# Course descriptions

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## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-412/22 | Abstract of a contribution from a domestic or an intenational conference (originally AFG, AFK, AFH, AFL) |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 4

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-505/22 | Bachelor's thesis reviewer |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 3

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-504/22 | Bachelor's thesis supervisor |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 8

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-414/22 | Completing an long-term ERASMUS+ internship (minimum 60 days) |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 20

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-415/22 | Completion of SAIA/NŠP internship program or other equivalent (minimum 30 days) |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 20

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-416/22 | Completion of a short-term foreign internship (15-30 days, and related to the topic of the PhD thesis) |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 7

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

**STATE EXAM DESCRIPTION**

| | |
|---|---|
| **Academic year:** 2022/2023 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Natural Sciences | |
| **Course ID:**<br>PriF.KIHG/N-DSSZ-303/22 | **Course title:**<br>Defence of the dissertation |
| **Number of credits:** 30 | |
| **Educational level:** III. | |
| **Course requirements:**<br>Conditions for passing the course:<br>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. | |
| **Learning outcomes:**<br>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. | |
| **Class syllabus:**<br>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 charactersied 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. | |
| **State exam syllabus:** | |
| **Recommended literature:**<br>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. | |
| **Languages necessary to complete the course:**<br>Required language for successful course completion:<br>Slovak language in combination with English (study literature in English) | |
| **Last change:** 24.10.2022 | |
| **Approved by:** | |

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/PriF-DSSZ-001/22 | Dissertation 1 |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 5

**Recommended semester:** 1.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
Conditions for passing the course:
Course evalutation 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.

**Learning outcomes:**
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.

**Class syllabus:**
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.

**Recommended literature:**
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.

**Languages necessary to complete the course:**
Required language for successful course completion:
Slovak language in combination with English (study literature in English)

**Notes:**

**Past grade distribution**
Total number of evaluated students: 4

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

**Lecturers:**

**Last change:** 18.10.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/PriF-DSSZ-002/22 | Dissertation 2 |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 5

**Recommended semester:** 2.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
Conditions for passing the course:
Course evalutation 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.

**Learning outcomes:**
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.

**Class syllabus:**
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.

**Recommended literature:**
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.

**Languages necessary to complete the course:**
Required language for successful course completion:
Slovak language in combination with English (study literature in English)

**Notes:**

**Past grade distribution**
Total number of evaluated students: 2

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

**Lecturers:**

**Last change:** 18.10.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/PriF-DSSZ-003/22 | Dissertation 3 |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 5

**Recommended semester:** 3.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
Conditions for passing the course:
Course evalutation 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.

**Learning outcomes:**
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.

**Class syllabus:**
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.

**Recommended literature:**
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.

**Languages necessary to complete the course:**
Required language for successful course completion:
Slovak language in combination with English (study literature in English)

**Notes:**

**Past grade distribution**
Total number of evaluated students: 4

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

**Lecturers:**

**Last change:** 18.10.2022

**Approved by:**

## COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2022/2023 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Natural Sciences | |
| **Course ID:**<br>PriF.KIHG/PriF-DSSZ-004/22 | **Course title:**<br>Dissertation 4 |
| **Educational activities:**<br>**Type of activities:**<br>**Number of hours:**<br>**per week: per level/semester:**<br>**Form of the course:** on-site learning | |
| **Number of credits:** 5 | |
| **Recommended semester:** 4. | |
| **Educational level:** III. | |
| **Prerequisites:** | |
| **Course requirements:**<br>Conditions for passing the course:<br>Course evalutation 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. | |
| **Learning outcomes:**<br>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. | |
| **Class syllabus:**<br>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.<br>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. | |
| **Recommended literature:**<br>Recommended literature:<br>No specifications regarding the character of a specific topic for the dissertation thesis.<br>Recommended literature is included in the doctoral student’s individual study plan. | |

**Languages necessary to complete the course:**
Required language for successful course completion:
Slovak language in combination with English (study literature in English)

**Notes:**

**Past grade distribution**
Total number of evaluated students: 2

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

**Lecturers:**

**Last change:** 10.10.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/PriF-DSSZ-005/22 | Dissertation 5 |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 5

**Recommended semester:** 5.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
Conditions for passing the course:
Course evalutation 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.

**Learning outcomes:**
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.

**Class syllabus:**
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.

**Recommended literature:**
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.

**Languages necessary to complete the course:**
Required language for successful course completion:
Slovak language in combination with English (study literature in English)

**Notes:**

**Past grade distribution**
Total number of evaluated students: 7

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

**Lecturers:**

**Last change:** 06.10.2022

**Approved by:**

## COURSE DESCRIPTION

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

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

| |
|---|
| **Lecturers:** |
| **Last change:** |
| **Approved by:** |

## COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2022/2023 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Natural Sciences | |
| **Course ID:**<br>PriF.KIHG/PriF-DSSZ-007/22 | **Course title:**<br>Dissertation 7 |
| **Educational activities:**<br>**Type of activities:**<br>**Number of hours:**<br>**per week:** **per level/semester:**<br>**Form of the course:** on-site learning | |
| **Number of credits:** 5 | |
| **Recommended semester:** 7. | |
| **Educational level:** III. | |
| **Prerequisites:** | |
| **Course requirements:** | |
| **Learning outcomes:** | |
| **Class syllabus:** | |
| **Recommended literature:** | |
| **Languages necessary to complete the course:** | |
| **Notes:** | |
| **Past grade distribution**<br>Total number of evaluated students: 5 | |

