Study plan

Name of study plan: Nanotechnology

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Biomedical and Clinical Informatics
Type of study: Follow-up master full-time
Required credits: 120
Elective courses credits: 0
Sum of credits in the plan: 120
Note on the plan:

Name of the block: Compulsory courses
Minimal number of credits of the block: 120
The role of the block: Z

Code of the group: F7NNT POV 21
Name of the group: Nanotechnology compulsory course
Requirement credits in the group: In this group you have to gain 120 credits
Requirement courses in the group: In this group you have to complete 29 courses
Credits in the group: 120
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
F7PMIARVD	**Analysis and Recognition of Multidimensional Data** *Olga Št pánková, Milan N mý* **Olga Št pánková** *Olga Št pánková (Gar.)*	Z,ZK	4	2P+2C	L	z
F7PMIAS1	**Signal Analysis I.** *Jan Hejda, Michal Huptych, Václav Gerla, Jan Kauler* **Jan Kauler** *Václav Gerla (Gar.)*	Z,ZK	4	2P+2C	Z	z
F7PMIAS2	**Signal Analysis II.** *Jan Hejda, Michal Huptych, Václav Gerla, Kamila Dvo ák* **Jan Hejda**	Z,ZK	4	2P+2C	L	z
F7PMIANM-N	**Application of Nanomaterials in Medicine** *Vladimíra Petráková, Václav Petrák* **Vladimíra Petráková** *Vladimíra Petráková (Gar.)*	Z,ZK	5	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
F7PMIBD	**Big Data** *Lenka Lhotská, Bohuslav Dvorský* **Lenka Lhotská** *Lenka Lhotská (Gar.)*	Z,ZK	4	2P+2C	Z	z
F7PMIBSB	**Biological Signals and Biometrics** *Jan Kauler, Lenka Lhotská, Vladimír Kraj a* **Jan Kauler** *Vladimír Kraj a (Gar.)*	Z,ZK	2	1P+1C	L	z
F7PMIBAB-N	**Biocompatible Materials** *Martin Otáhal, Petr Písa ík, Jan Mikšovský, Jan Remsa* **Petr Písa ík** *Petr Písa ík (Gar.)*	KZ	3	2P	L	z
F7PMIBST	**Biostatistics** *Vojt ch Kamenský, Aleš Tichopád, Martina Homolková* **Vojt ch Kamenský** *Aleš Tichopád (Gar.)*	Z,ZK	4	2P+2C	Z	z
F7PMIBMD-N	**Cellular and Molecular Diagnostics** *Veronika Vym talová* **Veronika Vym talová** *Veronika Vym talová (Gar.)*	Z,ZK	3	2P+2L	L	z
F7PMIDWT	**Database and Web Technologies** *Jan Hejda, Slávka Ne uková* **Slávka Ne uková** *Slávka Ne uková (Gar.)*	Z,ZK	4	2P+2C	L	z
F7PMIDP1	**Diploma Thesis I.** *Vladimíra Petráková, Aleš Tichopád, Veronika Vym talová, Zoltán Szabó, Christiane Malá, Ond ej Klempí , Jaroslav Ko íšek, Pavel Ostašov, Romana Široká, ...* **Radim Krupi ka** *Zoltán Szabó (Gar.)*	KZ	8	2S	Z	z
F7PMIDP2	**Diploma Thesis II.** *Milan N mý, Vladimíra Petráková, Aleš Tichopád, Veronika Vym talová, Zoltán Szabó, Christiane Malá, Ond ej Klempí , Jaroslav Ko íšek, Pavel Ostašov, ...* **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
F7PMILEG	**Legislation and Safety of Biomedical Software and Data** *Lenka Lhotská, Dagmar Brechlerová* **Dagmar Brechlerová** *Dagmar Brechlerová (Gar.)*	ZK	2	2P	Z	z
F7PMIMLB-N	**Molecular Biology** *Veronika Vym talová* **Veronika Vym talová** *Veronika Vym talová (Gar.)*	ZK	2	2C	Z	z
