

COURSE OUTLINE

ALGORITHMS AND CULTURAL DATA ANALYSIS

1. GENERAL

SCHOOL	CLASSICS AND HUMANITIES		
DEPARTMENT/UPS	HUMANITIES / DIGITAL APPLICATIONS IN ARTS AND CULTURE		
LEVEL OF STUDIES	UNDERGRADUATE – LEVEL 6		
COURSE CODE	XXXXX	SEMESTER	7 TH
COURSE TITLE	ALGORITHMS AND CULTURAL DATA ANALYSIS		
TEACHING ACTIVITIES		TEACHING HOURS PER WEEK	ECTS CREDITS
<i>If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.</i>			
		3	5
<i>Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.</i>			
COURSE TYPE	SCIENTIFIC AREA		
<i>Background, General Knowledge, Scientific Area, Skill Development</i>	SKILL DEVELOPMENT		
PREREQUISITES:	NO		
TEACHING & EXAMINATION LANGUAGE:	GREEK		
COURSE OFFERED TO ERASMUS STUDENTS:	YES		
COURSE URL:	https://eclass.duth.gr/courses/XXXXXX/		

2. LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.</i></p>																		
<p>Upon successful completion of the course, participants will be able to:</p> <ul style="list-style-type: none"> • Have a broad understanding of approaches to culture and data quantification. • Be familiar with methods of cultural data analysis and understand their significance for work in the humanities and social sciences. • Exhibit critical reflection on outcomes derived from computational methods (concerning ethical, statistical, and empirical/material issues). • Understand the benefits and limitations of digital research in the study of culture. • Evaluate scientific practices and the ways in which they contribute to cultural studies through interdisciplinary approaches. • Contextualize research in cultural analysis using computational tools. 																		
<p>General Skills</p> <p><i>Name the desirable general skills upon successful completion of the module</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><i>Search, analysis and synthesis of data and information,</i></td> <td style="width: 50%; border: none;"><i>Project design and management</i></td> </tr> <tr> <td style="border: none;"><i>ICT Use</i></td> <td style="border: none;"><i>Equity and Inclusion</i></td> </tr> <tr> <td style="border: none;"><i>Adaptation to new situations</i></td> <td style="border: none;"><i>Respect for the natural environment</i></td> </tr> <tr> <td style="border: none;"><i>Decision making</i></td> <td style="border: none;"><i>Sustainability</i></td> </tr> <tr> <td style="border: none;"><i>Autonomous work</i></td> <td style="border: none;"><i>Demonstration of social, professional and moral responsibility and sensitivity to gender issues</i></td> </tr> <tr> <td style="border: none;"><i>Teamwork</i></td> <td style="border: none;"><i>Critical thinking</i></td> </tr> <tr> <td style="border: none;"><i>Working in an international environment</i></td> <td style="border: none;"><i>Promoting free, creative and inductive reasoning</i></td> </tr> <tr> <td style="border: none;"><i>Working in an interdisciplinary environment</i></td> <td></td> </tr> <tr> <td style="border: none;"><i>Production of new research ideas</i></td> <td></td> </tr> </table>	<i>Search, analysis and synthesis of data and information,</i>	<i>Project design and management</i>	<i>ICT Use</i>	<i>Equity and Inclusion</i>	<i>Adaptation to new situations</i>	<i>Respect for the natural environment</i>	<i>Decision making</i>	<i>Sustainability</i>	<i>Autonomous work</i>	<i>Demonstration of social, professional and moral responsibility and sensitivity to gender issues</i>	<i>Teamwork</i>	<i>Critical thinking</i>	<i>Working in an international environment</i>	<i>Promoting free, creative and inductive reasoning</i>	<i>Working in an interdisciplinary environment</i>		<i>Production of new research ideas</i>	
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<ul style="list-style-type: none"> • Research, analysis, and synthesis of data and information, utilizing necessary technologies. • Independent work. • Teamwork. • Work in an interdisciplinary environment. • Generation of new research ideas. 																		

- Respect for diversity and multiculturalism.
- Fostering free, creative, and inductive thinking.

3. COURSE CONTENT

1	Introduction to Algorithms and Cultural Data Analysis	<ul style="list-style-type: none"> • What is cultural data analysis? • How are algorithms connected to the analysis of cultural phenomena? • Historical evolution and contemporary applications in culture (history, arts, social networks).
2	Fundamental Principles of Algorithms, Complexity, and Big Data	<ul style="list-style-type: none"> • Fundamental principles of algorithms • Introduction to Big Data and its analysis • Algorithms and complexity analysis • Time and space complexity (Big O notation) in processing cultural data
3	Cultural Text Analysis with Natural Language Processing (NLP) Algorithms	<ul style="list-style-type: none"> • Fundamental concepts of Natural Language Processing (NLP) • NLP applications in cultural data (sentiment analysis, text modeling) • Analysis of textual data from cultural sources (literary texts, historical documents) using NLP
4	Thematic Analysis with Algorithms (Topic Modeling)	<ul style="list-style-type: none"> • Theory and methods of thematic analysis (LDA, NMF) • Application to cultural data: Extracting themes from cultural texts • Applications in literature, history, and journalism • Case studies from historical and contemporary data
5	Image Analysis and Visual Cultural Heritage - Computer Vision	<ul style="list-style-type: none"> • Introduction to computer vision and algorithms for image recognition and processing • Use of algorithms for analyzing visual data in artistic works (photographs, artworks) • Classification of cultural images using algorithms
6	Pattern Recognition in Cultural Data and Classification Algorithms	<ul style="list-style-type: none"> • Basic techniques of pattern recognition in cultural data • Classification and clustering algorithms for cultural data • Applications in art, archaeology, and music data • Examples of pattern analysis and application of clustering algorithms in cultural data (archaeology, music, artworks)
7	Use of Machine Learning in Cultural Analysis	<ul style="list-style-type: none"> • Introduction to machine learning and its role in cultural analysis • Application of neural networks, supervised, and unsupervised learning for the analysis and classification of cultural data • Examples of machine learning algorithms applied to music, art, history, and language
8	Analysis of Cultural Data from Social Networks	<ul style="list-style-type: none"> • Data analysis from social media platforms (e.g., Twitter, Instagram) • Introduction to social network analysis techniques (Social Network Analysis) • Use of tools for social network data analysis • Extracting insights from user interactions with cultural patterns to understand cultural trends
9	Sentiment Analysis in Cultural Texts	<ul style="list-style-type: none"> • Techniques for sentiment analysis • Applications for mood analysis in literary works, historical documents, and social media • Interpretation of emotional trends in cultural data • Sentiment analysis in social media data and literary texts
10	Visualization and	<ul style="list-style-type: none"> • Principles of data visualization

