Study plan

Name of study plan: Information and Communication Technology in Medicine - full-time

Faculty/Institute/Others:
Department: Department of Information and Communication Technology in Medicine
Branch of study guaranteed by the department: Information and Communication Technology in Medicine
Garantor of the study branch: doc. PhDr. Ing. Jaroslav Průcha, Ph.D. et Ph.D.
Program of study: Biomedical and Clinical Technology
Type of study: Bachelor full-time
Required credits: 180
Elective courses credits: 0
Sum of credits in the plan: 180
Note on the plan:

Name of the block: Compulsory courses
Minimal number of credits of the block: 156
The role of the block: Z

Code of the group: 17PBT POV 16
Name of the group: Information and Communication Technology in Medicine compulsory course 16
Requirement credits in the group: In this group you have to gain 156 credits
Requirement courses in the group: In this group you have to complete 34 courses
Credits in the group: 156
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
17PBTALP	**Algoritmic and Programming Theory** *Pavel Smrčka* ***Pavel Smrčka*** *Pavel Smrčka (Gar.)*	Z,ZK	4	2P+2C	Z	z
17PBTAJ1	**English Language I** ***Eva Motyčková***	KZ	3	2C	Z	z
17PBTAJ2	**English Language II** ***Eva Motyčková***	KZ	3	2C	L	z
17PBTAJ3	**English Language III** *Eva Maxová, Eva Motyčková* ***Eva Motyčková*** *Eva Motyčková (Gar.)*	KZ	4	2C	Z	z
17PBTAJ4	**English Language IV**	KZ	4	2C	L	z
17PBTBP	**Bachelor Thesis** ***Karel Hána***	KZ	11	11C	L	z
17BOZP	**Occupational Safety and Health, Fire Protection and First Aid** *Petr Kudrna* ***Petr Kudrna*** *Petr Kudrna (Gar.)*	Z	0	1P	Z	z
17PBTDAS	**Data Network** *Dalibor Hrabec, Jan Mužík* ***Jan Mužík*** *Jan Mužík (Gar.)*	Z,ZK	4	2C	Z	z
17PBTFY1	**Physics I** *Jan Mikšovský, Jana Urzová, Petr Písařík* ***Petr Písařík*** *Jan Mikšovský (Gar.)*	Z,ZK	5	2P+2C	Z	z
17PBTFY2	**Physics II** ***Petr Písařík***	Z,ZK	5	2P+2C	L	z
17PBTITT	**Information Technology and Telemedicine** ***Karel Hána***	Z,ZK	4	2P	Z	z
17PBTITP	**Integral Calculus**	Z,ZK	4	2P+2C	L	z
17PBTKPZ	**Communication and Presentation in Healthcare**	KZ	3	1P+1C	L	z
17PBTLAD	**Linear Algebra and Differential Calculus** *Jana Urzová, Eva Feuerstein, Svitlana Strunina, Lucie Drbohlavová Eva Feuerstein (Gar.)*	Z,ZK	4	2P+2C	Z	z
17PBTNET	**Neurotechnologies** ***Karel Hána***	KZ	4	2P+2C	L	z
17PBTNPC	**Standards, Legislation, Law and Certification of Medical Equipment** *Peter Kneppo, Vojtěch Kamenský* ***Vojtěch Kamenský*** *Peter Kneppo (Gar.)*	KZ	4	1P	Z	z
17PBTOPS	**Operating Systems** ***Jan Mužík***	Z,ZK	4	2P+2C	L	z

