



Course title: General Climatology

Form of teaching: lecture – 26 hrs., 2p. ECTS; practices – 26 hrs., 5 p. ECTS, **total – 52 hrs., 7p. ECTS**

Course completion requirements : lecture – finale exam; practices – finale test, projects evaluation, evaluation of activity

Language of instruction: English

1. Short description, objectives:

Objective of the course is to provide the issues of general climatology - climate formation processes, factors and elements of the climate and their diversity of time and space. Students gain knowledge about the causes of climate change.

2. Prerequisites:

- 1) reading and writing in English,
- 2) preparing of multimedia presentations,
- 3.) geographical knowledge at the secondary level.

3. Learnin outcomes

The area of education in the natural sciences. General academic profile.

W01 - understands complex atmospheric phenomena and climate formation processes (14K-1A_W01, 14K-1A_W03, 14K-1A_W06)

W02 - possess a knowledge about actual problems of climatology discussed in the world literature on the subject (14K-1A_W04, 14K-1A_W12)

W03 - possess a knowledge about the time-spatial variability of climate elements and causes of climate change (14K-1A_W01, 14K-1A_W04, 14K-1A_W06)

W04 - in the investigations and practical applications consistently uses the rules of exact , based on empirical data, interpretation of the atmospheric phenomena and processes in urban atmosphere (14K-1A_W02)

U01 - freely uses scientific literature on climatology ; reads complex scientific texts in English (14K-1A_U06)

U02 - get skills of formulation of logical opinions on the base of information from different sources and critical analysis and selection of information, particularly from internet sources (14K-1A_U06, 14K-1A_U07)

U03 – get skills of statistical and climatological analysis of meteorological measurements and presents results in the form of a report or a research article (14K-1A_U03, 14K-1A_U05, 14K-1A_U09)

K01 - understands of needs for continuous education for all life (14K-1A_K01)

K02 - systematically updates knowledge in natural science and knows its practical applications (14K-1A_K02)

K03 - sees the possibility of using acquired skills in business practice (14K-1A_K06)



4. Course description:

- 1) Climate and climate system. Climate formation processes, factors of climate and climatic elements.
- 2) Causes of climate change.
- 3) Global climate - spatial and temporal distribution of selected elements of the climate : radiation, air temperature and its amplitude and anomalies, water vapor, cloud cover, precipitation, atmospheric pressure.
- 4) Planetary scale circulation of the atmosphere. Jet streams.
- 5) Circulation in the tropics (ENSO phenomenon El Niño - Southern Oscillation), in the middle and high latitudes. North Atlantic Oscillation (NAO North Atlantic Oscillation).
- 6) Tropical and extratropical cyclones. Disturbances of the global atmospheric circulation caused by the influence of geographical factors, monsoon circulation. Local winds.
- 7) Features of maritime and continental climate.
- 8) Types of climate on the globe, Köppen's classification. A review of selected climatic regions of the world. Climate of Poland.

5. Course evaluation

Finale exam (W01-W04) – 60% total score, (Exam can be taken by individuals who have passed practices)
 The finale test for practices (W01-W05) – 20% total score,
 projects evaluation (U01-U03) – 10% total score,
 evaluation of activity (K01-K03) – 10% total score.

6. Teaching methods

Teaching methods: informative (conventional), problem and a seminar lecture, multimedia presentations, discussion, work with the source material (book, article), exercise auditorium, practical methods (such as the development of the poster, the analysis of climatological data series), the method tables experts, exchange ideas, auditorium

7. Recommended reading list

- [1]. Ahrens C. D., 1994: *Meteorology Today, An Introduction to Weather, Climate, and the Environment*; 5th ed.; West Publishing Co.; 591 pp;
- [2]. Oke T.R., 1995, *Boundary Layer Climates*, Methuen, London, 372 s.
- [3]. Stull R. B., 1995: *Meteorology Today for Scientists and Engineers, A Technical Companion Book*; West Publishing Co.; 385 pp
- [5]. Bryant E., 1997: *Climate Process & Change*; Cambridge Univ. Press; 209 pp
- [6]. Barry R. G. and Chorley R. G., 1998: *Atmosphere, Weather and Climate*; 7th ed.; Routledge; 409 pp
- [7]. Anthes R. A., 1982: *Tropical Cyclones: Their Evolution, Structure and Effect*; American Meteor. Society; Meteorological Monographs 19; 208 pp
- [8]. Scientific journals in the field of climatology (np. International Journal of Climatology, Boundary Layer Meteorology, Theoretical and Applied Climatology, Atmospheric Environment)