F7PMINNI-N	**Nanoinformatics** *Lenka Lhotská* **Lenka Lhotská** *Lenka Lhotská (Gar.)*	KZ	4	2P+2C	L	z
F7PMINAN-N	**Nanotechnology and Nanomaterials** *Vladimíra Petráková, Václav Petrák* **Vladimíra Petráková** *Vladimíra Petráková (Gar.)*	Z,ZK	5	4P+2C	L	z
F7PMINUR	**Design of User Interfaces** *Zden k Míkovec* **Zden k Míkovec** *Zden k Míkovec (Gar.)*	Z,ZK	2	1P+1C	Z	z
F7PMIOOP	**Object-Oriented Programming** *Bohuslav Dvorský, Radim Krupi ka, Tomáš Kraj a* **Radim Krupi ka** *Radim Krupi ka (Gar.)*	Z,ZK	3	1P+2C	Z	z
F7PMIPLB-N	**Solids for Biomedicine** *Milan Ši or* **Milan Ši or** *Milan Ši or (Gar.)*	Z,ZK	3	2P+1C	Z	z
F7PMIPAZ	**Advanced Algorithms** *Pavel Smr ka, Jan Broulím* **Pavel Smr ka** *Pavel Smr ka (Gar.)*	Z,ZK	5	2P+2C	Z	z
F7PMIPBF-N	**Biophotonics** *Petr Písa ík, Jan Mikšovský, Jan Remsa* **Petr Písa ík** *Petr Písa ík (Gar.)*	Z,ZK	4	2P+2C	Z	z
F7PMIRAST	**Robotics and Assistive Technology** *Jan Kauler, Václav Hlavá* **Jan Kauler**	Z,ZK	5	2P+2C	L	z
F7PMIRPJ1	**Year Project I.** *Jan Hejda, Jan Kauler, Václav Petrák, Petr Písa ík, Zoltán Szabó, Christiane Malá, Ond ej Klempí , Radim Krupi ka, Št pán Timr* **Radim Krupi ka** *Zoltán Szabó (Gar.)*	KZ	8	2S	Z	z
F7PMIRPJ2	**Year Project II.** *Jan Hejda, Vladimíra Petráková, Václav Petrák, Petr Písa ík, Aleš Tichopád, Veronika Vym talová, Zoltán Szabó, Christiane Malá, Ond ej Klempí , ...* **Zoltán Szabó**	KZ	8	2S	L	z
F7PMISKJ	**Scripting Languages** *Ond ej Klempí , Radim Krupi ka* **Radim Krupi ka** *Radim Krupi ka (Gar.)*	KZ	2	2C	Z	z
F7PMIUMIT	**Artificial Intelligence** *Olga Št pánková, Martin Macaš* **Martin Macaš** *Olga Št pánková (Gar.)*	Z,ZK	4	2P+2C	Z	z

Characteristics of the courses of this group of Study Plan: Code=F7NNT POV 21 Name=Nanotechnology compulsory course

F7PMIARVD	Analysis and Recognition of Multidimensional Data	Z,ZK	4
F7PMIAS1	Signal Analysis I.	Z,ZK	4
F7PMIAS2	Signal Analysis II.	Z,ZK	4
F7PMIANM-N	Application of Nanomaterials in Medicine	Z,ZK	5
17BOZP	Occupational Safety and Health, Fire Protection and First Aid	Z	0
F7PMIBD	Big Data	Z,ZK	4
F7PMIBSB	Biological Signals and Biometrics	Z,ZK	2
F7PMIBAB-N	Biocompatible Materials	KZ	3
F7PMIBST	Biostatistics	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.			
F7PMIDWT	Database and Web Technologies	Z,ZK	4
F7PMIDP1	Diploma Thesis I.	KZ	8
F7PMIDP2	Diploma Thesis II.	Z	14
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.			
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.			
F7PMINAN-N	Nanotechnology and Nanomaterials	Z,ZK	5
F7PMINUR	Design of User Interfaces	Z,ZK	2
F7PMIOOP	Object-Oriented Programming	Z,ZK	3

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.			
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.			
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

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