

## Course descriptions

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## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-412/22			<b>Course title:</b> Abstract of a contribution from a domestic or an international conference (originally AFG, AFK, AFH, AFL)				
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:    per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 4							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 423							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-505/22				<b>Course title:</b> Bachelor's thesis reviewer			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:    per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 3							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 140							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-504/22				<b>Course title:</b> Bachelor's thesis supervisor			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 8							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 50							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/N-DCTP-011/22	<b>Course title:</b> Chemical Reactivity
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Type, volume, methods and workload of the student - additional information</b> Form of Study: lecture, seminar, individual Total number of contact hours per semester is 30, including lectures and seminars. Contact teaching is preferred. In critical situation the teaching might be performed online too.	
<b>Number of credits:</b> 3	
<b>Recommended semester:</b> 1.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Oral examination	
<b>Learning outcomes:</b> Student will extend the knowledge of quantum chemical methods and calculations in chemical reactivity with the focus on the thesis topic. He/she will utilize these skills in the course of doctoral training and in the solution of computational tasks associated with the thesis.	
<b>Class syllabus:</b> <ul style="list-style-type: none"> <li>· Mapping of the potential energy hypersurface, stationary points, reaction profile</li> <li>· Ab initio calculations of typical reaction mechanisms</li> <li>· Frontier orbitals (HOMO/LUMO interakcie), reactivity indices</li> <li>· Mapping of the reaction coordinate – IRC</li> <li>· Dynamic and non-dynamic correlation in chemical reactivity</li> <li>· Relativistic effects in chemical reactivity</li> <li>· Výpočty rovnovážnych a rýchlostných konštánt v plynnej fáze</li> <li>· Vplyv neadiabatických efektov na reaktivitu</li> <li>· Metódy na štúdium nekovalentných systémov s rastúcou zložitosťou</li> </ul>	
<b>Recommended literature:</b> <ul style="list-style-type: none"> <li>· J. Keeler a P. Wothers: Chemical structure and reactivity, Oxford 2014</li> <li>· Z. Havlas a R. Zahradník, Řešené úlohy z chemické reaktivity, Academia, 1987.</li> <li>· P. Atkins, J. De Paula, Elements of physical chemistry, Oxford 1994.</li> <li>· I. Fleming, Hraníční orbitály a reakce v organické chemii, SNTL 1983</li> <li>· K. Fukui, The role of frontier orbitals in chemical reactions, Nobel lecture, 8 December, 1981.</li> <li>·</li> </ul>	

<b>Languages necessary to complete the course:</b> English	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
<b>Lecturers:</b> prof. RNDr. Ivan Černušák, DrSc., doc. Mgr. Michal Pitoňák, PhD., RNDr. Lukáš Félix Pašteka, PhD.	
<b>Last change:</b> 28.09.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-414/22				<b>Course title:</b> Completing an long-term ERASMUS+ internship (minimum 60 days)			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:    per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 20							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 19							
A	ABS	B	C	D	E	FX	NEABS
0,0	94,74	0,0	0,0	0,0	0,0	0,0	5,26
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							



## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-415/22				<b>Course title:</b> Completion of SAIA/NŠP internship program or other equivalent (minimum 30 days)			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 20							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 25							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-416/22			<b>Course title:</b> Completion of a short-term foreign internship (15-30 days, and related to the topic of the PhD thesis)				
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 7							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 47							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/N-DCTP-012/22	<b>Course title:</b> Computer Simulations
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Type, volume, methods and workload of the student - additional information</b> Form of Study: lecture Number of contact hours: per week: 2 per level/semester: Method: Total number of contact hours per semester is 30. In an emergency situation the teaching might be performed online too.	
<b>Number of credits:</b> 3	
<b>Recommended semester:</b> 4.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Oral examination. Passed (60-100%)/Failed (<60%)	
<b>Learning outcomes:</b> Students will be provided with introduction to modern simulation methods in chemistry and their physical principles.	
<b>Class syllabus:</b> <ul style="list-style-type: none"> <li>· basic principles of Monte Carlo simulations</li> <li>· basic principles of molecular dynamics</li> <li>· Monte Carlo and molecular dynamics in various ensembles</li> <li>· calculation of free energy: thermodynamic integration, umbrella sampling</li> <li>· simulations of chemical reactions: metadynamics, bluemoon sampling, transition path sampling</li> <li>· the use of machine learning in simulations</li> </ul>	
<b>Recommended literature:</b> <ul style="list-style-type: none"> <li>· Statistical mechanics: Theory and molecular simulations, M. Tuckerman, Oxford university press 2010</li> <li>· Understanding molecular simulations, D. Frenkel and B. Smit, academic press 2002</li> </ul>	
<b>Languages necessary to complete the course:</b> English or Slovak	
<b>Notes:</b>	