17PBTVEZ	**Computer aided design, development and production of electronic devices** ***Martin Vítězník***	KZ	3	2C	L	z
17PBTZNM	**Practical Basics of Numerical Methods** ***Pavel Smrčka***	KZ	4	1P+1C	L	z
17PBTPR1	**Project I** *Karel Hána, Ondřej Antoš, Dominik Fiala, Dominik Fiala, Marek Doksanský* ***Karel Hána*** *Karel Hána (Gar.)*	KZ	6	12C	Z	z
17PBTPR2	**Project II** ***Karel Hána***	KZ	6	6C	L	z
17PBTPR3	**Project III** *Karel Hána* ***Karel Hána*** *Karel Hána (Gar.)*	KZ	10	12C	Z	z
17PBTPR4	**Project IV** ***Karel Hána***	KZ	6	6C	L	z
17PBTPR5	**Project V** *Karel Hána* ***Karel Hána*** *Karel Hána (Gar.)*	KZ	11	11C	Z	z
17PBTTCS	**Technology of Digital Systems** *Tomáš Funda, Jan Uhlíř* ***Tomáš Funda*** *Jan Uhlíř (Gar.)*	Z,ZK	4	2P+2C	Z	z
17PBTTEL	**Theory of Electrical Engineering**	Z,ZK	4	2P+2C	L	z
17PBTVBI	**Virtual Bioinstrumentation**	KZ	4	1P+1C	L	z
17PBTPOD	**Fundamentals of Entrepreneurship in the Czech Republic and Protection of Intellectual Property** *Vojtěch Kamenský, Martina Caithamlová* ***Vojtěch Kamenský*** *Martina Caithamlová (Gar.)*	Z	3	1P+1C	Z	z
17PBTPSM	**Basics of Programming and Simulation in Matlab** *David Jirsa* ***Slávka Neťuková*** *David Jirsa (Gar.)*	Z,ZK	4	2C	Z	z
17PBTSI1	**Fundamentals of Software Engineering** ***Jan Mužík***	Z,ZK	4	2P+2C	Z	z
17PBTSI2	**Fundamentals of Software Engineering II** ***Jan Mužík***	Z,ZK	4	2P+2C	L	z
17PBTMAS	**Introduction to Mobile Applications and Systems** ***Radim Kliment***	Z,ZK	5	2P+2C	L	z
17PBTUTM	**Introduction to Telemedicine** ***Karel Hána***	Z,ZK	4	2P+2C	L	z
17PBTZAK	**Introduction to Security and Applied Cryptography** *Dagmar Brechlerová* ***Dagmar Brechlerová*** *Dagmar Brechlerová (Gar.)*	KZ	4	2C	Z	z

Characteristics of the courses of this group of Study Plan: Code=17PBT POV 16 Name=Information and Communication Technology in Medicine compulsory course 16

17PBTALP	Algoritmic and Programming Theory	Z,ZK	4
Algorithm, data structures. Identifiers, data types. assignment statement, conditional statement, cycles. Arithmetical and logical operations. Digital representation of numbers, numeration systems. Introduction to structured programming in C language - building and structure of simple programs, creating of the user functions, user input and output, file management, memory management. Practical overview of programming techniques and basic algorithms in C language. Recursive and iterative methods, measuring algorithm quality. Abstract data-types, data sorting and searching, implementation of basic numerical algorithms. Introduction to biomedical data processing - programmers view. Introduction to software engineering.			
17PBTAJ1	English Language I	KZ	3
17PBTAJ2	English Language II	KZ	3
17PBTAJ3	English Language III	KZ	4
17PBTAJ4	English Language IV	KZ	4
17PBTBP	Bachelor Thesis	KZ	11
17BOZP	Occupational Safety and Health, Fire Protection and First Aid	Z	0
17PBTDAS	Data Network	Z,ZK	4
17PBTFY1	Physics I	Z,ZK	5
Physics I course will allow students to acquire and strengthen knowledge in these branches of physics: mechanics, thermodynamics and solid state physics. We focus on solid theoretical bases, but independent work in student labs as well as solving practical examples are also important parts of the course. Through the course we also touch the limits of the classical Physics.			
17PBTFY2	Physics II	Z,ZK	5
17PBTITT	Information Technology and Telemedicine	Z,ZK	4
Computer history, structure of computers, motherboard, processors, memody, graphical card, computer buses, BIOS, I/O devices, server, desktop, notebook, pocket PC, data storage, mobile devices, memory card, OS, tasks and memory management, printers scanner, multimedial devices, mass data storage, multitasking, multiprocessoring, set of instruction, assembler, programming languages, power test, network, LAN, WAN, interner, TCP/IP, HTTP, FTP etc., client-server, gate, router, using IT in medicine and telemedicine.			
17PBTITP	Integral Calculus	Z,ZK	4
The subject is an introduction to integral calculus and integral transforms. Integral calculus: primitive function, indefinite integral, properties and methods of integration (integration by parts and by substitution, partial fractions), definite integral, properties, Newton-Leibnitz fundamental theorem, simple applications of both indefinite and definite integrals, improper integral, solving differential equations (ODEs) (1st order ODEs with separable variables, linear 1st order homogenous as well as non-homogenous ODEs, 2nd order linear homogenous and non-homogenous ODEs with constant coefficients),intro to multiple integrals, particularly double integral and applications. Integral transforms: Laplace transform and inverse Laplace transform and their application for solving nth order linear ODEs with constant coefficients. Z-transform and inverse Z-transform, their application for solving nth order linear difference equations.			
17PBTKPZ	Communication and Presentation in Healthcare	KZ	3
17PBTLAD	Linear Algebra and Differential Calculus	Z,ZK	4
The course is an introduction into linear algebra and calculus of one variable. Linear algebra part consists of: systems of linear equations and their solutions, Gauss elimination, matrices, rank of a matrix, operations with matrices, inverse matrix, determinant and its calculation, eigenvalues and eigenvectors of matrices. Differential calculus consists of: sequences and their limits. Functions of one real variable, their limits, continuousness, derivatives. Local and absolute extremes of a function of one variable, investigations of functions. Taylor-polynome.			
17PBTNET	Neurotechnologies	KZ	4

