# Subjects of Geography MSc, Eszterházy Károly University

# 2020-2021

## Detailed study programmes

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| **Course unit: Modelling and simulation** | **Credit points: 3** |
| The type (lecture/**seminar**/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (exam/**end of course mark**/other assessment.): | |
| Course in the curriculum (which semester is the course taught in): 1st | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:** To show students the world of observation and the unique world of experimentation, where experiments are not carried out on the observed subject itself, but on a model which is an easily accessible, mostly simplified version of it  **Content:**   * Possible ways of acquiring knowledge, observations, experiments. From the question if there is a need for modeling to choosing the model. Types of models in general. * Material models: geometrical, physical, mathematical and cybernetic models. Theoretical models: image- signal models and mixed models. Conceptual models. * Analysis of the models and conclusions. From the independent monitoring of the model results to the possible revision of the theory. Examples for all these from the history of geography. * Geometric and physical models: two- and three-dimensional maps. Distance and area calculations depending on scales and projection types, as the role of knowledge transfer. * Physical modeling of moving systems. Criteria of similarity, possibilities and limits of their joint fulfillment. The modeling difficulties of the revolving Earth. * Models in natural geography. Mathematical models based on the similarity of structure- (mathematical) and function (cybernetic). Stochastic models. * Conditions for use of models (from accessing to adaptations through enforcing its own parameterizations) . The possible types and sources of parameterizations. Mathematical models in meteorology, hydrology and geomorphology. Famous simple models and models from these three areas that can be downloaded and tested. * The mathematical models of the Earth, its crust and its inside. * Models of social and political conflicts. * Mathematical models of the cyclical economic development. World models. * Processing the model tasks of students in 5 minutes per student. Students will learn about each other's models and the teacher will help the finalization of a written task.   **Competence:** Completing the course promotes the development of precise conceptual thinking, and enhances the ability to understand and see the essence of things. The autonomous work helps strengthen ICT competence and contributes to deepening the knowledge of the special field of geography chosen. Getting familiar with types and examples of modeling other than geographic modeling expands ones’ horizons and increases the competence of its interdisciplinary use.  The model which is likely to be described in a foreign language helps the competence of working in a foreign language. | |
| List the **3-5** most important required or recommended reading materials (notes, textbook), with bibliographic information (author, title, publishing data (or pages), ISBN) | |
| **Required reading:**  COX D. R., DONNELLY CH. A. (2011): *Principles of Applied Statistics*, Imperial College London, ISBN: 9781107644458  Diggle, P.J-Riberio-P-J. (2007): *Model based geostatistics*, Springer,p.230  KERSEBAUM, K.CH., HECKER, J-M., MIRSCHEL, W., (eds.) 2017: Modelling water and nutrient dyínamics in soil-crop systems. Springer, Dordrecht,Holland. 271 pp. ISBN 978-1-4020-4478-6  **Recommended reading:**  CAMARA, ANTONIO SOUSA DA (2002): *Environmental systems: a multidimensional approach*. Oxford University Press, Oxford.  HUDDART, D. – STOTT, T. (2010): *Earth Environments*. Past , Present, Future. Wiley-Blackwell, John Wiley & Sons, London.  LIU, J.G., MASON, Ph J., 2009: Essential Image Processing and GIS for Remote Sensing. Wiley Blackwell, 443 pp., ISBN 978-0-470-51031-5 | |
| **Lecturer responsible** for the course *(name, title, academic degree.*): **Prof. Dr. János Mika** | |
| **Other lecturers involved** if any *(name, title, academic degree*): **Dr. László Lakatos** | |