<b>Past grade distribution</b>	
Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
<b>Lecturers:</b> doc. Ing. Tomáš Bučko, PhD.	
<b>Last change:</b> 22.09.2022	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/N-DSSZ-303/22	<b>Course title:</b> Defence of Dissertation Thesis
<b>Number of credits:</b> 30	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Conditions for passing the course: Course evaluation takes place as a part of the State examination in accordance to the Study regulations of the Faculty of Natural Sciences UK in Bratislava upon submission of the written part of the dissertation thesis (as final work). Assessment is standard and reflects the student's sufficient orientation in the issue. The conditions for successful course completion are in accordance with the Study Regulations of the Faculty of Natural Sciences UK.	
<b>Learning outcomes:</b> Educational outcomes: The aim of the course is to capitalise on theoretical, methodological and applied knowledge of doctoral studies in the elaboration and subsequent defence of the dissertation thesis, and thus the successful completion of doctoral studies.	
<b>Class syllabus:</b> Brief outline of the course: The student's dissertation thesis will demonstrate his/her ability and readiness for independent scientific and creative activities in the area of research or development or for independent theoretical and creative artistic creativity. It should be characterised by a high degree of analysis and synthesis of knowledge, as well as a sufficient overview of existing literature. The work must be original and created by the author in compliance with the rules of working with information sources. The academic work must not appear to be plagiarised, nor infringe the copyrights of other authors. The author is required to thoroughly cite the information sources used, list the specific results of other authors or team of authors by citing the source, accurately describe the methods and working procedures of other authors or teams of authors, and document the laboratory results and field research of other authors or teams of authors. Style of citation is governed by the practice in the given scientific field, respecting the relevant norms and standards.	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> Recommended literature: No specifications regarding the character of a specific topic for the dissertation thesis. Recommended literature is included in the doctoral student's individual study plan.	
<b>Languages necessary to complete the course:</b> Required language for successful course completion: Slovak language in combination with English (study literature in English)	
<b>Last change:</b> 24.10.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/PriF-DSSZ-001/22	<b>Course title:</b> Dissertation 1
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 1.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Conditions for passing the course: Course evaluation will be conducted individually based on the doctoral student's individual study plan, as well as on the basis of an agreement between the academic supervisor and doctoral student. Evaluation is standard and shall reflect a sufficient orientation of the student in the presented subject matter for successful course completion according to the Study Regulations of the Faculty of Natural Sciences UK.	
<b>Learning outcomes:</b> Educational outcomes: By passing this subject, the student will achieve sufficient orientation in the project issue of the dissertation thesis based on specific individual topics. This set task of knowledge is essential for a firmly established theoretical readiness of the course graduate in terms of his/her awareness, and equally supports his/her potential in a wide field of applied practice. Undoubtedly, the outcomes of his/her education will also be reflected in the student's overview in terms of methodological approaches in the subject matter.	
<b>Class syllabus:</b> Brief outline of the course: The subject Dissertation Thesis is a compulsory part of the doctoral student's study activities. The student requires a supremely individual character with regard to the specifics of the individual topics of the dissertation thesis. The basic syllabus should already be evident within the individual study plan of the doctoral student. The subject is important especially in terms of understanding the basic theoretical and methodological aspects of the solution to the topic of the dissertation thesis with emphasis on self-study and consultation with the academic supervisor and a wide spectrum of consultants, who will take part in creating the professional potential of the doctoral student for the next (scientific) stage of his/her studies.	
<b>Recommended literature:</b> Recommended literature:	

No specifications regarding the character of a specific topic for the dissertation thesis. Recommended literature is included in the doctoral student's individual study plan.	
<b>Languages necessary to complete the course:</b> Required language for successful course completion: Slovak language in combination with English (study literature in English)	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 9	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b> 12.10.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/PriF-DSSZ-002/22	<b>Course title:</b> Dissertation 2
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Conditions for passing the course: Course evaluation will be conducted individually based on the doctoral student's individual study plan, as well as on the basis of an agreement between the academic supervisor and doctoral student. Evaluation is standard and shall reflect a sufficient orientation of the student in the presented subject matter for successful course completion according to the Study Regulations of the Faculty of Natural Sciences UK.	
<b>Learning outcomes:</b> Educational outcomes: By passing this subject, the student will achieve sufficient orientation in the project issue of the dissertation thesis based on specific individual topics. This set task of knowledge is essential for a firmly established theoretical readiness of the course graduate in terms of his/her awareness, and equally supports his/her potential in a wide field of applied practice. Undoubtedly, the outcomes of his/her education will also be reflected in the student's overview in terms of methodological approaches in the subject matter.	
<b>Class syllabus:</b> Brief outline of the course: The subject Dissertation Thesis is a compulsory part of the doctoral student's study activities. The student requires a supremely individual character with regard to the specifics of the individual topics of the dissertation thesis. The basic syllabus should already be evident within the individual study plan of the doctoral student. The subject is important especially in terms of understanding the basic theoretical and methodological aspects of the solution to the topic of the dissertation thesis with emphasis on self-study and consultation with the academic supervisor and a wide spectrum of consultants, who will take part in creating the professional potential of the doctoral student for the next (scientific) stage of his/her studies.	
<b>Recommended literature:</b> Recommended literature:	



No specifications regarding the character of a specific topic for the dissertation thesis. Recommended literature is included in the doctoral student's individual study plan.	
<b>Languages necessary to complete the course:</b> Required language for successful course completion: Slovak language in combination with English (study literature in English)	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 6	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b> 18.10.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/PriF-DSSZ-003/22	<b>Course title:</b> Dissertation 3
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 3.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Conditions for passing the course: Course evaluation will be conducted individually based on the doctoral student's individual study plan, as well as on the basis of an agreement between the academic supervisor and doctoral student. Evaluation is standard and shall reflect a sufficient orientation of the student in the presented subject matter for successful course completion according to the Study Regulations of the Faculty of Natural Sciences UK.	
<b>Learning outcomes:</b> Educational outcomes: By passing this subject, the student will achieve sufficient orientation in the project issue of the dissertation thesis based on specific individual topics. This set task of knowledge is essential for a firmly established theoretical readiness of the course graduate in terms of his/her awareness, and equally supports his/her potential in a wide field of applied practice. Undoubtedly, the outcomes of his/her education will also be reflected in the student's overview in terms of methodological approaches in the subject matter.	
<b>Class syllabus:</b> Brief outline of the course: The subject Dissertation Thesis is a compulsory part of the doctoral student's study activities. The student requires a supremely individual character with regard to the specifics of the individual topics of the dissertation thesis. The basic syllabus should already be evident within the individual study plan of the doctoral student. The subject is important especially in terms of understanding the basic theoretical and methodological aspects of the solution to the topic of the dissertation thesis with emphasis on self-study and consultation with the academic supervisor and a wide spectrum of consultants, who will take part in creating the professional potential of the doctoral student for the next (scientific) stage of his/her studies.	
<b>Recommended literature:</b> Recommended literature:	

