

## Appendix 1.

### Offered courses

Course list	Course list
Academic Writing	Geographical Consequences of Global Climate Change
Advanced Environmental Modeling by GIS	Geographic WWW
Advanced Pedology	Geopolitics in Central Europe and Balkans
Applied and Advanced Geomorphology	Geopolitics of Higher Education
Applied Geostatistics	International Field Trip (geopolitics programme)
Advanced Environmental Modeling	Introduction to Geochronology
Regional Political Geography	Introduction to Geography, Human Geography as a Research Field
Biostratigraphy, Paleoecology and Paleobiogeography of the Cretaceous	Introduction to the Scholarly Activities of Political Geography and Geopolitics
Chemical and Isotope Geology	Map Use –Reading, Analysis, and Interpretation
Cloud Physics I & II	Methods and Codes of Political Geographical and Geopolitical Research
Contemporary Issues in Urban Geography	Reconstruction of Sedimentary Environments
Coal Geology, Petrology and Geochemistry in the Scope of Low Emission Technologies and Non-Energy Utilization	Satellite Remote Sensing Applications in Earth Sciences
Cultural Geography	Stable Isotope Analyses in Paleontology
Domestic Field Trip (geopolitics programme)	
Evolution of Ammonites During the Phanerozoic	Thematic Mapping and Spatial Analysis in Desktop GIS Applications
Genre Types; Structural and Methodological Requirements of Dissertations	Turning Points in the Evolution of the Biosphere
Applied Regional Analysis Methods	Uneven Development
	Insight into Hungary

## **Thematic of the courses**

### **Applied Geostatistics**

Instructor in-charge: István Geresdi , lecturers: István Geresdi, Noémi Sarkadi, Levente Alpek

This seminar gives a solid background of the theories, and introduces cutting-edge statistical applications, techniques and software to the students. . In the first part of the semester an overview of the various hypothesis tests, clustering methods and spatial interpolation methods are given. In the second part of the semester the application of software (MATLAB, SPSS and MAPLE) will be presented. The students have an opportunity to obtain experience on the application procedure of this software for their own research purposes.

*ECTR credit equivalents: 10*

*Grading policy:* Each student is expected to accomplish a statistical analysis of a data base by using MATLAB or SPSS. The students are encouraged to use data bases related to their own research. The results of the analysis must be summarized in a report of a few pages. Grading will be based on a scale of 1 to 5 (traditional ranking of the Hungarian Educational System).

### **Cloud Physics**

Instructor in-charge: István Geresdi, lecturers: István Geresdi, Noémi Sarkadi

This seminar focuses on the cloud microphysical processes. An in-depth overview on precipitation formation and interaction between cloud dynamics and microphysics will be presented. Students are encouraged to apply their knowledge by solving problems related to their research. Also, the integration of numerical models of microphysical process into WRF mesoscale model and the characteristics of the different parameterization techniques will be presented.

*ECTR credit equivalents: 10*

*Grading policy:* Students should prepare for the lecture by reading sections from cloud physics textbooks. During lectures the topics of textbook sections will be discussed. The knowledge of the students will be checked during these discussions. Grading will be based on a scale of 1 to 5 (traditional ranking of the Hungarian Educational System).

### **Reconstruction of Sedimentary Environments**

Instructor in-charge: Tamás Budai, lecturers: Tamás Budai, László Bujtor, János Kovács, Krisztina Sebe

The purpose of this course is to provide an integrated overview of the sciences of sedimentology and paleontology. State-of-the-art analytical tools will be integrated with the latest theoretical concepts on deposition and diagenesis to provide a comprehensive answer to the questions "What is the origin of a sedimentary rock?" and "How can we reconstruct ancient sedimentary environments from the rock record"? Emphasis will be placed on: 1) sedimentological analyses of lithofacies, microfacies analyses; 2) spatial and temporal models for reconstructing depositional environments; 3) biofacies analyses; 4) synsedimentary

tectonics; 5) palaeoclimatological interpretation of sedimentary rocks, diagnostic fossils, and sediments, isotope geochemistry of sediments.