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| **Course unit: Contemporary methods of research in geography** | **Credit points: 2** |
| The type (lecture/**seminar**/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (exam/**end of course mark**/other assessment.): ... | |
| Course in the curriculum (which semester is the course taught in): 1st | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:** To introduce and teach students modern research methods in geography with the help of which, they will be able to plan and carry out high level geographical research on their own as well as summarize and present their research results.  **Content:**   * Research principles * Research scenarios * Gathering and processing information : I. statistical databases, statistical publications * Gathering and processing information: II. geographic, and other related scientific journals * Gathering and processing information: III. methods of representation * Modern natural geography research- field studies * Modern natural geography research-laboratory tests * Modern natural geography research-regional analysis methods * Modern natural geography research- empirical data collection * Devising a research report * Making a presentation   **Competence:**  The course encourages students' self-education, strengthens their commitment to professional development, and inspires them towards lifelong learning. The gathering and processing information individually increases students’ geographical awareness, develops their visual intelligence and it also enables them to use and integrate the new results and materials of geographical sciences and related disciplines. | |
| List the **3-5** most important required or recommended reading materials (notes, textbook), with bibliographic information (author, title, publishing data (or pages), ISBN) | |
| **Required Reading:**  Burt, James E. – Gerald M. Barber (2009): *Elementary Statistics for Geographers*, Guilford Press, 653 p.  Cloke, P. J. et al. 2004: *Practising Human Geography.* SAGE, London, 416 p. ISBN: 0 7619 7300 1  Hammond, Michael – Jerry Wellington (2012): *Research Methods: The Key Concepts*, Routledge Key Guides, 180 p.  Smith, Mike J. – Paolo Palon – James G. Griffiths (2011): *Geomorphological mapping, Volume 15: Methods and Applications* (Developments in Earth Surface Processes), Elsevier. (ISBN-13: 978-0444534460)  **Recommended Reading:**  Harris, Richard – Claire Jarvis (2010): *Statistics for Geography and Environmental Science*, Routlege Mental Health, Taylor and Francis Group, 280 p.  Knight, Peter (2014): *Practical Techniques in Physical Geography: Field and Laboratory Methods in Studing the Physical Environment*, (ISBN-13: 978-0415545587), Routlege Mental Health, Taylor and Francis Group, 324 p.  Parsons, Tony – Peter G. Knight (2015): *How to do your Dissertation in Geography and Related Disciplines*, (3rd editions), Routlege Mental Health, Taylor and Francis Group, 190 p.  Robinson, G. M. 1998: *Methods and Techniques in Human Geography.* JohnWiley and Sons, London, 556 p. (ISBN: 0471962317)  ELSEVIER Journals – *Geomorphology, Catena, Geoderma, Geoforum, Geography and Natural Reseources, Geographical Abstracts: Human Geography, Geographical Abstracts: Physical Geography*, etc. (http://www.elsevier.com/journals) | |
| **Lecturer responsible** for the course *(name, title, academic degree.*): **Dr. Anna Dobos** | |
| **Other lecturers involved** if any *(name, title, academic degree*): ....... | |

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| **Course unit: Environmental informatics** | **Credit points: 3** |
| The type (lecture/**seminar**/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (exam/**end of course mark**/other assessment.): ... | |
| Course in the curriculum (which semester is the course taught in): 1 st | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:**  Within the framework of the course, students will learn about the methods of creating digital elevation models as well as the possibilities of applying them .They will also be introduced to raster-based database operations ( sorting, SQL, etc.)  **Content:**   * The comparative analyses of vector and raster files. Hybrid systems. The possibilities and challenges of vector conversion, examining methods of digitalization (vectoring). * The problems and solutions of georeferencing. * The pre-processing of vector files (file format, drawing layers, object types). The overview of attribute data. * To create a GIS related database: Importing vector database and linking it with attribute data. The options of displaying data on maps. * Working with a vector database: classification of data, manual and automatic reclassification, query operations (SQL). * Creating, and the possibilities of using, digital elevation models (DEM) * Creating and pre-processing raster files using traditional data medium (paper) * The parameters of satellite images and their visualization. Creating composite images. * Evaluation of composite images. * Automatic reclassification of satellite images. * Coverage operations ( SQL ) * Editing thematic maps. The possibilities of 3-D   **Competence:**  Studying the background of GIS will enable students to deal with challenges of practical life and formulate them in the logic system of computers. It develops innovative and combinatory skills. It provides students with a wide range of GIS software, as a result of which students can learn to choose the most appropriate one for a given purpose. | |
| List the **3-5** most important required or recommended reading materials (notes, textbook), with bibliographic information (author, title, publishing data (or pages), ISBN) | |
| **Required Reading:**  Longley, Paul A. et al. (2011): Geographic Information Systems and Science 3e. – Wiley, ISBN : 978-0-470-94809-5  Keller, Randy G. (2011): Geoinformatics. – Cambridge U.P. ISBN 9780521897150  Awange, Joseph, Kyalo Kiema, John B. (2013): Environmental Geoinformatics. – Springer ISBN 978-3-642-34085-7  **Recommended Reading:**  Bernhardsen, T. (1999): Geographic Information System. John Wiley & Sons Inc., New York. P. 407, ISBN 0471321923  János, Tamás – Tünde Fórián (2008): Geoinformatics. - <http://www.tankonyvtar.hu/en/tartalom/tamop425/0032_terinformatika/ch07s02.html> | |
| **Lecturer responsible** for the course *(name, title, academic degree.*): **Dr. Zoltán Utasi** | |
| **Other lecturers involved** if any *(name, title, academic degree*): ....... | |

