



CURRICULUM

Study Type	Master
Study Language	Czech
Faculty	Faculty of Chemical Technology
Study programme	Conservation and Restoration of Cultural Heritage Objects
Study sub-programme	Technology of Conservation and Restoration
Year	2017/2018

Organization of the academic year 2017/2018

The academic year **2017/2018** starts on **11th September 2017** and ends on **7th September 2018**

Structure of the academic year

Winter semester (WS)	
The dates of registration for the summer semester will be organized by the Dean´s office of the respective faculty no later than by 29th September 2017 .	
Lectures, seminars, laboratory work:	18. 9. – 22. 12. 2017
Assessment period:	2. 1. – 16. 2. 2018

Summer semester (SS)	
The dates of registration for the summer semester will be organized by the Dean´s office of the respective faculty no later than 2nd March 2018	
Lectures, seminars, laboratory work:	19. 2. – 25. 5. 2018
Assessment period:	28. 5. – 29. 6. 2018 27. 8. – 7. 9. 2018

The lessons start no earlier than at 8:00 a.m. The lessons always start on the hour, the duration of one lesson is 50 minutes.

The Rector´s Days: **20. 11. and 24. 11. 2017**

The Students´ Scientific Conference: 20. 11. 2017
Open Days: 24. 11. and 25. 11. 2017
19. 1. and 20. 1. 2018

Enrolment in compulsory-optional and optional courses and registration for timetable

Enrolment in compulsory-optional and optional courses for WS (I. year of study)	At the Dean ´s office during Enrollment day or 8. 9. – 15. 9. 2017
Registration for the timetable for WS:	8. 9. – 15. 9. 2017
Preliminary enrolment in compulsory-optional and optional courses SS:	23. 11. – 1. 12. 2017
Registration for the timetable of the SS:	9. 2. -16. 2. 2018
Preliminary enrolment in compulsory-optional and optional courses WS 2018/19:	10. 5. – 18. 5. 2018

Important dates for students of II. year of Master studies

Check of study requirements fulfillment:	by 11. 5. 2018
Submission of Master Diploma Thesis	by 11. 5. 2018
Dates of State Final Examination *:	1. 6. – 8. 6. 2018

* The exact dates are to be decided by the Dean of the respective faculty.

The graduation ceremony for Master degree graduates will be held on **19th June and 21st June 2018.**

Abbreviations and their meaning:

Abbrev. ENG	Abbrev. CZE	
C	Z	credit
MC	KZ	classified credit
Ex	Zk	examination

p	lecture
c	seminar
l	laboratory work

the numbers preceding an abbreviation indicate number of lessons per week

Study Programme: **Conservation and Restoration of Cultural Heritage Objects**
 Study Sub-programme: **Technology of Conservation and Restoration**
 Code: **TKR**

1st year - WINTER SEMESTER

Code	Subject	Department	Study Hours	Exam	Cred
N108006	Chemistry and Physics of Solids	108	3p	Ex	5
N148054	Specialized Laboratory	148	10l	MC	7
N148055	Constructions and Materials of Historical Building	148	2p+1c	Ex	3
N148056	Constructional Historical Research	148	2p	Ex	3
Elective subjects 1, 2 (choose at least 2 subject(s) from this group)					
N106007	Phase Transformations in Metals	106	3p	Ex	4
N106008	Physics of Metals	106	3p	Ex	5
N106010	Chemical Metallurgy	106	2p+2c	C+Ex	5
N106017	Principles of Metallurgical and Corrosion Processes	106	3p	Ex	5
N107007	Chemistry of Inorganic Materials I	107	2p+1c	C+Ex	4
N107014	Technology of Inorganic Binders	107	4p+1c	C+Ex	7
N107015	Technology of Ceramics	107	4p+1c	C+Ex	7
N107016	Technology of Glass	107	4p+1c	C+Ex	7
N112001	Physics of Polymers	112	2p+1c	C+Ex	4
N112004	Characterization Methods for Polymeric Materials	112	2p+2c	C+Ex	4
N148007	Conservation of inorganic building materials	148	3p	Ex	4
N148071	Wood conservation	148	2p	Ex	3
List of optional subjects for this semester is located on the page 11					