No specifications regarding the character of a specific topic for the dissertation thesis. Recommended literature is included in the doctoral student's individual study plan.	
<b>Languages necessary to complete the course:</b> Required language for successful course completion: Slovak language in combination with English (study literature in English)	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 6	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b> 18.10.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/PriF-DSSZ-004/22	<b>Course title:</b> Dissertation 4
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 4.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Conditions for passing the course: Course evaluation will be conducted individually based on the doctoral student's individual study plan, as well as on the basis of an agreement between the academic supervisor and doctoral student. Evaluation is standard and shall reflect a sufficient orientation of the student in the presented subject matter for successful course completion according to the Study Regulations of the Faculty of Natural Sciences UK.	
<b>Learning outcomes:</b> Educational outcomes: By passing this subject, the student will achieve sufficient orientation in the project issue of the dissertation thesis based on specific individual topics. This set task of knowledge is essential for a firmly established theoretical readiness of the course graduate in terms of his/her awareness, and equally supports his/her potential in a wide field of applied practice. Undoubtedly, the outcomes of his/her education will also be reflected in the student's overview in terms of methodological approaches in the subject matter.	
<b>Class syllabus:</b> Brief outline of the course: The subject Dissertation Thesis is a compulsory part of the doctoral student's study activities. The student requires a supremely individual character with regard to the specifics of the individual topics of the dissertation thesis. The basic syllabus should already be evident within the individual study plan of the doctoral student. The subject is important especially in terms of understanding the basic theoretical and methodological aspects of the solution to the topic of the dissertation thesis with emphasis on self-study and consultation with the academic supervisor and a wide spectrum of consultants, who will take part in creating the professional potential of the doctoral student for the next (scientific) stage of his/her studies.	
<b>Recommended literature:</b> Recommended literature:	

No specifications regarding the character of a specific topic for the dissertation thesis. Recommended literature is included in the doctoral student's individual study plan.	
<b>Languages necessary to complete the course:</b> Required language for successful course completion: Slovak language in combination with English (study literature in English)	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b> 10.10.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/PriF-DSSZ-005/22	<b>Course title:</b> Dissertation 5
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Type, volume, methods and workload of the student - additional information</b> Type, scope and methods of instruction: No specifications concerning the degree of study (choice of methods – in class, distant learning, or a combination of both)	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 5.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Conditions for passing the course: Course evaluation will be conducted individually based on the doctoral student's individual study plan, as well as on the basis of an agreement between the academic supervisor and doctoral student. Evaluation is standard and shall reflect a sufficient orientation of the student in the presented subject matter for successful course completion according to the Study Regulations of the Faculty of Natural Sciences UK.	
<b>Learning outcomes:</b> Educational outcomes: By passing this subject, the student will achieve sufficient orientation in the project issue of the dissertation thesis based on specific individual topics. This set task of knowledge is essential for a firmly established theoretical readiness of the course graduate in terms of his/her awareness, and equally supports his/her potential in a wide field of applied practice. Undoubtedly, the outcomes of his/her education will also be reflected in the student's overview in terms of methodological approaches in the subject matter.	
<b>Class syllabus:</b> Brief outline of the course: The subject Dissertation Thesis is a compulsory part of the doctoral student's study activities. The student requires a supremely individual character with regard to the specifics of the individual topics of the dissertation thesis. The basic syllabus should already be evident within the individual study plan of the doctoral student. The subject is important especially in terms of understanding the basic theoretical and methodological aspects of the solution to the topic of the dissertation thesis with emphasis on self-study and consultation with the academic supervisor and a wide spectrum of consultants, who will take part in creating the professional potential of the doctoral student for the next (scientific) stage of his/her studies.	

<b>Recommended literature:</b> Recommended literature: No specifications regarding the character of a specific topic for the dissertation thesis. Recommended literature is included in the doctoral student's individual study plan.	
<b>Languages necessary to complete the course:</b> Required language for successful course completion: Slovak language in combination with English (study literature in English)	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 3	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b> 06.10.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/PriF-DSSZ-006/22	<b>Course title:</b> Dissertation 6
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 6.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 4	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	



## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/PriF-DSSZ-007/22	<b>Course title:</b> Dissertation 7
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 7.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 4	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/N-DGAG-400/22	<b>Course title:</b> Dissertation Exam
<b>Number of credits:</b> 15	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Conditions for passing the course: Course evaluation takes place as a part of the State examination in accordance to the Study regulations of the Faculty of Natural Sciences UK in Bratislava, as well as submission of the written part of the dissertation thesis within the set deadline. The subjects of the state examination include a discussion about the written work of the dissertation examination (prepared by the doctoral student), as well as other subjects of the oral examination (ad hoc) approved by the Dean. Assessment is standard and reflects the student's sufficient orientation in the issue. The conditions for successful course completion are in accordance with the Study Regulations of the Faculty of Natural Sciences UK.	
<b>Learning outcomes:</b> Educational outcomes: The objective of the course is to gain basic habits and cultural-ethical aspects of working with scientific literature, evaluation, and systemization of the studied knowledge. The doctoral student needs to successfully pass the dissertation examination according to the act on Universities and Study Regulations of the Faculty of Natural Sciences of Comenius University in Bratislava.	
<b>Class syllabus:</b> Brief outline of the course: Based on the description of the starting points, principles, and conclusions from the published results of the studied issues, the aim is to teach the doctoral student how to process critical research. A further objective is to understand the principles of scientific work and its legal, physical, and social attributes. The main output is the elaboration of the written work for the dissertation examination and its successful completion in accordance with the Study Regulations of the Faculty of Natural Sciences UK. The form and content of the work is regulated by article 34, paragraph 4 of the Study Regulations of the Faculty of Natural Sciences UK. The dissertation examination consists of a part consisting of a discussion of the written work for the dissertation examination, as well as a part in which the doctoral student needs to demonstrate theoretical knowledge according to the focus of the dissertation topic. The composition of the Examination Committee, the determination of the Opponent (expert examiner) and the general course of the dissertation examination are governed by the current Study Regulations of the Faculty of Natural Sciences UK.	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> Recommended literature: No specifications regarding the character of a specific topic for the dissertation thesis. Recommended literature is included in the doctoral student's individual study plan.	
<b>Languages necessary to complete the course:</b>	