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

| |
|---|
| **Lecturers:** |
| **Last change:** |
| **Approved by:** |

## STATE EXAM DESCRIPTION

| | |
|---|---|
| **Academic year:** 2022/2023 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Natural Sciences | |
| **Course ID:**<br>PriF.KIHG/N-DGAG-400/22 | **Course title:**<br>Dissertation Examination |
| **Number of credits:** 15 | |
| **Educational level:** III. | |

**Course requirements:**

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.

**Learning outcomes:**

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.

**Class syllabus:**

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 wel 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.

**State exam syllabus:**

**Recommended literature:**

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.

**Languages necessary to complete the course:**

| |
|---|
| Required language for successful course completion:<br>Slovak language in combination with English (study literature in English) |
| **Last change:** 19.10.2022 |
| **Approved by:** |

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/N-DGAG-010/22 | GIS and Databases in Applied Geophysics |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Type, volume, methods and workload of the student - additional information**
Without specification with regard to the doctoral degree, on-site/on-line/combined learning. Ongoing consultation between student and teacher/supervisor during the term.

**Number of credits:** 5

**Recommended semester:** 3.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
Requirement for receiving the credits is ongoing evaluation and final exam. Credits will not be awarded to students who receive less than 60% of the exam evaluation. Completion of the subject is graded as passed or failed.

**Learning outcomes:**
Expand knowledge on current application of geographic information systems (GIS), remote and satellite reconnaissance of the Earth, digital elevation model (DEM), geological maps and another geo-databases in applied geophysics. Acquire the basics of work with GIS applications on PC, acquaint with the WEB oriented GIS applications allowing to search and to use free online/offline geographic, geological and geophysical data on WMS and WFS servers. Acquaint, understand and manage basic processing steps of large volumes of spatial oriented geophysical, geological and geographic data in accessible software environment (ArcGIS, QGIS, Geosoft Oasis montaj or equivalent).

**Class syllabus:**
Characteristics of software environment; creation, import and export of different data types, maps, databases, grids, voxels, MXD files, raster and vector pictures and profiles; preparation and creation of exploration lines´ plan; creation of partial and main (master) database of survey data; data processing – database filling and quality control; gridding, contouring and 1D filtering; creation and visualization of 3D maps with the utilization of advanced CAD means; automatization using scripts; utilization of pre-arranged scripts and menus. Short basics of GIS; integration of geophysical data into GIS environment; work with free internet sources of geological and geophysical data.

**Recommended literature:**
[1] Schuurman, N. (2004): GIS a short introduction. Blackwell Publishing.
[2] Davis, D.E. (2000): GIS. How to create own maps. Computer Press, Praha (in Czech)

[3] Getachew Ebuy Tedla, 2005: A GIS Data Model for the Interpretation of MUlti-method Geophysical Data. International Institute for Geo-information Science and Earth Observation, Enschede, The Netherland
[4] Manuals, guides and instructions on internet pages

**Languages necessary to complete the course:**
Slovak in combination with English (literature is partly in English).

**Notes:**

**Past grade distribution**
Total number of evaluated students: 1

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

**Lecturers:** doc. RNDr. Andrej Mojzeš, PhD.

**Last change:** 20.09.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-400/22 | Grant CU or Grant SAS or equivalent grant |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 12

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-413/22 | Intellectual Property Rights Document (originally AGJ) |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 10

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/N-DIHG-001/22 | Methods of Engineering Geological Research |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Type, volume, methods and workload of the student - additional information**
Not specified, regarding the 3rd degree of study; combined method.

**Number of credits:** 5

**Recommended semester:** 2.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
The evaluation of the course takes place in the form of an oral exam, the successful completion of which reflects the sufficient orientation of the student in the issue. The course will be classified provided that the PhD student proves the fulfilment of obligations at the level of at least 60 %. The conditions for successful completion of the course are in accordance with the Study Regulations of the Faculty of Natural Sciences.

**Learning outcomes:**
By completing the course, the PhD student acquires advanced knowledge about the progress in the development of knowledge in the field of engineering geology. This knowledge is necessary for the theoretical equipment of the PhD student in terms of his knowledge, but also supports the development of his potential in a wide area of engineering geological practice. The results of education will also be reflected in the student's overview at the level of methodological approaches in the subject matter. The course is clearly designed in accordance with other courses, with the aim of training the student to solve specific problems of engineering geological research and practice.

**Class syllabus:**
The course presents an advanced course to learn about the methodological aspects in the theoretical and practical level necessary to handle successfully the tasks that an engineering geologist must solve when evaluating construction sites in complex engineering geological conditions, get acquainted with methods of prevention of the most important geohazards, with the methods of their monitoring, as well as with the methods of common construction procedures for the realization of various types of constructions. The course is adapted to the specific needs of PhD students.