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| **Course unit: Geographical analysis of environmental systems** | **Credit points: 2+2** |
| The type (**lecture**/**seminar**/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester / 2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (**exam**/**end of course mark**/other assessment.): | |
| Course in the curriculum (which semester is the course taught in): 1st and 2nd | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:** to introduce the students to how the environmental systems of the Earth function. As an apriori. these systems prior to mankind were considered as solely natural, while afterwards they came under the influence of human society and urbanization.  **Content:**   * Characteristics and modeling of environmental systems * Ecosystem of the Earth and the Gaia theory * Introduction of the living and not-living systems * The past present and future of global environmental changes * Capacity of the Earth to sustain life * Environmental systems and human society * Interference with the functioning of environmental systems and its effects * Introduction of different system indicators * System oriented explanation and assessment of different environmental crises * Assessment of environmental systems using geoinformatics and remote sensing   **Competence:** Students will become familiar with the so-called system oriented assessment and with the analysis and evaluation of large geographical processes. After successfully finishing the course, the students will be able to analyze and model natural and anthropogenic environmental systems along with completing the needed calculations. As an additional aim: hopefully, by the end of the semester, students will realize that geoinformatics is a perfect tool to model and describe such systems. | |
| List the **3-5** most important required or recommended reading materials (notes, textbook), with bibliographic information (author, title, publishing data (or pages), ISBN) | |
| **Required Reading:**  HUDDART D- SCOTT T. (2010): *Earth Environments*, Wiley-Blackwell, Chichester, 896. p.  MARSH M.W.-GROSSA J. (2005): *Environmental geography: Science, Land Use and Earth systems*, 3rd editon, John Wiley &Sons Inc.,Hoboken, ISBN: 0-471-48280-3 p.450  **Recommended Reading:**  CÂMARA A.S.(2004): *Environmental systems: a multidisciplinary approach*, Oxford University Press, New york 305. p.  HARRIS, F (2004): *Global Environmental issues*, Wiley and Sons, Chichester, 308.p ISBN:0-470-84560-0 | |
| **Lecturer responsible** for the course *(name, title, academic degree.*): **Prof. Dr. Márta Polgári** | |
| **Other lecturers involved** if any *(name, title, academic degree*): ....... | |

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| **Course unit: Regional and spatial development** | **Credit points: 3** |
| The type (**lecture**/seminar/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (**exam**/end of course mark/other assessment.): ... | |
| Course in the curriculum (which semester is the course taught in): 1st | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:** This subject summarizes the basic elements of regional and local development, extending it with the aspects of rural development. The possible economical and sociological bases of regional development policies is discussed with a couple of case studies concerning the topic.  **Content:**   * Regional development strategies in relation to the different spheres (society, economy, environments, culture, politics) * Basic rules in the EU and their technical consequences * Stepping stones and eras of Hungarian regional development * The role of the EU and the national level * The role of regional, county and small regional levels in regional development * Institutes in the last one and a half decade of regional development * Critical evaluation of national development programs: from before the EU up to the Széchenyi Plan * The National Development Program * The New Hungary Development Plan and the elements of the system planned after 2010 * Elements of rural development * The „players” in economy and regional development * NGOs in regional development   **Competence:**  The students will obtain knowledge of the results of the concerning field of science and development capability  Students will become able to critically assess and solve professional problems  Students will become able to communicate the problems towards the different partners in the most appropriate and efficient way possible.  Students will grow through participation in decision making. | |
| List the **3-5** most important required or recommended reading materials (notes, textbook), with bibliographic information (author, title, publishing data (or pages), ISBN) | |
| **Required Reading:**  Pike, Andy – Rodriguez-Pose, Andres – Tomaney, John (2006): *Local and Regional Development*. – Routledge, London 328 p. ISBN-13: 978-0415357180  Szirmai, Adam (2015): *Socio-Economic Development.* – Cambridge University Press SBN: 9781107624498  **Recommended Reading:**  Capello, Roberta (2006): *Regional Economics*. – Routledge, p 322. ISBN: 978-0-415-39521-2  Stimson, Robert J. et al (2006): Regional Economic Development. – Springer, ISBN 978-3-540-34829-0 | |
| **Lecturer responsible** for the course *(name, title, academic degree.*): **Dr. Tibor Kovács** | |
| **Other lecturers involved** if any *(name, title, academic degree*): **Dr. Csaba Patkós** | |