1st year - SUMMER SEMESTER

Code	Subject	Department	Study Hours	Exam	Cred
N148059	Basic of Archaeology	148	2p	Ex	3
N148060	Laboratory project I	148	10l	MC	7
N148065	Conservation	148	2p	Ex	3
N148080	Specialised Practice	148		C	3
N403036	Physical Chemistry of Surfaces and Colloidal Systems	403	2p+1c	C+Ex	4
Elective subjects 3, 4 (choose at least 2 subject(s) from this group)					
N106011	Corrosion Engineering	106	2p+1c	C+Ex	5
N106018	Metallic Materials	106	2p	Ex	3
N107004	Spectroscopic and Microscopic Methods for Characterization of Materials	107	3p+1c	C+Ex	5
N107008	Chemistry of Inorganic Materials II	107	2p+2c	C+Ex	5
N148006	Analytical Methods in the Care of Historical Buildings	148	2p	Ex	3
N148008	Conservation of leather and textile	148	2p	Ex	3
N148066	Conservation of archival and library collections	148	2p	Ex	3
List of optional subjects for this semester is located on the page 16					

2nd year - WINTER SEMESTER

Code	Subject	Department	Study Hours	Exam	Cred
N148061	History of Bohemian Fine Arts	148	2p	Ex	3
N148064	Laboratory project II	148	12l	MC	8
N402014	Methods of Structural and Surface Analysis	402	2p	Ex	3
Elective subjects 5, 6 (choose at least 2 subject(s) from this group)					
N106007	Phase Transformations in Metals	106	3p	Ex	4
N106008	Physics of Metals	106	3p	Ex	5
N106010	Chemical Metallurgy	106	2p+2c	C+Ex	5
N106017	Principles of Metallurgical and Corrosion Processes	106	3p	Ex	5
N107007	Chemistry of Inorganic Materials I	107	2p+1c	C+Ex	4
N107014	Technology of Inorganic Binders	107	4p+1c	C+Ex	7
N107015	Technology of Ceramics	107	4p+1c	C+Ex	7
N107016	Technology of Glass	107	4p+1c	C+Ex	7
N112001	Physics of Polymers	112	2p+1c	C+Ex	4
N112004	Characterization Methods for Polymeric Materials	112	2p+2c	C+Ex	4
N148007	Conservation of inorganic building materials	148	3p	Ex	4
N148071	Wood conservation	148	2p	Ex	3
List of optional subjects for this semester is located on the page 20					

2nd year - SUMMER SEMESTER

Code	Subject	Department	Study Hours	Exam	Cred
N963008	Diploma Thesis	963	30c	C	30

Optional subjects for 1st year, WINTER SEMESTER

Obory: TKR

Code	Subject	Department	Study Hours	Exam	Cred
N101001	Safety and Legislation in Chemistry	101	2p	Ex	3
N101004	Inorganic Chemistry: Laboratory II	101	4l	MC	4
N101011	Coordination Chemistry	101	3p+1c	C+Ex	6
N105005	Fundamentals of Computer Simulations + D129	105	2p+2c	C+Ex	5
N106002	Composite Materials	106	2p	Ex	3
N106009	Historical Methods of Metal Production and Processing	106	2p	Ex	3
N106010	Chemical Metallurgy	106	2p+2c	C+Ex	5
N106017	Principles of Metallurgical and Corrosion Processes	106	3p	Ex	5
N106044	Properties and processing technologies of metallic materials	106	4p	Ex	6
N107003	Mechanics of Materials	107	2p+1c	C+Ex	4
N107007	Chemistry of Inorganic Materials I	107	2p+1c	C+Ex	4
N107009	Calculations in Chemical Engineering	107	3c	MC	2
N107010	Corrosion and Application of Refractories and Inorganic Binders	107	2p+1c	C+Ex	4
N107013	Transport Phenomena	107	2p+2c	C+Ex	5
N107027	Microstructure and Properties of Heterogeneous Materials	107	2p+1c	C+Ex	4
N108006	Chemistry and Physics of Solids	108	3p	Ex	5
N108008	X-Ray Phase Analysis I	108	2p+1c	C+Ex	4
N108011	Structural Crystallography	108	2p	Ex	3
N108012	Crystal Growth Technology	108	2p+1c	C+Ex	4
N108014	Computer Graphics for Visualising the Structure of Molecules	108	2p	Ex	3
N108024	Hybrid materials	108	2p	Ex	3
N110005	Organic Chemistry II	110	3p+2c	C+Ex	7
N110011	Organic Chemistry of Selected Elements	110	2p	Ex	3
N110012	Organic Synthesis	110	3p+2c	C+Ex	7
N110015	Organic Reaction Mechanisms	110	2p+2c	C+Ex	5
N110019	Quantum Organic Chemistry	110	2p+1c	C+Ex	4
N110024	Computations and Visualization of Molecules	110	1p+2c	C+Ex	4
N110028	Toxicology for Chemists	110	2p	Ex	3
N111013	Chemical Reactors	111	2p+2c	C+Ex	5