**Recommended literature:**
According to the specific needs of the solved dissertation works.

**Languages necessary to complete the course:**
Slovak in combination with English (literature is in English).

| **Notes:** | |
|---|---|
| **Past grade distribution**<br>Total number of evaluated students: 0 | |
| ABS | NEABS |
| 0,0 | 0,0 |
| **Lecturers:** prof. RNDr. Martin Bednarik, PhD. | |
| **Last change:** 19.10.2022 | |
| **Approved by:** | |

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/N-DIHG-002/22 | Methods of Hydrogeological Research |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Type, volume, methods and workload of the student - additional information**
Without specification with regard to the doctoral degree, on-site/on-line/combined learning.

**Number of credits:** 5

**Recommended semester:** 3.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
The evaluation of the course takes place in the form of an oral exam, the successful completion of which reflects the sufficient orientation of the student in the issue. The course will be classified provided that the PhD student proves the fulfilment of obligations at the level of at least 60 %. The conditions for successful completion of the course are in accordance with the Study Regulations of the Faculty of Natural Sciences.

**Learning outcomes:**
By completing the course, the PhD student acquires advanced knowledge about the progress in the development of knowledge in the field of hydrogeology. This knowledge is necessary for the theoretical equipment of the PhD student in terms of his knowledge, but also supports the development of his potential in a wide area of hydrogeological practice. The results of education will also be reflected in the student's overview at the level of methodological approaches in the subject matter. The course is clearly designed in accordance with other courses, with the aim of training the student to solve specific problems of hydrogeological research and practice.

**Class syllabus:**
Rules of the groundwater creation, flow and circulation in the aquifer. Types of hydrogeological structures. Follow-up knowledge about the creation of physical and chemical composition of groundwater during its movement in transit-accumulation area of hydrogeological structure. Modern methods of hydrogeological investigation and research – intersection of knowledge of various geological disciplines by evaluation of conditions of development and accumulation of water in rock environment. Knowledge and forecasting modeling tools of groundwater natural amounts changes.

**Recommended literature:**
According to the specific needs of the solved dissertation works.

**Languages necessary to complete the course:**
Slovak in combination with English (literature is in English).

| **Notes:** | |
|---|---|
| **Past grade distribution**<br>Total number of evaluated students: 1 | |
| ABS | NEABS |
| 100,0 | 0,0 |
| **Lecturers:** doc. RNDr. Dávid Krčmář, PhD. | |
| **Last change:** 19.10.2022 | |
| **Approved by:** | |

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/PriF-DGAG-009/22 | Modelling Methods in Applied Geophysics |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Type, volume, methods and workload of the student - additional information**
Without specification with regard to the doctoral degree, on-site/on-line/combined learning. Ongoing consultation between student and teacher/supervisor during the term.

**Number of credits:** 4

**Recommended semester:** 1.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
Requirement for receiving the credits is ongoing evaluation and final exam. Credits will not be awarded to students who receive less than 60% of the exam evaluation. Completion of the subject is graded as passed or failed.

**Learning outcomes:**
Expanding knowledge of currently used modelling methods in geophysics including modern numerical and optimization methods. Overview of modern geophysical fields modelling methods presented at international conferences and prestigious scientific journals.

**Class syllabus:**
Concept of geophysical fields modelling: manual vs. automatic (optimization), 2D vs 3D, isolated vs integrated/parallel. Overview of numerical methods used in geophysical fields modelling: the method of least squares, optimization methods, genetic algorithms, neural networks. Principles of integrated/parallel modelling of multiple fields simultaneously. Examples of different approaches to the geophysical fields modelling.

**Recommended literature:**
[1] Hinze, W. J., von Friese, R. R. B., & Saad, A. H. (2013). Gravity and Magnetic Exploration. In Principles, practices, and applications (p. 512). Cam bridge: Cambridge University Press
[2] Menke W., 2012: Geophysical data analysis: discrete inverse theory. Elsevier, New York.
[3] special monothematic issue of the journal Geophysicial Prospecting, Vol. 59, Iss. 5, 2011: Modelling methods for geophysical imaging: trends and perspectives.

**Languages necessary to complete the course:**
Slovak in combination with English (literature is in English).

**Notes:**

| **Past grade distribution**<br>Total number of evaluated students: 0 | |
|---|---|
| ABS | NEABS |
| 0,0 | 0,0 |
| **Lecturers:** prof. RNDr. Miroslav Bielik, DrSc., prof. RNDr. Roman Pašteka, PhD., Mgr. Pavol Zahorec, PhD. | |
| **Last change:** 21.09.2022 | |
| **Approved by:** | |

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-508/22 | Other activities |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 1

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-501/22 | P1 Pedagogical output as a whole (originally ACA, ACB, BCI, BCB) |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 20

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-503/22 | P2 Pedagogical output as a part (originally BCK) |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 10

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-502/22 | P2 Pedagogical output as part (originally ACC, ACD) |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 15

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/PriF-DGAG-001/22 | PV 1 Geophysical Structure and Dynamics of Lithosphere |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Type, volume, methods and workload of the student - additional information**
Without specification with regard to the doctoral degree, on-site/on-line/combined learning. Ongoing consultation between student and teacher/supervisor during the term.