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| **Course unit: Astronomic Geography** | **Credit points: 3** |
| The type (**lecture**/seminar/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (**exam**/end of course mark/other assessment.): ... | |
| Course in the curriculum (which semester is the course taught in): 1st | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:** To introduce students into the world of the Earth’s tighter and broader surrounding. Students will hear about the state-of the-art discoveries related to the Solar System and the Galaxy. Attendees of this course will learn the basic definition concerning cosmology, cosmography and astronomy, but a deep insight will be provided into the technological development of astronomy and space sciences.  **Content:**   * Theories on the birth of the Universe * The structure of the Solar System, its birth, avolution, categories of planets, their movements * A general introduction into the development of starts. The structure of the Sun. * The Mercury: its research, natural characters (atmosphere, surface, structure) and evolution * The Venus: its research, natural characters (atmosphere, surface, structure) and evolution * The Earth: its research, natural characters (atmosphere, surface, structure) and evolution * The Mars: its research, natural characters (atmosphere, surface, structure) and evolution * Planetoids * The Jupiter: its research, natural characters (atmosphere, surface, structure) and evolution * The Saturn: its research, natural characters (atmosphere, surface, structure) and evolution * The Uranus: its research, natural characters (atmosphere, surface, structure) and evolution * The Neptune: its research, natural characters (atmosphere, surface, structure) and evolution * The Kuiper Belt and its characters * The Ort Cloud and comets * Meteors and meteorites | |
| List the **3-5** most important required or recommended reading materials (notes, textbook), with bibliographic information (author, title, publishing data (or pages), ISBN) | |
| **Required Reading:**  • Jones, Tom – Stofan, Ellen (2008): Planetology: Unlocking the secrets of the Solar System. National Geographic, Washington D. C., p. 224. ISBN: 9781426201219  • Wayne, John (2016): New frontiers in earth sciences and planetology. Cornerstone, p. 296. ISBN: 978-63239-704-1 | |
| **Lecturer responsible** for the course *(name, title, academic degree.*): **Dr. Arnold Gucsik** | |
| **Other lecturers involved** if any *(name, title, academic degree*): | |