Code	Subject	Department	Study Hours	Exam	Cred
N111020	Technical Catalysis	111	2p+2c	C+Ex	5
N111021	Computing in Process Engineering	111	3c	MC	3
N111022	Carbonaceous raw material for chemical and pharmaceutical industry	111	3p	Ex	5
N111048	Engineering of Chemical and Pharmaceutical Processes	111	3p+1c	C+Ex	6
N112007	Applied Rheology of Polymers	112	2p+1c	C+Ex	4
N112008	Physical Chemistry of Polymers	112	2p+2c	C+Ex	5
N112014	Recycling and Ecological Aspects of Polymer Applications	112	2p	Ex	3
N112016	Selected Chapters from Chemistry and Technology of Polymers I	112	2p	Ex	3
N112017	Polymer Manufacturing	112	2p+2c	C+Ex	5
N112041	Selected Chapters from Chemistry and Technology of Polymers II	112	2p	Ex	3
N126001	Biomaterials	126	2p	Ex	3
N126004	Thermodynamics of Materials	126	2p+1c	C+Ex	4
N126007	Quantum Mechanics for Materials Engineering	126	2p+1c	C+Ex	4
N215004	Industrial Lubricants	215	2p	Ex	3
N215010	Petrochemistry	215	3p	Ex	5
N215011	Special Analysis of Fuels	215	3p	Ex	5
N216002	Atmosphere Analytics	216	3p	Ex	5
N216007	Atmospheric Chemistry	216	2p	Ex	3
N216009	Gas industry	216	3p	Ex	5
N216013	Coal Technology	216	2p	Ex	3
N217012	Drinking Water Treatment and Supply	217	3p+2c	C+Ex	7
N217017	Microbiology in Water Technology	217	2p+1c	C+Ex	4
N217022	Hydrology and Pedology	217	2p+1c	C+Ex	4
N217023	Hydrobiology	217	2p+1c	C+Ex	4
N217024	Physico-chemical Methods of Wastewater Treatment	217	2p+1c	C+Ex	4
N217026	Biodegradation and Ecotoxicity	217	2p	Ex	3
N218010	Technical Nuclear Chemistry	218	2p+1c	C+Ex	4
N218017	Special Separation Processes in Water Technology	218	3p	Ex	5
N218018A	Radioactive Waste Management	218	2p	Ex	3
N240007	Life Cycle Assessment	240	3p	Ex	5
N240018	Ecotoxicology	240	3p	Ex	5
N240028	Environmental models	240	2p	Ex	3

Code	Subject	Department	Study Hours	Exam	Cred
N319007	Molecular Biology	319	2p	Ex	3
N319008	Bioengineering I	319	2p+1c	C+Ex	4
N319009	Separation Methods in Biotechnology	319	2p+1c	C+Ex	4
N320021	Biophysical Chemistry	320	2p	Ex	3
N320062	Genetically Modified Organisms	320	2p	Ex	3
N321003	Food and Biochemical Process Engineering	321	2p+1c	C+Ex	4
N321015	Applied PC Techniques	321	1p+2c	MC	3
N322003	Microbiology of Food and Cosmetics	322	2p+1c	C+Ex	4
N322005	Hygiene and sanitation of food processes	322	2p+1c	C+Ex	4
N322021	Food process chemistry	322	3p+2c	C+Ex	6
N322022	Physical Properties of Foods	322	2p+1c	C+Ex	4
N323015	Reaction Mechanisms in Food Chemistry	323	2p	Ex	3
N323017	Chemometrics	323	1p+2c	C+Ex	4
N323031	Nutraceuticals and Functional Foods	323	2p	Ex	3
N323034	Special Food Analysis	323	3p	Ex	4
N324007	Fundamentals of Food Processing Management	324	2p+1c	MC	3
N324009	Use and waste disposal from agricultural and food industry	324	2p	MC	2
N324028	Principles of Food Preservation	324	2p+1c	C+Ex	4
N342006	Chemistry of Natural Compounds	342	2p	Ex	3
N342007	Isolation and Separation of Molecules	342	2p+1c	C+Ex	4
N342020	Scientific Communication	342	1p+1c	MC	2
N402004	Analytical Chemistry II	402	2p+1c	C+Ex	4
N402005	Atomic Spectroscopy	402	2p+2c	C+Ex	5
N402011	Techniques of Measurement and Interpretation of Luminescence Spectra	402	1p	Ex	2
N402020	Theoretical Fundamentals of Analytical Chemistry	402	2p+1c	Ex	4
N402029	Techniques of Measurement and Interpretation of Mass Spectra	402	1p	Ex	2
N402030	Techniques of Measurement and Interpretation of IR and Raman Spectra	402	1p	Ex	2
N402032	Techniques of Measurement and Interpretation of NMR Spectra	402	1p	Ex	2
N402035	Advanced Analytical Methods: the Seminars	402	8c	MC	5
N402037	Molecular Modelling	402	1p+2c	Ex	4
N402038	Introduction to Molecular Physical Chemistry and Symmetry	402	2p+1c	C+Ex	4