**Number of credits:** 5

**Recommended semester:** 1.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
Requirement for receiving the credits is ongoing evaluation and final exam. Credits will not be awarded to students who receive less than 60% of the exam evaluation. Completion of the subject is graded as passed or failed.

**Learning outcomes:**
Creating a global and integrated view of geophysical structure, composition and dynamics of the lithosphere, processes in the lithosphere, interaction of the lithosphere with the asthenosphere and its physical properties.

**Class syllabus:**
Definition of the lithosphere and asthenosphere, structure of the lithosphere, difference between continental and oceanic lithosphere. Seismic, density and geothermal models of the lithosphere, transformation of the seismic waves to the densities, lithosphere and asthenosphere inhomogeneities, rheological properties of the lithosphere, calculations to predict lithosphere rheology, tension in the lithosphere, viscosity of the lithosphere, three-dimensional structure of the lithosphere and asthenosphere, seismic tomography, anisotropy of the lithosphere and asthenosphere. Geophysical mapping of the convergent and divergent lithospheric boundaries, rheology of the lithospheric plates. 3D seismic image of the lithosphere and asthenosphere, calculations of local and regional isostasy, deformation of the lithosphere, Poisson Theory of Elastic Plates - bending of the lithosphere. Integrated geophysical modelling of structure and geodynamics of the lithosphere. Integrated look at connections and interaction of the lithosphere and asthenosphere, relations between processes in the lithosphere, Earth's crust and asthenosphere. Selection of the given topics will be made by a supervisor according to a student's dissertation assignment.

**Recommended literature:**

[1] J. Šefara a M. Bielik: Geofyzikálny obraz Západných Karpát a ich okolia : geologická interpretácia
geofyzikálnych meraní regionálneho a hlbinného charakteru. - 1. vyd. Bratislava: Univerzita Komenského, 2009. 68s. ISBN 978-80-223-2626-1.
[2] D.L. Turcotte, G. Schubert: Geodynamics – Applications of Continuum Physics to Geological problems. John Wiley&Sons. New York-Chicherster-Brisbane-Toronto-Singapore 1985.
[3] R. J. Lillie: Whole Earth Geophysics. Prentice Hall-New Jersey, 1998.
[4] G. Schubert, D.L. Turcotte, P.Olson: Mantle Convection in the Earth and Planets. Cambridge University Press, Cambridge 2001.
[5] Current Slovak and foreign scientific literature.

**Languages necessary to complete the course:**
Slovak in combination with English (literature is in English).

**Notes:**

**Past grade distribution**
Total number of evaluated students: 0

| ABS | NEABS |
|---|---|
| 0,0 | 0,0 |

**Lecturers:** prof. RNDr. Miroslav Bielik, DrSc., RNDr. Ján Vozár, PhD., RNDr. Vladimir Bezak, CSc., Mgr. Pavol Zahorec, PhD.

**Last change:** 18.09.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/PriF-DGAG-003/22 | PV Application of Geophysics in Economic Geology |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Type, volume, methods and workload of the student - additional information**
Without specification with regard to the doctoral degree, on-site/on-line/combined learning. Ongoing consultation between student and teacher/supervisor during the term.

**Number of credits:** 5

**Recommended semester:** 1.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
Requirement for receiving the credits is ongoing evaluation and final exam. Credits will not be awarded to students who receive less than 60% of the exam evaluation. Completion of the subject is graded as passed or failed.

**Learning outcomes:**
Expanding knowledge of using applied geophysics to solve economic geology problems. The goal of this course is to get theoretical and practical skills in this field.

**Class syllabus:**
Definition of physical properties of mineral deposit structures, physical processes related to formation of deposits. Geophysical fields modelling and its use in interpretation of measured geophysical data. Processing and evaluation of measured data and processed data visualisation. Application of GIS techniques in correlating various geophysical and geologic data. Improvements in the development of new geophysical methods in the field; integrated geophysical modelling of structure and dynamics of the shallow Earth's crust. Integrated look at connections and interaction of the shallow crust with deposits formation processes. Selection of the given topics will be made by a supervisor according to a student's dissertation assignment.

**Recommended literature:**
[1] J.Gruntorád a kol: Geofyzikální metody v geologické praxi. PriF UK Praha, 1977.
[2] Kolektív autorov: Geologická interpretace geofyzikálních podkladů. PriF UK Praha, 1986.
[3] Current Slovak and foreign scientific literature.

**Languages necessary to complete the course:**
Slovak in combination with English (part of the literature is in English).

**Notes:**

**Past grade distribution**
Total number of evaluated students: 1

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

**Lecturers:** prof. RNDr. Roman Pašteka, PhD., doc. RNDr. René Putiška, PhD., doc. RNDr. Andrej Mojzeš, PhD., prof. RNDr. Miroslav Bielik, DrSc., RNDr. Bibiana Brixová, PhD.

**Last change:** 18.09.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/PriF-DGAG-002/22 | PV Geophysics in Engineering Geology and Hydrogeology |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Type, volume, methods and workload of the student - additional information**
Without specification with regard to the doctoral degree, on-site/on-line/combined learning. Ongoing consultation between student and teacher/supervisor during the term

**Number of credits:** 5

**Recommended semester:** 1.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
The evaluation of the course takes place in the form of an oral exam, the successful completion of which reflects the sufficient orientation of the student in the issue. The course will be classified provided that the PhD student proves the fulfilment of obligations at the level of at least 60 %. The conditions for successful completion of the course are in accordance with the Study Regulations of the Faculty of Natural Sciences. Completion of the subject is graded as passed or failed.