Required language for successful course completion: Slovak language in combination with English (study literature in English)
<b>Last change:</b> 19.10.2022
<b>Approved by:</b>

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-400/22				<b>Course title:</b> Grant CU or Grant SAS or equivalent grant			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 12							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 103							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/N-DCTP-009/22	<b>Course title:</b> Group Theory in Chemistry
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 3	
<b>Recommended semester:</b> 1.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 3	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b> prof. RNDr. Vladimír Kellö, DrSc., doc. Mgr. Pavel Neogrady, DrSc.	
<b>Last change:</b> 19.09.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-413/22			<b>Course title:</b> Intellectual Property Rights Document (originally AGJ)				
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 10							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 0							
A	ABS	B	C	D	E	FX	NEABS
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/N-DCTP-001/22	<b>Course title:</b> Modern computational methods of quantum chemistry
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Type, volume, methods and workload of the student - additional information</b> Form of Study: lecture, seminar, individual Number of contact hours: per week: per level/semester: 50 hrs in the 1st. year, winter semester Metóda štúdia: Total number of contact hours per semester is 50, including lectures and seminars. In critical situation the teaching might be performed online too.	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 1.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Oral examination. Passed (60-100%)/Failed (<60%)	
<b>Learning outcomes:</b> The aim of the course is to improve knowledge on current computational methods in quantum chemistry. Particular choice of the methods is determined by the thesis topic. Students will apply achieved skills for solving specific tasks in the frame of his/her dissertation.	
<b>Class syllabus:</b> <ul style="list-style-type: none"> <li>· Self-Consistent Field method – RHF, ROHF, UHF</li> <li>· Principle of configuration interaction (CI)</li> <li>· Multireference methods – non-dynamic correlation – CASSCF</li> <li>· Dynamic electron correlation – perturbation theory, coupled clusters methods</li> <li>· Density functional methods (DFT), types of functionals</li> <li>· Computational methods for atomic and molecular properties and solid-state models</li> <li>· Methods to include solvent effects</li> <li>· Molecular dynamics (MD), methods utilizing force fields, ab initio MD</li> <li>· Principles and applications of Monte Carlo methods</li> </ul>	
<b>Recommended literature:</b> <ul style="list-style-type: none"> <li>· L. Piela, Ideas of Quantum Chemistry, Elsevier Science, 2020.</li> <li>· A. Szabo, N. S. Ostlund, Modern Quantum Chemistry, Courier Corp., 1996.</li> <li>· P. Atkins, R. Friedman, Molecular Quantum Mechanics, Oxford Univ. Press, 2005.</li> <li>· F. Jensen, Introduction to Computational Chemistry, Wiley, 2007.</li> <li>· M. Urban, I. Černušák, V. Kello, J. Noga, Electron Correlation in Molecules, Plenum Press 1987.</li> </ul>	

- C. J. Cramer, Essentials of Computational Chemistry, Wiley, 2004.
- D. Marx, J. Hutter, Ab initio Molecular Dynamics, Cambridge, 2010.
- D. Frenkel, B. Smit, Understanding Molecular Simulation, Acad. Press 2002.
- M. P. Allen, D. J. Tildesley, Computer Simulation of Liquids, Oxford, 2017.
- T. Helgaker, P. Jorgensen, J. Olsen - Molecular Electronic-Structure Theory, Wiley, 2013.

**Languages necessary to complete the course:**

English or Slovak

**Notes:**

**Past grade distribution**

Total number of evaluated students: 5

ABS	NEABS
100,0	0,0

**Lecturers:** prof. RNDr. Ivan Černušák, DrSc., doc. Ing. Tomáš Bučko, PhD., prof. RNDr. Vladimír Kellö, DrSc., doc. Mgr. Pavel Neogrady, DrSc., prof. RNDr. Miroslav Urban, DrSc., doc. Mgr. Michal Pitoňák, PhD., RNDr. Lukáš Félix Pašteka, PhD.

**Last change:** 22.09.2022

**Approved by:**



## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-508/22				<b>Course title:</b> Other activities			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 1							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 332							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-501/22				<b>Course title:</b> P1 Pedagogical output as a whole (originally ACA, ACB, BCI, BCB)			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 20							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 8							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-503/22				<b>Course title:</b> P2 Pedagogical output as a part (originally BCK)			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 10							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 0							
A	ABS	B	C	D	E	FX	NEABS
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-502/22				<b>Course title:</b> P2 Pedagogical output as part (originally ACC, ACD)			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 15							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 0							
A	ABS	B	C	D	E	FX	NEABS
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-507/22				<b>Course title:</b> Pedagogical activity (4 hours/WS and 4 hours/SS) or alternative pedagogical work			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 2							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 367							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KJ/N-DSSZ-026/22	<b>Course title:</b> Professional English 1
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 1.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Each course participant is required to achieve proficient knowledge and usage of the English grammar, professional vocabulary, reading and listening comprehension, writing professional texts and oral presentations. Credits will be awarded to students who will demonstrate active participation and deliver all set tasks and assignments successfully. The course participants will be awarded a pass or a fail upon course completion.	
<b>Learning outcomes:</b> Upon completion of the course, PhD students will effectively use the English language for professional purposes. They will proficiently comprehend targeted written and audio texts and present their viewpoints in required forms.	
<b>Class syllabus:</b> Theoretical and practical skills in professional written communication include appropriate structure of formal written texts (emails, application forms, personal statements, cover letters, abstracts, scientific articles, paraphrasing, using citations, citing sources, etc.) The course also focuses on theoretical explanation of correct delivery of oral texts, professional presentations and discussions. The course primary target is to facilitate PhD students with proficient usage of all the aspects of written and oral communication in various settings.	
<b>Recommended literature:</b> Armer, T.: Cambridge English for Scientists CD ROM Writing Professional English Team of authors: Test your Listening Skills: A Handbook for Science Doctoral students Team of authors: Test your Reading Skills: A Handbook for Science Doctoral students	
<b>Languages necessary to complete the course:</b> English	
<b>Notes:</b>	