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| **Course unit: Atmosphere as risk and resource** | **Credit points: 2+2** |
| The type (**lecture/seminar**/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester and 2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (**exam/end of course mark**/other assessment.): ... | |
| Course in the curriculum (which semester is the course taught in): 3rd and 4th | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:** To intensify the knowledge and skills acquired in Meteorology and climatology, help to acquire the materials of other courses, with similar names and characteristic features, by introducing resources and risks originated in the atmosphere.  **Content:**   * Weather and climate. Resources and risks. Spatial and temporal characteristics of atmospheric motion systems. Main circulatory objects of the atmosphere. * Key process of dangerous weather phenomena: convection (vertical updraft). Role of convection in particular atmospheric objects. * Characteristics of temperate zone: planetary waves, cyclones, anticyclones. Role of mesoscale formations in the intensity of weather fronts. * Tropical cyclones (hurricanes), tornados, other mesoscale or convective systems. * *Atmosphere as a resource* for water supplies, natural and cultivated vegetation cover, transport, construction and human life. * Atmosphere as the transmitter of the majority of renewable sources of energy: solar energy, wind power. Estimation of the supplies of renewable sources of energy. Effects on hydro power and biomass. * General features of the atmosphere as a resource in Hungary and in major climatic districts. Comparison with spatial and temporal density of other energy forms. * *Atmosphere* as a *risk*-factor. Risks related to the physical state of the atmosphere in the decreasing order of space-time scale. The most important effects of these formations on animate and inanimate nature, on man itself and on the elements of our man-made environment. * Droughts, severe frosts, heat waves, late spring frosts, huge convective increase of wind, constant and heavy rainfalls, sudden melt, floods, hails etc. * Tools of scientific forecast of dangerous weather phenomena, their possibilities and constraints. Theoretical fundamentals and prospects of averting hails, dissolving clouds and gaining precipitation. * Characteristics of chemical components of air. Global, continental, regional, local and town-scales. Air quality monitoring networks. * Air quality problems of modern age in Hungary, in the developed world and in districts with backward technologies. Harmful chemical effects of polluted air.   **Methods:** Lectures, online illustrations, presentations.  **Competences:**  Recognising the internal regularities of geographical space, remembering the division patterns related to particular topics. Understanding deeper correlations of geography, integrating elements of space, place and region. Preparation for working out alternative solutions, to examine and solve problems of the interaction of human society and geographical environment. Strengthening taking personal responsibility, examples for co-operation, solutions in group work. Commitment to future, responsibility for sustainable development. | |
| List the **3-5** most important required or recommended reading materials (notes, textbook), with bibliographic information (author, title, publishing data (or pages), ISBN) | |
| **Required reading:**  HENSON R., (2002): *Rough Guide on Weather*. Rough Guides Ltd. 416 pp.  POTTER TH. D. AND COLMAN B. R., (eds), (2003): *Handbook of Weather, Climate and Water. Dynamics, Climate, I. Physical Meteorology, Weather Systems and Measurements*. 973 pp., II. Atmospheric Chemistry, Hydrology, and Societal Impacts. 966 pp.  **Recommended reading:**  NOTT, JONATHAN, (2006): *Extreme Events. A physical reconstruction and risk assessment.* Cambridge University Press, 297 pp. | |
| **Lecturer responsible** for the course *(name, title, academic degree.*): **Prof. Dr. János Mika** | |
| **Other lecturers involved** if any *(name, title, academic degree*): ....... | |

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| **Course unit: Water as risk and resource** | **Credit points: 2+2** |
| The type (**lecture/seminar**/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester and 2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (**exam/end of course mark**/other assessment.): ... | |
| Course in the curriculum (which semester is the course taught in): 3rd and 4th | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:**  To outline the measures necessary for the natural water retention, modifying effects of human activities and sustainable development.  **Content:**   * Hydrologic cycle. Precipitation, evaporation, runoff. * Balance equations. * Factors influencing runoff. * Rivers and man (contamination, flood control, water storage, hydroelectric power plants, inland water transport) * Lakes and man (recreation, pollution, eutrophication) * Groundwater: soil water, aquifer, karst water, thermal and mineral water. * Groundwater flow and contaminate-transport phenomena. * Water supplies of the Earth, Europe and Hungary. * Water management policy of the European Union. * Domestic and international case studies: Lake Balaton, Rhine-Maine-Danube Waterway. * Lake Aral, Lake Baikal, Great Lakes of North America. * Love Canal (USA), Aswan dam, etc.   **Competences:**  Students have a complex vision including natural, social-cultural and economic environment, a way of thinking locally, regionally and globally concerning geography and environment. During the course students acquire environment intelligence, they can recognise and categorise environment elements, their relationships. They also become committed to their future and sustainable development.  They have practical knowledge in the field of hydrology for their everyday lives as well. | |
| List the **3-5** most important required or recommended reading materials (notes, textbook), with bibliographic information (author, title, publishing data (or pages), ISBN) | |
| **Required reading:**  SERRANO, S.E. (1997): *Hydrology* (An integrated treatment of surface, subsurface and contaminant hydrology). Hydroscience Inc. Lexington, USA.  **Recommended reading:**  Fetter, C.W. (2000): *Applied Hydrogeology*. – Prentice Hall, ISBN-13: 978-0130882394 598 p. | |
| **Lecturer responsible** for the course *(name, title, academic degree.*): **Dr. Zoltán Utasi** | |
| **Other lecturers involved** if any *(name, title, academic degree*): **Lívia Kürti** | |

