Recomended pass through the study plan

Name of the pass: Nanotechnology 21/22, 22/23, 23/24, 24/25, 25/26

Faculty/Institute/Others:
Department:
Pass through the study plan: Nanotechnology
Branch of study guranteed by the department: Welcome page
Guarantor of the study branch:
Program of study: Biomedical and Clinical Informatics
Type of study: Follow-up master full-time
Note on the pass: Informaci o předepsaném minimálním počtu PV předmětů pro konkrétní jednotlivé semestry najdete v odpovídajícím studijním plánu specializace.

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
F7PMIAS1	**Signal Analysis I.** *Jan Hejda, Michal Huptych, Václav Gerla, Jan Kauler **Jan Kauler** Václav Gerla (Gar.)*	Z,ZK	4	2P+2C	Z	z
17BOZP	**Occupational Safety and Health, Fire Protection and First Aid** *Petr Kudrna **Petr Kudrna** Petr Kudrna (Gar.)*	Z	0	1P	Z	z
F7PMIBST	**Biostatistics** *Vojtěch Kamenský, Aleš Tichopád, Martina Homolková **Vojtěch Kamenský** Aleš Tichopád (Gar.)*	Z,ZK	4	2P+2C	Z	z
F7PMILEG	**Legislation and Safety of Biomedical Software and Data** *Dagmar Brechlerová, Lenka Lhotská **Dagmar Brechlerová** Dagmar Brechlerová (Gar.)*	ZK	2	2P	Z	z
F7PMIMLB-N	**Molecular Biology** *Veronika Vymětalová **Veronika Vymětalová** Veronika Vymětalová (Gar.)*	ZK	2	2C	Z	z
F7PMIOOP	**Object-Oriented Programming** *Radim Krupička, Bohuslav Dvorský, Tomáš Krajča **Radim Krupička** Radim Krupička (Gar.)*	Z,ZK	3	1P+2C	Z	z
F7PMIPAZ	**Advanced Algorithms** *Jan Broulím, Pavel Smrčka **Pavel Smrčka** Pavel Smrčka (Gar.)*	Z,ZK	5	2P+2C	Z	z
F7PMIRPJ1	**Year Project I.** *Jan Hejda, Jan Kauler, Radim Krupička, Václav Petrák, Petr Písařík, Štěpán Timr, Ondřej Klempíř, Christiane Malá, Zoltán Szabó **Radim Krupička** Zoltán Szabó (Gar.)*	KZ	8	2S	Z	z
F7PMISKJ	**Scripting Languages** *Radim Krupička, Ondřej Klempíř **Radim Krupička** Radim Krupička (Gar.)*	KZ	2	2C	Z	z

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
F7PMIARVD	**Analysis and Recognition of Multidimensional Data** *Olga Štěpánková, Milan Němý **Olga Štěpánková** Olga Štěpánková (Gar.)*	Z,ZK	4	2P+2C	L	z
F7PMIAS2	**Signal Analysis II.** *Jan Hejda, Michal Huptych, Václav Gerla, Kamila Dvořák **Jan Hejda***	Z,ZK	4	2P+2C	L	z
F7PMIBSB	**Biological Signals and Biometrics** *Jan Kauler, Lenka Lhotská, Vladimír Krajča **Jan Kauler** Vladimír Krajča (Gar.)*	Z,ZK	2	1P+1C	L	z
F7PMIBMD-N	**Cellular and Molecular Diagnostics** *Veronika Vymětalová **Veronika Vymětalová** Veronika Vymětalová (Gar.)*	Z,ZK	3	2P+2L	L	z
F7PMIDWT	**Database and Web Technologies** *Jan Hejda, Slávka Neťuková **Slávka Neťuková** Slávka Neťuková (Gar.)*	Z,ZK	4	2P+2C	L	z
F7PMINAN-N	**Nanotechnology and Nanomaterials** *Václav Petrák, Vladimíra Petráková **Vladimíra Petráková** Vladimíra Petráková (Gar.)*	Z,ZK	5	4P+2C	L	z

