processor of the processor or devotors are received from the processor or devotors are received as one over three fields. We will present the concepts of classes and dimension and learn to solve systems of linear equations using the Gaussian elimination method (CEAI) and a the committee of the processor or devotors are received and complex and a second or manufactured from the processor or devotors are received and complex and a second or manufactured from the processor or devotors are received and complex and and different processors. The processor of th	BIF-JPO 21	·	7 7K	5
guestzeinn of computer units and processors and their interactions with the environment, including accordancing antiment-logic units and unity appropriate contex for implementation military interaction of parallel and sends data transmissions. They will also get accountment with the remodology of controller design, with the principles of communication of the processor is environment and the architecture of the bus system. The procedure will be practically wealthed in the last and with the help of the odecational minimisor programmed processor similar or programmed the parallel and will be processor. The processor is environment and the architecture of the bus system. The procedure will be practically and so that the processor is environment and the architecture of the bus so completed on the main and so that the processor is expensively and so that the processor is expensively and so that the processor is expensively and the processor is an ad	I		,	_
BIE-LA2.1 Cryptography and Security Students will uncertained the mathematical foundations of cryptography and grant and average cryptographic algorithms. They will be able to use cryptographic less an eventive and surjective programmes in systems based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hearh functions in applications. Within labs, studies are uncertainties in systems based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems or security and will also get acquariated with the basic correctly objective proparames in CC++ (on a small scale). Basic Python knowledge is an advantage. BIE-LA1.21 Linear Algebra 1 Linear Algebra 2 Linear Algebra 3 Linear Algebra 2 Linear Algebra 3 Linear Algebra 2 Linear Algebra 3 Linear Linear Linear Algebra 3 Linear	ganization of computer u multiplication. The organ prrection for parallel and s	units and processors and their interactions with the environment, including accelerating arithmetic-logic units and using appropriation of main memory and other internal memories (addressable, LIFO, FIFO and CAM) will be discussed in detail, including of serial data transmissions. They will also get acquainted with the methodology of controller design, with the principles of communications of the bus system. The problems will be practically evaluated in the labs and with the help of the educational microprogram.	ate codes for imposed codes for error conication of the properties.	plementation detection ar ocessor wi
Sudents will understand the mathematical foundations of cryptographic legis and reflectives in systems based on them and clear the basic of sels use of symmetric and asymmetric reciprographic systems and heaft functions and heaft must be subjected and selected to excepted the sels use of symmetric and asymmetric reciprographic systems and heaft functions and heaft throations and heaft throations and heaft functions and heaft throations are supported by an advantage in an advantage is an advantage is an advantage in a distance of the connection will incore manifolds. We define the requisitor of matrices where the recognition is a support of the connection will be connected on will present the concepts of basis and dimension and learn to solve systems of linear equations using the Gaussian elimination method (GEM) and he deconnection will be connected on will be connected on the connection of the connection will be connected on the connection of the connection of the connection will be connected the connection of the c	RIF-KAR 21			5
is a system based on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in applications. Within habs, students are expected to be competent programmes in CiC++ (on a small scale), Basic Python knowledge is an advantage. BIE-LA1.21 Linear Algebra 1 Linear Algebra 1 Linear Algebra 2 Linear Alge			,	-
No will introduce students to the basic concepts of linear algebra, such as vectors, martices, vector spaces. We will define vector spaces over the field of real and complex number and allow over finite falles. We will rearn the concepts of basis and demands and earn to she waysterns of linear equations using the Gastines using the Gastines instination and learn to find their inversions using GEM. We will also learn to find digenvalues and eigenvectors of a martic. We will also demonstrate own and learn to find their inversions using GEM. We will also learn to find digenvalues and eigenvectors of a martice. We will also demonstrate own as applications or these concepts in computer science. BIE-LA.2.21 Linear Algebra 2 L	ertificates in systems bas	sed on them and learn the basics of safe use of symmetric and asymmetric cryptographic systems and hash functions in applications using standard cryptographic methods with an emphasis on security and will also get acquainted with the basic procedures of	cations. Within la	bs, student
indicates over finite fields. We will present the concepts of basis and dimension and learn to reduce systems of linear equations using the Gaussian elimination method (SEM) and shirt connection with linear manifolds. We define the regularity of martices and learn to first their inversions using GEM. We will also demonstrate some applications of these concepts in computer science. BIE-LA2.21 Linear Algebra? Linear Algebra? Linear Algebra? Linear Algebra? Linear Algebra? Z,ZK 5 5 Tudents will broaden their knowledge gained in the BIE-LA1 introductory course, where only vectors in the form of n-tuples of marters were considered. Here we will introduce we species in a general abstract from The notions of a scalar product and is linear any will enable to demonstrate the product link between linear algebra general and the production of the production of the there is no computers. The result will be demonstrated mainly on the natifix isotrization problems will solving systems of linear equations on computers. The issues of numerical linear algebra, in particular problems will solving systems of linear equations on computers. The issues of numerical linear algebra will be demonstrated mainly on the natifix isotrization problems will solving systems of linear equations on computers. The issues of numerical linear algebra in reductions of a real variable will be a transmitted in a patient of a real variable. We gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of functions. There is turn the algebra is a reduction of a real variable will be reductive to the second of the problems (by the second of the problems of the course is devoted to number series, and functions, continuous functions, and derivatives of functions of a real variable will be an observed accuracy. There were a functionary to the course is devoted to number series, and functions, problems is a substitution method. The next part of the course is devoted to number series, and functions probl	BIE-LA1.21	Linear Algebra 1	Z,ZK	5
the connection with linear manifolds. We define the regularity of martrices and learn to find their inversions using CEM. We will also learn to find eigenvalues and eigenvectors of a martrix. We will also demonstrates one applications of these concepts in computer science. BIE-LA.2.1	Ve will introduce students	s to the basic concepts of linear algebra, such as vectors, matrices, vector spaces. We will define vector spaces over the field of	f real and compl	lex numbers
Intertit. We will also demonstrate some applications of these concepts in computer science. EliE-LA2.21			•	
BIE-LA2 21 Linear Algebra 2 Linear Algebra 3 Linear Algebra 3 Linear Algebra 4 Linear Algeb	the connection with linea		lues and eigenv	ectors of a
uidents will broaden their knowledge gained in the BIE-LAT introductory course, where only vectors in the form of n-tuples of numbers were considered. Here we will introduce we spaces in a general abstract form. The notions of a scale product and an ilean raps will enable to demonstrate the proflound life where linear legiblers, generally, and computer graphics. The other main topic will be unumerical linear algebra, in particular problems with solving systems of linear algebra in various fields will be presented. BIE-MA1.21 Mathematical Analysis 1 Z, ZK 5 be begin the course by introducing students to the set of real numbers and its properties, and we note its differences with the set of machine numbers. Then we study real sequence of real functions, continuous functions, and derivatives of functions. This theoretical foundation of a real variable. We gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of functions. This theoretical foundation of a real variable. We gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of functions. This theoretical foundation of a real variable. We gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of functions and sendence of complexity of algorithm from a functions. The course is closed with the Landavis asymptotic notions and methods of mortimatical description of complexity of algorithm from course completes the theme of analysis of real functions of a real variable initiated in BlE-MA1 by introducing the Riemann integral. Students will learn the normal part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the computation of element motions with a prescribed accuracy. Then we study the linear recurrence equations with constitute elegibral and series and the prescribed accuracy. Then we study the linear recurrence equations with constitute al	DIE I A2 24		7 71/	
spaces in a general abstract form. The notions of a scalar product and a linear map will enable to demonstrate the profound link between linear algebra, geometry, and computer graphics. The other main topic will be unmerical linear algebra, in particular problems will so wholing systems of linear algebra in various fields will be presented. **BIE-MA1.21** Mathematical Analysis 1	l l		•	
will be demonstrated mainly on the matrix factorization problem. Selected applications of linear algebra in various fields will be presented. Z, ZK 5	spaces in a general abs	tract form. The notions of a scalar product and a linear map will enable to demonstrate the profound link between linear algebra	a, geometry, and	l computer
BIE-MA1.21 Mathematical Analysis 1 8 to begin the course by introducing students to the set of real numbers and its properties, and we note its differences with the set of machine numbers. Them we study real sequence of real functions of a real variable. We gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of functions. This theoretical foundait then applied to root-finding problems (treative method of bisection and Newton's method), construction of outbic interpolation (spline), and formulation and solution of simple optimizate them applied to root-finding problems (treative method of bisection and Newton's method), construction of outbic interpolation (spline), and formulation and solution of simple optimization of the second o	- :			ear aigebra