17PBTNPC	Standards, Legislation, Law and Certification of Medical Equipment	KZ	4
17PBTOPS	Operating Systems	Z,ZK	4
17PBTVEZ	Computer aided design, development and production of electronic devices	KZ	3
Introduction to computer-aided design, development and manufacturing of electronic devices.			
17PBTZNM	Practical Basics of Numerical Methods	KZ	4
17PBTPR1	Project I	KZ	6
17PBTPR2	Project II	KZ	6
17PBTPR3	Project III	KZ	10
17PBTPR4	Project IV	KZ	6
17PBTPR5	Project V	KZ	11
17PBTTCS	Technology of Digital Systems	Z,ZK	4
17PBTTEL	Theory of Electrical Engineering	Z,ZK	4
17PBTVBI	Virtual Bioinstrumentation	KZ	4
17PBTPOD	Fundamentals of Entrepreneurship in the Czech Republic and Protection of Intellectual Property	Z	3
17PBTPSM	Basics of Programming and Simulation in Matlab	Z,ZK	4
17PBTSI1	Fundamentals of Software Engineering	Z,ZK	4
17PBTSI2	Fundamentals of Software Engineering II	Z,ZK	4
17PBTMAS	Introduction to Mobile Applications and Systems	Z,ZK	5
17PBTUTM	Introduction to Telemedicine	Z,ZK	4
17PBTZAK	Introduction to Security and Applied Cryptography	KZ	4

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 24
The role of the block: S

Code of the group: 17PBT PV 3S 16
Name of the group: Information and Communication Technology in Medicine compulsory optional course 3rd semester 16
Requirement credits in the group: In this group you have to gain at least 4 credits (at most 8)
Requirement courses in the group: In this group you have to complete at least 1 course (at most 2)
Credits in the group: 4
Note on the group:

Code	**Name of the course / Name of the group of courses** ***(in case of groups of courses the list of codes of their members)*** *Tutors,* ***authors*** *and guarantors (gar.)*	**Completion**	**Credits**	**Scope**	**Semester**	**Role**
17PBTOOP	**Object Oriented Programming** *David Jirsa, Radim Krupička* ***Radim Krupička*** *Radim Krupička (Gar.)*	Z,ZK	4	2P+2C	Z	S
17PBTZBS	**Biological Signal Processing Methods** ***Vladimír Krajča***	Z,ZK	4	2P+2C	Z	S

Characteristics of the courses of this group of Study Plan: Code=17PBT PV 3S 16 Name=Information and Communication Technology in Medicine compulsory optional course 3rd semester 16

17PBTOOP	Object Oriented Programming	Z,ZK	4
Object oriented programming. Variables, strings. Classes (methods, parameters, constructors, polymorphism, virtual methods, inheritance). Arrays. GUI, Windows Forms, WPF. Genericity, lists, dictionary. Errors and exceptions. Input-output operations.Files, streams - read, write. XML. Databases and Entity Framework.			
17PBTZBS	Biological Signal Processing Methods	Z,ZK	4
The subject deals with origins and description of the most important electric and non-electric biological signals. The principles of generation, recording and basic properties are studied in all the signals. The studied signals involve native and evoked biosignals, including biological signals of the heart, brain, muscles, nervous system, auditory signals, visual system, signals from the gastro-intestinal system etc. Advanced methods of digital biosignal processing,spectrum analysis, modern methods of artificial intelligence, features extraction, automatic classification, graphic presentation of results. Adaptive segmentation, artificial neural networks for signal procesing.			