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| **Course unit: Climate change, impacts and responses** | **Credit points: 2** |
| The type (**lecture**/seminar/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (**exam**/end of course mark/other assessment.): ... | |
| Course in the curriculum (which semester is the course taught in): 3rd | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:** to familiarize students with the following three aspects: the scientific causes and regional characteristics of the climate changes caused by human beings, expected climate change impacts, the climate sensitive sectors, the scientific and technical measures for the reduction of emissions.  **Content:**   * *Science.* Climate fluctuation in time and space. The changing composition of the atmosphere: greenhouse gases, aerosol particles, ozone. Further anthropogenic constraints * Natural climate constraints. Climate system elements, climate changeability. The means of weather forecasting and the sources of uncertainty in forecast models. * Greenhouse gas emissions. Global climate models. Empirical evidence of the human contribution to climate change. Components of climate change scepticism. * Global temperature projection: ice age or global warming? Climate averages, extremes and the forecast of regional extremes. * Expected climate changes in our country and other parts of the world. * *Impacts and coping with them.* Sensibility and vulnerability.Consequences of global warming on sea levels and in the cryospheric elements   The impact of climate change on water resources. How have ecosystems changed? Climate change impacts on food and forestry.   * Climate impacts on industry, on settlements and on cities. Climate impacts on human health. * Impacts and vulnerability in our country, in Europe, on the four other continents, in the polar regions and on seashores. * *Reducing emissions.* Greenhouse gas emission statistics – the main components according to sectors and countries. Energy management – the scope for reducing energy production in the long term. * Transport, housing, public buildings and industrial plants – the scope for reducing emissions. Reduction in energy use in agriculture, forestry and waste management. * Geopolitical implications and limits. Geoengineering. Climate change and Hungarian legislation. Adapt and reduce! The role of individual in climate protection.   **Competences:**  The course will help students to develop their general knowledge of the world along with their skills and abilities and become lifelong learners. The course will also enable students to acquire a wide geographical and enviromental knowledge which they can use in other areas of everyday life as well. They will also develop problem-solving skills and critical thinking which will help them to tackle problems on a daily basis. Students will be able to think about geographical and enviromental issues on a local, regional and global level. The course will help students to develop a strong commitment to sustainability and will demonstrate ways  of how to be more responsible in regard to enviromental issues. The course plays a crucial role in raising awareness of enviromental challanges and shaping the attitudes and behaviour that can make a difference. | |
| List the **3-5** most important required or recommended reading materials (notes, textbook), with bibliographic information (author, title, publishing data (or pages), ISBN) | |
| **Required reading:**  BUCKLEY, B., HOPKINS E.J. and WHITAKER R., 2005: *The Encyclopedia of Climate Research. Illustrated guide* Jószöveg Műhely Kiadó, 303 o.  BORROUGHS, W., 2003: *Climate into the 21th Century.* World Meteorological Organisation. University Press, Cambrdge, UK., 240 pp. .  **Recommended reading:**  OLIVER J.E. (ed.), 2005: *Encyclopedia o World Climatology.* Encyclopedia of Earth Sciences Series. Springer, 854 pp. .  SCHELLNHUBER H-J., CRAMER W., NAKICENOVIC N., WIGLEY T. and YOHE G., 2006: *Avoiding Dangerous Climate Change.* Cambridge University Press, 392m pp.  LEROUX M., 2005: *Global Warming – Myth or Reality? The Erring Ways of Climatology*. Springer 509 o. | |
| **Lecturer responsible** for the course *(name, title, academic degree.*): **Prof. Dr. János Mika** | |
| **Other lecturers involved** if any *(name, title, academic degree*): ....... | |

