

**Information Retrieval
COURSE OUTLINE**

(1) GENERAL

SCHOOL	ENGINEERING		
ACADEMIC UNIT	INFORMATICS AND COMPUTER ENGINEERING		
LEVEL OF STUDIES	UNDEGRADUATE		
COURSE CODE		SEMESTER	7 th
COURSE TITLE	Information Retrieval		
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Laboratory Exercises		1	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		4	5
COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialised general knowledge, skills development		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

Learning outcomes The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described. Consult Appendix A • Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area • Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B • Guidelines for writing Learning Outcomes		
The postgraduate students who complete successfully this course will have: • Gained knowledge of the principles and algorithms of Information Retrieval Systems. • Critical awareness of the issues that arise during indexing and searching the World Wide Web. • Get specialized skills in problem-solving that arise during the development of Information Retrieval Systems, required in research and innovation in order to contribute to the development of new knowledge and processes • The ability to manage complex Information Retrieval systems and apply new strategic approaches to address unforeseen problems that arise during their management.		
General Competences Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim? <table><tr><td>Search for, analysis and synthesis of data and information, with the use of the</td><td>Project planning and management Respect for difference and multiculturalism</td></tr></table>	Search for, analysis and synthesis of data and information, with the use of the	Project planning and management Respect for difference and multiculturalism
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necessary technology	Respect for the natural environment
Adapting to new situations	Showing social, professional and ethical responsibility and sensitivity to gender issues
Decision-making	Criticism and self-criticism
Working independently	Production of free, creative and inductive thinking
Team work	
Working in an international environment	Others...
Working in an interdisciplinary environment	
Production of new research ideas	
Search for, analysis and synthesis of data and information, with the use of the necessary technology	
Working independently	
Team work	
Working in an interdisciplinary environment	
Criticism and self-criticism	
Production of free, creative and inductive thinking	

(3) SYLLABUS

- Introduction and field overview. Components of Information Retrieval Systems.
- Information Retrieval Models
- Automatic indexing
- Inverted indexes, index compression
- Evaluation of information retrieval systems
- Relevance feedback and query expansion
- Language models for information retrieval
- Text classification
- Document clustering
- Latent semantic indexing
- Natural language processing techniques
- Cross-lingual information retrieval
- User interfaces for searching
- Digital Libraries
- Web search, link analysis

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	Face-to-face, laboratory exercises	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Use of ICT in: • Teaching • Laboratory education • Communication with students	
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Activity	Semester workload
	Lectures	39
	Laboratory practice	13
	Study and analysis of bibliography, Project	25
	Fieldwork	48
	Course total	125
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	I. Written final exam (60%*) which includes: - Short answer questions - Problem solving - Comparative evaluation of theory elements II. Lab project (20%) III. Team work presentation (20%) *The final exam can be replaced by a bibliography research project and its public presentation. The evaluation criteria are communicated to students during the lectures and posted on the course website (e-class)	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Manning, Ch., Raghavan, P., Schütze, H. Εισαγωγή στην Ανάκτηση Πληροφοριών, Εκδόσεις Κλειδάριθμος, 2012 (Introduction to Information Retrieval, CUP, 2008)
2. Baeza-Yates, R. and Ribeiro-Neto, B., Ανάκτηση Πληροφορίας (2η έκδοση), Εκδόσεις Τζιόλα, 2015, (Modern Information Retrieval, 2nd edition, Addison-Wesley, 2011)
3. Büttcher, S., Clarke, C. and Cormack, G.V. Information retrieval: implementing and evaluating search engines. The MIT Press, 2010
4. Croft, W.B., J. Lafferty, J. (eds.), Language Modeling for Information Retrieval, Springer, 2003
5. Croft, W.B., Metzler, D., Strohman, T. Search Engines: Information Retrieval in Practice. Pearson Education, 2009
6. Grossman, D.A. Frieder, O. Information Retrieval: Algorithms and Heuristics. Springer, 2004.
7. Korfhage, R., Information Storage and Retrieval, John Wiley & Sons, 1997

8. Παπαδόπουλος, Α., Μανωλόπουλος, Ι., Τσίχλας, Κ. Ανάκτηση Πληροφορίας, Ελληνικά Ακαδημαϊκά Συγγράμματα και Βοηθήματα, 2015, <http://www.kallipos.gr>
9. Tait, J.I. (ed.), Charting a New Course: Natural Language Processing and Information Retrieval. Essays in Honour of Karen Sparck Jones. Springer, 2005.
10. Witten, I.H., Moffat, A. and Bell, T.C., Managing Gigabytes: Compressing and Indexing Documents and Images, Morgan Kaufmann Publishing, 1999

- Related academic journals:

- Information Processing and Management (IP&M) (Elsevier)
- Information Retrieval (Springer)
- International Journal on Digital Libraries (Springer)
- ACM Transactions on Information Systems (TOIS) (ACM)
- ACM Transactions on the Web (TWEB) (ACM)