Code	Subject	Department	Study Hours	Exam	Cred
N402042	Chemometrics in Analytical Chemistry	402	2p+1c	C+Ex	4
N402081	Theory and Experiment of Atomic Spectroscopy	402	2p	Ex	3
N403008	Electrochemistry	403	2p+1c	C+Ex	4
N403010	Estimation Methods for Technology and the Environment	403	2p	C+Ex	4
N403018	State Behaviour and Thermodynamic Properties of Fluids	403	3p+2c	C+Ex	7
N403019	Special Methods in Physical Chemistry: Laboratory I	403	4l	MC	3
N403021	Quantum Chemistry	403	2p+1c	C+Ex	4
N403022	Physical Chemistry of Aqueous Solutions	403	2p+1c	C+Ex	4
N403043	Quantum Mechanics in Chemistry: Advanced Course	403	2p+1c	C+Ex	5
N403049	Experiments of Physical Chemistry in Light of Computer Simulations	403	1c	C	1
N409021	Unit Operations of Chemical Engineering III	409	2p+2c	C+Ex	5
N413003A	Mathematics II	413	3p+3c	C+Ex	8
N413006	Fourier Transform	413	2p+2c	C+Ex	5
N413007	Systems of Ordinary Differential Equations (ODE)	413	2p+2c	C+Ex	5
N413038	Numerical algorithms	413	3p+2c	C+Ex	7
N437010A	Management Communication	837	1p+1c	MC	2
N437035	Pharmacoeconomy and economy of Drug Development	837	3p	Ex	5
N444006	Physics II	444	2p+2c	C+Ex	5
N444008	Measurement in Environmental Protection	444	2p+1c	Ex	4
N444009	Physics III	444	2p+1c	C+Ex	4
N444010	Biophysics	444	2p+1c	C+Ex	4
N444011	Chemical Sensors	444	2p+3c	C+Ex	6
N444021	Measuring Technique	444	2p+3c	C+Ex	6
N445003	Database Systems	445	1p+3c	C+Ex	5
N445008	Spreadsheet Applications	445	1p+2c	MC	4
N445012	Signal Processing	445	3p+2c	C+Ex	5
N445015	Technical Instrumentation for Control	445	2p+2c	C+Ex	5
N445016	Digital Signal and Image Processing	445	2p+2c	C+Ex	5
N445055	Programming Techniques	445	1p+3c	C+Ex	5
N445056	Project Management	445	2p+2c	C+Ex	5
N445060	Image Processing II	445	1p+2c	C+Ex	4
N445071	Applied Artificial Intelligence	445	2p+1c	C+Ex	4

Code	Subject	Department	Study Hours	Exam	Cred
N832043	Soft Skills I	832	2p	C	2
N832046	Contract Law	832	2p	Ex	3
N832051	Science Journalism	832	2c	C	2
N832053	Science Photography I.	832	2c	C	2
N834048	German - advanced I	834	2c	C	1
N834060	German for Engineers I	834	2c	C	1
N834062	English for Engineers I	834	2c	C	1
N834064	English - Upper Advanced I	834	2c	C	1

