COURSE OUTLINE

(1) General

School:	Social Sciences		
Academic Unit:	Geography		
Level of studies	Undergraduate		
Course Code:	GEO 444	Semester:	G
Course Title:	Applications of Geoinformatics in the social sciences		
Independent Teaching Activities		Weekly Teaching Hours	Credits
Lecture		2	
Laboratory practice		2	
		Course total	5
Course Type:	Required Elective		
Prerequisite Courses:	None		
Language of Instruction and Examinations	Greek		
Is the course offered to Erasmus students:	No		
Course Website (Url):	https://geography.aegean.gr/pps/index_en.php?content=0&lesson=444		

(2) Learning Outcomes

Learning Outcomes

The course examines applications of Geographic Information Systems (GIS) in Human Geography and Social Sciences in general, with particular emphasis on the design and evaluation of economic and social policies.
The student with the successful completion of the course will be able:

- To introduce concepts and techniques related to the field of Geographic Information Systems (GIS) in the evaluation of economic and social policies
- To focus on GIS software design and implementation technologies
- To present skills to use specific architectural solutions in GIS software design through exploiting a variety of programming interfaces
- To teach methodologies for conducting research in the field of Geographic Information Systems (GIS), Anthropogeography and Social Sciences in general through the learning of modern programming languages.

General Competences

1. Search for, analysis and synthesis of data and information, with the use of the necessary technology
2. Decision-making

3. Working independently

4. Production of new research ideas

5. Production of free, creative and inductive thinking

(3) Syllabus

Extensive reference is made to the software application through exploiting a variety of Geographic Information Systems (GIS) in Human Geography and Social Sciences in general. The thematic modules of the course cover a wide range of methodologies and applications, including geographic microprojections, cartography in policy making and decision making, human-centered visualizations, optimal GIS installation, and demographic data classifications. It also analyzes the contribution of innovative Geoinformatics technologies such as those of GIS and GIS in Social Sciences. Each chapter is accompanied by an extensive bibliographic review. The structure, organization and distribution of matter are analyzed below:

1. Introduction to GIS
    - Visualization and analysis of data in GIS
    - Geodesy and georeferencing
    - Digitizing data
    - Geo-design
    - Introduction to thematic cartography
    - Examples of thematic maps of social character
    - Sample data and thematic cartography
2. The Contribution of Cartography to Policy Making and Decision Making
    - Multi-factorial depiction
    - Percentage mapping
    - Dynamic maps and spatio-temporal representation of social indicators
    - Multi-variable maps
    - Examples of cartography in policy making
3. Geo-spatial modeling and GIS
    - The concept of space in process modeling
    - Data types in spatial modeling
    - Software classes in spatial modeling
    - Spatial Data Analysis
    - Design and use of models using geospatial modeling tools
4. Geographical micro-simulations
    - Types of microprojections
    - Microprojections in policy analysis
    - Geographic approaches for research data analysis
    - Microprocessing applications in policy making
5. Applied topics in geographic micro-simulations
    - The geographical concept in the national survey data
    - Small area statistical data
    - Use of microdata and detailed statistical information in data forecast
    - Evaluation of the results of microprojections and political affinity
    - Examples of policy analysis / policy making
6. GIS and Society
    - Concepts, principles, tools and challenges in the Science of Geoinformatics in Social Sciences
    - Geographic Ontologies and Society
    - The Social Perspective of GIS
    - Critical Decision Making and GIS
    - GIS and modern lifestyle
    - Linking Geographic Information and Society through Cyberspace
    - Environmental sustainability
    - GIS and social robustness

7. Classification of areas by deprivation indexes and geodemographic classifications
8. Social and spatial inequalities in the provision of services
9. Alternative Representations through GIS in Social Sciences
    - Human-centered visualizations
    - The Social Atlas of Europe
10. Optimal placement of businesses and installations through GIS
11. The online cartography in Social Sciences
    - Searching social-time spatial data on the Internet
    - Using GeoEnrichment Widgets in online cartography
    - Composition of cartographic mashups to highlight social indicators
12. GIS Mobile Web in Social Sciences
    - Volunteered Geographic Information
    - Cartographic applications for voluntary publicity for mobile devices
13. Prevention and management of forest fires through GIS

(4) Teaching and Learning Methods - Evaluation

Delivery:	
Use of Information and Communication Technology:	Use of Information and Communication Technology in Laboratory Education (through special software)
Teaching Methods:	

Activity	Semester workload
Lecture	39
Tutorials	13
Laboratory practice	26
Non-supervised study	59
Performance evaluation/Exams	3
Course total	140

Student Performance Evaluation	Intermediate and final exams that include understanding of the content of the course, as well as problem solving. Laboratory works. Assessment of candidates based on their presence in the lectures.

(5) Attached Bibliography

- Course Notes "Introduction to Cartogaphy (ΓΕΩ 105)"
- Course Notes "Introduction to GIS (ΓΕΩ 200)"
- Course Notes "Geographical Data bases (ΓΕΩ 241)"
- Parker, R. N., Asencio, E. K. 2009. GIS and spatial analysis for the social sciences: Coding, mapping, and modeling. Routledge.
- Ballas, D., Rossiter, D., Thomas, B., Clarke, G.P. and Dorling, D. 2005. Geography matters: simulating the local impacts of national social policies, Joseph Rowntree Foundation contemporary research issues, Joseph Rowntree

Foundation, York. ISBN 1859352650.

- Kavroudakis, D., Ballas, D. and Birkin, M. 2013. A spatial microsimulation approach to the analysis of social and spatial inequalities in Higher Education attainment. *Applied Spatial Analysis and Policy*, 6(1), 1-23.
- Higgs, G. 2012. The SAGE Handbook of GIS and Society. International Planning Studies, 17(3), 323-325.
- Ballas, D., Dorling, D. 2011. Human scaled visualizations and society. *The SAGE Handbook of GIS and Society*, 177-201.
- Ballas, D., Dorling, D., Hennig, B. 2014. *The social atlas of Europe*. Policy Press.