the begin the course by introducing students to the set of real numbers and its properties, and we note its differences with the set of machine numbers. Then we study real sequence directly and real functions of a real variable (will gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of functions. This here recorded in the applied to root-finding problems (terrative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and solution of simple optimizati roblems (i.e., the issue of finding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description of complexity of algorithm BIE-MA2.21 Mathematical Analysis 2 Z,ZK 6 The course completes the theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral Students will learn how to integrate by part due she to substitution method. The next part of the course is devoted to number series, and Taylor ophomials and series. We apply Taylor's theorem to the computation of elements unctions with a prescribed accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and its analysis using the Mass theorem. Finally, we introduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the nativariate functions as well as the numerical descent method. We conclude the course with the integration of multivariate functions as well as the numerical descent method. We conclude the course with the integration of multivariate functions as well as the numerical descent method. We conclude the course with the integration of prodiferent devices. BIE-MP2.1				5
then applied to root-lifiding problems (flerative method of bisection and Newton's method), construction of cubic interpolation (spine), and formulation and subtuin of simple optimizatio roblems (i.e., the issue of finding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description of complexity of algorithm BIE-MA2.21 Mathematical (inclined in the course is devoted to number series, and Taylor ophnomials and series. We apply Taylor's theorem to the computation of elemental dust we the substitution method. The next part of the course is devoted to number series, and Taylor ophnomials and series. We apply Taylor's theorem to the computation of elemental dust we the substitution method. The next part of the course is devoted to number series, and Taylor ophnomials and series. We apply Taylor's theorem to the computation of elemental customs with a prescribed accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and its analysis using the Mastheorem. Finally, we introduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the halytical method of localization of local extrema of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the halytical method of localization of local extrema of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the health of the course is foliated and peripheral devices as well as the numerical descent method. We conclude the course with the integrated to multivariate functions and the course of the course is observed on methods of interfacing of peripheral devices is for such particles. The particles and particles and particles and the particles are such as a particle function of the particles and particles and particles and pa	l l	•	,	1
roblems (i.e., the issue of finding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description of complexity of algorithm BIE-MA2.21 Mathematical Analysis 2 The course completes the theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will learn how to integrate by part due the substitution method. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the computation of element unctions with a prescribed accuracy. Then we study the linear recurrence equations with constant coefficients, the condition of complexity of the prescribed accuracy. Then we study the linear recurrence equations with constant coefficients, the construction of constant and the sain analysis using the Mast theorem. Finally, we introduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the nalytical method of localization of local extrema of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the nalytical method of localization of local extrema of multivariate functions. Methods of interfacing of real peripheral devices is focused on the course with the integration of multivariate functions as well as the numerical devices. Is focused to the course with the integration of multivariate functions of the programming and devices is focused on methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on the device of the programming and design patterns. BIE-ODP	1 16 2			
Mathematical Analysis 2 Nathematical Analysis 2 Nathematical Analysis 2 Nathematical Malysis 2 Nathematical Analysis and series. We apply Taylor's theorem the tent of element incident analysis and interestive and interestive particular devices in a nathematical devices in formatical devices in f	nd real functions of a real	variable. We gradually introduce the notions of limits of sequences and functions, continuous functions, and derivatives of function	ns. This theoretic	al foundation
The course completes the theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will learn how to integrate by part due such the substitution method. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the computation of elements unctions with a prescribed accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and its analysis using the Mas theorem. Finally, we introduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the inear recurrence equations with constant coefficients, the course with the integration of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the matrix of local extrema of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the Masterian of the partial devices as the numerical descent method. Conclude the course with the integration of multivariate functions are well as the numerical devices concepts of partial derivative, gradient, and Hessian matrix, we study the Masterian of the partial devices is tocused on techniques based on Universal serial buts (USB). The modulates but PC side and peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB devices, Linux and Windows drivers, simple application development, and APIs of selected devices. ■ BIE-OOP	then applied to root-finding	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and s	solution of simple	optimization
ind use the substitution method. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the computation of elements uncloins with a prescribed accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and its analysis using the Mas theorem. Finally, we introduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the nalytical method of localization of local extrema of multivariate functions. After establishing basic concepts of partial derivative, gradient, and Hessian matrix, we study the nalytical method of localization of local extrema of multivariate functions. BIE-MPP.21 Methods of interfacing of peripheral devices is focused on techniques based on Universal serial bus (USB). The course is focused on methods for interfacing of peripheral devices. Interfacing of peripheral devices is focused on techniques based on Universal serial bus (USB). The course is focused on methods for interfacing of peripheral devices is focused on techniques based on Universal serial bus (USB). The course is focused on methods for interfacing of peripheral devices is focused on techniques based on Universal serial bus (USB). The course we lost and peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB devices, Linux and Window Green and Programming and APIs of selected devices. BIE-OOP	s then applied to root-findin roblems (i.e., the issue of t	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and s finding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description	solution of simple on of complexity o	optimization
The course is focused on methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on Universal serial bus (USB). The councidudes both PC side and peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB devices, Linux and Window drivers, simple application development, and APIs of selected devices. BIE-OOP Object-Oriented Programming Z,ZK 4 Object-Oriented Programming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together by message passing. In this course we look at some of the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development including testing, error handing, refactoring and design patterns. BIE-OSY.21 Operating Systems Z,ZK 5 BIE-OSY.21 Operating Systems Operating systems course students deepen their knowledge in areas of OS kernels, process and thread implementations, race condition ritical regions, thread scheduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monitoring. They are able to design and implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Windows. BIE-PA1.21 Programming and Algorithmics 1 Z,ZK 7 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, structured), expressions, statements and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fundamental algorithms for searching, sorting, and manipulating linked lists and trees. BIE-PA2.21 Programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, stable). They learn these skills using th	s then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the and use the substitution me	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and significantly finding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description Mathematical Analysis 2 theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the	solution of simple on of complexity of Z,ZK arn how to integrate computation of	optimization of algorithm 6 cate by part of elementa
BIE-OOP Object-Oriented Programming and Sudents gain experience with implementation of relevant parts of USB devices, Linux and Window drivers, simple application development, and APIs of selected devices. BIE-OOP Object-Oriented Programming Z,ZK 4 Object-oriented programming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together by message passing. In this course we look at some of the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development including testing, erro handing, refactoring and design and design patterns. BIE-OSY.21 Operating Systems Z,ZK 5 It is course that is a follow-up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread implementations, race condition intical regions, thread scheduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monitoring. They are able to design and implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Windows. BIE-PA1.21 Programming and Algorithmics 1 Z,ZK 7 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, structured), expressions, statements and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fundamental algorithms for searching, sorting, and manipulating linked lists and trees. BIE-PA2.21 Programming and Algorithmics 2 Z,ZK 7 Tudents know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, stable). They learn these skills using the C++ programming and are able to tome them for specifying and implementing abstract data types (stack,	then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the notate the substitution means the substitution means with a prescribed theorem. Finally, we intronallytical method of localizations.	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and significantly finding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lease thod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and aduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He teation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral.	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using essian matrix, we attion of multivaria	e optimization of algorithm 6 rate by parts of elemental og the Maste e study the late function