*ECTR credit equivalents: 10*

*Grading policy:* Grades will be based on homework, which is a presentation (ppt) related to the research topic of the student or an optional case study. Grading will be based on a scale of 1 to 5 (traditional ranking of the Hungarian Educational System).

### **Chemical and Isotope Geology**

Instructor in-charge: János Kovács, lecturers: János Kovács, Mária Hámorné Vidó, Éva Farics

This class will be an introduction to the field of stable isotope geochemistry and its application to environmental processes and problems. The utility of stable isotopes as tracers of environmental processes will be examined concerning the disciplines of paleoclimatology, paleoceanography, hydrology, and hydrogeology. We will focus on the light elements and stable isotopes of hydrogen, carbon, oxygen, nitrogen in the water, carbonates, and organic compounds and why they fractionate in the environment. The theoretical background for isotope fractionation will be discussed in class. Additional key parts of the class will be a review of the paper and student-led reviews of published papers on relevant topics and a review paper.

*ECTR credit equivalents: 10*

*Grading policy:* Grades will be based on homework, which is a presentation (ppt) related to the research topic of the student. Grading will be based on a scale of 1 to 5 (traditional ranking of the Hungarian Educational System).

### **Introduction to Geochronology**

Instructor in-charge: János Kovács, lecturer: János Kovács

An overview of approaches to estimating ages of sedimentary sequences and events in Earth history. Intended for students who want to use geochronological techniques in their studies. The geochronology emphasis will be on emerging improvements in precision and accuracy of the Ar-Ar and U-Pb systems as well as alternative approaches to directly dating sedimentary strata in the first half. The thermochronology emphasis will be on exploring approaches to understanding uplift and erosion histories.

*ECTR credit equivalents: 10*

*Grading policy:* There will be approximately 8-10 problem sets. These will be assigned in class and due in class on a date given when assigned, typically 7-10 days later. Each student will present and lead one 20-30-minute discussion on an assigned paper. The topic of the assigned paper will be decided in class. All students should have a plan for their topic a priori. Grading will be based on a scale of 1 to 5 (traditional ranking of the Hungarian Educational System).

### **Evolution of Ammonites during the Phanerozoic**

Instructor in-charge: Bujtor László, lecturer: Bujtor László

The seminar offers an insight into the evolution, phylogeny and lineage of one of the most important paleontological groups of the past 550 million years and describes the phylogeny of the different taxa. It highlights the causes and processes of the reasons of the groups with slow

and fast evolutionary tempos. The seminar introduces the most important evolutionary characteristics of the group, supported by examples the convergent evolution, neoteny, homeomorphy, pedomorphosis, heterochrony, polymorphoses etc. and highlights the role of the environmental impacts in the evolution of ammonites.

*ECTR credit equivalents:* 10

*Grading policy:* Each student needs to prepare a PPT presentation (min. 15, max. 25 slides) on a chosen ammonite family of the Phanerozoic introducing its evolution, importance, phylogenetic relationships, stratigraphic relevance, and biogeographical distribution. A PPT presentation should be presented to the instructor and the other students. Grading will be based on a scale of 1 to 5 (traditional ranking of the in Hungarian Educational System).

### **Biostratigraphy, Paleocology and Paleobiogeography of the Cretaceous**

Instructor in-charge: László Bujtor; lecturer: László Bujtor

The seminar introduces the paleocology, paleobiogeography and paleoenvironments of the second-longest period of the Phanerozoic. It describes the most important fossil groups suitable for marine and terrestrial biostratigraphy, the feasibility of biostratigraphy, current problems and open questions. The seminar introduces the CORB and OAE anomalies, root causes and patterns and highlights the importance of plate tectonics, the birth of the proto-Atlantic Ocean and the ecological, and biogeographical consequences of the birth of a new oceanic basin. The seminar also introduces into the climatic conditions of the Cretaceous Period, its climatic zones and the special facies of the marine environments (e.g. chalk).

*ECTR credit equivalents:* 10

*Grading policy:* Each student needs to prepare a PPT presentation (min. 15, max. 25 slides) on a chosen stage of the Cretaceous introducing its palaeoecological, plate tectonics, climatic settings and major terrestrial and marine biochores highlighting the changes and major ecological and biogeographical patterns. A PPT presentation should be presented to the instructor and the other students. Grading will be based on a scale of 1 to 5 (traditional ranking of the in Hungarian Educational System).