<b>Past grade distribution</b>							
Total number of evaluated students: 179							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b> Mgr. Aneta Barnes, RNDr. Tatiana Slov�kov�, PhD.							
<b>Last change:</b> 03.10.2022							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KJ/N-DSSZ-027/22	<b>Course title:</b> Professional English 2
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Each course participant is required to achieve proficient knowledge and usage of the English grammar, professional vocabulary, reading and listening comprehension, writing professional texts and oral presentations. Credits will be awarded to students who will demonstrate active participation during seminars and deliver all prior set tasks and assignments successfully. The course participants will be awarded a pass or a fail upon course completion	
<b>Learning outcomes:</b> Doctoral students who successfully pass the examination in Professional English 2 will be enabled to use the English language for specific purposes in all its forms effectively and sufficiently. They will thoroughly comprehend professional texts in written and/or audio form, acquire professional vocabulary and actively participate in various oral communication settings.	
<b>Class syllabus:</b> Theoretical and practical skills in professional writing communication in the English language as a follow up to prior gained knowledge in the previous semester encompass writing professional résumés, summaries, lay summaries, responses to job interview questions, professional CVs, comparing and contrasting in scientific articles, etc. Professional oral communication focusses on research-based scientific presentations and effectively led discussions.	
<b>Recommended literature:</b> Armer, T.: Cambridge English for Scientists CD ROM Writing Professional English Team of authors: Test your Listening Skills: A Handbook for Science Doctoral students Team of authors: Test your Reading Skills: A Handbook for Science Doctoral students	
<b>Languages necessary to complete the course:</b> English	
<b>Notes:</b> B1 level in English is required in order to pass this course. Seminars are held in summer semester. Number of students in one course is limited to twenty.	



Students can choose from four offered time slots.	
<b>Past grade distribution</b>	
Total number of evaluated students: 43	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b> Mgr. Aneta Barnes	
<b>Last change:</b> 03.10.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/N-DCTP-010/22	<b>Course title:</b> Relativistic Effects in Chemistry
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Type, volume, methods and workload of the student - additional information</b> Total number of contact hours per semester is 30, including lectures and seminars. In critical situation the teaching might be performed online too.	
<b>Number of credits:</b> 3	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Grading Policy (Assessment/Evaluation): Oral examination. Passed/Failed	
<b>Learning outcomes:</b> The aim of the course is to improve knowledge about relativistic quantum chemistry. Within this course will be explained the nature of relativistic effects and importance of relativity in chemistry. Students will be acquainted with basic theoretical methods describing relativistic effects and will apply achieved skills for solving specific tasks in the frame of his/her dissertation.	
<b>Class syllabus:</b> Syllabus/Indicative Content: <ul style="list-style-type: none"> <li>• Basic theoretical principles of special theory of relativity: Galileo and Lorentz transformation, Dirac equation, 4- and 2-component methods, quasirelativistic methods.</li> <li>• Spin-orbit interaction and its role in chemistry. Classification of electronic states in relativistic chemistry.</li> <li>• Combination of relativistic effects and effects of electron correlation.</li> <li>• Periodic table and relativistic effects.</li> <li>• Influence of relativistic effects on:             <ul style="list-style-type: none"> <li>intermolecular interactions, link to nanotechnologies,</li> <li>electric properties of atoms and molecules,</li> <li>spectroscopic properties of transition metals compounds, diatomics of heavy p-elements from Ga to Bi, and compounds of lanthanides and actinides.</li> </ul> </li> <li>• Extremely accurate calculations of molecular properties.</li> </ul>	
<b>Recommended literature:</b> <ul style="list-style-type: none"> <li>• M. Iliaš, V. Kellö, M. Urban; Relativistic effects in atomic and molecular properties, Acta Physica Slovaca 60, 259-391, (2010).</li> <li>• K. Balasubramanian; Relativistic Effects in Chemistry, J. Wiley, New York, 1997.</li> </ul>	

- P. Pyykkö; Relativistic Effects in structural chemistry. Chem. Rev. 88, 563-594, (1988).
- P. Pyykkö; Relativistic Effects in Chemistry: More Common Than You Thought. Ann. Rev. Phys. Chem. 63, 45–64 (2012).
- M. Reiher, A. Wolf; Relativistic Quantum Chemistry: The Fundamental Theory of Molecular Science. Wiley-VCH, Weinheim, 2009
- P. Schwerdtfeger, O. R. Smits, P. Pyykkö; The periodic table and the physics that drives it, Nature Rev. Chem. 4, 359-380 (2020).

**Languages necessary to complete the course:**

English or Slovak

**Notes:**

**Past grade distribution**

Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

**Lecturers:** prof. RNDr. Vladimír Kellö, DrSc., prof. RNDr. Miroslav Urban, DrSc., RNDr. Lukáš Félix Pašteka, PhD.

**Last change:** 29.09.2022

**Approved by:**

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF.KDPP/N-DSSZ-500/22				<b>Course title:</b> Selected topics from university pedagogy for non-teachers			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 3							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 12							
A	ABS	B	C	D	E	FX	NEABS
0,0	91,67	0,0	0,0	0,0	0,0	0,0	8,33
<b>Lecturers:</b> RNDr. Jana Ciceková, PhD., doc. RNDr. PaedDr. Zuzana Haláková, PhD., PhDr. ThLic. Peter Ikhardt, PhD.							
<b>Last change:</b> 30.09.2022							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KJ/N-DSSZ-022/22	<b>Course title:</b> Slovak for Foreign Doctoral Students 1
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 3	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> The objective of the course is to acquire the basics of Slovak in a communicative way, to develop individual language skills (listening, reading, writing and speaking) based on the Common European Framework of Reference for Languages (CEFR) for the level A1, from a complete beginner level. Based on the completion of the course, the participants are able to understand and react to common situations. They are able to speak about themselves, ask for more information they need to know. Scale of assessment (preliminary/final): Credits will not be awarded to students who receive less than 60% on the final examination.	
<b>Learning outcomes:</b> The objective of the course is to acquire the basics of Slovak in a communicative way, to develop individual language skills (listening, reading, writing and speaking) based on the Common European Framework of Reference for Languages (CEFR) for the level A1, from a complete beginner level. Based on the completion of the course, the participants are able to understand and react to common situations. They are able to speak about themselves, ask for more information they need to know.	
<b>Class syllabus:</b> Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1 (Lekcia: 1-5). UK v Bratislave, 2012. Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1+A2, cvičebnica Audio program: <a href="https://uniba.sk/krizom-krazom">https://uniba.sk/krizom-krazom</a> Worksheets, website: <a href="https://slovake.eu/sk">https://slovake.eu/sk</a>	
<b>Recommended literature:</b> Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1 (Lekcia: 1-5). UK v Bratislave, 2012. Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1+A2, cvičebnica Audio program: <a href="https://uniba.sk/krizom-krazom">https://uniba.sk/krizom-krazom</a> Worksheets, website: <a href="https://slovake.eu/sk">https://slovake.eu/sk</a>	