BIE-OOP Object-Oriented Programming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together by message passing. In this course we look at some of the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development including testing, en handing, refactoring and design patterns. BIE-OSY.21 Operating Systems Operating Systems Operating Systems It is course that is a follow-up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread implementations, race condition ritical regions, thread scheduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monitoring. They are able to design and implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Windows. BIE-PA1.21 Programming and Algorithmics 1 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, structured), expressions, statements and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fundamental algorithms for searching, sorting, and manipulating linked lists and trees. BIE-PA2.21 Programming and Algorithmics 2 Programming and Algorithmics 2 Rogramming and Algorithmics 2 Rogramming and are introduced to all C++ features needed in object-oriented programming (e.g., template programming, copying/moving of objects, operator overloading, inheritance, polymorphism). BIE-PJP Programming Languages and Compilers Copying/moving of objects, operator overloading, inheritance, polymorphism). BIE-PJP Programming languages and are introduced to all C++ features needed in object-oriented programming or a simple programming languages. They get experience with the design and implementation of individu	then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the not use the substitution means and the substitution with a prescribed theorem. Finally, we intromalytical method of localize	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and significantly finding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 etheme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and be oduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He cation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral Methods of interfacing peripheral devices	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis usin essian matrix, we ation of multivaria Z,ZK	e optimization of algorithm 6 rate by part of elementating the Mastre study the attention
Object-oriented programming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together by message passing. In this course we look at some of the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development including testing, error handing, refactoring and design patterns. BIE-OSY.21 Operating Systems Operating Systems Operating Systems Operating Systems Active course that is a follow-up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread implementations, race condition titical regions, thread scheduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monitoring. They are able to design and implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Windows. BIE-PA1.21 Programming and Algorithmics 1 Programming and Algorithmics 1 Programming and Algorithmics 2 Indents know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, stable). They learn these skills using the C++ programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, stable). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming (e.g., template programming, copying/moving of objects, operator overloading, inheritance, polymorphism). BIE-PJP Programming Languages and Compilers Or a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a targer and any organization of a text that has a certain syntax into a targer and any organization of a text that has a certain	then applied to root-finding to blems (i.e., the issue of the BIE-MA2.21 The course completes the and use the substitution means to be substitution of the course. Finally, we introduced theorem. Finally, we introduced the substitution of localizing bies.	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and significantly finding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 et theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discouracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and oduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He cation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on Universal states are practically oriented. Students gain experience with implementation of relevant parts of USB of the peripheral devices are practically oriented. Students gain experience with implementation of relevant parts of USB of the peripheral devices is focused on techniques based on Universal states.	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis usin essian matrix, we ation of multivariation of multivariation of size of the computation of size of the computation of multivariation of size of the computation of simple of the computation of simple of the computation	e optimization of algorithm 6 arate by part of elementa and the Mastre study the attention 5 or The Course
BIE-OSY.21 Operating Systems	then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the find use the substitution means theorem. Finally, we introduced theorem. Finally, we introduced the substitution of localizing bies. BIE-MPP.21 The course is focused on includes both PC side and	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and significantly finding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 e theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead eithod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discouracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and adduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He exation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on Universal states of the peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices.	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis usin essian matrix, we ation of multivariation of multivariation of size (USB) devices, Linux a	e optimization of algorithm 6 arate by part of elementa and the Mast estudy the ate function 5. The cours and Window
this course that is a follow-up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread implementations, race condition itical regions, thread scheduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monitoring. They are able to design and implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Windows. BIE-PA1.21 Programming and Algorithmics 1 Z,ZK 7 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, structured), expressions, statements and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fundamental algorithms for searching, sorting, and manipulating linked lists and trees. BIE-PA2.21 Programming and Algorithmics 2 Z,ZK 7 tudents know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, stable). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming (e.g., template programming, copying/moving of objects, operator overloading, inheritance, polymorphism). BIE-PJP Programming Languages and Compilers Z,ZK 5 tudents master basic methods of implementation of common high-level programming languages. They get experience with the design and implementation of individual compiler paor a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a targer of parsing and processing text in a language defined by a LL(1) grammar. BIE-PJV Programming in Java will introduce students to the object oriented programming in Java programming language. B	then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the not use the substitution means the substitution means theorem. Finally, we introduced theorem. Finally, we introduced the course is focused on not not use the substitution means the course is focused on not not substitute the course is focused on not not substitute the course is focused on not substitute the	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and significant of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 e theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and aduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He exation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral methods for interfacing of peripheral devices. Interfacing peripheral devices is focused on techniques based on Universal states of the peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together by	solution of simple on of complexity of Z,ZK arn how to integrate e computation of its analysis usin essian matrix, we ation of multivariation of multivariat	e optimization of algorithm 6 arate by part of elementa on the Mastre study the attention 5 or The Cours and Window 4 sing. In this
and implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Windows. BIE-PA1.21 Programming and Algorithmics 1 Z,ZK 7 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, structured), expressions, statements and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fundamental algorithms for searching, sorting, and manipulating linked lists and trees. BIE-PA2.21 Programming and Algorithmics 2 Z,ZK 7 tudents know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, stable). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming (e.g., template programming, copying/moving of objects, operator overloading, inheritance, polymorphism). BIE-PJP Programming Languages and Compilers Z,ZK 5 tudents master basic methods of implementation of common high-level programming languages. They get experience with the design and implementation of individual compiler particle or a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a target or a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a target or a simple programming language; but extends to all other program or a simple programming languages, but extends to all other program or parsing and processing text in a language defined by a LL(1) grammar. BIE-PJV Programming in Java Will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the rod use the substitution means theorem. Finally, we intromally tical method of localizing BIE-MPP.21 The course is focused on machine both PC side and BIE-OOP Tobject-oriented programs course we look at some or	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and significant of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 e theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and oduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He reation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral methods for interfacing of peripheral devices. Interfacing peripheral devices is focused on techniques based on Universal states of the peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together but the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development, and design patterns.	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using essian matrix, we atton of multivariation of multivariati	e optimization of algorithm 6 rate by part of elementating the Mast estudy the attention of the cours and Window 4 sing. In this esting, error
