



## Study Plan

**School:** School of Sciences and Technology

**Degree:** Bachelor

**Course:** Geography (cód. 700)

### 1st Year - 1st Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
GEO13348L	Geographical Thinking	*** TRANSLATE ME: ***	3	Semester	78
GEO13353L	Challenges of the Contemporary World	*** TRANSLATE ME: ***	9	Semester	234
GEO13385L	Introduction to Human Geography	*** TRANSLATE ME: ***	6	Semester	156
GEO13360L	Cartography	*** TRANSLATE ME: ***	6	Semester	156
GEO12614L	General Geology	Geosciences	6	Semester	156

### 1st Year - 2nd Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
MAT12644L	Statistics Applied to Human and Social Sciences	Mathematics	6	Semester	156
GEO13354L	Climatology	*** TRANSLATE ME: ***	6	Semester	156
GEO13351L	Urban Geography	*** TRANSLATE ME: ***	6	Semester	156
ECN2289L	Economic Geography	Geography	6	Semester	156
GEO2370L	Geography Methods	Geography	6	Semester	156

### 2nd Year - 3rd Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
MAT2557L	Multivariate Data Analysis	Mathematics	6	Semester	156
GEO0780L	Systems of Geographical Information in Geosciences	Geography	6	Semester	156
ERU13357L	Remote Sensing	*** TRANSLATE ME: ***	6	Semester	156
PAO0782L	Landscape and Countryside	Geography	6	Semester	156
GEO2376L	Geomorphology	Geography	6	Semester	156

### 2nd Year - 4th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
SOC2385L	Demography	Sociology	6	Semester	156
PAO0769L	Space Analysis	Geography	6	Semester	156
PAO13359L	Biogeography	*** TRANSLATE ME: ***	6	Semester	156



### 2nd Year - 4th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
GEO13352L	Quaternary Environments	*** TRANSLATE ME: ***	6	Semester	156

#### Group of Options

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
GEO13356L	Pedology for Planning	*** TRANSLATE ME: ***	3	Semester	78
GEO2386L	Social and Cultural Geography	Geography	3	Semester	78
ECN2307L	Regional Economics	Economy	6	Semester	156
PAO13361L	Landscape Geography and Ecology	*** TRANSLATE ME: ***	3	Semester	78
GEO2377L	Geography of Portugal	Geography	6	Semester	156

### 3rd Year - 5th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
GEO13362L	Research Methodologies in Geography	*** TRANSLATE ME: ***	6	Semester	156
PAO13347L	Characterization and Spatial Planning	*** TRANSLATE ME: ***	6	Semester	156
ECN2304L	Development Economics	Economy	6	Semester	156
GEO13349L	Political Geography and Geopolitics	*** TRANSLATE ME: ***	6	Semester	156

#### Group of Options

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
PAO2388L	Planning of Touristic Resources	Environment and Ecology Sciences	3	Semester	78
PAO2390L	Ecology	Environment and Ecology Sciences	6	Semester	156
GEO13350L	Geography of Transports and Communications	*** TRANSLATE ME: ***	3	Semester	78
GEO13355L	Habitat microclimatology	*** TRANSLATE ME: ***	3	Semester	78
GEO13358L	Natural Hazards	*** TRANSLATE ME: ***	3	Semester	78

### 3rd Year - 6th Semester

Component code	Name	Scientific Area Field	ECTS	Duration	Hours
GEO2382L	Research Project in Geography	Geography	12	Semester	312
Free option					



## Conditions for obtaining the Degree:

\*\*\* TRANSLATE ME:

Para obtenção do grau de licenciado em Geografia é necessário obter aprovação a 150 ECTS em unidades curriculares obrigatórias e 30 ECTS em unidades curriculares optativas distribuídas da seguinte forma:

1º Ano

1º Semestre:

5 UC Obrigatórias num total de 30 ECTS

2º Semestre

5 UC Obrigatórias num total de 30 ECTS

2º Ano

3º Semestre

5 UC Obrigatórias num total de 30 ECTS

4º Semestre

4 UC Obrigatórias num total de 24 ECTS

1 UC Optativa do Grupo de Optativas deste semestre num total de 6 ECTS

3º Ano

5º Semestre

4 UC Obrigatórias num total 24 ECTS

1 UC Optativa do Grupo de Optativas deste semestre num total de 6 ECTS

6º Semestre

1 UC Obrigatórias num total de 12 ECTS

UC Optativas livres num total de 18 ECTS \*\*\*

## Program Contents

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### Geographical Thinking (GEO13348L)