### **Turning Points in the Evolution of the Biosphere**

Instructor in-charge: László Bujtor; lecturer: László Bujtor

The seminar highlights the milestones of the development of the Biosphere from the formation of life till the Anthropocene. It introduces the crisis triggered by GOE, the SET theory and its evidence, the phenomena of the Snowball Earth, the reasons of the Cambrian life explosion, and the lesser known GOBE process and its background, the relationship between the Wilson cycle and the Pangea configuration and its context regarding the supervening of the biggest extinction event. The seminar explains in detail the changes of the oxygen level of the atmosphere with special regard to the Carboniferous peak and its reference to the Roemer Gap. It highlights the role of the extra-terrestrial events to impact the evolution of the Earth underlining its unintentional character.

*ECTR credit equivalents:* 10

*Grading policy:* Each student needs to prepare a PPT presentation (min. 15, max. 25 slides) on a chosen Biosphere turning point introducing its importance, timing, drivers and impacts of the chosen event highlighting its relevance to the later evolution of the Biosphere. A PPT presentation should be presented to the instructor and the other students. Grading will be based on a scale of 1 to 5 (traditional ranking of the Hungarian Educational System).

## **Stable Isotope Analyses in Paleontology**

Instructor in-charge: László Bujtor; lecturer: László Bujtor

The seminar introduces this analytical method and its scope. It highlights the scientific background of the oxygen, carbon and sulphur stable isotope analysis and the applications of the results in solving scientific problems. It illustrates the scope and limits of the applicability of different stable isotopes backed up by case studies in the fields of paleoenvironmental, paleoclimatological and paleotemperature studies. The seminar describes the  $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ,  $\delta^{18}\text{O}$ ,  $\delta^{30}\text{Si}$ ,  $\delta^{34}\text{S}$ ,  $\delta^{37}\text{Cl}$ ,  $\delta^{81}\text{Br}$  and  $\delta^{87}\text{Sr}$  stable isotope analyses and their scopes supported their successful applications by case studies.

*ECTR credit equivalents: 10*

*Grading policy:* Each student needs to prepare a PPT presentation (min. 15, max. 25 slides) on a chosen stable isotope introducing its importance in paleontological research, highlighting the development of the method, important fossil groups to be applied, relevance of the method in and beyond paleontology. A PPT presentation should be presented to the instructor and the other students. Grading will be based on a scale of 1 to 5 (traditional ranking of the Hungarian Educational System).

## **Coal Geology, Petrology and Geochemistry in the Scope of Low Emission Technologies and Non-Energy Utilization**

Instructor in-charge: Mária Hámorné Vidó, lecturer: Mária Hámorné Vidó

The course deals with the formation and type of coals in different depositional environments, the physical and chemical changes during the coalification processes and their relationship to the different primary and secondary utilizations. The organic matter and the inherent mineral and elemental composition in the coal seams and connected rock beds are also discussed; e.g. the occurrences of rare earth elements (REE) and critical elements in coal seams associated with low organic matter containing rocks and extended with the knowledge for bottom and fly ash.

*ECTR credit equivalents: 10*

*Grading policy:* Grades will be based on homework, which is a presentation in PPT format with min. 15, max. 25 slides, related to the research topic of the student. Grading will be based on a scale of 1 to 5 (traditional ranking of the Hungarian Educational System).

## **Thematic Mapping and Spatial Analysis in Desktop GIS Applications**

Instructor in-charge: Titusz Bugya, lecturer: Titusz Bugya

The course is mainly to expand the current, existing GIS and visualization skills of our students, but could be useful for beginners (in the field of GIS) too. Main aim is to empower our students to create well-designed and well-created thematic maps – helping them in their research and dissertation work too. However, the course is flexible, considering specialization and existing skills of the current participants. Base topics are:

- map projections and transformations, georeferencing, resampling,
- online map databases and their use (Google Maps, Natural Earth, OSM, etc.),
- creating and managing vector-based thematic maps,
- advanced data visualization by graphs and charts – complex thematic maps.