F7PMIRPJ2	**Year Project II.** *Jan Hejda, Radim Krupička, Václav Petrák, Petr Písařík, Štěpán Timr, Ondřej Klempíř, Christiane Malá, Zoltán Szabó, Petr Volf* ***Zoltán Szabó***	KZ	8	2S	L	z

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
F7PMIANM-N	**Application of Nanomaterials in Medicine** *Václav Petrák, Vladimíra Petráková* ***Vladimíra Petráková*** *Vladimíra Petráková (Gar.)*	Z,ZK	5	2P+2C	Z	z
F7PMIBD	**Big Data** *Lenka Lhotská, Bohuslav Dvorský* ***Lenka Lhotská*** *Lenka Lhotská (Gar.)*	Z,ZK	4	2P+2C	Z	z
F7PMIDP1	**Diploma Thesis I.** *Aleš Tichopád, Veronika Vymětalová, Radim Krupička, Pavel Smrčka, Ondřej Klempíř, Christiane Malá, Zoltán Szabó, Vladimíra Petráková, Jaroslav Kočišek, ...* ***Radim Krupička*** *Zoltán Szabó (Gar.)*	KZ	8	2S	Z	z
F7PMINUR	**Design of User Interfaces** *Zdeněk Míkovec* ***Zdeněk Míkovec*** *Zdeněk Míkovec (Gar.)*	Z,ZK	2	1P+1C	Z	z
F7PMIPLB-N	**Solids for Biomedicine** *Milan Šiňor* ***Milan Šiňor*** *Milan Šiňor (Gar.)*	Z,ZK	3	2P+1C	Z	z
F7PMIPBF-N	**Biophotonics** *Petr Písařík, Jan Mikšovský, Jan Remsa* ***Petr Písařík*** *Petr Písařík (Gar.)*	Z,ZK	4	2P+2C	Z	z
F7PMIUMIT	**Artificial Intelligence** *Olga Štěpánková, Martin Macaš* ***Martin Macaš*** *Olga Štěpánková (Gar.)*	Z,ZK	4	2P+2C	Z	z

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
F7PMIBAB-N	**Biocompatible Materials** *Petr Písařík, Jan Mikšovský, Jan Remsa, Martin Otáhal* ***Petr Písařík*** *Petr Písařík (Gar.)*	KZ	3	2P	L	z
F7PMIDP2	**Diploma Thesis II.** *Aleš Tichopád, Veronika Vymětalová, Radim Krupička, Jan Broulím, Pavel Smrčka, Ondřej Klempíř, Christiane Malá, Zoltán Szabó, Milan Němý, ...* ***Zoltán Szabó*** *Zoltán Szabó (Gar.)*	Z	14	2S	L	z
F7PMIFS-N	**Fluorescent Spectroscopy** *Eva Urbánková* ***Eva Urbánková*** *Eva Urbánková (Gar.)*	KZ	2	3P	L	z
F7PMILAM-N	**Lasers and their Application in Medicine** *Marie Pospíšilová* ***Marie Pospíšilová*** *Marie Pospíšilová (Gar.)*	KZ	2	2P+2C	L	z
F7PMINNI-N	**Nanoinformatics** *Lenka Lhotská* ***Lenka Lhotská*** *Lenka Lhotská (Gar.)*	KZ	4	2P+2C	L	z
F7PMIRAST	**Robotics and Assistive Technology** *Jan Kauler, Václav Hlaváč* ***Jan Kauler***	Z,ZK	5	2P+2C	L	z

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

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
F7PMIANM-N	Application of Nanomaterials in Medicine	Z,ZK	5
F7PMIARVD	Analysis and Recognition of Multidimensional Data	Z,ZK	4
F7PMIAS1	Signal Analysis I.	Z,ZK	4
F7PMIAS2	Signal Analysis II.	Z,ZK	4
F7PMIBAB-N	Biocompatible Materials	KZ	3
F7PMIBD	Big Data	Z,ZK	4

