

MODULE INFORMATION SHEET

Name of Module Unit	Applied Climatology
Name in polish language	Klimatologia stosowana
Module type	compulsory / elective
Form of studying	full-time day courses
Level of study	graduate course (M.Sc. level)
Type of study (for extra-mural courses)	-
Programme	Environmental Engineering
Speciality	Environment Protection Engineering
Responsible department	Chair of Environmental Protection and Management
Responsible person	dr hab inż. Joanna Strużewska, prof. WUT

Semester	Lectures(E)	Tutorials	Laboratory	Computer Exercises	Projects	ECTS
1	30E			15		3

Learning outcomes (knowledge, skills, competencies)

The objective of the course is to introduce a concept of climate as a system controlled by feedbacks and forcings in a global scale (energy balance, general circulation, ocean circulation). Hypothesis of the causes climate changes in the past (paleoclimatology) and in the present time will be presented as well as principles of climate modelling. The characteristics of climatic regions will be discussed and the climate of Europe and Poland will be described in details. For the local scale the urban climate problems will be presented.

Students will:

- better understand problems of climate and climate change
- have knowledge on European climate characteristics and variability
- have basic information on urban climate issues
- explore internet sources of climate data
- get information on climate data processing and interpretation

Prerequisites

Meteorology

Rules for integrated grade setting

60% (examination score) + 40% (lab reports score)

Recommended readings

1. Taylor F. W., 2005: Elementary Climate Physics. Oxford University Press, Oxford
2. Oliver J.E., Hidore J. J, Climatology – an atmospheric science, 2002: Prentice Hall, Inc., Upper Saddle River, New Jersey
3. Hardy J. T., 2003: Climate Change – causes, effects and solutions, John Wiley and Sons Ltd, Chichester, West Sussex
4. McGuffie K., Henderson-Sellers A., A climate modeling primer, John Wiley and Sons, 2005

5. Washington W.M., Parkinson C.P., An introduction to three-dimensional climate modeling, University Science Books, 2005

Contents of lectures (syllabus)

	Topics	Time (hrs.)	Scope (S / Ex)
1	Introduction – climate system. Climate forcings and feedbacks.	2	S
2	Solar and Earth radiation.	2	S
3	The Land Surface & Surface Energy Budget	2	S
5	General Atmospheric Circulation	2	S
6	The role of oceans circulation and air-sea interaction	2	S
7	Natural and anthropogenic climate changes	4	S
9	Climate Modelling	4	Ex
10	Regional climatology: Europe	2	S
11	Regional climatology: Poland	2	S
13	Urban climate	3	Ex
14	Policy and economics of climate change	3	Ex
15	Exam	2	
Total		30	hours

S – topics listed in the legal study programme standards from 12.07.2007

Ex – extended topics

Lecturers

dr hab. inż. Joanna Strużewska, prof. WUT

Assessment method

Written exam

Contents of computer exercises

	Topics	Time (hrs.)	Scope (S / Ex)
1	Long term variability of temperature in selected region	4	S
2	Long term variability of precipitation in selected region	4	S
3	Assessment of solar/wind energy based on climate data	4	Ex
4	Climate Explorer - a comprehensive tool for climate data analysis	3	Ex
Total		15	hours

S – topics listed in the legal study programme standards from 12.07.2007

Ex – extended topics

Persons responsible for computer exercises

dr hab. inż. Joanna Strużewska, prof. WUT

Assessment method for computer exercises

Report from each exercise.