Optionally – as requested by the current participants – new topics can be added to the course (such as real 3D – volume – models in GIS, advanced digitization, etc.).

*ECTR credit equivalents: 10*

*Grading policy:* Students have to select an actual and relevant (local, regional or global) environmental or social problem/situation.

1. This topic has to be presented on a thematic map, displaying its spatial distribution.
2. A spatial analysis, using a selected GIS tool, is also requested. This also have to be presented, with the processes and the results too.

### **Satellite Remote Sensing Applications in Earth Sciences**

Instructor in-charge: István Péter Kovács, lecturers: István Péter Kovács

The main objective of the course is to provide general overview of the application of satellite-based remote sensing in earth sciences. The course focuses on ESA, NASA and NOAA satellite data collections. Active SAR sensors is the core part of the course, where we emphasize the cutting-edge application of this technology. Mainly land cover, land use changes and deformation monitoring will be discussed.

*ECTR credit equivalents:* 10

*Grading policy:* Students shall prepare a brief (two-page) English-language summary about a selected application field of a chosen Sentinel sensor of Copernicus Programme. Alternatively, any two or more earth observation (EO) projects (published in Q1 journals) can be summarized in two pages.

### **Map Use –Reading, Analysis, and Interpretation**

Instructor in-charge: László Nagyvárad, lecturer: László Nagyvárad

This seminar gives a solid background about the theories, and introduces the student into the applications of Map Use map reading and map interpretation. The map uses an overview about the map scale map projections, coordinate system, and relief portrayal. The map analysis pointed the positioning finding and navigation, surface analysis and spatial pattern analysis. The course provides aid on map interpretation, including thematic cartography. Students have an opportunity to obtain experience about how they can apply the thematic maps in their research.

*ECTR credit equivalents:* 10

*Grading policy:* The students have an opportunity to obtain experience on the application of thematic maps in their research. Grading is based on a ppt presentation that includes at least two thematic maps like qualitative and quantitativemap using own PhD research results. Grading will be based on a scale of 1 to 5 (traditional ranking of the Hungarian Educational System).

### **Geographic WWW**

Instructor in-charge: Titusz Bugya, lecturer: Gábor Farkas

According to the students' goals and background, first they get introduced into the basics of the World Wide Web. The seminar will touch several important, but otherwise largely ignored general aspects, such as the structure of the web, client-server architecture, and the inner workings of a web application (e.g., data exchange, server side data storage and security). When they have adequate understanding of the basics, depending on their choice, they will get some insight into one of the typical lines of web development through a geographic example. This can be web page development, client side application development, client-server application development with a server side database, web mapping, and Web GIS development.

*ECTR credit equivalents:* 10

*Grading policy:* Students have to prepare a simple web page (in HTML 5 format). The page has to contain links, and a simple web mapping implementation (as, for example, embedding a Leaflet map and so on). The embedded map has a symbology, designed and defined by the student.

### **Geographical Consequences of Global Climate Change**

Instructor in-charge: Dr. Dénes Lóczy, lecturer: Dr. Dénes Lóczy

After revising basic climate terms (e.g., greenhouse effect) answers are sought to the following questions: What is the difference between climate change and climatic oscillations? What are the geological-geomorphological indicators of climate? What evidence points to glaciations? What is the difference between weather forecasting and climate change modelling? What is the role of the world ocean on climate change? What impacts of climate change are observed in polar, mid-latitude and tropical areas? What can be predicted for Hungary? What measures have been taken to mitigate climate change impacts or to adjust to changing climate?

*ECTR credit equivalents:* 10

*Grading policy:* Students prepare a brief (one- or two-page) English-language summary of the latest achievements in the study of some aspects of climate change (glacier retreat, sea-level rise, heat waves, etc.) using up to date data. Alternatively, the impact of climate change on the physical environment of Hungary can also be described.

### **Academic Writing**

Instructor in-charge: Dr. Dénes Lóczy, lecturer: Dr. Dénes Lóczy and István Kovács

The course will be centered around the following issues: What are the main reliable social media sources to collect ideas and sources for research (academia.edu, ResearchGate, etc.)? How to formulate the title of your paper? What should be included in an Abstract and among Keywords? How to cite precedents to your research in the Introduction chapter? What are the main rules to design the structure of your paper? How to cite similar papers? What are the formal requirements of a List of references? What special features are typical for a natural and a human sciences paper?