Code of the group: 17PBT PV 4S 16
Name of the group: Information and Communication Technology in Medicine compulsory optional course 4th semester 16
Requirement credits in the group: In this group you have to gain at least 4 credits (at most 8)
Requirement courses in the group: In this group you have to complete at least 1 course (at most 2)
Credits in the group: 4
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
17PBTDSL	**Database Systems in Medicine** ***Radim Krupička***	Z,ZK	4	2P+2C	L	S
17PBTZLT	**Principles of Medical Instrumentation**	Z,ZK	4	2P+2C	L	S

Characteristics of the courses of this group of Study Plan: Code=17PBT PV 4S 16 Name=Information and Communication Technology in Medicine compulsory optional course 4th semester 16

17PBTDSL	Database Systems in Medicine	Z,ZK	4
The aim of the subject is to teach students to work with the most used tools for structured storage and data interrogation with respect to the primary use in medicine. The course is primary focused on a relational database and SQL query language. Students will learn how to design an optimal data model, how to implement it and to create simple queries over this model. In addition, students will learn to work with advanced SQL techniques such as view, stored procedures, transactions, etc. Last but not least, students will be introduced to modern technologies for processing large amounts of data and technologies for increasing data availability			
17PBTZLT	Principles of Medical Instrumentation	Z,ZK	4

Code of the group: 17PBT PV 5S 16
Name of the group: Information and Communication Technology in Medicine compulsory optional course 5th semester 16
Requirement credits in the group: In this group you have to gain at least 8 credits (at most 16)
Requirement courses in the group: In this group you have to complete at least 2 courses (at most 4)
Credits in the group: 8
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
17PBTAIB	**Applications of Artificial Intelligence and Biokybernetics** *Pavel Smrčka, Vladimír Krajča* ***Pavel Smrčka*** *Vladimír Krajča (Gar.)*	Z,ZK	4	2P+2C	Z	S
17PBTDST	**Data Standards in Telemedicine**	Z,ZK	4	2P+2C	Z	S
17PBTZMT	**Fundamentals of Microprocessor Technologies** *Pavel Smrčka* ***Pavel Smrčka*** *Pavel Smrčka (Gar.)*	Z,ZK	4	2P+2C	Z	S
17PBTZWA	**Fundamentals of Design and Development of Web Applications** *Tomáš Hrůza, Slávka Netùková* ***Slávka Netùková*** *Tomáš Hrůza (Gar.)*	Z,ZK	4	2P+2C	Z	S

Characteristics of the courses of this group of Study Plan: Code=17PBT PV 5S 16 Name=Information and Communication Technology in Medicine compulsory optional course 5th semester 16

17PBTAIB	Applications of Artificial Intelligence and Biokybernetics	Z,ZK	4
17PBTDST	Data Standards in Telemedicine	Z,ZK	4
17PBTZMT	Fundamentals of Microprocessor Technologies	Z,ZK	4
17PBTZWA	Fundamentals of Design and Development of Web Applications	Z,ZK	4

Code of the group: 17PBT PV 6S 16
Name of the group: Information and Communication Technology in Medicine compulsory optional course 6th semester 16
Requirement credits in the group: In this group you have to gain at least 8 credits (at most 24)
Requirement courses in the group: In this group you have to complete at least 2 courses (at most 6)
Credits in the group: 8
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
17PBTABS	**Architecture of Biotelemetric Systems** ***Karel Hána***	Z,ZK	4	2P+2C	L	S
17PBTPAA	**Programming Applications for the Android Mobile Platform** ***Radim Kliment***	Z,ZK	4	2P+2C	L	S
17PBTPAI	**Programming Applications for the Apple iOS Mobile Platform** ***Karel Hána***	Z,ZK	4	2P+2C	L	S
17PBTVRM	**Virtual Reality and Multimedia** ***Karel Hána***	Z,ZK	4	2P+2C	L	S
17PBTAKL	**Development of Client Server Applications** ***Jan Mužík***	Z,ZK	4	2P+2C	L	S