Optional subjects for 1st year, SUMMER SEMESTER

Obory: TKR

Code	Subject	Department	Study Hours	Exam	Cred
N101006	General and Inorganic Chemistry II	101	2p+2c	C+Ex	5
N101009	Crystal chemistry	101	2p+1c	C+Ex	4
N101012	Theoretical Principles of Inorganic Chemistry	101	2p+1c	C+Ex	4
N101024	Inorganic Energetics	101	3p	Ex	5
N105012	Complex Processing of Raw Materials	105	2p	Ex	3
N105018	Thermodynamics of Aqueous Solutions	105	2p+1c	C+Ex	4
N105019	Sustainable Development and Renewable Energy Sources	105	2p+1c	Ex	4
N105020	Inorganic Technology	105	3p	Ex	5
N105024	Electrochemical Technologies	105	2p	Ex	3
N106011	Corrosion Engineering	106	2p+1c	C+Ex	5
N106013	Metallurgy of Non-ferrous Metals	106	2p	Ex	3
N106014	Metallurgy of Iron and Steelmaking	106	2p	Ex	3
N106015	Metallic Coatings	106	2p	Ex	3
N106018	Metallic Materials	106	2p	Ex	3
N107004	Spectroscopic and Microscopic Methods for Characterization of Materials	107	3p+1c	C+Ex	5
N107008	Chemistry of Inorganic Materials II	107	2p+2c	C+Ex	5
N107011	Processes and Equipment in the Ceramic Industry	107	2p+1c	C+Ex	4
N107012	Processes and Equipment in the Glass Industry	107	2p+1c	C+Ex	4
N107025	Characterization of Particles and Microstructures	107	2p+1c	C+Ex	4
N108007	Formation and use of ore deposits	108	2p	Ex	3
N108010	Structure and Properties of Zeolites	108	2p	Ex	3
N110001	Pharmacochemistry	110	3p	Ex	5
N110007	Physical Organic Chemistry	110	2p+2c	C+Ex	5
N110013	Retrosynthesis	110	3p+1c	C+Ex	6
N110027	Bioorganic Chemistry	110	3p	Ex	5
N111015	Industrial Chemical Technology (Organic Technology)	111	3p	Ex	5
N111016	Separation Processes	111	2p+2c	C+Ex	5
N111023	Multiphase Chemical Reactors	111	2p+2c	C+Ex	5
N112003	Macromolecular Chemistry	112	2p+1c	C+Ex	4

Code	Subject	Department	Study Hours	Exam	Cred
N112006	Technology of Polymeric Materials Processing	112	2p	Ex	3
N112010	Mechanisms of Polymerization Reactions	112	2p+1c	C+Ex	4
N112011	Special polymers for modern applications	112	2p	Ex	3
N112012	Plastics and Plastics Compounding Materials	112	2p	Ex	3
N112015	Natural Polymers	112	2p	Ex	3
N126002	Materials for Electronics	126	2p+1c	C+Ex	4
N126009	Nanomaterials	126	2p	Ex	3
N126027	Physical chemistry of nanomaterials	126	2p+1c	C+Ex	4
N143014	Advanced Chemical Informatics	143	3c	MC	3
N215008	Petroleum Technology I	215	3p	Ex	5
N215017	Equipment for Fuel Processing Technology and Petrochemistry	215	2p+2c	C+Ex	5
N216006	Atmosphere Protection Technology	216	2p+1c	C+Ex	4
N217009	Biological Wastewater Treatment	217	3p+1c	C+Ex	6
N217027	Anaerobic Digestion Processes for Wastewater Treatment	217	2p+1c	C+Ex	4
N218024	Power Engineering	218	3p+1c	C+Ex	6
N218080	Specialised Internship	218		C	2
N240010	Ecology	240	2p	Ex	3
N319010	Applied Cell Biology	319	2p+1c	C+Ex	4
N319011	Biochemistry of Secondary Metabolites	319	2p+1c	C+Ex	4
N319012	Malting Technology	319	2p+1c	C+Ex	4
N319016	Bioengineering II	319	3p	Ex	5
N319034	Biotechnological Applications of Microorganisms	319	2p+1c	C+Ex	4
N320034	Enzymology	320	2p+2c	C+Ex	5
N320071	Food biochemistry	320	2p+1c	C+Ex	4
N321020	Food production and nutritional value	321	2p+1c	MC	3
N321021	Natural and modified polysaccharides	321	2p	Ex	3
N322023	Surfactants and detergents	322	2p+1c	C+Ex	4
N323030	Quality in Laboratory and Control Practice	323	1p+1l	C+Ex	3
N324030	Food process quality control	324	2p+1c	C+Ex	4
N324031	Consumer Sciences	324	2p	MC	2
N342002	Raw materials from Sustainable Sources	342	2p	Ex	3
N342003	Structure and Reactivity	342	2p+1c	C+Ex	4
N342005	Structural Analysis of Natural Compounds	342	2p	Ex	3
N342009	Biologically Active Natural Compounds	342	3p	Ex	5