*ECTR credit equivalents:* 10

*Grading policy:* The assignments include a list of references (15-20 items) compiled according to the requirements of a leading international journal in the topic of the student's research; an English-language Abstract summarizing the student's research to date and a one- or two-page English-language Introduction, evaluating preceding research for a paper in an international journal under preparation.

### **Advanced Environmental Modeling by GIS**

Instructor in-charge: Ervin Pirkhoffer, lecturer: Ervin Pirkhoffer

Students of the course will learn about the modeling background of the currently running research projects of the Institute of Geography and Earth Sciences. Students will be introduced to the concepts and the state-of-the-art of GIS modelling, hydrological modelling, surface modelling and their potential applicability in environmental research. Students will also gain experience on the latest modelling software programs including ArcGISPro, HYDRUS 1D-2D, AgisoPhotoScan, Jewel and RockWorks.

*ECTR credit equivalents: 10*

*Grading policy:* Compilation of a spatial database preferably on the student's field of research. Generation of simple spatial models intended to solve real (non-theoretical problems) using the database, and data visualization. The model needs to be presented to instructor. Evaluation criteria: applicability and esthetics (F/P).

### **Applied and Advanced Geomorphology**

Instructor in-charge: Szabolcs Ákos Fábrián, lecturer: Szabolcs Ákos Fábrián

PhD students of this course will learn about applied geomorphology through a theoretical and practical explanation of selected topics. Moreover, they will be familiarized with advanced research issues and solutions in geomorphology. They will study advanced geomorphological and landform mappings such as a detailed field survey, digital geomorphological maps and geomorphological features extracting from digital elevation data. They will test applied geomorphological techniques within practical tasks, moreover, they will examine theoretical and practical issues of fieldwork in geomorphology.

*ECTR credit equivalents: 10*

*Grading policy:* Students should prepare a presentation of a geomorphic issue related to research interest in a maximum of ten slides. Grading will be based on a scale of 1 to 5 (traditional ranking of the Hungarian Educational System).

### **Advanced Pedology**

*Instructors in charge:* Szabolcs Czigány, *lecturer:* Szabolcs Czigány

The course will be delivered in spring semesters.

*Course description:*

The course, intended to be delivered in a lecture series of 4 x 90 minutes is going to cover the following topics:

Soil as a medium, definition of soils, pedogenesis, soil forming factors and processes. Soil profiles, master horizons, epipedons, subsurface horizons. Physical, diagnostic and genetical types of soils in terms of climatic zones, spatial correspondence among climate, vegetation and soils. The basic physical and chemical properties of soils. Soil fertility, productivity and organisms in the soil. Soil organic matter, carbon sequestration in the soils. Soil as a carbon pool. Nutrient cycles in the pedosphere-atmosphere-hydrosphere continuum. Impact of soils on weather and climate. Soil classification systems, soil taxonomy. Usability of classification systems for characterizing soil productivity. Soils according to Soil Taxonomy (ST) of USDA and the World Reference Base for soil resources (WRB).

*ECTR credit equivalents: 10*

*Grading policy:* As a term project, each student needs to excavate and describe an arbitrarily chosen soil profile. The soil should be described according to either Soil Taxonomy or WRB or ST. A ppt presentation should be prepared and presented on the soil profile and the major physical, chemical and biological properties of the soil to the instructors and the other students. Grading will be based on a scale of 1 to 5 (traditional ranking of the Hungarian Educational System).

### **Genre, Structural and Methodological Requirements for Dissertation**

*Instructors in charge:* Róbert Tésits

The course provide help to the students on editing their PhD dissertation and preparing and submitting research papers. The aim of the course is to provide a unified approach and framework for the preparation of dissertations. Students are acquainted with the purpose, structure,



content, logic and genre principles of the main structural units. In parallel, the course highlights the general formal and typographic expectations including practical examples and also draws attention to the most common errors.