BIE-PA1.21 Programming and Algorithmics 1 Z,ZK 7 Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, structured), expressions, statements and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fundamental algorithms for searching, sorting, and manipulating linked lists and trees. BIE-PA2.21 Programming and Algorithmics 2 Z,ZK 7 tudents know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, stable). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming (e.g., template programming, copying/moving of objects, operator overloading, inheritance, polymorphism). BIE-PJP Programming Languages and Compilers tudents master basic methods of implementation of common high-level programming languages. They get experience with the design and implementation of individual compiler paramming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a targ true and write a compiler based on such a specification. The notion of compiler in this context is not limited to compilers of programming languages, but extends to all other program for parsing and processing text in a language defined by a LL(1) grammar. BIE-PJV Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java language the fundamental Afwill also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	then applied to root-finding to blems (i.e., the issue of the BIE-MA2.21 The course completes the rod use the substitution means to be substitution of the course is focused on a national state of the course is focused on a national state of the course is focused on a national state of the course is focused on a national state of the course is focused on a national state of the course is focused on a national state of the course is focused on a national state of the course is focused on a national state of the course is focused on the course we look at some of the course we look at some of the course we look at some of the course of the course we look at some of the course of the course we look at some of the course of th	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and significant of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 e theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discouracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and oduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He reation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral methods for interfacing of peripheral devices. Interfacing peripheral devices is focused on techniques based on Universal states are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be of the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development, and design patterns. Operating Systems	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using essian matrix, we attion of multivariate Z,ZK serial bus (USB) devices, Linux are Z,ZK oy message passement including to Z,ZK	e optimization of algorithm 6 rate by part of elementating the Mast estudy the attention of the cours and Window 4 sing. In this esting, error
Students learn to construct algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, structured), expressions, statements and functions presented in C language. They understand the principle of recursion and basics of algorithm complexity analysis. They know fundamental algorithms for searching, sorting, and manipulating linked lists and trees. BIE-PA2.21 Programming and Algorithmics 2 Z,ZK 7 tudents know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, stable). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming (e.g., template programming, copying/moving of objects, operator overloading, inheritance, polymorphism). BIE-PJP Programming Languages and Compilers Z,ZK 5 Tudents master basic methods of implementation of common high-level programming languages. They get experience with the design and implementation of individual compiler paper or a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a targer mand write a compiler based on such a specification. The notion of compiler in this context is not limited to compilers of programming languages, but extends to all other program for parsing and processing text in a language defined by a LL(1) grammar. BIE-PJV Programming in Java Z,ZK 4 He course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java language the fundamental AF will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	then applied to root-finding to them solves (i.e., the issue of the BIE-MA2.21 The course completes the and use the substitution means to the substitution means to the substitution means to the substitution means the substitution of localization of the substitution of localization o	Ing problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and splinding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 The theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will least ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and adduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He reation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral Methods of interfacing peripheral devices Methods of interfacing peripheral devices is focused on techniques based on Universal standard devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together by the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development, and design patterns. Operating Systems Weup of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread imple eduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monito	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using essian matrix, we attion of multivariation of multivariat	e optimization of algorithm 6 arate by part of elementa and the Master of estudy the attention of the cours and Window 4 sing. In this esting, error of the condition of the con
BIE-PA2.21 Programming and Algorithmics 2 Z,ZK 7 Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, stable). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming (e.g., template programming, copying/moving of objects, operator overloading, inheritance, polymorphism). BIE-PJP Programming Languages and Compilers Z,ZK 5 Students master basic methods of implementation of common high-level programming languages. They get experience with the design and implementation of individual compiler part or a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a target orm and write a compiler based on such a specification. The notion of compiler in this context is not limited to compilers of programming languages, but extends to all other programming and processing text in a language defined by a LL(1) grammar. BIE-PJV Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java language the fundamental AF will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the rod use the substitution means and theorem. Finally, we intromally its management of the course is focused on management of the course is focused on management of the course is focused on the course is focused on the course we look at some of the course we look at some of the course that is a following ritical regions, thread schematic in the course that is a following ritical regions, thread schematic in the course that is a following ritical regions, thread schematic in the course that is a following ritical regions, thread schematic in the course that is a following ritical regions, thread schematic in the course that is a following ritical regions, thread schematic in the course that is a following ritical regions, thread schematic in the course that is a following ritical regions, thread schematic in the course that is a following ritical regions, thread schematic in the course that is a following ritical regions, thread schematic in the course that is a following ritical regions, thread schematic in the course that is a following ritical regions, thread schematic in the course is the course that is a following ritical regions, thread schematic in the course that is a following ritical region in the course that is a following ritical region in the course that is a following ritical region in the course that is a following ritical region in the course ritical region in th	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and se finding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description Mathematical Analysis 2 etheme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and adduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He cation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral methods for interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on Universal set of peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be the main principles of object-oriented programming and design patterns. Operating Systems weup of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Winch implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Winch implements in the last solaries.	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using essian matrix, we attion of multivariate Z,ZK serial bus (USB) devices, Linux are Z,ZK over ment including to Z,ZK ementations, ractoring. They are andows.	e optimization of algorithm 6 rate by part of elemental of the Mastre estudy the late function of the cours
Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, stable). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming (e.g., template programming, copying/moving of objects, operator overloading, inheritance, polymorphism). BIE-PJP Programming Languages and Compilers Z,ZK 5 students master basic methods of implementation of common high-level programming languages. They get experience with the design and implementation of individual compiler pator a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a target or and write a compiler based on such a specification. The notion of compiler in this context is not limited to compilers of programming languages, but extends to all other program of programming and processing text in a language defined by a LL(1) grammar. BIE-PJV Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java language the fundamental AF will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	s then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the notion of use the substitution means and theorem. Finally, we intromally its management of localization	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and section generally secured as functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 etheme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discouracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and adduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He cation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral methods for interfacing of peripheral devices. Interfacing peripheral devices is focused on techniques based on Universals of peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be of the main principles of object-oriented programming and design patterns. Operating Systems w-up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread implementation implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Win Programming and Algorithmics 1	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using essian matrix, we atton of multivariation of multivariati	e optimization of algorithm 6 rate by part of elementating the Mastre study the late function 5. The cours and Window 4 sing. In this esting, error 5 the condition ble to design
