COURSE DATA

DATA SUBJECT

Code: 33785
Name: Climatology
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1318 - Degree in Geography and the Environment	Facultat de Geografia i Història	1	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1318 - Degree in Geography and the Environment	Climatology	COMPULSORY

COORDINATION

LOPEZ CARRATALA JORGE

CORELL CUSTARDOY DAVID

SUMMARY

By title of Geography, the study of the weather is critical for understanding the physical and human environment. The climate conditions the ground modeling, water resources, the distribution of living things on the planet and human activities. Following the introduction in the main components of the physical environment in the first quarter, this course explores the knowledge of the atmosphere, the dynamic processes that determine the weather, atmospheric circulation and distribution of world climates. It also introduces students to the key climate-male interaction in the current context where climate change is becoming more and more important

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PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

No

COMPETENCES / LEARNING OUTCOMES

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Analyse and value landscapes from a spatial-temporal perspective.

Be able to relate the natural environment and the social and human spheres.

Be able to work independently.

Be able to work in interdisciplinary teams.

Have capacity for analysis and synthesis.

Have oral and written communication skills in one's own language and in a foreign language.

Learn about methodology and fieldwork.

Learn about physical geography.

Learn basic techniques for fieldwork in geography and particularly for reading and interpreting the landscape in geographic terms.

Show motivation for quality, responsibility and intellectual honesty.

DESCRIPTION OF CONTENTS

1. Introduction to the Climatology

1.1. Weather and climate
1.2. The global climate system
1.3. Variability and climatic change

2. The atmosphere: composition and structure

2.1. The atmosphere: thickness and composition.
2.1.1. Ozone
2.1.2. Greenhouse gases (GHG)
2.1.3. Water vapor

2.2. Vertical structure of the atmosphere
2.2.1. Structure by composition
2.2.2. Thermal structure

3. Solar energy and global warming

3.1. Physical Concepts
3.1.1. Heat and temperature
3.1.2. Forms of heat transmission
3.1.3. Electromagnetic radiation. Radiation laws
3.1.4. Solar radiation and terrestrial radiation
3.2. Global sunshine on the planet
3.2.1. Radiation Processes
3.2.2. Heat the outer limit of the atmosphere
3.2.3. Heat stroke
3.3. Radiation balance
3.3.1. Short wave
3.3.2. The long wave and the "greenhouse effect"
3.3.3. Global energy balance
3.3.4. Climate change
3.4. Geographic factors and horizontal energy transfers
3.5. Balloon temperatures
3.5.1. Factors that influence the distribution of temperature
3.5.2. Thermal Variations
3.5.3. Global distribution of temperatures

4. Atmospheric humidity and precipitation

4.1. Atmospheric humidity
4.1.1. Concept and measurements of humidity
4.1.2. Evapotranspiration
4.1.3. Condensation
4.2. Stability and atmospheric instability
4.2.1. Adiabatic processes.
4.2.2. Vertical gradients and instability
4.2.3. Absolute stability and thermal inversions
4.2.4. The foehn effect
4.3. Precipitation
4.3.1. Genesis
4.3.2. Types of precipitation
4.3.3. Aridity and drought
4.3.4. Global distribution of rainfall

5. Atmospheric humidity and precipitation Global atmospheric circulation

5.1. Pressure and wind
5.1.1. The pressure and laws of the atmospheric movement
5.1.2. The horizontal movement
5.1.3. Convergence and divergence
5.1.4. Principles of conservation of the atmospheric movement
5.2. Global Atmospheric Circulation
5.2.1. Planetary pressure belts
5.2.2. Planetary wind system
5.2.3. Global circulation models

6. Air masses

6.1. Barotropic and baroclinic atmosphere
6.2. Origin and types of masses of air. Modifications of air masses
6.3. Cyclogenesis
6.3.1. Cycllogenesis of the "polar front" and types of fronts
6.3.2. Other phenomena of cyclogenesis: tropical cyclones, Tornadoes, cold drops
6.4. Weather maps: analysis and interpretation

7. The climates of the world

7.1. The climatic classification of Köppen
7.2. Dry climates
7.3. Hot and humid climates
7.4. Temperate climates
7.5. Continental climates
7.6. Cold climates

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Other activities	15,00
Computer classroom practice	15,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	20,00
Independent study and work	20,00
Preparation of lessons	35,00
Preparation for assessment activities	15,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

Lectures, exercises classes and workshops

EVALUATION

Final examination of theoretical and practical (80%) and continuous assessment (20%).

Continuous assessment exercises and seminars will not be recoverable

In second call, the qualification of the seminars and exercises of continuous evaluation will be kept

REFERENCES

- Cuadrat, J.M. i Pita, M.F. 1997. Climatología. Madrid, Cátedra. 496 pp.
- Martín Vide, J. 1991. Fundamentos de Climatología Analítica. Madrid, Síntesis.
- Rosselló, V.M., Panareda, J.M. i Pérez, A. 1994. Geografia Física, Valencia, Universitat de València, 438 pp
- Martín Vide, J. 2005. Los mapas del tiempo. Davinci Continental. Colección Geoambiente XXI nº 1, Mataró.

- Barry, R.G. i Chorley, R.J. 1992. Atmósfera, tiempo y clima. London, Routledge, 392 pp.

- Martín Vide, J. y Olcina Cantos, J. 2001. Climas y tiempos de España. Madrid. Alianza Editorial, 258pp.