*ECTR credit equivalents: 10*

*Grading policy:* Preparation of a bibliography related to one's own field of research in the given reference format (APA) (Consultation 2). Preparation of a short presentation (pptx) outlining the research plan and the progress of the research (Consultation 4).

### **Cultural Geography**

Instructor in-charge: András Trócsányi, lecturer: András Trócsányi

The course deals with the spatial issues of culture and its interaction with space. It describes and discusses the different (changing in time and space) interpretations of culture, the different approaches, and trends of cultural geography, which is a very colourful field of study along this line. International and national case studies illustrate the changing interrelation of cultural attributes and phenomena and the social science research on them.

*ECTR credit equivalents: 10*

*Grading policy:* Scientific-theoretical grounding of a research topic from a cultural geography perspective in your own field of research – submission of an essay by the end of the examination period

### **Introduction to Geography, the World of Human Geography**

Instructor in-charge: András Trócsányi, lecturers: Gábor Pirisi and András Trócsányi

The primary aim of the course is to provide students – with no geography or earth science related background - of the Doctoral School of Geography with an overview of the changing understanding of geography and its place in the system of sciences. In addition to the external interrelationship, the changing nature of the internal structure, the changing fields of study and themes of geography over time will be addressed. We will look at traditional and modern research topics in human geography and explore the practical everyday applications of the results.

*ECTR credit equivalents: 10*

*Grading policy:* Scientific-theoretical grounding of a(n applied) geographical topic relevant to the field of own research – submission of essay by the end of the exam period

### **Applied Regional Analysis Methods**

Responsible lecturer: Alpek B. Levente, lecturer: Alpek B. Levente

The course aims at providing an insight into the theoretical background of regional researches and introducing the main methodological issues of spatial analysis. The course focuses on the practical application of statistical methods related to spatial analysis. It covers requirements related to spatial databases, data collection and sampling. Through examples, the wide range of spatial data sources, the data management process and software used in the spatial analysis will be presented. The course will concern the range of indicators used to measure spatial differences, the methodological background for the construction of the indices, several complex statistical methods of spatial analysis and their applications through examples.

*ECTR credit equivalents: 10*

*Grading policy:* The course can be completed by writing a project paper, which includes the application of one of the methods presented in the lectures.

## **Contemporary Issues in Urban Geography**

Responsible lecturer: Pirisi Gábor, lecturer: Pirisi Gábor

The aim of the course is to provide an overlook about the urbanisation of the 21st century, including the globality and regionality of the post-industrial urban spaces, highlighting the new paradigm and approaches of the urban development (like smart cities, sustainable cities, resilient cities, learning cities and others). Also, we like to introduce the recently prevailing theoretical frameworks, research approaches and methodologies defining the mainstream of the contemporary urban geographies. Topics discussed could cover the new stages of post-industrial urbanisation (counter-urbanisation, post-suburbanisation, reurbanisation), spatial production in urban environment, social conflicts of urban spaces, the changing relation of urban and rural spaces.

*ECTR credit equivalents:* 10

*Grading policy:* Type of exam is writing an essay. Topic of essay is regarding the choice of the students, but must include a selected sub-field of urban geography and provide a review paper including some of the main tendencies and approaches of the topic (globally) and reflections in a selected country's local geography.

## **Uneven Development**

Responsible lecturer: Pirisi Gábor, lecturer: Alpek Levente, Pirisi Gábor, Tésits Róbert, Trócsányi András

The aim of this course is to analyse the problem of unevenness in geography, highlighting some possible approaches and research fields connected with this topic. Major subfields are 1) the theory of uneven development, political economic and macroeconomic approaches for spatial inequalities; 2) The globalisation and unevenness: the changing pattern and nature of the disparities, convergencies and divergencies in global societies 3) measuring unevenness: methodological possibilities of global and local researches, statistical databases and their limits; 4) Unevenness and locality: uneven development in urban and rural spaces.

*ECTR credit equivalents:* 10

*Grading policy:* Type of exam is oral presentation. At the beginning of the semester students have to select a subfield in the topic of unevenness and prepare an approx. 20-25 minutes long presentation, referring also to the most influential papers regarding on that topic.