	Publication of Cultural Data in Interactive Environments	<ul style="list-style-type: none"> • Presentation of cultural data through graphs, maps, and charts • Creation of interactive cultural experiences through visualizations and simulations using interactive data visualization tools
11	Ethical and Legal Issues in Cultural Data Analysis	<ul style="list-style-type: none"> • Ethical and legal issues arising from data analysis • Privacy concerns, management of cultural heritage, and algorithmic biases • Discussion of ethical issues encountered in the collection and analysis of cultural data (personal data, intellectual property) • Case studies of ethical dilemmas and development of best practices
12	Project Presentations	<ul style="list-style-type: none"> • Presentation of student projects • Discussion of results based on contemporary methods and theories • Development of presentation and communication skills for research findings
13	Recap	<ul style="list-style-type: none"> • Recap and resolving questions • Student feedback

4. LEARNING & TEACHING METHODS - EVALUATION

<p>TEACHING METHOD <i>Face to face, Distance learning, etc.</i></p>	<p>Lectures Active learning (hands-on learning) – Experiential learning Collaborative learning</p>																	
<p>USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) <i>Use of ICT in Teaching, in Laboratory Education, in Communication with students</i></p>	<p>Use of ICT in teaching and communication with students PPT presentations Teaching material, announcements and communication through the eClass platform Student study of supplementary material related to course content Communication with students via email</p>																	
<p>TEACHING ORGANIZATION <i>The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.</i></p> <p><i>The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.</i></p>	<table border="1"> <thead> <tr> <th>Activity</th> <th>Workload/semester</th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td>26</td> </tr> <tr> <td>Laboratory Exercise</td> <td>13</td> </tr> <tr> <td>Essay</td> <td>30</td> </tr> <tr> <td>Weekly projects/tasks</td> <td>38</td> </tr> <tr> <td>Study and analysis of bibliography</td> <td>40</td> </tr> <tr> <td>Written examination</td> <td>3</td> </tr> <tr> <td>Total</td> <td>150</td> </tr> </tbody> </table>	Activity	Workload/semester	Lectures	26	Laboratory Exercise	13	Essay	30	Weekly projects/tasks	38	Study and analysis of bibliography	40	Written examination	3	Total	150	
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<p>STUDENT EVALUATION <i>Description of the evaluation process</i></p> <p><i>Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others</i></p> <p><i>Please indicate all relevant information about the course assessment and how students are informed</i></p>	<p>Formative</p> <p>Presentation in audience: 10%</p> <p>Laboratory Report: 10%</p> <p>Essay (mandatory): 20%</p> <p>Final written examination: 60%</p> <p>Oral examination upon student's request.</p>																	



5. SUGGESTED BIBLIOGRAPHY

1. Lev Manovich.(2020) Cultural Analytics
2. Shahin Jalili. (2022) Cultural Algorithms. Recent Advances
3. Robert G. Reynolds (2020) Cultural Algorithms: Tools to Model Complex Dynamic Social Systems

ANNEX OF THE COURSE OUTLINE

Alternative ways of examining a course in emergency situations

Teacher (full name):	XXXXXXXX
Contact details:	XXXXXXXX
Supervisors:	YES
Evaluation methods:	Laboratory Report: 10% Essay (mandatory): 20% Presentation in audience: 10% Final written examination:60%
Implementation Instructions:	<p>Laboratory Report (10%): This assignment involves students' reports on their lab visits and practical exercises following laboratory protocols. The assessment focuses on students' practical skills, such as their ability to adhere to laboratory procedures, as well as on the clarity and thoroughness of the report they submit.</p> <p>Essay (mandatory) (20%): This paper prepares students for writing scientific research aimed at publication and for drafting their thesis. It includes a literature review and original data analysis. The evaluation focuses on students' abilities to review relevant literature, analyse data, and assess the quality, relevance, and originality of their work.</p> <p>The selection of the paper topic will be carried out in collaboration with the instructor during the second lecture to ensure sufficient time for the preparation of both the paper and its presentation. The final paper will be submitted to the instructor via the eClass platform.</p> <p>Presentation in audience (10%): The public presentation involves presenting the mandatory paper in a PowerPoint format. The assessment focuses on students' ability to present their work clearly, respond to questions, and engage in discussions.</p> <p>Final written examination (60%): The final written exam assesses students' understanding of the fundamental theories, concepts, and principles of the course. The exam will be conducted in person on a date and time announced in advance, along with the duration and content outline of the exam.</p>