<b>Languages necessary to complete the course:</b> Slovak in combination with English (the study literature is in both Slovak and English)							
<b>Notes:</b> It is possible to register for the course just once. Students may begin in either the Summer or Winter semester.							
<b>Past grade distribution</b> Total number of evaluated students: 40							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b> Mgr. Karin Rózsová Wolfová							
<b>Last change:</b> 28.09.2022							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KJ/N-DSSZ-023/22	<b>Course title:</b> Slovak for Foreign Doctoral Students 2
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Type, extent and method of academic activities: 2 hours (at 60 min. per hour) of weekly lessons in the form of seminars. All academic activities will take place during the lessons. Number of credits: 3 credits Recommended semester/trimester of study: from 1st to 8th semester Level of study: third Subject conditions: Slovak for Foreign Doctoral Students 1 Requirements for course completion: active participation during lessons, ongoing work on the assignments. There will be a final examination at the end of the semester. Scale of assessment (preliminary/final): Credits will not be awarded to students who receive less than 60% on the final examination.	
<b>Learning outcomes:</b> Course Objectives: The objective of the course is to acquire the basics of Slovak in a communicative way, to develop individual language skills (listening, reading, writing and speaking) based on the Common European Framework of Reference for Languages (CEFR) for the level A1 - intended for beginner or pre-intermediate.	
<b>Class syllabus:</b> The lessons contain the basics of Slovak grammar which are relevant to the specifics of Slovak as a foreign language. Selected grammatical phenomena, conjugation and declination are practised. Vocabulary is focused on real-life communication needs.	
<b>Recommended literature:</b> Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1 Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1+A2, workbook Audio program: <a href="https://uniba.sk/krizom-krazom">https://uniba.sk/krizom-krazom</a> Worksheets are prepared by the course instructor. Portal: <a href="https://slovake.eu/sk">https://slovake.eu/sk</a>	
<b>Languages necessary to complete the course:</b> Slovak in combination with English (the study literature is in both Slovak and English)	

**Notes:**

It is possible to register for the course just once. Students may begin in either the Summer or Winter semester.

**Past grade distribution**

Total number of evaluated students: 27

A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0

**Lecturers:** Mgr. Karin Rózsová Wolfová

**Last change:** 18.07.2022

**Approved by:**



## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KJ/N-DSSZ-024/22	<b>Course title:</b> Slovak for Foreign Doctoral Students 3
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Type, extent and method of academic activities: 2 hours (at 60 min. per hour) of weekly lessons in the form of seminars. All academic activities will take place during the lessons. Number of credits: 3 credits Recommended semester/trimester of study: from 1st to 8th semester Level of study: third Subject conditions: Slovak for Foreign Doctoral Students 2 Requirements for course completion: active participation during lessons, ongoing work on the assignments. There will be a final examination at the end of the semester. Scale of assessment (preliminary/final): Credits will not be awarded to students who receive less than 60% on the final examination.	
<b>Learning outcomes:</b> The objective of the course is to acquire the basics of Slovak in a communicative way, to develop individual language skills (listening, reading, writing and speaking) based on the Common European Framework of Reference for Languages (CEFR) for the levels A1 – A2. Intended for levels A1-A2, beginner to pre-intermediate	
<b>Class syllabus:</b> The lessons contain the basics of Slovak grammar which are relevant to the specifics of Slovak as a foreign language. Selected grammatical phenomena, conjugation and declination are practised. Vocabulary is focused on real-life communication needs.	
<b>Recommended literature:</b> Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1, A2 Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1+A2, workbook Audio program: <a href="https://uniba.sk/krizom-krazom">https://uniba.sk/krizom-krazom</a> Worksheets are prepared by the course instructor. Portal: <a href="https://slovakie.eu/sk">https://slovakie.eu/sk</a>	
<b>Languages necessary to complete the course:</b> Slovak in combination with English (the study literature is in both Slovak and English)	

**Notes:**

It is possible to register for the course just once. Students may begin in either the Summer or Winter semester.

**Past grade distribution**

Total number of evaluated students: 27

A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0

**Lecturers:** Mgr. Karin Rózsová Wolfová

**Last change:** 18.07.2022

**Approved by:**

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KJ/N-DSSZ-028/22	<b>Course title:</b> Slovak for Foreign Doctoral Students 4
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Grading (Assessment/Evaluation): Active participation during lessons, ongoing work on the assignments. There will be a final examination at the end of the semester. Credits will be awarded to students who receive more than 60% on the final examination. The course participants will be awarded a pass or a fail upon course completion.	
<b>Learning outcomes:</b> Objectives and outcomes: The objective of the course is to acquire the basics of Slovak in a communicative way, to develop individual language skills (listening, reading, writing and speaking) based on the Common European Framework of Reference for Languages (CEFR) for the levels A1 – A2, pre-intermediate level. Based on the completion of the course, the participants are able to understand the common situations and they are able to have a discussion and comment basic daily scenarios.	
<b>Class syllabus:</b> Brief outline of the course: The lessons contain the basics of Slovak grammar which are relevant to the specifics of Slovak as a foreign language. Selected grammatical aspects (verb - conjugation/next conjugation classes, possessive pronouns, I like/enjoy doing something, I like something, comparison of adjectives and adverbs, conditional) are practised. Vocabulary is focused on real-life communication needs.	
<b>Recommended literature:</b> Recommended literature: Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1. UK v Bratislave, 2012. Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A2. (Lekcia 1-4). UK v Bratislave, 2012. Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1+A2, cvičebnica Audio program: <a href="https://uniba.sk/krizom-krazom">https://uniba.sk/krizom-krazom</a> Worksheets, website: <a href="https://slovake.eu/sk">https://slovake.eu/sk</a>	
<b>Languages necessary to complete the course:</b>	