Code	Subject	Department	Study Hours	Exam	Cred
N342010	NMR spectroscopy in Natural Compounds	342	2p+1c	MC	3
N352013	Advanced Food Technology I	352	4p	C+Ex	5
N402015	Molecular Spectroscopy	402	2p+3c	C+Ex	6
N402016	Bioanalytical Methods	402	2p	Ex	3
N402021	Radioanalytical Methods	402	2p+2c	C+Ex	5
N402023	Molecular Engineering	402	2p	Ex	3
N402039	Multivariate Statistical Methods	402	2p+2c	C+Ex	5
N402040	Quality Management Systems	402	2p	Ex	3
N402069	Crystal engineering in pharmaceutical industry	402	2p	Ex	3
N402082	Theory and Experiment of Molecular Spectroscopy	402	2p+1c	Ex	4
N402083	Theory and Experiment of Radioanalytical Methods	402	2p	Ex	3
N403020	Phase Equilibria	403	3p+2c	C+Ex	7
N403023	Statistical Thermodynamics, Molecular Modeling and Simulation	403	3p+1c	C+Ex	6
N403033	Physical Chemistry: Semestral Work I	403	4c	MC	4
N413003	Mathematics II	413	3p+3c	C+Ex	8
N413009	Introduction to Mathematical Optimization	413	2p+2c	C+Ex	5
N413012	Methods of Analysis of Non-linear Dynamical Models	413	2p+2c	C+Ex	5
N413013	Methods of Applied Mathematics	413	2p+1c	C+Ex	4
N413017	Financial Mathematics	413	2p+1c	MC	3
N413038A	Numerical algorithms	413	3p+2c	C+Ex	7
N437036	Environmental Management Systems	837	2p	Ex	3
N437053	Economic Aspects of Chemical Industry	837	2p	MC	2
N437054	Soft skills in use	837	2p+1c	C	3
N444004	Measuring and Control Engineering	444	2p	Ex	3
N444005	Fundamentals of Machinery	444	2p+1c	C+Ex	4
N444007	Fundamentals of Electronics	444	2p+2c	C+Ex	5
N444012	Metrology	444	2p+3c	C+Ex	5
N444019	Sensors and Sensor Systems	444	2p+2c	C+Ex	5
N444020	Measuring and Control Engineering: Laboratory	444	3l	MC	3
N445002	Algorithms and Programming	445	2c	MC	2
N445004	Mathematical Methods in Engineering	445	2p+2c	C+Ex	5
N445006	Computer Graphics	445	1p+3c	C+Ex	5
N445007	Object Oriented Programming	445	2p+3c	C+Ex	5

Code	Subject	Department	Study Hours	Exam	Cred
N445022A	Image Processing I	445	2p+2c	C+Ex	5
N445024	Artificial Neural Networks	445	2p+2c	C+Ex	5
N445036	Enterprise Processes Simulation	445	1p+2c	MC	3
N445044	Graphs in Engineering	445	2p+1c	MC	3
N445052	Database Systems Design	445	1p+3c	C+Ex	5
N445068	Application of Microprocessors	445	2p+1c	MC	3
N445070	Geographical Information Systems	445	2p+1c	MC	3
N445084	Robotic Systems	445	1p+2c	MC	3
N445085	Predictive Control	445	2p+2c	C+Ex	5
N832043A	Soft Skills I	832	2p	C	2
N832054	Science Photography II.	832	2c	C	2
N834049	German - advanced II	834	2c	C	1
N834060	German for Engineers I	834	2c	C	1
N834061	German for Engineers II	834	2c	MC	1
N834062	English for Engineers I	834	2c	C	1
N834063	English for Engineers II	834	2c	MC	1
N834065	English - Upper Advanced II	834	2c	C	1