1. Geography: theory, object and method
  - 1.1. Unity and diversity: physical geography and human geography
  - 1.2. Applied geography: contexts and practices
2. Geographical thinking: evolution, debates and controversies
  - 2.1. Pre-modern geography: classical antiquity, renaissance and enlightenment
  - 2.2. Appearance of modern geography: scientific and disciplinary institutionalization
  - 2.3. The regional perspective
  - 2.4. The "new geography": quantitative revolution and spatial science
  - 2.5. Humanist geographies
  - 2.6. Radical Geographies
  - 2.7. Feminist Geographies: gender and sexuality
  - 2.8. Postcolonial geographies, ethnicity and "race"
3. Portuguese geography: themes and protagonists
  - 3.1. From the origins to Orlando Ribeiro
  - 3.2. From the 1974 revolution to the present
4. The future of geography: challenges and opportunities
  - 4.1. Theoretical challenges in a post-paradigmatic world
  - 4.2. New themes and approaches



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### **Challenges of the Contemporary World (GEO13353L)**

The global world and the relations between the global and the local. A geographical view on the local-global relationship and the ongoing changes. Geography as an integrative approach between the ecological and physical, and the social and economics dimensions.

Population and demography, public intervention

Urban concentration and new urban-rural linkages, new life models and new relations

Economic inequalities and the limits of capitalism as model for society organization

Mobility and transports: a look at the future and the challenges of a world getting smaller

The limits of natural resources, environmental degradation and recuperation: water and soils

The climate change scenarios and impacts, mitigation and adaptation

Food and nutrition sustainability

Sustainability for the 21th century and beyond

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### **Introduction to Human Geography (GEO13385L)**

- Fundamentals in Human Geography (fundamental concepts of Geography: scale, landscape, region, geographical space, territory, processes or geographical properties (other concepts): location, distribution, differentiation, spatial interactions, structures and networks; in human geography, space and time, some relationships that (pre) occupy geographers: local - global, society - nature - culture, territory and representations)

- Population, resources and sustainable development (population dynamics, growth and environmental crisis)

- Processes and organization of geographic space (geographies of global urbanization, transport, networks and settlement structures, dynamics in rural areas)

- Power and territory (territory and territoriality, nation-state, nationalisms and governance, citizenship)

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### **Cartography (GEO13360L)**

1.Graphic and cartographic expression. Fundamental concepts of graphic and cartographic expression; use and elaboration of various types of maps. Main stages of evolution of Portuguese cartography.

2.Characteristics of cartographic information: scales; projections, geographic and rectangular coordinates; cartographic symbols; the legend of the map.

3.Thematic mapping. The design phases of a thematic map. The visual variables.

4.Introduction to geographic representation: from cartography to GIS, historical evolution of digital cartography.

5.Introduction of the concept of geographic information system: Presentation of the basic characteristics of spatial data models, i.e. vector data models, raster data models and other spatial data models, with an introductory evaluation of their main possibilities and limitations.

6.Introduction to spatial analysis in GIS: spatial patterns and relations; geo-referencing

7.Introduction to GIS mapping.

8.Design and creation of a digital map.



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### **General Geology (GEO12614L)**

- 1 - Introduction of the Geology. Geological Time. Geology and Society.
- 2 - Structure of the Earth. Direct and indirect methods. Physical and chemical zoning.
- 3 - Plate Tectonics and Wilson Cycle (tectonic cycle). Continental drift and seafloor spreading. Morphology and evolution of oceans and continents.
- 4 - Minerals. Major rock-forming minerals. Minerals and the rock cycle.
- 5 - Magmatic rocks. Magmas, partial melting, magma evolution. Systematic of magmatic rocks. Magmatism and plate tectonics. Volcanism.
- 6 - Sedimentary rocks. Weathering, transport, sedimentation and diagenesis. Systematic of sedimentary rocks.
- 7 - Metamorphic rocks. Types of metamorphism. Systematic of metamorphic rocks. Metamorphism and plate tectonics.
- 8 - Hydrologic Cycle. Chemical and physics weathering. River, coastal, glaciers systems and mass movements.
- 9 - Introduction to Geology of Portugal.

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### **Statistics Applied to Human and Social Sciences (MAT12644L)**

Descriptive statistics  
Introduction to probability  
Random variables : unidimensional and bidimensional  
Main probability distributions  
Point estimation and confidence intervals  
Hypothesis testing  
Goodness of fit and independence tests  
Other non-parametric tests  
Correlation and linear regression  
Use of statistical software.