Students know the instruments of object-oriented programming and are able to use them for specifying and implementing abstract data types (stack, queue, enlargeable array, list, stable). They learn these skills using the C++ programming language and are introduced to all C++ features needed in object-oriented programming (e.g., template programming, copying/moving of objects, operator overloading, inheritance, polymorphism). BIE-PJP Programming Languages and Compilers Z,ZK 5 Students master basic methods of implementation of common high-level programming languages. They get experience with the design and implementation of individual compiler particle for a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a target orm and write a compiler based on such a specification. The notion of compiler in this context is not limited to compilers of programming languages, but extends to all other programming in parameters of programming languages, but extends to all other programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java language the fundamental AF will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	s then applied to root-finding to blems (i.e., the issue of the BIE-MA2.21 The course completes the individual of the substitution means the substitution means the rescribed theorem. Finally, we intromally in the course is focused on more than the course is focused on more than the course is focused on more than the course we look at some of the course we look at some of the course that is a following ritical regions, thread schemand BIE-PA1.21 Students learn to constru	In problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and splinding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 The theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discouracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and oduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He teation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral of peripheral devices. Methods of interfacing peripheral devices is focused on techniques based on Universal states of interfacing of peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be of the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development, and design patterns. Operating Systems Operating Systems Operating Systems We up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Win Programming a	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using essian matrix, we attion of multivariation of multivariat	e optimization of algorithm 6 rate by part of elementating the Mastre estudy the late function 5. The cours and Window 4 sing. In this esting, error the condition ble to design 7 statements
copying/moving of objects, operator overloading, inheritance, polymorphism). BIE-PJP Programming Languages and Compilers Z,ZK 5 tudents master basic methods of implementation of common high-level programming languages. They get experience with the design and implementation of individual compiler part or a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a target or mand write a compiler based on such a specification. The notion of compiler in this context is not limited to compilers of programming languages, but extends to all other programming or parsing and processing text in a language defined by a LL(1) grammar. BIE-PJV Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java language the fundamental AF will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the rod use the substitution means the rescribed theorem. Finally, we intromalytical method of localizing BIE-MPP.21 The course is focused on management of the course is focused on the course is focused on the course we look at some of the course we look at some of the course that is a following ritical regions, thread schemand BIE-PA1.21 Students learn to construand functions presented	In problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and splinding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 In theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discouracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and adduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He cation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral of peripheral devices. Interfacing peripheral devices is focused on techniques based on Universal states of interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on Universal states are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development, and design patterns. Operating Systems w-up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread imple eduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file syste	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using assian matrix, we attion of multivariation of multivariat	e optimization of algorithm 6 rate by part of elementating the Mast estudy the late function 5. The cours and Window 4 sing. In this esting, error 5. Exe condition ble to design of the searching, error of the searching, error of the country of
Students master basic methods of implementation of common high-level programming languages. They get experience with the design and implementation of individual compiler paterial components of a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a target or mand write a compiler based on such a specification. The notion of compiler in this context is not limited to compilers of programming languages, but extends to all other program for parsing and processing text in a language defined by a LL(1) grammar. BIE-PJV Programming in Java Programming in Java Z,ZK 4 The course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java language the fundamental AF will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	sthen applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the rod use the substitution means and theorem. Finally, we intromally find the roots of the course is focused on respectively. The course is focused on respectively. The course is focused on respectively. The course we look at some of the course that is a following ritical regions, thread schemand BIE-PA1.21 Students learn to construand functions presented the source of the roots of the r	In groblems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and splinding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description Mathematical Analysis 2 In theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discouracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and adduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He tation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integra Methods of interfacing peripheral devices. Methods of interfacing peripheral devices Methods of interfacing peripheral devices is focused on techniques based on Universals of peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB of divers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be of the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development, and design patterns. Operating Systems Operating Systems wup of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread implements simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Win Programming and Algorithmics 1 In C language. They understand the principle of recursion and basics of algorithm comple	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using assian matrix, we attion of multivariation of multivariat	e optimization of algorithm of algorithm of algorithm of algorithm of elementating the Mastria estudy the state function of the state function of the cours of the cours of the cours of the course of
tudents master basic methods of implementation of common high-level programming languages. They get experience with the design and implementation of individual compiler pa or a simple programming language: data types, subroutines, and data abstractions. Students are able to formally specify a translation of a text that has a certain syntax into a targ orm and write a compiler based on such a specification. The notion of compiler in this context is not limited to compilers of programming languages, but extends to all other program for parsing and processing text in a language defined by a LL(1) grammar. BIE-PJV Programming in Java Z,ZK 4 The course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java language the fundamental AF will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the root in the course the substitution means the reservibed theorem. Finally, we intromally tical method of localized by the course is focused on an includes both PC side and the course is focused on the course we look at some of the course we look at some of the course that is a following that is a following the course that is a following that is a followin	In groblems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and splinding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description Mathematical Analysis 2 The theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lead the thod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and adduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He cation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integra Methods of interfacing peripheral devices is focused on techniques based on Universal dependence of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on Universal dependence of peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be find the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development, and design patterns. Operating Systems Operating Systems W-up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread imple deuling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monito implement simple multithreaded applications. General principles are illus	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using assian matrix, we attion of multivariation of multivariat	e optimization of algorithm of algorithm of algorithm of algorithm of algorithm of elementation of the Mastria estudy the state function of 5. The cours and Window of 4. The course of the condition of the condi
orm and write a compiler based on such a specification. The notion of compiler in this context is not limited to compilers of programming languages, but extends to all other program for parsing and processing text in a language defined by a LL(1) grammar. Programming in Java Programming in Java Z,ZK 4 the course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java language the fundamental AF will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	then applied to root-finding to them applied to root-finding to them (i.e., the issue of the BIE-MA2.21 The course completes them duse the substitution means the finding with a prescribed theorem. Finally, we intropose the finding with a prescribed theorem. Finally, we intropose the finding with a prescribed theorem. Finally, we intropose the course is focused on a course is focused on a course both PC side and the finding with a prescribed programment of the finding with a findi	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and splinding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description Mathematical Analysis 2 at theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lease thod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discouracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and adduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He ration of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral Methods of interfacing of peripheral devices. Methods of interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on Universal at peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be fully the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development, and a peripheral devices are practically oriented. Systems When of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread imple eduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monito implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, L	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using assian matrix, we attion of multivariation of Z,ZK as a control of the control of th	e optimization of algorithm of algorithm of algorithm of algorithm of elementa in the study the