**Learning outcomes:**
Expanding knowledge of using geophysics to solve engineering geology and hydrology problems. The course is focused on acquiring a global and integrated view of application of geophysics to solving engineering geology and hydrogeology problems. Definition of physical properties of the shallow Earth's crust, physical processes in this part and the effect of rock environments on natural and artificial geophysical fields. Geophysical fields modelling and its use in interpretation of measured data.

**Class syllabus:**
Processing and evaluation of measured data and processed data visualisation. Progress in development of new geophysical methods in engineering geology and hydrogeology, integrated geophysical modelling of structure and dynamics of the shallow Earth's crust. Integrated look at connections and interaction of the shallow crust with products of anthropogenic activities. Selection of the given topics will be made by a supervisor according to a student's dissertation assignment.

**Recommended literature:**
[1] S.Mareš a kol: Geofyzikální metody v hydrogeologii a inženýrské geologii. SNTL/ALFA, Praha, 1983.
[2] Kolektív autorov: Geologická interpretace geofyzikálních podkladů. PriF UK Praha, 1986.

[3] McCann,D.M. et al: Modern Geophysics in Enineering Geology, The Geological society London, 1997.
[4] Current Slovak and foreign scientific literature.

**Languages necessary to complete the course:**
Slovak in combination with English (literature is in English).

**Notes:**

**Past grade distribution**
Total number of evaluated students: 1

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

**Lecturers:** doc. RNDr. René Putiška, PhD., prof. RNDr. Roman Pašteka, PhD., doc. RNDr. Andrej Mojzeš, PhD., RNDr. Bibiana Brixová, PhD., Mgr. Pavol Zahorec, PhD.

**Last change:** 07.10.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/PriF-DGAG-004/22 | PV Geophysics in Environmental Problems Solution |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Type, volume, methods and workload of the student - additional information**
Without specification with regard to the doctoral degree, on-site/on-line/combined learning. Ongoing consultation between student and teacher/supervisor during the term.

**Number of credits:** 5

**Recommended semester:** 2.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
Requirement for receiving the credits is ongoing evaluation and final exam. Credits will not be awarded to students who receive less than 60% of the exam evaluation. Completion of the subject is graded as passed or failed.

**Learning outcomes:**
Expanding knowledge and acquiring skills of applying geophysics to solving environmental problems, georisks and geohazards.

**Class syllabus:**
Definition of physical properties of the shallow Earth's crust, physical processes in this part and the effect of rock environments on natural and artificial geophysical fields. Properties of anthropogenic activities and how these activities are studied in geophysical research. Geophysical fields modelling and its use in interpretation of measured data. Processing and evaluation of measured data and processed data visualisation. Progress in development of new geophysical methods in solving environmental issues, integrated geophysical modelling of structure and dynamics of the shallow Earth's crust. Integrated look at connections and interaction of the shallow crust with products of anthropogenic activity. Selection of the given topics will be made by a supervisor according to a student's dissertation assignment.

**Recommended literature:**
[1] S.Mareš a kol: Geofyzikální metody v hydrogeologii a inženýrské geologii. SNTL/ALFA, Praha, 1983.
[2] Kolektív autorov: Geologická interpretace geofyzikálních podkladů. PriF UK Praha, 1986.
[3] D. Vogelsang: Environmental geophysics. Springer-Verlag Berlin, 1994.
[4] Current Slovak and foreign scientific literature.

**Languages necessary to complete the course:**

Slovak in combination with English (literature is in English).

**Notes:**

**Past grade distribution**
Total number of evaluated students: 1

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

**Lecturers:** doc. RNDr. Andrej Mojzeš, PhD., doc. RNDr. René Putiška, PhD., prof. RNDr. Roman Pašteka, PhD., RNDr. Bibiana Brixová, PhD., Mgr. Pavol Zahorec, PhD., RNDr. Iveta Smetanová, PhD.

**Last change:** 20.09.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-507/22 | Pedagogical activity (4 hours/WS and 4 hours/SS) or alternative pedagogical work |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 2

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2022/2023 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Natural Sciences | |
| **Course ID:**<br>PriF.KJ/N-DSSZ-026/22 | **Course title:**<br>Professional English 1 |
| **Educational activities:**<br>**Type of activities:**<br>**Number of hours:**<br>**per week: per level/semester:**<br>**Form of the course:** on-site learning | |
| **Number of credits:** 5 | |
| **Recommended semester:** 1., 3. | |
| **Educational level:** III. | |
| **Prerequisites:** | |
| **Course requirements:**<br>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. | |
| **Learning outcomes:**<br>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. | |
| **Class syllabus:**<br>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. | |
| **Recommended literature:**<br>Armer, T.: Cambridge English for Scientists<br>CD ROM Writing Professional English<br>Team of authors: Test your Listening Skills: A Handbook for Science Doctoral students<br>Team of authors: Test your Reading Skills: A Handbook for Science Doctoral students | |
| **Languages necessary to complete the course:**<br>English | |
| **Notes:** | |