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| **Course unit: Sustainability and risk awareness rising** | **Credit points: 3** |
| The type (lecture/**seminar**/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (exam/**end of course mark**/other assessment.): ... | |
| Course in the curriculum (which semester is the course taught in): 3rd | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:** to master the ethical and moral principles and operative skills relating to disaster risk reductionbearing inmind cultural identity, democratic decision-making processes, natural values and the proper use of natural resources.  **Content:** Learning and teaching in relation to environmental and sustainability issues.   * Sustainable development and the characteristics of raising awareness related to the topic.   I. An integrated approach, developing special programs, new teaching methods.   * Sustainable development and the characteristics of raising awareness related to the topic   II. Integrate the values inherent in sustainable development, respect for others including those of present and future genrations, promote critical and problem-solving thinking.   * Sustainable development and the characteristics of raising awareness related to the topic   III. It covers all layers of society, practical uses in everyday life, an active process of learner involvement, dealing with local and global issues.   * Sustainable development conditions   I. Government and its educational policy committed to sustainable development. Science and scientific knowledge related to sustainable development.   * Sustainable development conditions   II. Pedagogical knowledge and methods related to sustainable development. A society sharing common values of sustainable development. Modern mass media becoming a powerful tool for disseminating information related to sustainability.   * Creating environmental awareness and its methods: a holistic, an interdisciplinary approach, skill development (critical and creative thinking, civil engagement, cooperation, conflict management). Competence development, to improve the quality of basic education, to improve institutional policy as well as other forms of education. * Timing raising awareness for sustainability. In the short term to launch a process to make members of society be aware of sustainability, to increase sustainability in everyday life, work on sustainabilty indicators. In the medium term the majority of society should understand the meaning of sustainability and should develop a need for it. In the long term to create the cultural and structural framework of a sustainable society, to meet sustainability requirements.   **Competences:**  To encourage students to develop skills to understand the complexities of issues threatening sustainability and access their own values and those of the society in which they live in the context of sustainability. To engage students in negotiating a sustainable future, making decisions and acting on them. To examine economic, enviromental, social and cultural structures in the context of sustainable development. To acknowledge complexities and looking for links and synergies when trying to find solutions to problems. Therefore ESD (Education for Sustainable Development) is essential at all levels of education. | |
| List the **3-5** most important required or recommended reading materials (notes, textbook), with bibliographic information (author, title, publishing data (or pages), ISBN) | |
| **Required reading:**  Education for Sustanable Development Toolkit. UNESCO, paris, 2006. pp.1-131.  **Recommended reading:**  Guidelines and Recommendations for Reorienting Teacher Education to Adress Sustanability. UNESCO, Paris, 2005. pp 1-74  Az Európai Unió Fenntartható Fejlődési Stratégiája  <http://register.consilium.europa.eu/pdf/en/06/st10/st10917.en06.pdf> (2010-09-15) | |
| **Lecturer responsible** for the course *(name, title, academic degree.*): **Dr. Ilona Tari Pajtók,** | |
| **Other lecturers involved** if any *(name, title, academic degree*): Prof. Dr. János Mika | |

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| **Course unit: Geographical analysis of environmental systems** | **Credit points: 2+2** |
| The type (**lecture**/**seminar**/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester / 2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (**exam**/**end of course mark**/other assessment.): | |
| Course in the curriculum (which semester is the course taught in): 1st and 2nd | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:** to introduce the students to how the environmental systems of the Earth function. As an apriori. these systems prior to mankind were considered as solely natural, while afterwards they came under the influence of human society and urbanization.  **Content:**   * Characteristics and modeling of environmental systems * Ecosystem of the Earth and the Gaia theory * Introduction of the living and not-living systems * The past present and future of global environmental changes * Capacity of the Earth to sustain life * Environmental systems and human society * Interference with the functioning of environmental systems and its effects * Introduction of different system indicators * System oriented explanation and assessment of different environmental crises * Assessment of environmental systems using geoinformatics and remote sensing   **Competence:** Students will become familiar with the so-called system oriented assessment and with the analysis and evaluation of large geographical processes. After successfully finishing the course, the students will be able to analyze and model natural and anthropogenic environmental systems along with completing the needed calculations. As an additional aim: hopefully, by the end of the semester, students will realize that geoinformatics is a perfect tool to model and describe such systems. | |
| List the **3-5** most important required or recommended reading materials (notes, textbook), with bibliographic information (author, title, publishing data (or pages), ISBN) | |
| **Required Reading:**  HUDDART D- SCOTT T. (2010): *Earth Environments*, Wiley-Blackwell,Chichester, 896. p.  MARSH M.W.-GROSSA J. (2005): *Environmental geography: Science, Land Use and Earth systems*, 3rd editon, John Wiley &Sons Inc.,Hoboken, ISBN: 0-471-48280-3 p.450  **Recommended Reading:**  CÂMARA A.S.(2004): *Environmental systems: a multidisciplinary approach*, Oxford University Press, New york 305. p.  HARRIS, F (2004): *Global Environmental issues*, Wiley and Sons, Chichester, 308.p ISBN:0-470-84560-0 | |
| **Lecturer responsible** for the course *(name, title, academic degree.*): **Prof. Dr. Márta Polgári** | |
| **Other lecturers involved** if any *(name, title, academic degree*): ....... | |