## **INTRODUCTION TO THE SCHOLARLY ACTIVITIES OF POLITICAL GEOGRAPHY AND GEOPOLITICS**

Instructor in-charge: Norbert Pap, lecturers: Zoltán Dövényi; István Szilágyi, Dénes Lóczy

PhD students of this course are introduced to the scholarly world of political geography and geopolitical thinking. Within this field, they will learn about spatial theories, spatial approaches, and the nature of power. Geopolitics is defined as a multidisciplinary social science. Students get to know the modern theories of political geography and research topics. They get an overview on the global distribution of natural resources and the global energy conflicts. As part of geopolitical thinking modern theories of international relations are introduced as well.

*ECTR credit equivalents:* 10

*Grading policy:* Each students have to prepare a short (8-10 pages) work on his/her research topic and send it to the instructors. An oral exam is organized a few weeks after the deadline where the instructors and students discuss the papers.

## **METHODS AND CODES OF POLITICAL GEOGRAPHICAL AND GEOPOLITICAL RESEARCH**

Instructor in-charge: Norbert Pap, lecturers: László Kákai, Péter Gyenizse, Péter Reményi

In the second semester PhD students focus on methodological and terminological questions of political geography. Geopolitical thinking and geopolitical models of the 21st century are introduced. The relevant methods include both quantitative and qualitative ones. They study the analysis and modelling of social geography with the use of GIS. Case studies focus on the spatialities of war and peace, terrorism and other conflicts.

*ECTR credit equivalents: 10*

*Grading policy:* Each student has to prepare a short (5-10 pages) work on his/her research topic with a methodological focus and send it to the instructors. An oral exam is organized a few weeks after the deadline where the instructors and students discuss the papers and the methodology presented in them.

## **GEOPOLITICS IN CENTRAL EUROPE AND BALKANS**

Instructor in-charge: Péter Reményi, lecturers: Zoltán Dövényi

During the course, students go in-depth in modern political geographical theories and practices focusing on case studies from Central Europe. Central Europe is investigated first of all with the help of post-structuralist geopolitics (critical geopolitics). Regional political geographical analysis focuses on the major problems of CE. Hungarian geopolitics and international relations of Hungary is analyzed within the CE framework. Structure of global economics and the global and CE effects of monetary policy decisions are presented with the use of geoeconomics

*ECTR credit equivalents: 10*

*Grading policy:* The students have to write a review paper of 5 pages on a chosen topic, related to Central Europe based on their research in the literature. Grading uses a 1-5 scale.

## **Regional Political Geography**

Instructor in-charge: Zoltán Wilhelm, lecturers: Péter Reményi, István Szilágyi, András Rácz, Norbert Pap, István Tarrósy

Students of the course are introduced into selected political geographical issues outside of CE. Theories of border studies present the framework of the analysis of European neighborhood policy (east&south). The relationship of Russia and the world focuses on the global role of this old-new player. The political geography of the Islamic world, India, China and Africa give an overview of the political geography outside of the West.

*ECTR credit equivalents: 10*

*Grading policy:* Students have to write an essay of 6-10 pages on a chosen topic, related to the content of the semester and the relevant literature. Grading uses 1 to 5 scale.

## **DOMESTIC FIELD TRIP**

Instructor in-charge: Péter Reményi,

The aim is to introduce the students to some major political geographical and geopolitical phenomena with the help of on-site landscape analysis in Hungary. Therefore, the field trip visits places like the Danube, the capital of Hungary, sections of its international borders of political geographical significance.

*ECTR credit equivalents: 10*

*Grading policy:* Students are expected to actively participate in the field trip, furthermore, each of them is expected to choose a relevant topic and prepare a short, 15 min presentation on site.

### **INTERNATIONAL FIELD TRIP**

Instructor in-charge: Péter Reményi,

The aim is to introduce the students to some major political geographical and geopolitical phenomena with the help of on-site landscape analysis in the Western Balkans. Therefore, the field trip visits places like Bosnia and Herzegovina, Croatia and Serbia, the Bosnian corridor to the sea, the divided Sarajevo, the IEBL, ethnic enclaves, etc.