Optional subjects for 2nd year, WINTER SEMESTER

Obory: TKR

Code	Subject	Department	Study Hours	Exam	Cred
N101001	Safety and Legislation in Chemistry	101	2p	Ex	3
N101004	Inorganic Chemistry: Laboratory II	101	4l	MC	4
N101010	Technology of Special Inorganic Materials	101	2p	Ex	3
N101025	Bioinorganic Chemistry	101	2p	Ex	3
N105005	Fundamentals of Computer Simulations + D129	105	2p+2c	C+Ex	5
N105009	Experimental Methods in Electrochemistry	105	2p+1c	C+Ex	4
N105017	Technology and Application of Industrial Fertilizers	105	2p+1c	C+Ex	4
N106007	Phase Transformations in Metals	106	3p	Ex	4
N106008	Physics of Metals	106	3p	Ex	5
N106016	Corrosion Protection Mechanisms	106	2p	Ex	3
N107003	Mechanics of Materials	107	2p+1c	C+Ex	4
N107009	Calculations in Chemical Engineering	107	3c	MC	2
N107010	Corrosion and Application of Refractories and Inorganic Binders	107	2p+1c	C+Ex	4
N107013	Transport Phenomena	107	2p+2c	C+Ex	5
N107014	Technology of Inorganic Binders	107	4p+1c	C+Ex	7
N107015	Technology of Ceramics	107	4p+1c	C+Ex	7
N107016	Technology of Glass	107	4p+1c	C+Ex	7
N107027	Microstructure and Properties of Heterogeneous Materials	107	2p+1c	C+Ex	4
N108008	X-Ray Phase Analysis I	108	2p+1c	C+Ex	4
N108009	X-Ray Phase Analysis II	108	2p+1c	C+Ex	4
N108011	Structural Crystallography	108	2p	Ex	3
N108012	Crystal Growth Technology	108	2p+1c	C+Ex	4
N108014	Computer Graphics for Visualising the Structure of Molecules	108	2p	Ex	3
N108024	Hybrid materials	108	2p	Ex	3
N108025	Advanced Structure of Crystals	108	2p	Ex	3
N110005	Organic Chemistry II	110	3p+2c	C+Ex	7
N110008	Chemistry of Heterocyclic Compounds	110	2p	Ex	3
N110010	Introduction to Supramolecular Chemistry	110	2p+1c	C+Ex	4
N110011	Organic Chemistry of Selected Elements	110	2p	Ex	3
N110012	Organic Synthesis	110	3p+2c	C+Ex	7
N110014	Transition Metals in Organic Synthesis	110	3p+1c	C+Ex	6
N110015	Organic Reaction Mechanisms	110	2p+2c	C+Ex	5

Code	Subject	Department	Study Hours	Exam	Cred
N110019	Quantum Organic Chemistry	110	2p+1c	C+Ex	4
N110024	Computations and Visualization of Molecules	110	1p+2c	C+Ex	4
N110028	Toxicology for Chemists	110	2p	Ex	3
N111001	Chemical Process Safety	111	2p+1c	C+Ex	4
N111004	Fine Chemicals	111	3p	Ex	5
N111018	Laboratory and industrial data	111	1p+2l	C+Ex	4
N111019	Technology Process Design	111	3p+1c	C+Ex	6
N111048	Engineering of Chemical and Pharmaceutical Processes	111	3p+1c	C+Ex	6
N112007	Applied Rheology of Polymers	112	2p+1c	C+Ex	4
N112008	Physical Chemistry of Polymers	112	2p+2c	C+Ex	5
N112009	Elastomers and Rubber Compounding Materials	112	2p	Ex	3
N112014	Recycling and Ecological Aspects of Polymer Applications	112	2p	Ex	3
N112016	Selected Chapters from Chemistry and Technology of Polymers I	112	2p	Ex	3
N112017	Polymer Manufacturing	112	2p+2c	C+Ex	5
N112041	Selected Chapters from Chemistry and Technology of Polymers II	112	2p	Ex	3
N126001	Biomaterials	126	2p	Ex	3
N126006	Materials Diagnostics	126	2p	Ex	3
N215004	Industrial Lubricants	215	2p	Ex	3
N215009	Petroleum Technology II	215	2p	Ex	3
N215010	Petrochemistry	215	3p	Ex	5
N215011	Special Analysis of Fuels	215	3p	Ex	5
N216002	Atmosphere Analytics	216	3p	Ex	5
N216007	Atmospheric Chemistry	216	2p	Ex	3
N216009	Gas industry	216	3p	Ex	5
N217012	Drinking Water Treatment and Supply	217	3p+2c	C+Ex	7
N217017	Microbiology in Water Technology	217	2p+1c	C+Ex	4
N217022	Hydrology and Pedology	217	2p+1c	C+Ex	4
N217023	Hydrobiology	217	2p+1c	C+Ex	4
N217026	Biodegradation and Ecotoxicity	217	2p	Ex	3
N218010	Technical Nuclear Chemistry	218	2p+1c	C+Ex	4
N218014	Energetic Equipment	218	2p+1c	C+Ex	4
N218018A	Radioactive Waste Management	218	2p	Ex	3
N218020	Chemistry of the Power Cycle	218	3p	Ex	5