**Past grade distribution**
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 |

**Lecturers:** Mgr. Aneta Barnes, RNDr. Tatiana Slováková, PhD.

**Last change:** 03.10.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KJ/N-DSSZ-027/22 | Professional English 2 |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 5

**Recommended semester:** 2.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
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

**Learning outcomes:**
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.

**Class syllabus:**
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.

**Recommended literature:**
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

**Languages necessary to complete the course:**
English

**Notes:**
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.

**Past grade distribution**
Total number of evaluated students: 43

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

**Lecturers:** Mgr. Aneta Barnes

**Last change:** 03.10.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/PriF-DGAG-008/22 | Selected Topics from Mathematical Methods in Geophysics |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Type, volume, methods and workload of the student - additional information**
Without specification with regard to the doctoral degree, on-site/on-line/combined learning. Ongoing consultation between student and teacher/supervisor during the term.

**Number of credits:** 5

**Recommended semester:** 2.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
Requirement for receiving the credits is ongoing evaluation and final oral exam. Credits will not be awarded to students who receive less than 60% of the exam evaluation. Completion of the subject is graded as passed or failed.

**Learning outcomes:**
Expanding knowledge with advances topics from the area of special functions, theory of complex variable functions, basics of variational calculus, mathematical transformations and solutions of more complicated differential equations, and methods of numerical mathematics – focused on the solutions of theoretical problems in geophysics.

**Class syllabus:**
Recapitulation of Laplace equation solutions in Cartesian, cylindrical and spherical coordinate systems; properties of various kinds of Bessel functions, properties of Legendre and associated Legendre functions. Solution of the Laplace equation in ellipsoidal coordinate system. Special functions and transformations (Laplace, Hilbert, etc.). Solution of diffusion differential equation (heat conduction); Solution of differential equation, describing the lithospherical plate flexure. Cauchy lemma, Cauchy integral formula, residual lemma. Basics of variational calculus, solution of Euler-Lagrange equation; Selected topics from the area of mathematical analysis and numerical mathematics, based on various topics of final theses.

**Recommended literature:**
[1] Bath, M., Berkhout, A. J., 1984: Mathematical Aspects of Seismology. Elsevier, Amsterdam.
[2] Hvoždara, M., Pašteka, R., 2000: Matematické základy teórie geofyzikálnych metód II. Vysokoškolské skriptá, Prírodovedecká fakulta UK Bratislava.
[3] Karcol, R., 2020: Vybrané špeciálne funkcie v aplikovanej geofyzike 1. Vysokoškolské skriptá, Prírodovedecká fakulta UK Bratislava.

[4] Karcol, R., 2020: Vybrané špeciálne funkcie v aplikovanej geofyzike 2. Vysokoškolské skriptá, Prírodovedecká fakulta UK Bratislava.
[5] Vybrané aktuálne vedecké články s témou riešenia matematických úloh v rámci geofyzikálnych metód.

**Languages necessary to complete the course:**
Slovak in combination with English (part of the literature is in English).

**Notes:**

**Past grade distribution**
Total number of evaluated students: 1

| ABS | NEABS |
|---|---|
| 100,0 | 0,0 |

**Lecturers:** doc. RNDr. Roland Karcol, PhD., prof. RNDr. Roman Pašteka, PhD., Mgr. Ivan Zvara, PhD.

**Last change:** 18.09.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KDPP/N-DSSZ-500/22 | Selected topics from university pedagogy for non-teachers |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 3

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:** RNDr. Jana Ciceková, PhD., doc. RNDr. PaedDr. Zuzana Haláková, PhD., PhDr. ThLic. Peter Ikhardt, PhD.

**Last change:** 30.09.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KJ/N-DSSZ-022/22 | Slovak for Foreign Doctoral Students 1 |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 3

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
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.

**Learning 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 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.

**Class syllabus:**
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: https://uniba.sk/krizom-krazom
Worksheets, website: https://slovake.eu/sk

**Recommended literature:**
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: https://uniba.sk/krizom-krazom
Worksheets, website: https://slovake.eu/sk

**Languages necessary to complete the course:**
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: 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 |

**Lecturers:** Mgr. Karin Rózsová Wolfová

**Last change:** 28.09.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KJ/N-DSSZ-023/22 | Slovak for Foreign Doctoral Students 2 |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 2

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
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.

**Learning outcomes:**
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.

**Class syllabus:**
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.

**Recommended literature:**
Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1
Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1+A2, workbook
Audio program: https://uniba.sk/krizom-krazom
Worksheets are prepared by the course instructor.
Portal: https://slovake.eu/sk

**Languages necessary to complete the course:**
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

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KJ/N-DSSZ-024/22 | Slovak for Foreign Doctoral Students 3 |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 2

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
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.

**Learning 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. Intended for levels A1-A2, beginner to pre-intermediate

**Class syllabus:**
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.

**Recommended literature:**
Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1, A2
Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1+A2, workbook
Audio program: https://uniba.sk/krizom-krazom
Worksheets are prepared by the course instructor.
Portal: https://slovake.eu/sk

**Languages necessary to complete the course:**
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

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KJ/N-DSSZ-028/22 | Slovak for Foreign Doctoral Students 4 |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 2

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
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.