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| **Course unit: Political Geography and Word Economy** | **Credit points: 3** |
| The type (**lecture**/**seminar**/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester / 2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (**exam**/**end of course mark**/other assessment.): | |
| Course in the curriculum (which semester is the course taught in): 1st and 2nd | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:** to present the spatial connections - to be thoroughly revaluated - between politics and economic processes. The focus is shifted from national economies towards a globalized one creating a whole new situation where the global market plays the most important role. This phenomenon determines the new directions of political geography changing the basic paradigms.  **Content:**   * Formation of the global economy and its characterization * The importance of transnational companies in world economy * Economical and geopolitical centers of the world, now and then. * Hegemonious cycles * The political and geographical side of globalization * Critical geopolitics and geoeconomy (base-role: without global economical processes the geopolitical relationships of today cannot be evaluated) * The theory of Huntington on the “Clash of civilizations” * The geographical interpretation of the state. Are the nations still sovereign? * A core area, and the political and geographical interpretation of capitals * International political and economical organizations in the globalized world * Energy sources (water etc.) as geopolitical factors * Electoral geography   **Competence:**  The interdisciplinary approach when discussing the political and geographical question of the globalized world will help students to form a complex and modern geographical view regarding local, regional and global problems. The subject, besides themes from geography, contains material of related subjects as well (politics, economics, history etc.), thus helps to integrate knowledge gained from these throughout a new perspective. | |
| **Required Reading:**  Flint, C. - Taylor, P. J. 2007: *Political geography: world-economy, nation-state and locality.* Pearson Education Limited, Harlow, 368 p. ISBN: 0131960121  **Recommended Reading:**  Muir, R. 1997: *Political geography: a new introduction.* Macmillan, London, 316 p. ISBN: 0 333 64189 2 | |
| **Responsible lecturer** :**: Dr. Antal Tóth, associate professor, PhD** | |
| **Other lecturers involved** if any *(name, title, academic degree*)**: Dr. Zsuzsa Piskóti-Kovács, PhD** | |

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| **Course unit: Waste management** | **Credit points: 2** |
| The type (**lecture**/**seminar**/fieldwork/consultation hours) and number of lessons: ... in the given semester, **2/30 weekly/full semester / 2/30 weekly/full semester**  if the subject is not taught in English, the language of teaching: ..................... | |
| The method of assessment (**exam**/**end of course mark**/other assessment.): | |
| Course in the curriculum (which semester is the course taught in): 1st and 2nd | |
| Entry requirements(if any): ... | |
| **Course description**: Information outlining the course requirements in a concise yet descriptive manner. | |
| **Aims:** Theaim isthat students know basic tasks of waste management, types of waste, their environmental effects, the basic related regulations of the European Union and Hungary. The are expected to acquire chemical, microbiological and geographical aspects of presently known waste management technologies.  **Content**:   * Concepts, legal background of waste management, EU outlook. * Types, creation of waste. Connection of quality and quantity of waste. * Technology system of waste management: collection, transport of waste, and utilization, various possibilities for disposal and their technical solutions * Life cycle analysis. * Possibilities to decrease quantity of waste, the most important examples of recycling. * Waste related data provision.   **Competence:** On completion the subject students are able to realize waste related problems. They can recognize logistic problems arising at waste management, can give suggestions to solve regional problems. The are able to obtain permits, list, data related to waste, to use experts. | |
| **Required reading:**  JACQUELINE VAUGHN (2009): Waste Management: A Reference Handbook, ABC-CLIO, Santa Barbara p.312  ANNE E. MACZULAK (2009): *Waste treatment (Green Technology),* Facts On File Inc,p.198 ISBN-13: 978-0816072040 | |
| **Responsible lecture: Dr. Tamás Misik, PhD** | |