Code	Subject	Department	Study Hours	Exam	Cred
N240008	Legal and Administrative Aspects of Environmental Protection	240	3p	Ex	5
N240015	Environmental Toxicology	240	3p	Ex	5
N240028	Environmental models	240	2p	Ex	3
N319013	Brewing Technology	319	3p+1c	C+Ex	5
N319015	Processes and Operations in Brewing Industry	319	2p+1c	C+Ex	4
N319018	Viticulture, production of non-alkoholic and low-alkoholic beverages	319	2p+2c	C+Ex	5
N319035	Biotechnology in Chemical and Pharmaceutical Industry	319	2p+2c	C+Ex	5
N319036	Biotechnology in Food Industry	319	2p+2c	C+Ex	5
N320067	Biopharmaceuticals	320	2p	Ex	3
N320087	Structural Biology	320	3c	MC	3
N321014	Marketing of Food Products	321	1p+1c	MC	2
N322019	Chemistry and Technology of Cosmetics	322	2p+1c	C+Ex	4
N324009	Use and waste disposal from agricultural and food industry	324	2p	MC	2
N324026	Food Packaging	324	2p+1c	C+Ex	4
N324029	Food traceability and authenticity	324	2p+1c	C+Ex	4
N342011	Chemistry of Natural Compounds: Selected Chapters	342	2p+1c	C+Ex	4
N342012	Labelled Compounds	342	2p	Ex	3
N342013	Chemistry of Saccharides and Biopolymers	342	2p	Ex	3
N342016	Stereoselective Syntheses	342	2p+1c	C+Ex	4
N402004	Analytical Chemistry II	402	2p+1c	C+Ex	4
N402006	Separation Methods	402	2p+3c	C+Ex	6
N402011	Techniques of Measurement and Interpretation of Luminescence Spectra	402	1p	Ex	2
N402012	Electroanalytical Methods	402	2p+3c	C+Ex	6
N402018	Sensors	402	2p	Ex	3
N402024	Supramolecular Chemistry	402	2p	Ex	3
N402026	Analysis by Origin: Biological Samples	402	1p	Ex	2
N402028	Analysis by Origin: Environmental Samples	402	2p	Ex	3
N402029	Techniques of Measurement and Interpretation of Mass Spectra	402	1p	Ex	2
N402030	Techniques of Measurement and Interpretation of IR and Raman Spectra	402	1p	Ex	2
N402032	Techniques of Measurement and Interpretation of NMR Spectra	402	1p	Ex	2

Code	Subject	Department	Study Hours	Exam	Cred
N402057	Metrology in chemistry	402	1c	Ex	2
N402085	Theory and Experiment of Electroanalytical Methods	402	2p	Ex	3
N403025	Chemical Equilibria	403	1p+1c	Ex	2
N403028	Physical Chemistry of Phase Boundaries	403	2p+1c	C+Ex	4
N403034	Physical Chemistry: Semestral Work II	403	4c	MC	4
N403042	Introduction to the modern theory of phase transitions	403	3p	Ex	4
N403043	Quantum Mechanics in Chemistry: Advanced Course	403	2p+1c	C+Ex	5
N413015	Mathematical Fundamentals of Optimal Control and Games Theory	413	2p+1c	C+Ex	4
N437024	Intellectual Capital Management	837	2p+1c	C+Ex	4
N444006	Physics II	444	2p+2c	C+Ex	5
N444008	Measurement in Environmental Protection	444	2p+1c	Ex	4
N444010	Biophysics	444	2p+1c	C+Ex	4
N444011	Chemical Sensors	444	2p+3c	C+Ex	6
N444021	Measuring Technique	444	2p+3c	C+Ex	6
N445003	Database Systems	445	1p+3c	C+Ex	5
N445015	Technical Instrumentation for Control	445	2p+2c	C+Ex	5
N445016	Digital Signal and Image Processing	445	2p+2c	C+Ex	5
N445056	Project Management	445	2p+2c	C+Ex	5
N445060	Image Processing II	445	1p+2c	C+Ex	4
N445071	Applied Artificial Intelligence	445	2p+1c	C+Ex	4
N832043	Soft Skills I	832	2p	C	2
N832046	Contract Law	832	2p	Ex	3
N832053	Science Photography I.	832	2c	C	2
N834063	English for Engineers II	834	2c	MC	1