BACHELOR 'S PROGRAMME
2ND YEAR OF STUDY, 2nd SEMESTER

COURSE TITLE	**GLOBAL CLIMATE CHANGES**
COURSE CODE	JHM3505
COURSE TYPE	full attendance/ tutorial
COURSE LEVEL	1st cycle (bachelor's degree)
YEAR OF STUDY, SEMESTER	2nd year of study, 2nd semester
NUMBER OF ECTS CREDITS	5
NUMBER OF HOURS PER WEEK	4 (2 lecture hours + 2 seminar hours)
NAME OF LECTURE HOLDER	Associate Professor Lucian SFICA
NAME OF SEMINAR HOLDER	Associate Professor Lucian SFICA
PREREQUISITES	Advanced level of English

A – GENERAL AND COURSE-SPECIFIC COMPETENCES

General competences:

→ Acquiring the adequate professional and transversal competencies, according to the specific requirements of the subject and the qualifications listed in the National Index of Higher Education Qualifications (RNCIS) for Hidrology-Meteororology specialization

Course-specific competences:

→ Understand the mechanisms that change climate changes into global changes

→ Explain the changes at the level of the active surface, able to produce detectable changes of different elements, phenomena and climate processes at different scales.

→ Analyse the ways in which the change of the physico-chemical composition of the atmosphere produces changes in the reception and transfer of solar energy

B – LEARNING OUTCOMES

→ Assess the impact that climate change can have on human society

→ Objectively identify ways in which human society can adapt to climate change

→ Imagine a solution to mitigate the possible impact that man can have on the climate

C – LECTURE CONTENT

The primordial importance that the climate had and has in the development of the geosociosystem.
Paleoclimatic evolution in Paleozoic and Mesozoic
Paleoclimatic evolution in Neozoic
Paleoclimatic evolution in the Quaternary. Ice ages
Climate variability in the Holocene and in historical time. Known causes.
The problem of the existence of other cycles (apart from the diurnal, annual ones and those imposed by the variability of the solar activity), cycles with different periods, having known, presumed or unknown causes.
Analysis of the arguments in the controversy: are we on a trend in the case of a climate cycle, as has often happened in historical time, or are there irreversible climate changes, so cyclicality or climate change?
Theories of climate change: astronomical or orbital theories; theories related to the effects of moving continents; theories on natural and anthropogenic changes in the composition of the atmosphere;
Climate change at the local level, general causes and local causes - elementary anthropic topoclimates and air pollution
Climate change at the regional level - major changes in the underlying active area and background pollution.
The main anthropogenic causes of current global climate change: greenhouse gases, ozone-depleting gases, air pollution, acid rain, acidification of the planet, deforestation, etc.
Results of global climate change: global warming, aridization, continentalization, increasing climate excess, shrinking areas occupied by ice and snow, increasing the level of the planet's ocean, changes in the distribution of vegetation and fauna, etc.
Climate change, the global problem of mankind. Atmosphere, the main seat of global change. Measures taken to stop climate change. International conventions and national law.

D – RECOMMENDED READING FOR LECTURES

1. Drăgan, J. C., Airinei, Şt. (1993), *Geoclima şi istoria,* Edit. ,,Europa Nova", Caransebeş.
2. Sciama Y.(2010), Le changement climatique, une nouvelle ere sur la Terre, Larousse.
3. Ruddiman, W. (2008), Earth's Climate, past and future, Second Edition, Freeman and company, New York.
4. Ludwig Karl-Heinz (2006), Eine kurze Geschichte des Klimas von der Estehung der Erde bis heute, Verlag C.H.Beck, Munchen.

	5. Benestad R., (2006), Solar activity and Earth's Climate,Springer, Praxis plubishing, Chichester, Marea Britanie.
E	SEMINAR CONTENT
	Methods for determining paleoclimates. Earth movements and climate cyclizing. Reconstructing the climate of the last 5000 years. The physical and mathematical bases of climate modeling. Methods for analyzing the anthropogenic causes of current climate change: major changes in the earth's surface and atmosphere, greenhouse gases, ozone-depleting gases, air pollution, deforestation, etc. Major changes in the last century. Paper presentation: historical sources of research on climate change. Subjective causes in the lack of homogeneity of the measured climate data series. Changes of equipment, measurement methodology, change of measurement hours, change of locations of meteorological stations and rainfall stations. Homogenization methods Analysis of anthropogenic changes at the level of the earth's surface and atmosphere, at the local level, in the last century. Topoclimatic map in support of local climate change analysis. Watching documentaries on climate change Analysis of cyclicalities, variability, and climatic trends in Romania, in the case of representative climate data. Analysis of global climate change and the chain effects that lead to global climate change and global environmental change. Open debate Pro / Against anthropogenic causes of global climate change
F	RECOMMENDED READING FOR SEMINARS
	1. Drăgan, J. C., Airinei, Şt. (1993), *Geoclima şi istoria,* Edit. ,,Europa Nova", Caransebeş. 2. Sciama Y.(2010), Le changement climatique, une nouvelle ere sur la Terre, Larousse. 3. Ruddiman, W. (2008), Earth's Climate, past and future, Second Edition, Freeman and company, New York. 4. Ludwig Karl-Heinz (2006), Eine kurze Geschichte des Klimas von der Estehung der Erde bis heute, Verlag C.H.Beck, Munchen. 5. Benestad R., (2006), Solar activity and Earth's Climate,Springer, Praxis plubishing, Chichester, Marea Britanie.
G	EDUCATION STYLE
LEARNING AND TEACHING METHODS	Lecture, explanation, problematization, case study
ASSESSMENT METHODS	Examination + Seminar Grades
LANGUAGE OF INSTRUCTION	English