17PBTVMA	**Development of Mobile and Embedded Applications on GNU/Linux** ***Pavel Smrčka***	Z,ZK	4	2P+2C	L	s

Characteristics of the courses of this group of Study Plan: Code=17PBT PV 6S 16 Name=Information and Communication Technology in Medicine compulsory optional course 6th semester 16

17PBTABS	Architecture of Biotelemetric Systems	Z,ZK	4
17PBTPAA	Programming Applications for the Android Mobile Platform	Z,ZK	4
17PBTPAI	Programming Applications for the Apple iOS Mobile Platform	Z,ZK	4
17PBTVRM	Virtual Reality and Multimedia	Z,ZK	4
17PBTAKL	Development of Client Server Applications	Z,ZK	4
17PBTVMA	Development of Mobile and Embedded Applications on GNU/Linux	Z,ZK	4

List of courses of this pass:

Code	Name of the course	Completion	Credits
17BOZP	Occupational Safety and Health, Fire Protection and First Aid	Z	0
17PBTABS	Architecture of Biotelemetric Systems	Z,ZK	4
17PBTAIB	Applications of Artificial Intelligence and Biokybernetics	Z,ZK	4
17PBTAJ1	English Language I	KZ	3
17PBTAJ2	English Language II	KZ	3
17PBTAJ3	English Language III	KZ	4
17PBTAJ4	English Language IV	KZ	4
17PBTAKL	Development of Client Server Applications	Z,ZK	4
17PBTALP	Algoritmic and Programming Theory	Z,ZK	4
Algorithm, data structures. Identifiers, data types. assignment statement, conditional statement, cycles. Arithmetical and logical operations. Digital representation of numbers, numeration systems. Introduction to structured programming in C language - building and structure of simple programs, creating of the user functions, user input and output, file management, memory management. Practical overview of programming techniques and basic algorithms in C language. Recursive and iterative methods, measuring algorithm quality. Abstract data-types, data sorting and searching, implementation of basic numerical algorithms. Introduction to biomedical data processing - programmers view. Introduction to software engineering.			
17PBTBP	Bachelor Thesis	KZ	11
17PBTDAS	Data Network	Z,ZK	4
17PBTDSL	Database Systems in Medicine	Z,ZK	4
The aim of the subject is to teach students to work with the most used tools for structured storage and data interrogation with respect to the primary use in medicine. The course is primary focused on a relational database and SQL query language. Students will learn how to design an optimal data model, how to implement it and to create simple queries over this model. In addition, students will learn to work with advanced SQL techniques such as view, stored procedures, transactions, etc. Last but not least, students will be introduced to modern technologies for processing large amounts of data and technologies for increasing data availability			
17PBTDST	Data Standards in Telemedicine	Z,ZK	4
17PBTFY1	Physics I	Z,ZK	5
Physics I course will allow students to acquire and strengthen knowledge in these branches of physics: mechanics, thermodynamics and solid state physics. We focus on solid theoretical bases, but independent work in student labs as well as solving practical examples are also important parts of the course. Through the course we also touch the limits of the classical Physics.			
17PBTFY2	Physics II	Z,ZK	5
17PBTITP	Integral Calculus	Z,ZK	4
The subject is an introduction to integral calculus and integral transforms. Integral calculus: primitive function, indefinite integral, properties and methods of integration (integration by parts and by substitution, partial fractions), definite integral, properties, Newton-Leibnitz fundamental theorem, simple applications of both indefinite and definite integrals, improper integral, solving differential equations (ODEs) (1st order ODEs with separable variables, linear 1st order homogenous as well as non-homogenous ODEs, 2nd order linear homogenous and non-homogenous ODEs with constant coefficients),intro to multiple integrals, particularly double integral and applications. Integral transforms: Laplace transform and inverse Laplace transform and their application for solving nth order linear ODEs with constant coefficients. Z-transform and inverse Z-transform, their application for solving nth order linear difference equations.			
17PBTITT	Information Technology and Telemedicine	Z,ZK	4
Computer history, structure of computers, motherboard, processors, memody, graphical card, computer buses, BIOS, I/O devices, server, desktop, notebook, pocket PC, data storage, mobile devices, memory card, OS, tasks and memory management, printers scanner, multimedial devices, mass data storage, multitasking, multiprocessoring, set of instruction, assembler, programming languages, power test, network, LAN, WAN, interner, TCP/IP, HTTP, FTP etc., client-server, gate, router, using IT in medicine and telemedicine.			
17PBTKPZ	Communication and Presentation in Healthcare	KZ	3
17PBTLAD	Linear Algebra and Differential Calculus	Z,ZK	4
The course is an introduction into linear algebra and calculus of one variable. Linear algebra part consists of: systems of linear equations and their solutions, Gauss elimination, matrices, rank of a matrix, operations with matrices, inverse matrix, determinant and its calculation, eigenvalues and eigenvectors of matrices. Differential calculus consists of: sequences and their limits. Functions of one real variable, their limits, continuousness, derivatives. Local and absolute extremes of a function of one variable, investigations of functions. Taylor-polynome.			
17PBTMAS	Introduction to Mobile Applications and Systems	Z,ZK	5
17PBTNET	Neurotechnologies	KZ	4
17PBTNPC	Standards, Legislation, Law and Certification of Medical Equipment	KZ	4
17PBTOOP	Object Oriented Programming	Z,ZK	4
Object oriented programming. Variables, strings. Classes (methods, parameters, constructors, polymorphism, virtual methods, inheritance). Arrays. GUI, Windows Forms, WPF. Genericity, lists, dictionary. Errors and exceptions. Input-output operations.Files, streams - read, write. XML. Databases and Entity Framework.			