**Learning outcomes:**
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.

**Class syllabus:**
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.

**Recommended literature:**
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: https://uniba.sk/krizom-krazom
Worksheets, website: https://slovake.eu/sk

**Languages necessary to complete the course:**

Language of instruction:
Slovak in combination with English (the study literature is in Slovak).

**Notes:**

**Past grade distribution**
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 |

**Lecturers:** Mgr. Karin Rózsová Wolfová

**Last change:** 18.10.2022

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-506/22 | Supervisor of the SSC contribution |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 4

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF.KIHG/PriF-DGAG-005/22 | V Numerical Methods in Applied Geophysics |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week: per level/semester:**
**Form of the course:** on-site learning

**Type, volume, methods and workload of the student - additional information**
Without specification with regard to the doctoral degree, on-site/on-line/combined learning. Ongoing consultation between student and teacher/supervisor during the term.

**Number of credits:** 4

**Recommended semester:** 1.

**Educational level:** III.

**Prerequisites:**

**Course requirements:**
Requirement for receiving the credits is ongoing evaluation and final exam. Credits will not be awarded to students who receive less than 60% of the exam evaluation. Completion of the subject is graded as passed or failed.

**Learning outcomes:**
Expanding knowledge of a wide range of numerical methods that are currently used in the interpretation area of applied geophysics. Acquiring an overview of modern numerical methods presented at international conferences and prestigious scientific journals.

**Class syllabus:**
Review of solving systems of linear equations. Gauss elimination method and decomposition methods, SVD method. Solving systems of nonlinear equations. Selected properties of the method of least squares. Optimization methods - derivative and non-derivative, neural networks and genetic algorithms. Levenberg-Marquadt method, Tikhonov regularization, Monte Carlo method. Properties of the Discrete Fourier Transform. Examples of solving specific tasks using MATLAB software package tools. Solving selected problems that are related to solving numerical problems within dissertation assignments of the field of study and programme.

**Recommended literature:**
[1] Hamming R.W., 1973: Numerical methods for scientists and engineers. 2nd edition. Dover.
[2] Mathews H.J., Kurtis D.F., 2004: Numerical methods using Matlab. Pearson Prentice Hill.
[3] Menke W., 2012: Geophysical data analysis: discrete inverse theory. Elsevier, New York.
[4] Press W. H., Teukolsky, S.A., Vetterling W.T., Flannery B.P., 1989: Numerical Recipes, Cambridge UniversityPress, 5th Edition

**Languages necessary to complete the course:**
Slovak in combination with English (literature is in English).

| **Notes:** | |
|---|---|
| **Past grade distribution**<br>Total number of evaluated students: 0 | |
| ABS | NEABS |
| 0,0 | 0,0 |
| **Lecturers:** doc. RNDr. Roland Karcol, PhD., prof. RNDr. Roman Pašteka, PhD., Mgr. Ivan Zvara, PhD. | |
| **Last change:** 18.09.2022 | |
| **Approved by:** | |

## COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2022/2023 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Natural Sciences | |
| **Course ID:**<br>PriF.KIHG/PriF-DGAG-007/22 | **Course title:**<br>V Regional Tectonics of the Western Carpathians and Surrounding Regions |
| **Educational activities:**<br>**Type of activities:**<br>**Number of hours:**<br>**per week: per level/semester:**<br>**Form of the course:** on-site learning | |
| **Type, volume, methods and workload of the student - additional information**<br>Sort, range and methods of teaching activities: self-study of requisite literature, 2 hours per week consultations with teachers and supervisor; attendance form for daily study, distance form for external study. | |
| **Number of credits:** 5 | |
| **Recommended semester:** 2. | |
| **Educational level:** III. | |
| **Prerequisites:** | |
| **Course requirements:**<br>Requirements to pass the subjects is screening evaluation – submission of studied literature conspects according to the instructions of teachers and supervisor, final oral exam. Completion of the subject is graded as passed or failed. | |
| **Learning outcomes:**<br>Students achieve comprehensive knowledge about the geological structure of the Western Carpathians, augmented in geophysical image of the crust, principles of tectonic division of the Alpine belts and principles of compilation of tectonic maps. | |
| **Class syllabus:**<br>Structure of the West Carpathian crust and lithosphere – regional geophysics (gravimetry, reflection and refraction seismics, magnetics, magnetotelurics, heat flow), anomalies and discontinuities. Paleomagnetism – translations and rotations of the Alpine belt megaunits. Structure of the pre-Tertiary basement of the Central and Internal Western Carpathians. Relief and morphological manifestations of tectonic structures. Tectonic division of the Western Carpathians and the adjacent orogenic systems, principles of definition of tectonic units and compilation of tectonic and structural maps. regional tectonics of the European Alpides and their foreland. Tectonic synthesis of the Western Carpathians – tectonic cycles, periods and regional tectonic phases, deformation stages, isotectonic zones. | |
| **Recommended literature:**<br>[1] Šefara J. & Bielik M., 2009: Geofyzikálny obraz Západných Karpát a ich okolia: geologická interpretácia geofyzikálnych meraní regionálneho a hlbinného charakteru. Univerzita Komenského, Bratislava, 172 s. | |