F7PMIBMD-N	Cellular and Molecular Diagnostics	Z,ZK	3
The students will obtain information regarding basic diagnostic methods used in cell biology with particular focus on laboratory training.			
F7PMIBSB	Biological Signals and Biometrics	Z,ZK	2
F7PMIBST	Biostatistics	Z,ZK	4
F7PMIDP1	Diploma Thesis I.	KZ	8
F7PMIDP2	Diploma Thesis II.	Z	14
F7PMIDWT	Database and Web Technologies	Z,ZK	4
F7PMIFS-N	Fluorescent Spectroscopy	KZ	2
F7PMILAM-N	Lasers and their Application in Medicine	KZ	2
In the course, the student will learn about the use of laser radiation in medical applications for diagnosis and treatment. In the introductory lectures, they will learn about the principle of the laser, its main parts and parameters. An overview of laser systems and their use in medicine will be given. He will acquire basic knowledge about the interaction of laser radiation with tissue, their division into primary and secondary factors. At the end, they will be introduced to specific applications of lasers in medicine. Keywords: laser, laser diagnosis, laser treatment, interaction laser beam with tissue			
F7PMILEG	Legislation and Safety of Biomedical Software and Data	ZK	2
F7PMIMLB-N	Molecular Biology	ZK	2
Structure and function of nucleic acids DNA and RNA. Replication, transcription, translation. Protein synthesis, prokaryotic and eukaryotic gene expression. Structure and function of proteins. Enzymes. Reproduction of cells, cell cycle, cell division. Biotechnology, hybridoma technology. Recombinant DNA vectors, restriction enzymes. Changes in genetic information, mutation. Methods of molecular biology - DNA isolation, centrifugation, electrophoresis, PCR. Flow cytometry. Genetic manipulation - genetic engineering, gene modification, gene splicing.			
F7PMINAN-N	Nanotechnology and Nanomaterials	Z,ZK	5
F7PMINNI-N	Nanoinformatics	KZ	4
he aim of the Nanoinformatics course is to introduce to students the areae of nanomaterials and nanostructures and data collection in this environment. Follow-up lectures will introduce students to the issue of data representation and information about materials, structures and properties, data sources, more complex forms of representation in the form of ontologies. Further lectures will focus on machine learning methods applicable to data from the nanoworld. At the end, students will get information about the latest trends in nanoinformatics.			
F7PMINUR	Design of User Interfaces	Z,ZK	2
F7PMIOOP	Object-Oriented Programming	Z,ZK	3
F7PMIPAZ	Advanced Algorithms	Z,ZK	5
F7PMIPBF-N	Biophotonics	Z,ZK	4
Overview of principles and applications in interdisciplinary region connecting disciplines of physics, optics and biology. Interaction of optical radiation with matter, with tissue, basics of biology, photobiology, bioimaging, microscopy, basics of lasers, laser safety, optical biosensors, nanotechnology for biophotonics.			
F7PMIPLB-N	Solids for Biomedicine	Z,ZK	3
Solid state physics is very wide line of physics with many application, topics of lectures: structure of solid states, bindings, mechanical properties, specific heat, electrical properties, superconductivity, bands theory, physics of semiconductors, optical properties of solid states, luminescence, liquid crystals, application at biomedical engineering.			
F7PMIRAST	Robotics and Assistive Technology	Z,ZK	5
F7PMIRPJ1	Year Project I.	KZ	8
F7PMIRPJ2	Year Project II.	KZ	8
F7PMISKJ	Scripting Languages	KZ	2
F7PMIUMIT	Artificial Intelligence	Z,ZK	4

For updated information see http://bilakniha.cvut.cz/en/FF.html
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