COURSE DESCRIPTION – ACADEMIC YEAR 2016/2017

Course title	**Information Search and Retrieval**
Course code	72009
Scientific sector	INF/01
Degree	Master in Computer Science (LM-18)
Semester	2
Year	1
Credits	8
Modular	No

Total lecturing hours	48
Total lab hours	--
Total exercise hours	24
Attendance	Not compulsory
Prerequisites	Introductory courses on: data structures and algorithms, linear algebra, probability theory, and data mining.
Course page	https://ole.unibz.it/

Specific educational objectives	The course belongs to the type "caratterizzanti – discipline informatiche" in the curriculum "Data and Knowledge Engineering". The first objective of this course is to present the scientific underpinnings of the field of Information Search and Retrieval. The student will study fundamental, mathematically sophisticated, information retrieval concepts first and then more advanced techniques for information filtering and decision support (personalization and recommender systems). The second objective of this course is to provide to the student a rich and comprehensive catalogue of information search techniques that can be exploited in the design and implementation of a specific Web site, such an eCommerce or eGovernment application for travel and tourism or health. The third objective is to develop the capacity to use, manipulate and extend the studied techniques. This means that the student must be able to solve new problems using the illustrated techniques. For instance must be able to define a new rating prediction method for suggesting groups to join in a social network.

Lecturer	Markus Zanker
Contact	Piazza Domenicani 3, Room 1.04, Markus.Zanker@unibz.it
Scientific sector of lecturer	INF/01
Teaching language	English
Office hours	During the lecture time span, Wednesday, 14:00-16:00, prior arrangement via e-mail
Lecturing Assistant (if any)	Francesco Ricci
Contact TA	Piazza Domenicani 3, Room 2.17, Francesco.Ricci@unibz.it
Office hours TA	During the lecture time span, Tuesday, 16:00-18:00, prior arrangement via e-mail
List of topics	• Document indexing • Vector space model • Evaluation of information retrieval

	• Web search • Text classification • User Interfaces and Visualization • Personalization • Recommender Systems
Teaching format	Frontal lectures, inverted classroom model, exercises and discussions in the lab, and projects in teams.

Learning outcomes	Knowledge and understanding • Know the main modelling techniques of unstructured data and content (text and multimedia) and the main research techniques on these types of data. • Know the main techniques for extracting information (associations, trends, dependencies, forecasts) from structured and unstructured data. Applying knowledge and understanding • Be able to design and implement information systems in vertical sectors of applications in compliance with technical, functional and organizational requirements. • Be able to identify new application requirements and business opportunities in the field of systems based on data and knowledge. • Be able to define an algorithmic solution to a computational problem and to estimate its complexity. Making judgments • Be able to plan and re-plan a technical project activity aimed at building an information system and to bring it to completion by meeting the defined deadlines and objectives. • Be able to independently select the documentation required to keep abreast of the frequent technological innovations in the field by using a wide variety of documentary sources: books, web, magazines. Communication skills • Be able to structure and prepare scientific and technical documentation describing project activities. • Be able to present in a fixed time the content of a scientific / technical report. Learning skills • Be able to autonomously extend the knowledge acquired during the study course by reading and understanding scientific and technical documentation.

Assessment	The assessment of the course consists of the following parts: • Project in a small team (2 students), 50% • Final exam, written, 50% of mark
Assessment language	English
Evaluation criteria and criteria for awarding marks	The project will consist of the design of an information search and recommendation system in a specific application domain selected by the students. The project results are a written report (~ 5.000 words), an optional system prototype implementation, and a presentation.

	The project will be evaluated at the end of the semester and it is a prerequisite for attending the written exam. The project is aimed at assessing to what extent the student has achieved the above-mentioned learning outcomes related to: applying knowledge and understanding, making judgments, communication skills and ability to learn. The written exam will assess to what extent the student has achieved above-mentioned learning outcomes related to: knowledge and understanding, applying knowledge and understanding, ability to learn.

Required readings	The suggested book for the information retrieval topics is: • C. D. Manning, P. Raghavan and H. Schutze. Introduction to Information Retrieval, Cambridge University Press, 2008. (Online: http://informationretrieval.org) The suggested book for recommender systems topics is: • Ricci, F.; Rokach, L.; Shapira, B. (Eds.). Recommender Systems Handbook. Berlin: Springer, 2015. All the required reading material will be provided during the course and will be available in electronic format. Copy of the slides will be available as well.
Supplementary readings	--
Software used	Java, Excel, Web browser