[2] Maheľ M. (ed.), 1974: Tectonics of the Carpathian-Balkan regions and their foreland. Explanation to the tectonic map 1:1000000. Geol. Inst. D. Stur Bratislava, 453 p.
[3] Horváth F. & Galácz A. (eds), 2006: The Carpathian-Pannonian region. A review of Mesozoic-Cenozoic stratigraphy and tectonics. Vol. 1+2, Hantken Press, Budapest, 624 p. McCann T. (ed.), 2008: The geology of Central Europe. Vol. 1+2, The Geological Society of London, 1449 p.
[4] Vozár J. (ed.): 2010: Variscan and Alpine terranes of the Circum-Pannonian region. Alov. Acad. Sci., Geol. Inst., 233 p.
[5] Fusán O., Biely A., Ibrmajer J., Plančár J. & Rozložník L., 1987: Podložie terciéru vnútorných Západných Karpát. GÚDŠ Bratislava, 123 s.
[6] Suk M., Reichwalder P., Šefara J. & Schenk V., 1996: Regionalizace v geologických vědách. Folia Fac. Sci. Nat. Univ. Mas. Brun., Geologia 38, 227 s.
[7] Kováč M., 2000: Geodynamický, paleogeografický a štruktúrny vývoj karpatsko-panónskeho regiónu v miocéne: Nový pohľad na neogénne panvy Slovenska. Veda, Bratislava, 202 s.
[8] Regionálna tektonická literatúra (Alpy, dinaridy, Východné a Južné Karpaty, Český masív, severoeurópska platforma)

**Languages necessary to complete the course:**
Slovak in combination with English (part of the literature is in English).

**Notes:**

**Past grade distribution**
Total number of evaluated students: 0

| ABS | NEABS |
|---|---|
| 0,0 | 0,0 |

**Lecturers:** doc. Mgr. Rastislav Vojtko, PhD., prof. RNDr. Dušan Plašienka, DrSc.

**Last change:** 18.09.2022

**Approved by:**

## COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2022/2023 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Natural Sciences | |
| **Course ID:**<br>PriF/N-DSSZ-404/22 | **Course title:**<br>V1 Scientific output as a whole - ESB monograph (originally AAA, ABA), individual authorship less than 3 AH |
| **Educational activities:**<br>**Type of activities:**<br>**Number of hours:**<br>**per week:** **per level/semester:**<br>**Form of the course:** on-site learning | |
| **Number of credits:** 20 | |
| **Recommended semester:** | |
| **Educational level:** III. | |
| **Prerequisites:** | |
| **Course requirements:** | |
| **Learning outcomes:** | |
| **Class syllabus:** | |
| **Recommended literature:** | |
| **Languages necessary to complete the course:** | |
| **Notes:** | |

**Past grade distribution**

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 |

| | |
|---|---|
| **Lecturers:** | |
| **Last change:** | |
| **Approved by:** | |

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-401/22 | V1 Scientific output as a whole – ESB monograph (originally AAA, ABA), individual authorship share ≥ 3 AH |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 30

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-405/22 | V2 Scientific output as part - study in ESB or collection (originally AAB, ABA, ABB), individual authorship less than 3 AH |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 20

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-402/22 | V2 Scientific output as part - study in ESB or collection (originally AAB, ABA, ABB), individual authorship share ≥ 3 AH |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 30

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-411/22 | V2 Scientific output as part of ESB, collection - contribution in peer reviewed scientific collection, monograph (originally AEC, AFA, AFC, AED) |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 6

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-406/22 | V3 Scientific output as a part - study in a journal (originally AAB, ABA, ABB), individual authorship less than 3 AH |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 20

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-403/22 | V3 Scientific output as a part - study in a journal (originally AAB, ABA, ABB), individual authorship ≥ 3 AH |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 30

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-410/22 | V3 Scientific output in a journal outside the index databases (originally ADE, ADF) |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 12

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-407/22 | V3 Scientific output in a journal registered by CCC, WOS, SCOPUS - JCR/Q1 – Q2 (originally ADC, ADD, ADM, ADN), first or corresponding author |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 50

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-408/22 | V3 Scientific output in a journal registered by CCC, WOS, SCOPUS - JCR/Q3- Q4 (originally ADC, ADD, ADM, ADN), first or corresponding author |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 40

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**

## COURSE DESCRIPTION

**Academic year:** 2022/2023

**University:** Comenius University Bratislava

**Faculty:** Faculty of Natural Sciences

| **Course ID:** | **Course title:** |
|---|---|
| PriF/N-DSSZ-409/22 | V3 Scientific output in the journal registered by CCC, WOS, SCOPUS - JCR/Q1 – Q2 – Q3 - Q4 (originally ADC, ADD, ADM, ADN), co-author |

**Educational activities:**
**Type of activities:**
**Number of hours:**
**per week:** **per level/semester:**
**Form of the course:** on-site learning

**Number of credits:** 20

**Recommended semester:**

**Educational level:** III.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
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 |

**Lecturers:**

**Last change:**

**Approved by:**