BIE-PJV Programming in Java Programming in Java Z,ZK 4 The course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java language the fundamental AF will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the rod use the substitution means the rescribed theorem. Finally, we intropose the course is focused on rescribing the course is focused on rescribing the course is focused on rescribing the course is focused on the course is focused on the course we look at some of the course we look at some of the course we look at some of the course that is a follow ritical regions, thread schemand BIE-PA1.21 Students learn to construe and functions presented the course when the instrument that is a follow ritical regions, thread schemand functions presented the course when the course we look at some of t	Ing problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and splinding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description Mathematical Analysis 2 In theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will least ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the discuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and aduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He reation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integrated in local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integrated peripheral devices are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together by the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development and problems by using graphs of objects that collaborate together by the main principles of object-oriented programming and design and design patterns. Operating Systems Operating Systems Weup of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread imple eduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monito implement simple multithreaded applications. Ge	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using assian matrix, we attion of multivariation of multivariat	e optimization of algorithm of algorithm of algorithm of algorithm of elementary of elementary of elementary of elementary of the Mastrian of
The course Programming in Java will introduce students to the object oriented programming in Java programming language. Beside of basics of Java language the fundamental AF will also be presented, especially data structures, files, GUI, networking, databases and concurrent APIs.	then applied to root-finding roblems (i.e., the issue of the BIE-MA2.21 The course completes the rod use the substitution means the rescribed theorem. Finally, we intropose the course is focused on rescribing the course is focused on rescribing the course is focused on rescribing the course is focused on the course is focused on the course we look at some of the course we look at some of the course we look at some of the course that is a follow ritical regions, thread schemand BIE-PA1.21 Students learn to construe and functions presented the course when the instrument the course we look at some of look at the course we look at some of look at the course we look at some of look at the course we look at some of look at the course we look	Ing problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and signifing extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description Mathematical Analysis 2 In theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will leae ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and oduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He tation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integration of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integration of concepts of interfacing of peripheral devices. Interfacing peripheral devices is focused on techniques based on Universal to peripheral devices interfacing of peripheral devices. Interfacing of real peripheral devices is focused on techniques based on Universal to peripheral devices are practically oriented. Students gain experience with implementation of relevant parts of USB of divers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be fet main principles of object-oriented programming and design. The emphasis is on practical techniques for software development of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread imple eduling, shared resource allocation and deadlocks, management of virtual memory and data storages, f	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using assian matrix, we attion of multivariation of Z,ZK over mentations, ractoring. They are a nation of the complex of the comp	e optimization of algorithm of algorithm of algorithm of algorithm of elementa in general structure
	s then applied to root-finding or oblems (i.e., the issue of the BIE-MA2.21 The course completes the and use the substitution mean unctions with a prescribed theorem. Finally, we introduced and BIE-MP.21 The course is focused on mincludes both PC side and BIE-OSY.21 In this course that is a follow pritical regions, thread schema and BIE-PA1.21 Students learn to construe and functions presented BIE-PA2.21 Students know the instrum table). They learn these BIE-PJP Students master basic met for a simple programming orm and write a compiler the state of the same and the same	Ing problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and signifing extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description Mathematical Analysis 2 In theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will leae ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and oduce the student to the theory of multivariate functions. After establishing basic concepts of partial devirative, gradient, and He tation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integration of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integration of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integration of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integration of the part of multivariate functions as well as the numerical descent method. We conclude the course with the integration of the part of the part of multivariate functions as well as the numerical descent method. We conclude the course with the integration of the part of the part of multivariate functions as well as the numerical descent method. We conclude the course with the integration of the part of the part of the part of the part of the particles. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be for the main principles of object-oriented programming and design. The emphasis is on practi	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using assian matrix, we attion of multivariation of J,ZK asserial bus (USB) devices, Linux and Z,ZK asseriation of multivariation of multivariation of J,ZK and algorithms for Z,ZK are, enlargeable and g., template programment individual contains a certain syntax extends to all other complexity of the complexity of	e optimization of algorithm 6 rate by parts of elementaring the Master estudy the late function 5 on The cours and Window 4 sing. In this esting, erro 5 ce condition ble to design of the design
BIE-PKM Preparatory Mathematics Z 4	s then applied to root-finding or oblems (i.e., the issue of the BIE-MA2.21 The course completes the sund use the substitution mean unctions with a prescribed theorem. Finally, we introduced the course is focused on mincludes both PC side and solve the course we look at some of look at some o	ng problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and signifing extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description Mathematical Analysis 2 stheme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lea ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recursive algorithms, and adouce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and He ration of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral Methods of interfacing of interfacing peripheral devices. Methods of interfacing peripheral devices is focused on techniques based on Universal of peripheral devices side. Labs are practically oriented. Students gain experience with implementation of relevant parts of USB of drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be of the main principles of object-oriented programming and design. The emphasis is on practical techniques for software development, and factoring and design patterns. Operating Systems W-up of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread imple eduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monito implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Win Programming and Algorithmics	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using assian matrix, we ation of multivariation of multivariations (USB) devices, Linux at Z,ZK opy message passiment including to Z,ZK ementations, ractoring. They are an andows. Z,ZK ementations, ractoring. They are an andows. Z,ZK all algorithms for Z,ZK all algorithms for Z,ZK are, enlargeable at g., template programmer individual of a certain syntax extends to all other Z,ZK are a certain syntax extends to all other Z,ZK	e optimization of algorithm 6 rate by partire of elemental graph of e
The purpose of Preparatory Mathematics is to help students revise the most important topics of high-school mathematics.	s then applied to root-finding or oblems (i.e., the issue of the BIE-MA2.21 The course completes the sund use the substitution mean unctions with a prescribed theorem. Finally, we introduced the form of the course is focused on mincludes both PC side and some of the course that is a follow stritical regions, thread school and BIE-PA1.21 Students learn to construent and functions presented the summer of the summer	Ing problems (iterative method of bisection and Newton's method), construction of cubic interpolation (spline), and formulation and is finding extrema of functions). The course is closed with the Landau's asymptotic notation and methods of mathematical description. Mathematical Analysis 2 In theme of analysis of real functions of a real variable initiated in BIE-MA1 by introducing the Riemann integral. Students will lea ethod. The next part of the course is devoted to number series, and Taylor polynomials and series. We apply Taylor's theorem to the accuracy. Then we study the linear recurrence equations with constant coefficients, the complexity of recrusive algorithms, and aduce the student to the theory of multivariate functions. After establishing basic concepts of partial derivative, gradient, and he tation of local extrema of multivariate functions as well as the numerical descent method. We conclude the course with the integral methods for interfacing of peripheral devices. Interfacing operipheral devices is focused on techniques based on Universal is drivers, simple application development, and APIs of selected devices. Object-Oriented Programming ming has been used in the last 50 years to solve computational problems by using graphs of objects that collaborate together be the main principles of object-oriented programming and design. The emphasis is on practical techniques for software develope handing, refactoring and design patterns. Operating Systems Wup of the Unix-like operating systems course students deepen their knowledge in areas of OS kernels, process and thread imple eduling, shared resource allocation and deadlocks, management of virtual memory and data storages, file systems, OS monito implement simple multithreaded applications. General principles are illustrated on operating systems Solaris, Linux, or MS Win Programming and Algorithmics 1 Ict algorithms for solving basic problems and write them in the C language. They master data types (simple, pointers, structured it in C languag	solution of simple on of complexity of Z,ZK arn how to integrate computation of its analysis using assian matrix, we ation of multivariation of Z,ZK asserial bus (USB) devices, Linux and Z,ZK arn and and all algorithms for Z,ZK are, enlargeable and g., template programment individual confideration of individual confi	e optimization of algorithm 6 rate by particular of elementaring the Master of elementaring the elementaring the Master of elementaring the elementaring t