Language of instruction: Slovak in combination with English (the study literature is in Slovak).							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 8							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b> Mgr. Karin Rózsová Wolfová							
<b>Last change:</b> 18.10.2022							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-506/22				<b>Course title:</b> Supervisor of the SSC contribution			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 4							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 6							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/N-DCTP-006/22	<b>Course title:</b> Theoretical Chemistry Seminar (1)
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Type, volume, methods and workload of the student - additional information</b> Form: seminar. Total number of contact hours per week is 2, per semester is 26. Contact method of study is preferred. Alternatives are: on-line or combined.	
<b>Number of credits:</b> 3	
<b>Recommended semester:</b> 1.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Active participation in seminars, presentation of the topic and partial results of the dissertation. Completion of the course is assessed by the classification grades "passed" or "failed". The final evaluation will be "passed" if the student submits a minimum performance corresponding to 50% of the maximum performance. The final evaluation will be "failed" if the student submits an unacceptably weak performance corresponding to less than 60% of the maximum performance. Conditions for successful completion of the course are also regulated by the Study Regulations of PriF UK.	
<b>Learning outcomes:</b> Study of the topic of the assigned dissertation, methods of its research and data processing. The aim is to teach the doctoral student to work with scientific literature, interpret the results of various types of laboratory results and critically evaluate their limits. The doctoral student will learn to present and discuss the partial results of the dissertation.	
<b>Class syllabus:</b> Status of development and planning of work on the dissertation project. Discussion on the chapters of the dissertation on the basis of set objectives. Formal and content shortcomings of the dissertation. Presentation and evaluation of dissertation results with discussion in the presence of members of the department.	
<b>Recommended literature:</b> 1. D. Meško, D. Katuščák, J. Findra, Akademická príručka. Osveta, Martin, 2013. 2. Current monographs, journals and internet information sources. 3. Original papers and reviews in chemistry domain.	
<b>Languages necessary to complete the course:</b>	

<b>Notes:</b>	
<b>Past grade distribution</b>	
Total number of evaluated students: 2	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b> doc. Ing. Tomáš Bučko, PhD., prof. RNDr. Ivan Černušák, DrSc., prof. RNDr. Vladimír Kellö, DrSc., doc. Mgr. Pavel Neogrady, DrSc., doc. Mgr. Michal Pitoňák, PhD., prof. RNDr. Miroslav Urban, DrSc.	
<b>Last change:</b> 04.11.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/N-DCTP-007/22	<b>Course title:</b> Theoretical Chemistry Seminar (2)
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 3	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Active participation in seminars, presentation of the topic and partial results of the dissertation. Completion of the course is assessed by the classification grades "passed" or "failed". The final evaluation will be "passed" if the student submits a minimum performance corresponding to 60% of the maximum performance. The final evaluation will be "failed" if the student submits an unacceptably weak performance corresponding to less than 60% of the maximum performance. Conditions for successful completion of the course are also regulated by the Study Regulations of PriF UK.	
<b>Learning outcomes:</b> Study of the topic of the assigned dissertation, methods of its research and data processing. The aim is to teach the doctoral student to work with scientific literature, interpret the results of various types of laboratory results and critically evaluate their limits. The doctoral student will learn to present and discuss the partial results of the dissertation.	
<b>Class syllabus:</b> Status of development and planning of work on the dissertation project. Discussion on the chapters of the dissertation on the basis of set objectives. Formal and content shortcomings of the dissertation. Presentation and evaluation of dissertation results with discussion in the presence of members of the department.	
<b>Recommended literature:</b> D. Meško, D. Katuščák, J. Findra, Akademická príručka. Osveta, Martin, 2013. 2. Current monographs, journals and internet information sources. 3. Original papers and reviews in chemistry domain.	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	



<b>Past grade distribution</b>	
Total number of evaluated students: 2	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b> doc. Ing. Tomáš Bučko, PhD., prof. RNDr. Ivan Černušák, DrSc., prof. RNDr. Vladimír Kellö, DrSc., doc. Mgr. Pavel Neogrady, DrSc., doc. Mgr. Michal Pitoňák, PhD., prof. RNDr. Miroslav Urban, DrSc.	
<b>Last change:</b> 04.11.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/N-DCTP-008/22	<b>Course title:</b> Theoretical Chemistry Seminar (3)
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 3	
<b>Recommended semester:</b> 3.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Active participation in seminars, presentation of the topic and partial results of the dissertation. Completion of the course is assessed by the classification grades "passed" or "failed". The final evaluation will be "passed" if the student submits a minimum performance corresponding to 60% of the maximum performance. The final evaluation will be "failed" if the student submits an unacceptably weak performance corresponding to less than 60% of the maximum performance. Conditions for successful completion of the course are also regulated by the Study Regulations of PriF UK.	
<b>Learning outcomes:</b> Study of the topic of the assigned dissertation, methods of its research and data processing. The aim is to teach the doctoral student to work with scientific literature, interpret the results of various types of laboratory results and critically evaluate their limits. The doctoral student will learn to present and discuss the partial results of the dissertation.	
<b>Class syllabus:</b> Status of development and planning of work on the dissertation project. Discussion on the chapters of the dissertation on the basis of set objectives. Formal and content shortcomings of the dissertation. Presentation and evaluation of dissertation results with discussion in the presence of members of the department.	
<b>Recommended literature:</b> D. Meško, D. Katuščák, J. Findra, Akademická príručka. Osveta, Martin, 2013. 2. Current monographs, journals and internet information sources. 3. Original papers and reviews in chemistry domain.	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	

