

Academic Year: ( 2022 / 2023 )

Review date: 19-05-2022

Department assigned to the subject: Library and Information Sciences Department

Coordinating teacher: SERRANO LOPEZ, ANTONIO ELEAZAR

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 1

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

Any

**OBJECTIVES**

In general, search and retrieve information, thanks to computer and manual methods and tools, that allow responding to the demands of users in optimal conditions of costs and terms, and evaluate the adequacy between the demand and the response provided, as well as determining and to evaluate the technological needs related to the management of documentary databases that may be of interest and useful at the present time or in the near future for the services and information units. And specifically:

1. Understand and know the definition of terms related to Information Retrieval (RI).
2. Understand and apply the principles and techniques for IR and its evaluation.
3. Know the theoretical models of information retrieval.
4. Handle with ease the different interrogation languages and interfaces of information retrieval systems.
5. Interact with the information retrieval systems to solve the possible information needs that may arise.
6. Distinguish the different theoretical models of IR and recognize them in the Real Information Retrieval Systems (IRS).
7. Convert a request for information into a search strategy appropriate to the system and transcribe and transmit the results of a search.
8. Handle with ease, compare and evaluate different interrogation languages and interfaces that allow interaction with a local SRI or with engines, metasearch engines and other search tools in the network.
9. Master at least one software for information retrieval, advanced features, extended installation and recognized quality, which serves as a basis for the analysis and evaluation of any other.
10. Evaluate the results of a search in terms of reliability and relevance, in any environment of use of an SRI.

**DESCRIPTION OF CONTENTS: PROGRAMME****THEORETICAL CONTENT****LEARNING UNIT 1: Introduction to Information Retrieval Systems (IRS).**

- Lesson 0: Information Retrieval (IR) in text databases
- Lesson T1: The theoretical framework for IR: Relation to Indexing; difference with Data Retrieval

**LEARNING UNIT 2: Main formal models of IR (as D. Blair).**

- Lesson T2: Basic models (Models 1-4): one descriptor, several descriptors, cutoff value and ordered output
- Lesson T3: Models with weighted descriptors (Models 5-8): weighted search only, only weighted indexing, weighted search and indexing and search in a vector space
- Lesson T4: Models with Boolean search (Models 9 and 10): Boolean search and peculiarities on free text
- Lesson T5: thesaurus-based models (Models 11 and 12): Search with binary and weighted thesauri

**LEARNING UNIT 3: Ranking systems.**

- Lesson T6: Ranking systems on search engines
- Lesson T7: Ranking practical exercises

**LEARNING UNIT 3: Evaluation of Information Retrieval Systems.**

- Lesson T8: Principles for evaluating the effectiveness of retrieval: Relevance, Recall and Precision and its complements; relationship between P and R; other measures
- Lesson T9: Difficulties in obtaining indicators: The problem of Silence; Relevance, as Affinity (relatedness) and Utility; Relevance, as binary or weighted

## PRACTICAL CONTENT

- Exploration and evaluation of web crawlers.
- Practical exercises for term weighting with R (TF-IDF).
- Boolean logic exercises
- Designing a model for an SRI
- SRI evaluation exercises
- Building a search engine and its evaluation: selection of seeds, crawling system, positioning system, putting into production and evaluation of the results.

## LEARNING ACTIVITIES AND METHODOLOGY

- Acquisition of theoretical knowledge (total 3 credits ECTS) through lectures, teaching materials prepared by the teacher, online tutorials, specialized readings and discussions (1.2 ECTS), and the personal study and work of students (1.8 ECTS). It relates to the abilities 1 to 3.
- Acquisition of practical skills (total 3 ECTS) through various practical assumptions of information retrieval in different environments (local systems, online and other websites), with which they can acquire skills and develop abilities 4 to 10.
- Tutorship: The schedule of tutorship sessions could be looked up in the Aula Global space for the course. In addition to the tutorship at the times and places officially set for the course, students can apply for other outside these hours and to be held by digital media.

## ASSESSMENT SYSTEM

The final course grade will be determined by the following factors and their corresponding weights:

1. Continuous assessment [= 60% of the final score, 6 points out of 10]
  - Tests: 30%, 3 points out 10
  - Practicing: 30%, 3 points out 10
2. Final exam [= 40% of the final score, 4 points out 10]

According to University policy, in the regular exam session, the student who did not follow the continuous assessment is entitled to take an exam for the 60% of the final grade.

In the extra exam session, if the student did not follow the continuous assessment, is entitled to take an exam for the 100% of the final grade, and if he did follow the continuous assessment, will be evaluated in the most beneficial way, considering an exam weight of 40% plus the continuous assessment score, or an exam weight of 100%, discarding the score obtained in continuous assessment.

In any case, it will be necessary to obtain at least a 4 out of 10 in the final exam in order to obtain the continuous assessment mark.

<b>% end-of-term-examination:</b>	40
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	60

## BASIC BIBLIOGRAPHY

- BLAIR, D.C. Language and Representation in Information Retrieval., Elsevier Science Publishers, 1990
- Baeza-Yates, R.; Ribeiro-Neto, B Modern information retrieval, Addison-Wesley, 1999
- CHOWDHURY, G.G. Introduction to modern information retrieval (3ª ed.), Library Association, 2010
- LANCASTER, F.W El control del vocabulario en la recuperación de la información (2ª ed. corr.), Universitat de València, 2002
- MEADOW, CH.T.; BOYCE, B.R.; KRAFT, D.H Text information retrieval systems (3ª ed.), San Diego, Academic Press, 2007

## ADDITIONAL BIBLIOGRAPHY

- Buckland, M.K. Information and Information Systems, Greenwood Pres, 1991
- Chamis, A.Y. Vocabulary Control and Search Strategies in Online Searching, Greenwood Press, 1991
- Manning, C.D.; Raghavan, P.; Schütze, H. Introduction to Information Retrieval., Cambridge University Press, 2008
- Meadow, Ch.T Text information retrieval systems, Academic Press, 2000
- Salton, G Automatic text processing: The Transformation, Analysis, and Retrieval of Information by Computer, Addison Wesl, 1989