BIE-PNO.21 Practical Digital Design ΚZ 5 Students get an overview of the contemporary digital design flow and learn practical skills to use synchronous design techniques. They understand the basics of the VHDL language and implementation technologies FPGA and ASIC. Students demonstrate practical use of the design techniques in the course project using modern industry-standard CAD design tools. BIE-PRR.21 Project management Z,ZK The aim of the course is to introduce students into the basic concepts and principles of project management, i.e. methods of planning, teamwork, analysis, crisis management in a project, communication, argumentation and meeting management. Students will practice project management techniques (e.g. SWOT analysis, risk assessment and management, Gantt charts, resource schedule, resource balancing, network graphs) and creation of project documentation. The course is designed especially for students who are interested in deepening their knowledge outside IT, consider starting their own company, or have ambitions to work in middle or senior management positions in large companies. The course is also suitable for all those who will develop software or hardware in the form of team projects. BIE-PS2 Programming in shell 2 Students get a general overview of scripting languages, introduction into syntax, semantics, programming style, data structures, pros and cons. In addition, they gain a deeper insight into Bourne Again shell and some other particular scripting languages and will get practical experience with shell script programming. Note to Erasmus students: We are ready do adapt the lectures to provide even very basic Bourne shell usage. Depending on actual knowledge of the students, orientation in user filesystem tools (cp, ln, mkdir, rm...) and useful basic data filtering tools (cut, tr, sort, uniq...) can be provided. The advantage of this module is that we do not stop at this point - we will show you also a selection of advanced scripting techniques used in practice. BIE-PSI.21 Computer Networks The course introduces students to the principles of computer networking. It covers basic technologies, protocols, and services commonly used in local networks and in the Internet as well. The lectures will be amended by proseminars that introduce students into network programming and demonstrate the abilities of advanced network technologies. Students practically verify configurations and management of network devices in the lab within the environment of the operating systems Linux and Cisco IOS. Probability and Statistics Students will learn the basics of probabilistic thinking, the ability to synthesize prior and posterior information and learn to work with random variables. They will be able to apply basic models of random variable distributions and solve applied probabilistic problems in informatics and computer science. Using the statistical induction they will be able to perform estimations of unknown distributional parameters from random sample characteristics. They will also be introduced to the methods for testing statistical hypotheses and determining the statistical dependence of two or more random variables. BIE-SAP.21 Computer Structures and Architectures Z,ZK 5 Students understand basic digital computer units and their structures, functions, and hardware implementation: ALU, control unit, memory system, inputs, outputs, data storage and transfer. In the labs, students gain practical experience with the design and implementation of the logic of a simple processor using modern digital design tools Computer Engineering Seminar I The Seminar of Computer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to failures and attacks. Students are approached individually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the subject is work with scientific articles and other professional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teachers. The topics are new for each semester. BIE-SCE2 Computer Engineering Seminar II The Seminar of Computer Engineering is a (s)elective course for students who want to deal with deeper topics of digital design, reliability and resistance to failures and attacks. Students are approached individually within the subject. Each student or group of students solves some interesting topic with the selected supervisor. Part of the subject is work with scientific articles and other professional literature and/or work in K N laboratories. The capacity of the subject is limited by the possibilities of the seminar teachers. The topics are new for each **BIE-SEG** Systems Engineering Ζ This is an introductory class on systems engineering for bachelor students in computer science. The goal of the class is to introduce basic principles of operating systems for students to understand processor and memory virtualization. Seeing and actually understanding virtualization is the overarching theme of the class. After taking the class, students are able to understand the difference between processes and threads as well as emulation and virtualization, what virtual memory is and how it works, what concurrency is, as opposed to parallelism, and how processes and threads synchronize efficiently to overcome concurrency for communication. **BIE-SEP** World Economy and Business 7 7K The course introduces students of technical university to the international business. It does that predominantly by comparing individual countries and key regions of world economy. Students get to know about different religions and cultures, necessary for doing business in diverse societies as well as indexes of economic freedom, corruption and economic development, which are needed for the right investment decision. Seminars help to improve on the knowledge in the form of discussions based on individual readings. It is advised to take bachelor level of this course BIE-SEP as a prerequisite. Scripting Languages Students get a general overview of scripting languages, introduction into syntax, semantics, programming style, data structures, pros and cons. In addition, they gain a deeper insight into Bourne Again shell and some other particular scripting languages and will get practical experience with shell script programming. Note to Erasmus students: We are ready do adapt the lectures to provide even very basic Bourne shell usage. Depending on actual knowledge of the students, orientation in user filesystem tools (cp, In, mkdir, rm...) and useful basic data filtering tools (cut, tr, sort, uniq...) can be provided. The advantage of this module is that we do not stop at this point - we will show you also a selection of advanced scripting techniques used in practice. BIE-SRC.21 Real-time systems Z,ZK Students obtain the basic knowledge in the real-time (RT) system theory and in the design methods for RT systems including the dependability issues. Theoretical knowledge from lectures will be experimentally verified in department specialized labs. The course is mainly focused on embedded RT systems, therefore the design kits in the lab are the same as in the BIE-VES course and FPGAs. BIE-ST1 Network Technology 1 Ζ 3 The course is focused on essentials of computer networks and practice with network technologies. The course corresponds to the Cisco Netacad curriculum, CCNA1 - R&S Introduction to Networks. BIE-TDP.21 **Documentation and Presentation** The course is focused on the basics of creating electronic documentation with emphasis on the creation of technical reports of a larger scope, typically final university theses. Students learn to create text of a technical report in the LaTeX system, process an electronic presentation using the LaTeX Beamer system, and practically present it in front of classmates and the teacher. The course is intended primarily for those students who have chosen the topic of their bachelor's thesis or will choose it within the first 14 days of teaching. Within the exercises of the course, an active approach to the creation of individual parts of the bachelor's thesis is assumed. BIE-TUR.21 User Interface Design Z,ZK 5 Students gain a basic overview of methods for designing and testing common user interfaces. They get experience to solve the problems where software and other products do not communicate with the user optimally, since the needs and characteristics of users are not taken into account during product development. Students gain an overview of methods that bring users into the development process to ensure optimal interface for them.