<b>Past grade distribution</b>	
Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
<b>Lecturers:</b> doc. Ing. Tomáš Bučko, PhD., prof. RNDr. Ivan Černušák, DrSc., prof. RNDr. Vladimír Kellö, DrSc., doc. Mgr. Pavel Neogrady, DrSc., doc. Mgr. Michal Pitoňák, PhD., prof. RNDr. Miroslav Urban, DrSc.	
<b>Last change:</b> 04.11.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course ID:</b> PriF.KFTCh/N-DCTP-002/22	<b>Course title:</b> Theoretical chemistry
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning	
<b>Type, volume, methods and workload of the student - additional information</b> Form of Study: lecture, seminar, individual Number of contact hours: per week: per level/semester: 50 hrs in the 1st. year, summer semester Method: Total number of contact hours per semester is 50, including lectures and seminars. In critical situation the teaching might be performed online too.	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Oral examination. Passed (60-100%)/Failed (<60%)	
<b>Learning outcomes:</b> The aim of the course is to provide an overview of basic theoretical chemistry methods for study of structural and dynamical properties of molecules and molecular models.	
<b>Class syllabus:</b> <ul style="list-style-type: none"> <li>· Mathematical and physical background of quantum chemistry. The importance of computers in chemistry.</li> <li>· Electronic structures, statistical thermodynamics and reaction dynamics.</li> <li>· Modern theories of chemical bond, properties and interactions of molecules. One-particle and many-body “picture” in theoretical chemistry.</li> <li>· Theoretical foundations of spectroscopy techniques.</li> <li>· Extended molecular systems, molecular mechanics and dynamics, solid state.</li> <li>· Applications of theoretical chemistry in related disciplines (physics, biology).</li> </ul>	
<b>Recommended literature:</b> <ul style="list-style-type: none"> <li>· J. Simons, An Introduction to Theoretical Chemistry, Cambridge Univ. Press, Cambridge, 2003</li> <li>· L. Piela, Ideas of Quantum Chemistry, Elsevier, Amsterdam, 2007</li> </ul>	
<b>Languages necessary to complete the course:</b> English or Slovak, literature mostly in English	
<b>Notes:</b>	

<b>Past grade distribution</b>	
Total number of evaluated students: 2	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b> prof. RNDr. Ivan Černušák, DrSc., doc. Ing. Tomáš Bučko, PhD., prof. RNDr. Vladimír Kellö, DrSc., doc. Mgr. Pavel Neogrady, DrSc., doc. Mgr. Michal Pitoňák, PhD., prof. RNDr. Miroslav Urban, DrSc., RNDr. Lukáš Félix Pašteka, PhD.	
<b>Last change:</b> 22.09.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-404/22			<b>Course title:</b> V1 Scientific output as a whole - ESB monograph (originally AAA, ABA), individual authorship less than 3 AH				
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 20							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 0							
A	ABS	B	C	D	E	FX	NEABS
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-401/22			<b>Course title:</b> V1 Scientific output as a whole – ESB monograph (originally AAA, ABA), individual authorship share $\geq 3$ AH				
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 30							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 0							
A	ABS	B	C	D	E	FX	NEABS
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-405/22			<b>Course title:</b> V2 Scientific output as part - study in ESB or collection (originally AAB, ABA, ABB), individual authorship less than 3 AH				
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 20							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 3							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							



## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-402/22			<b>Course title:</b> V2 Scientific output as part - study in ESB or collection (originally AAB, ABA, ABB), individual authorship share $\geq 3$ AH				
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 30							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 1							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-411/22			<b>Course title:</b> V2 Scientific output as part of ESB, collection - contribution in peer reviewed scientific collection, monograph (originally AEC, AFA, AFC, AED)				
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 6							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 202							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-406/22				<b>Course title:</b> V3 Scientific output as a part - study in a journal (originally AAB, ABA, ABB), individual authorship less than 3 AH			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 20							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 0							
A	ABS	B	C	D	E	FX	NEABS
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-403/22				<b>Course title:</b> V3 Scientific output as a part - study in a journal (originally AAB, ABA, ABB), individual authorship $\geq 3$ AH			
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 30							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 0							
A	ABS	B	C	D	E	FX	NEABS
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-410/22			<b>Course title:</b> V3 Scientific output in a journal outside the index databases (originally ADE, ADF)				
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:    per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 12							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 39							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-407/22		<b>Course title:</b> V3 Scientific output in a journal registered by CCC, WOS, SCOPUS - JCR/Q1 – Q2 (originally ADC, ADD, ADM, ADN), first or corresponding author					
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 50							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 86							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-408/22		<b>Course title:</b> V3 Scientific output in a journal registered by CCC, WOS, SCOPUS - JCR/Q3- Q4 (originally ADC, ADD, ADM, ADN), first or corresponding author					
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 40							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 38							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023							
<b>University:</b> Comenius University Bratislava							
<b>Faculty:</b> Faculty of Natural Sciences							
<b>Course ID:</b> PriF/N-DSSZ-409/22		<b>Course title:</b> V3 Scientific output in the journal registered by CCC, WOS, SCOPUS - JCR/Q1 – Q2 – Q3 - Q4 (originally ADC, ADD, ADM, ADN), co-author					
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning							
<b>Number of credits:</b> 20							
<b>Recommended semester:</b>							
<b>Educational level:</b> III.							
<b>Prerequisites:</b>							
<b>Course requirements:</b>							
<b>Learning outcomes:</b>							
<b>Class syllabus:</b>							
<b>Recommended literature:</b>							
<b>Languages necessary to complete the course:</b>							
<b>Notes:</b>							
<b>Past grade distribution</b> Total number of evaluated students: 153							
A	ABS	B	C	D	E	FX	NEABS
0,0	100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>							
<b>Last change:</b>							
<b>Approved by:</b>							