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### **Climatology (GEO13354L)**

Climatology. Climate and weather. Scale of atmospheric phenomena.  
The planet Earth. The shape of the Earth. Maximum circles and smaller circles. Earth's movements and their effects. Geographic location. The time.  
The Climate System. The Atmosphere subsystem.  
Solar radiation, terrestrial and atmospheric. Radiation and energy balances.  
Atmospheric Thermodynamics. Temperature and humidity of air. Atmospheric Stability and Instability. Condensation of atmospheric water vapor. Evaporation and evapotranspiration. Soil water balance. Precipitation.  
Dynamics of the Atmosphere. Atmospheric pressure. Wind. General Circulation of Atmosphere.  
Air Masses and Fronts.  
Synoptic Meteorology: concept, systems of observation; weather charts.  
Elements and climatic factors.  
Climate classifications. Classification of Köppen. Climate of Portugal.  
Climate variability and climate change.  
Climate data. Observations and meteorological instruments. Meteorological stations. Climate normal. Methods of climatic anal



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### **Urban Geography (GEO13351L)**

1. Discussion about the concept of city and urbanization process.

2. Origin and historical evolution of the cities.

From the first cities to the Industrial Revolution;

The Industrial Revolution, the development and reorganization of the cities.

3. Urban morphology and structure:

Elements of urban landscape;

Typology of built spaces;

Typology and functions of not constructed urban spaces;

Urban structure models.

4. The dynamics of the social and functional organization of the city:

Urban Functions; Residential areas - segregation, fragmentation and gentrification;

Hierarchy of trade centers/services - from the city center to the suburban leisure and entertainment complexes;

Industrial areas - the position of the industry in the city, decentralization;

5. Main problems of the urban development.

Degradation of urban life quality;

Aging and requalification of historical centers;

The urban expansion and the integration in the landscape.

6. National Urban Network: features and evolution.

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### **Economic Geography (ECN2289L)**

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### **Geography Methods (GEO2370L)**

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### **Multivariate Data Analysis (MAT2557L)**

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### **Systems of Geographical Information in Geosciences (GEO0780L)**



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### **Remote Sensing (ERU13357L)**

I.Fundamentals of Remote Sensing

1.1.Origin of Earth observation data 1.2.Electromagnetic Radiation/Electromagnetic Spectrum 1.3.Laws of thermal radiation, 1.4.Interaction with the atmosphere and image correction; 1.5.Interaction with the Earth's surface 1.6.Active and passive sensors

II.Characteristics of images

2.1.Concept of resolution (spectral, spatial, temporal, radiometric)

III.Remote Sensing systems

3.1.Platforms and their characteristics 3.2.Components and orbits of satellites; 3.3.Sensors and their characteristics; 3.5.Applications and characteristics of its satellites and optical sensors

IV.Processing and image analysis

4.1.Visual interpretation, 4.2. Pre-processing (geometric and radiometric corrections; Ortho-rectification image), 4.3. Transformation of the data (Vegetation indices, principal component analysis; Tasseled Cap Transformation), 4.4. multispectral segmentation; 4.5. Classification imaging

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### **Landscape and Countryside (PAO0782L)**

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### **Geomorphology (GEO2376L)**

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### **Demography (SOC2385L)**

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### **Space Analysis (PAO0769L)**



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### **Biogeography (PAO13359L)**

I. Foundations of Biogeography.

- Scales of space, time, and change
- Abiotic and biotic factors
- Evolutionary processes
- Distribution patterns of species and communities

II. Applications and Case Studies

- Indices of gradients and diversity
- Cluster analysis of chorotypes
- Peculiarities of the Iberian flora and fauna

III. Conservation Biogeography

- Principles, values, priorities and the role of science in the decision process in conservation
- Models for selection of protected areas in theory and practice
- Decision support systems in conservation biogeography
- Conservation biogeography under global environmental change

IV. Predictive Biogeography

- Description vs. prediction – concepts, challenges and opportunities
- Theory of ecological niche and species geographical distributions
- Correlative models of species distributions
- Species distribution models based on processes

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### **Quaternary Environments (GEO13352L)**

1- The Quaternary concept, duration on the geological scale. Conventional subdivisions. The stratigraphy of Northern Europe, the Netherlands, the British Isles, European Russia and North America.

2 - Astronomical causes of climatic variability.

3- Expansion and retraction of ice caps, sea level, phenomena of isostasy.

4 - Main geomorphological elements (erosive and accumulation) generated during the glacial, interglacial, periods in different physical systems of the Earth.

5 - Stratigraphy based on oxygen isotopes  $^{18}\text{O}$  /  $^{16}\text{O}$  of foraminifera. Stratigraphy based on Greenland (GRIP) and Antarctic (Vostok) cores.

