| **1. Course title:** Meteorology and Climatology | | | | |
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| **2. Code:** | | **3. Type (lecture, seminar, laboratory):** lecture | | |
| **4. Total of contact hours:** 39 hours | | **5. Number of credits (ECTS):** 4 | | |
| **6. Pre-requisites (max. 3):** none | | | | |
| **7. Announced:☐** autumn semester, ☒ spring semester, ☐ both semesters | | | | |
| **8. Limit for participants:** no | | | | |
| **10. Instructor-in-charge (faculty, institute and department):**  István GERESDI, PhD (FS, Institute of Geography, Department of Geology and Meteorology) | | | | |
| **11. Instructor(s) and percentage:** | | István GERESDI | | 100 % |
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| **12. Language:** English | | | | |
| **13. Course objectives and learning outcomes:**  Aims:  To provide an understanding of the structure of the atmosphere, the physical processes impact the weather and the climate  Knowledge:  On successful completion of this course students are expected to understand the basic concepts about the atmosphere and they be familiar with phenomena occur in the atmosphere  Subject-specific skills:  *On successful completion of the course students are expected to be able to*  *give explanation about the different atmospherical phenomena. They are able to involve critically in the debates about the climate changes. They are able to apply their knowledge in the other fields of the earth sciences.* | | | | |
| **14. Course outline / Milestones**   1. Introduction; history of the meteorology 2. Evolution of the atmosphere, composition of the atmosphere, vertical structure of the atmosphere. Radiation balance of the Earth - atmosphere system. Processes impact the short and long wave radiation. Zonal and seasonal change of the radiation budget. 3. Physics about the atmospheric motions. Different types of atmospheric motions: geostrophic, gradient and cyclostrophic winds. Effect of surface friction on the atmospheric motion. 4. Cloud and precipitation formation. Characteristics of the different type of precipitations. 5. Global circulation in the atmosphere. Formation of Headly’s cell, polar fronts and jets. The hydrological cycle. Observation of vapor content in the atmosphere. Residence time of vapor in different reservoir. Potential evaporation and aridity index. 6. Weather of tropics. The tropical monsoon, characteristics and evolution of the tropical cyclones. 7. Characteristics of the mid-latitude cyclones and anticyclones. Weather at cold fronts and warm fronts. Effect of topography on the local weather. Foehn and bora; anabatic and katabatic wind; sea and land breezes. Characteristics of the thunderstorm, formation of gust front and tornados. 8. Optical and electrical phenomena in the atmosphere (rainbow, halo, circle around moon, lightning). Observation of the atmosphere. Surface observation, radio sounding, remote sensing (radar and satellite). 9. Weather forecast. 10. The climate system (the components of the climate system, constraints). External and internal factors. 11. The climate of the Earth. The climate zones, the deviations from the zonal pattern. Trewartha type climate classification. 12. Climate of Hungary (the spatial and temporal distribution of the characteristics of the climate. Antropogén factors in climate change. Forecast of climate. 13. Oral presentation about a selected atmospheric phenomenon. | | | | |
| **15. Mid-semester works**  Students have to choose an atmospheric phenomenon, and they have to present an oral presentation about 5 – 10 minutes long. The date of the presentation is the 13th week of the semester. | | | | |
| **16. Summative assessment, formative assessment**  Oral presentation about the selected atmospheric phenomenon.  After passing a written test (with success of at least 70%) oral examination | | | | |
| **17. Reading assignments:**   1. Barry, Charley and Routledge: Atmosphere, Weather and Climate 2. Ahrens : Meteorology Today: An Introduction to Weather, Climate and Environment | | | | |
| **18. Recommended texts:** | | | | |
| **Date** | 13 November, 2017 | **Prepared** |  | |
| István GERESDI PhD  instructor-in-charge | |
| **Endorsed** | | |  | |
| András TRÓCSÁNYI PhD leader of the program | |