COURSE OUTLINE

- **GENERAL**

SCHOOL	School of Social Sciences		
DEPARTMENT	Sociology		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**505**	SEMESTER	ΣΤ (6th}
COURSE TITLE	Use of New Technologies in Contemporary Social Issues		

INDEPENDENT TEACHING ACTIVITIES If ECTS credits are awarded separately for parts of the course (e.g. Lectures, Lab Exercises, etc.) list them accordingly. If credits are awarded as a whole, state the weekly teaching hours and total credits	WEEKLY TEACHING HOURS	ECTS CREDITS
	3	6

COURSE TYPE General background, specific background, specialization General knowledge, skills development	Elective /SEMINAR
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMS:	Greek and English
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	www.soc.aegean.gr

LEARNING OUTCOMES
The course aims to enable students to: - Understand the fundamental concepts and principles of Artificial Intelligence (AI) and its main subfields relevant to social research (e.g., machine learning, natural language processing, network analysis). - Recognize and evaluate the potential applications of AI in the various stages of the research process in the social sciences, from research design and data collection to analysis and interpretation of findings. - Become familiar with specific AI tools and techniques that can be used for analyzing

quantitative and qualitative social data (e.g., big data analysis, sentiment analysis, topic modeling).
- Develop critical awareness of the methodological, social, and ethical challenges accompanying the use of AI in social research, including issues such as algorithmic bias, privacy, transparency, and accountability.
- Be able to design and evaluate research proposals that appropriately incorporate AI methods and tools to address social questions.
- Be prepared for future developments at the intersection of AI and the social sciences, promoting responsible and innovative use of technology in research.

General Competencies	

Teaching Approach

This course contributes to the development of the following key competencies:
- Searching, analyzing, and synthesizing data and information using the necessary technologies
- Adapting to new situations
- Decision-making
- Autonomous work and teamwork
- Working in an international environment
- Working in an interdisciplinary environment
- Generating new research ideas
- Project design and management
- Respect for diversity and multiculturalism
- Respect for the natural environment
- Demonstrating social, professional, and ethical responsibility and sensitivity to gender issues
- Exercising critical and self-critical thinking
- Promoting free, creative, and inductive thinking

COURSE CONTENT

Course Summary

Artificial Intelligence (AI) is rapidly transforming the way social research is conducted, offering new methodological approaches, analytical tools, and possibilities for understanding complex social phenomena. The course "Artificial Intelligence in Social Research" is designed to provide students with a comprehensive overview of the core principles of AI and its applications in the social sciences. It also aims to cultivate critical thinking regarding the capabilities, limitations, and ethical challenges arising from the use of AI in research.

Weeks 1–5: Introduction to Applied Social Research
- Definitions and Core Concepts of AI: What is Artificial Intelligence? Historical overview. (Machine Learning, Natural Language Processing, Computer Vision, etc.). Types of AI.
- AI as a Tool and Object of Study in the Social Sciences: How is AI changing social research? Opportunities and challenges. AI as a social phenomenon.
- Challenges and Limitations: The importance of human interpretation and context.

Unit 7: Ethical, Social, and Methodological Challenges of AI in Social Research
- Bias in Algorithms and Data: Sources of bias, implications for research findings and social justice. Techniques for detection and mitigation.
- Privacy and Protection of Personal Data: GDPR and other regulations. Ethical dimensions of using sensitive data.
- Transparency, Interpretability, and Accountability of AI Systems: The challenge of the 'black box'.
- The Role of the Social Researcher in the AI Era: New skills, critical attitude, ethical responsibility.
- Social Impacts of AI: Labor market, democracy, social inequalities.

Unit 8: Designing Research Projects Using AI and Future Prospects
- Formulating Research Questions Suitable for AI Approaches
- Selecting Appropriate AI Methods and Tools
- Evaluating the Validity and Reliability of AI-Derived Research Findings
- Practical Exercises and Case Studies
- Emerging Trends and Future Directions in AI for Social Research
- Overview of AI Applications in Various Social Science Fields: Examples from sociology, political science, psychology, communication, anthropology, ethics

Week 6: Design of Applied Social Research
- Formulating research questions
- Literature review and identification of research gaps
- Selecting appropriate theoretical framework
- Methodological design based on the research problem and the support of AI

- Choosing data collection and analysis methods using AI
- Ethical issues in applied social research

Weeks 7–9: Fundamentals of Machine Learning for Social Scientists
- Introduction to Machine Learning: Basic concepts (training data, features, algorithms). Categories of ML (supervised, unsupervised, reinforcement learning).
- Supervised Learning: Classification algorithms (e.g., logistic regression, decision trees, support vector machines - SVM). Regression algorithms. Model evaluation.
- Unsupervised Learning: Clustering algorithms (e.g., k-means). Dimensionality reduction (e.g., Principal Component Analysis - PCA).
- Data Preparation for ML: Data cleaning, feature transformation, feature selection.