6 - Polynomial diagrams and paleo-environmental interpretations, correspondence with equivalent marine records.

7 - Main methods of dating used in Quaternary sediments. Limitations of each of the methods.

8- Study of the allocyclic and autocyclic factors of the main transition sedimentary environments. Importance in Spatial Planning, the assessment of natural hazards.

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### **Pedology for Planning (GEO13356L)**

Soil functions, spatial and temporal framework for soil study. Soil profile, horizons and soil material. Soil composition. Basic chemical and physical soil properties. "Classificação dos Solos de Portugal". Soil maps and soil information systems. Sustainable soil use and main types of soil degradation. Soils and land use management.





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### **Social and Cultural Geography (GEO2386L)**

1. Themes: Social and cultural geographical processes ; cultural systems ; cultural nationalism; culture and identity; gender inequities in geographic perspective; globalization and social and cultural changes
2. Contexts: some examples about place - the distinctions of public and private and rural and urban places. Our understandings of places can play a central role in processes of social and cultural exclusion.

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### **Regional Economics (ECN2307L)**

1. The variable space in economic analysis. The space and its scales. The space and its indicators analysis and planning. Region concept. The territory and its agents. The territory and its organization and hierarchy. The territory and its infrastructure and equipment. Political and administrative territorial structure. Factors dynamic economic territories. The assessment of potential territorial and sectoral.
2. The regional economic theory. The precursors. The economic base of export theory. The growth poles theory. Models of regional growth. Theories of endogenous and exogenous regional development. The new approaches and perspectives.
3. The spatial analysis methods and techniques.
4. The Portuguese system for regional policy and territorial planning. Regional planning in Portugal. The financial programming period 2014-2020.
5. The EU Cohesion Policy 2021-2027.

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### **Landscape Geography and Ecology (PAO13361L)**

- The origins and historical evolution of landscape science and its role in the scientific and professional development of geography,
- Fundamental Concepts in Landscape Geography and Ecology,
- Methods and techniques of landscape geography and ecology,
- Contribution of landscape geography and ecology towards sustainable territorial development,
- Examples of scientific and professional applications for geographers,
- Case studies on rural and urban landscapes of the Alentejo.

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### **Geography of Portugal (GEO2377L)**

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### **Research Methodologies in Geography (GEO13362L)**

- 1 - The process of research in geography: The object of study, interpretation of reality (the common sense and scientific knowledge); The production of scientific knowledge and broad conceptions of science, theory, concepts and methods.
- 2 - Recognition of the importance of linking different approaches to the analysis and contextualization of research.
- 3 - The question of the choice of methodologies. The data processing.
- 4 - The importance of the advisor / advising: contacts and discussion of research. Progress reports.
- 5 - Didactic examples of the application of the investigation in Geography and exercises of application in different domains of Geography.
- 6 - Presentation of results in the form of scientific articles, reports, dashboards and oral communications.



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## **Characterization and Spatial Planning (PAO13347L)**

### Part I

Concept of Landscape

The nature of spatial information

Perception of the nature of the landscape: Scale, structure and function:

Landscape assessment:

- the analytical, synthetic and hierarchical perspectives. the landscape as a complex object.

The practice of landscape assessment. Material and circumstantial elements Climatology, Morphology Geology, Soil, Hydrology, Ecology

### Part II

1. Spatial planning process:

1.1. Introduction to theories and their evolution;

1.2. Basic concepts;

1.3. Planning System in Portugal;

1.4. Public participation in Spatial planning.

2. Case studies in protected areas. Presentation of plans at different levels.

3. Evaluation and public decision: notions of Evaluation. Multicriteira decision aid methodology.

4. Potentialities and constraints for the future of spatial planning in Portugal.



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## **Development Economics (ECN2304L)**

ECONOMIC DEVELOPMENT

[ERASMUS Programme]

Academic Year 2013/2014

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Office Hours: Office 256 CES: 10h-13h on Tuesday or by appointment via email or in class.