*ECTR credit equivalents:* 10

*Grading policy:* Students are expected to actively participate in the field trip, furthermore, each of them is expected to choose a relevant topic and prepare a short, 15 min presentation on site.

### **Seminar for the Physical Geography and Earth Sciences I. , II., III. and IV.**

The head of the program holds the seminar. The students present their results regularly and discussions about the presentation are expected. Invited speakers have presentations related to the topics of the seminar.

*ECTR credit equivalents:* 5

*Grading policy:* Students write a one-page report on the messages taken home from a selected presentation heard personally or online and on the relevance of the lecture to their work.

### **Seminar for the Human Geography I. , II., III. and IV.**

The head of the program holds the seminar. The students present their results regularly and discussions about the presentation are expected. Invited speakers have presentations related to the topics of the seminar.

*ECTR credit equivalents:* 5

*Grading policy:* Students have to write a review paper of 8-10 pages on a chosen topic, related to the professional content of the semester. Grading uses 1 to 5 scale.

### **Seminar for the Geopolitics I. , II., III. and IV.**

The head of the program holds the seminar. The student presents their results regularly and discussion about the presentation are expected. Invited speakers have presentations related to the topics of the seminar.

*ECTR credit equivalents:* 5

*Grading policy:* Students have to write a review paper of 8-10 pages on a chosen topic, related to the professional content of the semester. Grading uses 1 to 5 scale.

## Appendix 2

### Assessment of the research activity

<b>I. Publication</b>	<b>credits</b>
<i>Publication in scientific journal</i>	
a) Paper published in the Q1 journal ranking by SCIMAGO	60
b) Paper published in the Q2 journal ranking by SCIMAGO	40
c) Paper published in the Q3 journal ranking by SCIMAGO	20
d) Paper published in the Q4 journal ranking by SCIMAGO	15
e) Paper published in not ranked, but reviewed journal	5-10
f) Paper published in Hungarian journal (see the appendix 9)	10 / 5
g) Reviewed book or monography by high ranking high-ranking publisher (e.g., Elsevier, Springer, Wiley etc.)	40
h) Chapters in books	6 / sheet
i) Extended abstract in conference proceeding, foreign language	3
j) Extended abstract in conference proceeding, in Hungarian	2
<i>Short summary of conference or poster presentation (short abstract)</i>	
k) Short abstract in conference proceedings	1
<b>II. Conference presentation</b>	
a) Oral presentation in conference session, the conference was held in Hungary	6
b) Poster presentation, the conference was held in Hungary	3
c) Oral presentation in conference session, international conference	16
d) Poster presentation in international conference	8
e) Plenary oral presentation in conference, the conference was held in Hungary	8
f) Plenary oral presentation in conference session, international conference	24
g) Poster presentation at high-ranking international conference	12

**Appendix 3.****Topics of the complex exam, group A**

Mineralogy and petrology	General human geography
General geology	General tourism geography
History of Earth and paleontology	General physical geography
Climatology	Geomorphology
Meteorology	Geoinformatics
Geography of world economy	Pedology and biogeography
General population geography	General hydrogeography and hydrogeology
Geopolitics	

## Topics of the complex exam, group B

<b>Geopolitics, geoeconomics and political geography and Human geography</b>	<b>Regional geography</b>	<b>Physical geography, geology, meteorology</b>
The methodology of the science of geography	Nature and environmental conservation in Hungary	Cloud physics
History of the science of geography	Geology of Carpathian valley	Ore geology
Sustainability studies	Cultural geography of Hungary	Stratigraphy
Rural studies	Regional geographical issues in Africa	Sedimentology
Urban studies	Regional geographical issues in Asia	Structural geology
General geography of transportation	Historical geography of Hungary	Landscape evaluation, environmental qualification and landscape ecology
Historical geography	Regional geographical issues in Australia	Remote sensing
Health geography	Geomorphology of Carpathian valley	Cartography
Geography of ethnics and religions	Tourism geography of Hungary	Classification of the soil
Geography of education	Regional geographical issues in Europe	Physics and chemistry of the soil
Military geography	Regional geographical issues in America	Geomorphological mapping
Administrative geography		Surface run off and its modelling
Regional politics and economics		
Geography of sports		
Social geography		
Tourism product development and planning		