17PBTOPS	Operating Systems	Z,ZK	4
17PBTPAA	Programming Applications for the Android Mobile Platform	Z,ZK	4
17PBTPAI	Programming Applications for the Apple iOS Mobile Platform	Z,ZK	4
17PBTPOD	Fundamentals of Entrepreneurship in the Czech Republic and Protection of Intellectual Property	Z	3
17PBTPR1	Project I	KZ	6
17PBTPR2	Project II	KZ	6
17PBTPR3	Project III	KZ	10
17PBTPR4	Project IV	KZ	6
17PBTPR5	Project V	KZ	11
17PBTPSM	Basics of Programming and Simulation in Matlab	Z,ZK	4
17PBTSI1	Fundamentals of Software Engineering	Z,ZK	4
17PBTSI2	Fundamentals of Software Engineering II	Z,ZK	4
17PBTTCS	Technology of Digital Systems	Z,ZK	4
17PBTTEL	Theory of Electrical Engineering	Z,ZK	4
17PBTUTM	Introduction to Telemedicine	Z,ZK	4
17PBTVBI	Virtual Bioinstrumentation	KZ	4
17PBTVEZ	Computer aided design, development and production of electronic devices	KZ	3
	Introduction to computer-aided design, development and manufacturing of electronic devices.		
17PBTVMA	Development of Mobile and Embedded Applications on GNU/Linux	Z,ZK	4
17PBTVRM	Virtual Reality and Multimedia	Z,ZK	4
17PBTZAK	Introduction to Security and Applied Cryptography	KZ	4
17PBTZBS	Biological Signal Processing Methods	Z,ZK	4
	The subject deals with origins and description of the most important electric and non-electric biological signals. The principles of generation, recording and basic properties are studied in all the signals. The studied signals involve native and evoked biosignals, including biological signals of the heart, brain, muscles, nervous system, auditory signals, visual system, signals from the gastro-intestinal system etc. Advanced methods of digital biosignal processing,spectrum analysis, modern methods of artificial intelligence, features extraction, automatic classification, graphic presentation of results. Adaptive segmentation, artificial neural networks for signal procesing.		
17PBTZLT	Principles of Medical Instrumentation	Z,ZK	4
17PBTZMT	Fundamentals of Microprocessor Technologies	Z,ZK	4
17PBTZNM	Practical Basics of Numerical Methods	KZ	4
17PBTZWA	Fundamentals of Design and Development of Web Applications	Z,ZK	4

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