### DETAILED PROGRAMME

#### 1 A DEFINITION OF CONCEPTS OF DEVELOPMENT AND UNDERDEVELOPMENT

- 1.1 The concepts of Development and Underdevelopment
- 1.2 The Purpose of Development Economics
- 1.3 The Indicators
  - 1.3.1 The monetary and economic indicators
  - 1.3.2 The quality indicators
  - 1.3.3 The search for a synthetic indicator

- 1.4 What are the indicators
  - 1.4.1 Measure and neutrality
  - 1.4.2 The necessity of the measure

#### 2 THEORIES OF DEVELOPMENT AND UNDERDEVELOPMENT

- 2.1 The development as a linear process
  - 2.1.1 Underdevelopment as a delay in Development
  - 2.1.2 The growth stages of W. W. Rostow
  - 2.1.3 Models for growth
- 2.2 The Development and structural change
  - 2.2.1 The creative destruction of J. Schumpeter
  - 2.2.2 The Latin American structuralism
  - 2.2.3 The model A. Lewis
- 2.3 The Product Development and Underdevelopment
  - 2.3.1 The dual society. The model of cumulative causation of G. Myrdal
  - 2.3.2 Imperialism and colonialism
  - 2.3.3 The neo-colonialism and unequal exchange
- 2.4 The Basic Needs Approach
  - 2.4.1 Basic needs
  - 2.4.2 The man at the center of the problem
  - 2.4.3 The ethical question
- 2.5 The Neo-Classical approach
  - 2.5.1 The classical model
  - 2.5.2 A New Political Economy
  - 2.5.3 Counter-revolution or "apolozing";
- 2.6 The Institutional Approach
  - 2.6.1 Definition of institutions
  - 2.6.2 The issue of cultural blockade
  - 2.6.3 The nature of political regimes
- 2.7 The New Economic Geography
  - 2.7.1 The role of natural conditions
  - 2.7.2 The problem of interiority with J. Sachs



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### **Political Geography and Geopolitics (GEO13349L)**

1. Political geography and geopolitics: concepts and perspectives
2. Political Geography
  - 2.1. Theoretical perspectives in political geography
  - 2.2. State, territory and borders
  - 2.3. Democracy and citizenship
3. Geopolitics
  - 3.1. Classic geopolitical thinking
  - 3.2. Global Theories of World Power I: Maritime Power and Land Power
  - 3.3. Global Theories of World Power II: Airpower and Conjugated Powers
  - 3.4. New geopolitics
  - 3.5. Critical geopolitics
4. Conflicts, crises and challenges of the contemporary world
  - 4.1. The UK in crisis in a changing Europe
  - 4.2. The rise of China and the role of Asia in the 21st century.
  - 4.3. The conflict between Israel and Palestine and the situation in the Middle East
  - 4.4. The US-Mexico border in a world surrounded by walls and barriers

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### **Planning of Touristic Resources (PAO2388L)**

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### **Ecology (PAO2390L)**

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### **Geography of Transports and Communications (GEO13350L)**

1. Transport, communications and geography
  - 1.1. Transports, economy, society and the environment
  - 1.2. Theories of territorial organization: networks and infrastructures
2. Geography of transports
  - 2.1. Transports and territories: characteristics, modes and contexts
  - 2.2. Evolution and distribution of transports in Portugal and worldwide
  - 2.3. Urban transports, mobility and accessibility
3. Geography of communications
  - 3.1. Evolution of communications: dynamics and infrastructure
  - 3.2. ICT, Internet and digital economy
4. Challenges for the future of transport and communications
  - 4.1. Politics, governance and network management
  - 4.2. Spatial planning and territorial impacts



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### **Habitat microclimatology (GEO13355L)**

Microclimatology: scale of atmospheric phenomena; boundary layer. The Climatic System: Components, properties and processes. Energy in the Climatic System: solar, terrestrial and atmospheric radiation; radiation and energy balances on a surface. Water in the climate system: the hydrological cycle. components. Hydrological Balance (the case of soil). Physical bases of Microclimatology: basic thermodynamic relations. Atmospheric stability. Transport of momentum, energy and mass in the boundary layer: The active surface. Wind, temperature and water vapor in the boundary layer. Soil temperature and humidity. Natural atmospheric environments: bare surfaces. vegetated surfaces (forest, agricultural or agro-forestry). Non-uniform terrains. Homoeothermic animals. The climate of modified environments. The climate of modified environments. Buildings and urban landscapes. Greenhouses and shelter effects. Fires. Air pollution. Acid precipitation. Microclimatological instrumentation.

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### **Natural Hazards (GEO13358L)**

Volcanoes  
Earthquakes  
Landslides  
Floods  
Glacier  
Hurricanes

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### **Research Project in Geography (GEO2382L)**

- Research project: guiding principles for research (philosophy of science); project concept (science geographical) operationalization of the project (methods).  
- Steps of the research process: defining the starting point, holding the object of study; questioning the purpose of study; identifying key concepts; research structure (relations between concepts) identification of hypotheses; data collection appropriate to the development of hypotheses; data processing; conclusion - response and / or theses.