Weeks 10–11: Natural Language Processing (NLP) in Social Research
- Introduction to NLP: Basic concepts and techniques (tokenization, stemming, lemmatization, part-of-speech tagging)
- Text Analysis: Information extraction, named entity recognition, sentiment analysis, topic modeling
- Applications of NLP in Social Research: Content analysis of social media, surveys, interviews, historical records
- Large Language Models (LLMs) and Social Research: Capabilities (e.g., text generation, summarization, question answering) and limitations

Unit 4: Network and Complexity Analysis Using AI
- Introduction to Social Network Analysis (SNA): Basic concepts (nodes, edges, centrality metrics, communities)
- AI in Network Analysis: Pattern detection, link prediction, community detection in large-scale networks
- Agent-Based Modeling and Simulation of Social Systems: Understanding dynamic social phenomena

Weeks 12–13: AI in the Collection and Management of Social Data
- New Data Sources: Social media data, sensors, digital traces. The concept of Big Data in the social sciences
- Automated Data Collection: Web scraping, APIs
- Management and Storage of Large Data Sets: Databases, cloud computing
- Anonymization and Data Protection Techniques in the AI Era

Unit 6: Qualitative Research and Artificial Intelligence
- AI Capabilities in Supporting Qualitative Analysis: Analysis of large volumes of qualitative data, assistance in coding, visualization
- AI Tools for Analyzing Interviews, Focus Groups, and Ethnographic Data

From Research to Policy and Social Intervention

- Linking research to policymaking - Evaluation of social programs and interventions - Social impact of research and its measurement - Collaboration with social partners and civil society organizations - Dissemination of research findings

- **TEACHING AND LEARNING METHODS - ASSESSMENT**

<table>
<tr><td>Delivery Method
.</td><td colspan="2">Face-to-face teaching.</td></tr>
<tr><td>Use of Information and Communication Technologies
Use of ICT in Teaching, Laboratory Education, and Communication with Students.</td><td colspan="2">Yes</td></tr>
<tr><td rowspan="11">Teaching Organization
The teaching method and methodology are described in detail.
Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorial, Internship (Placement), Clinical Exercise, Artistic Workshop, Interactive Teaching, Educational Visits, Study Preparation (Project), Writing of Work / Assignments, Artistic Creation, etc.</td><td>Activity</td><td>Workload (Semester Hours)</td></tr>
<tr><td>Lectures</td><td>39 hours</td></tr>
<tr><td>Assignment Writing</td><td>78 hours</td></tr>
<tr><td>Fieldwork and Literature Study</td><td>60 hours</td></tr>
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<tr><td rowspan="4">The student's study hours for each learning activity are listed as well as the hours of unguided study according to ECTS principles.</td><td></td><td></td></tr>
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<tr><td></td><td></td></tr>
<tr><td>Total Course Workload:</td><td>177 hours</td></tr>
<tr><td>Student Assessment</td><td colspan="2">Assessment Language: Greek and English</td></tr>
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Language of Assessment, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Report / Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others	Student assessment will be based on the following criteria: 1. Research Protocol (5%): Design of a complete research protocol using AI to study a contemporary social problem (individual assignment). 2. Group Research Project (30%): Implementation of a small-scale research project in groups of 3–4 students, including data collection, analysis, and final report preparation. 3. Presentation (5%): Presentation of the group project in class and response to questions. 4. Written Examination (50%): Critical analysis of a research article and evaluation of its methodology. 5. Class Participation (10%): Active participation in discussions, workshops, and group activities.
Clearly defined evaluation criteria will be provided and made accessible to students.	

- **RECOMMENDED BIBLIOGRAPHY**

Book	**Authors**	**Year**	**Publishers**
Στατιστική Έρευνα Μέθοδοι και Εφαρμογές	Ρόντος Κ., Παπάνης Ε.	2006	Σιδέρη
Social Research Methods	Bryman, A.	2020	OxfordUniversityPress
Social Research Methods: Qualitative	Neuman, W. L.	2019	Pearson

and Quantitative Approaches			
Research Design: Qualitative, Quantitative, and Mixed Methods Approaches	Creswell, J. W., & Creswell, J. D.	2018	SAGE Publications
Qualitative Research Practice: A Guide for Social Science Students and Researchers	Ritchie, J., Lewis, J., Nicholls, C. M., & Ormston, R. (Eds.)	2014	SAGE Publications
Real World Research	Robson, C., & McCartan, K.	2016	Wiley
An Introduction to Qualitative Research	Flick, U.	2018	SAGE Publications
Longitudinal and Panel Studies	Elliot, J., Holland, J., & Thomson, R.	2008	SAGE Publications
The Essential Guide to Doing Your Research Project	O'Leary, Z.	2017	SAGE Publications
Case Study Research and Applications: Design and Methods	Yin, R. K.	2018	SAGE Publications
Introduction to Longitudinal Research	Ruspini, E.	2002	Routledge
Designing Social Research: The Logic of Anticipation	Blaikie, N., & Priest, J.	2019	PolityPress
Constructing Survey Data: An Interactional Approach	Gobo, G., & Mauceri, S.	2014	SAGE Publications
Bringing quality and meaning to quantitative data – Bringing quantitative evidence to qualitative	Karpatschof, B.	2007	NordicPsychology

observation			
ΕπιστημονικάΠεριοδικά	Τίτλος		
Social Problems	Journal of Social Issues		
Social Indicators Research	Journal of Applied Social Science		
Sociological Research Online	Qualitative Research		
Quality & Quantity	International Journal of Social Research Methodology		
ΗλεκτρονικοίΠόροι και Εργαλεία	URL		
Social Science Research Network (SSRN)	https://www.ssrn.com		
Social Science Statistics	https://www.socscistatistics.com		
EUROSTAT	https://ec.europa.eu/eurostat		
ΕΛΣΤΑΤ (Ελληνική ΣτατιστικήΑρχή)	https://www.statistics.gr		
CESSDA (Consortium of European Social Science Data Archives)	https://www.cessda.eu		
Εθνικό Κέντρο Κοινωνικών Ερευνών (ΕΚΚΕ)	https://www.ekke.gr		
European Social Survey	https://www.europeansocialsurvey.org		
OECD Social Indicators	https://www.oecd.org/social/		