BIE-TZP.21	Technological Fundamentals of Computers	Z.ZK	5
	ainted with the fundamentals of digital and analog circuits, as well as basic methods of analyzing them. Students learn how computer s	,	_
	roduced to the function of a transistor. They will understand why processors generate heat, why cooling is necessary, and how to redi		
•	num operating frequency are and how to raise them; why a computer bus needs to be terminated, what happens if it is not; how a cor	•	
inits to the maxin	(in principle). In the labs, students model the behavior of basic electrical circuits in SW Mathematica.	ilputer power supp	ny looks like
DIE LIGO 04		1/7	
BIE-UOS.21	Unix-like Operating Systems	KZ	5
-	g systems represent a large family mostly open-source codes that kept bringing during the history of computers efficient innovative fu		
	outers and their networks and clusters. The most popular OS today, Android, has a unix kernel. Students get overview of basic proper		•
	eads, access rights and user identity, filters, or handling files in a file system. They learn to use practically these systems at the level		
	e to utilize powerful system tools that are available to users, but are also able to automatize routine agenda using the unix scripting in		
BIE-VAK.21	Selected Combinatorics Applications	Z	3
	o introduce students in an accessible form to various branches of theoretical computer science and combinatorics. In contrast to the b		
	tions to theory. Together, we will first refresh the basic knowledge needed to design and analyze algorithms and introduce some basic		
· · · · · · · · · · · · · · · · · · ·	ticipation of students, we will focus on solving popular and easily formulated problems from various areas of (not only theoretical) info		
vill select probler	ms to be solved will include, for example, graph theory, combinatorial and algorithmic game theory, approximation algorithms, optimiz	ation and more. S	tudents will
	also try to implement solutions to the studied problems with a special focus on the effective use of existing tools.	1	
BIE-VES.21	Embedded Systems	Z,ZK	5
udents learn to d	lesign embedded systems and develop software for them. They get basic knowledge of the most common microcontrollers and embedo	led processors, the	eir integrated
	peripheral circuits, programming methods, and applications. They get practical skills with development kits and tools.		
BIE-VR1.21	Virtual reality I	KZ	4
ntroduction to Vi	rtual Reality (VR), virtual reality operations, metaverse, and creation. Rules and requirements for virtual worlds communication. The c	ourse focuses on	the ways of
	creating virtual reality worlds and interactive activities in 3D worlds. It improves computational thinking, empathy, and shared social	activities.	
BIE-ZRS	Basics of Systems Control	Z.ZK	4
optional subject E	Sasics of System Control is designed for anyone interested in applied computer science in bachelor studies. A brief introduction to the	field of automation	control will
e definitely evalu	uated by our graduates in the industrial practice. Students will gain knowledge in this rapidly evolving field of great future. We will focu	s our attention pa	ticularly on
ontrol of enginee	ring and physical systems. We will provide basic information from the feedback control of linear dynamical SISO systems. We will tea	ch you description	methods of
stem models, ba	isic linear dynamic systems analysis and design verification, simple PID feedback, PSD and fuzzy controllers. This is a survey course	in which students	will learn the
ethods of creatin	g a description of the system model, the basic linear dynamic systems analysis and design verification and simple PID feedback, PSD	and fuzzy controlle	ers. Attentio
also given to se	nsors and actuators in control loops, issues of stability in control systems, single and continuous adjustment of the controller parame	ters and certain as	spects of the
industrial impler	mentation of continuous and digital controllers and PLC control. The themes of lectures are accompanied by a number of useful exan	ples and practical	industrial
	implementations.		
BIE-ZRS.21	Basics of System Control	Z.ZK	5
	an introduction to the field of automatic control. It focuses particularly on the control of engineering and physical systems. It covers ba	, ,	_
•	namical single-input-single-output systems. Students will learn the methods of creating descriptions of system models, basic linear of	ŭ	
	ation of simple feedback PID, PSD, and fuzzy controllers. Attention is also given to sensors and actuators in control loops, issues of sta		
•	and continuous adjustment of the controller parameters, and certain aspects of the industrial implementations of continuous and digit		
BIE-ZUM	Artificial Intelligence Fundamentals	Z.ZK	4
_	duced to the fundamental problems in the Artificial Intelligence, and the basic methods for their solving. It focuses mainly on the classic	1 '	
	ti-agent systems, game theory, planning, and machine learning. Modern soft-computing methods, including the evolutionary algorithm		
acc scaron, mar	be presented as well.	is and the neutain	ictworks, wi
BIE-ZUM.21	,	Z.ZK	5
_	Artificial Intelligence Fundamentals	,	
	duced to the fundamental problems in the Artificial Intelligence, and the basic methods for their solving. It focuses mainly on the classic		
ace search, mu	ti-agent systems, game theory, planning, and machine learning. Modern soft-computing methods, including the evolutionary algorithm	is and the neural r	etworks, wi
·	be presented as well.		
TV2K1	be presented as well. Physical Education 2	Z	1
•	be presented as well.		· · · · · · · · · · · · · · · · · · ·

Physical education

Physical education

Czech language for advanced Z,ZK

An advanced Czech course for Ukrainian students with refugee status. The exam will confirm knowledge of Czech at B2 level with validity for CTU.

Z

Z

0

0

2

For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2024-05-18, time 08:43.

TVV

TVV0

UKCJP