Jordan University of Science and Technology

Faculty of Computer & Information Technology

Computer Science Department

CS422 Information Retrieval Systems
Second Semester 2020-2021

Course Catalog
3 Credit Hours. This course aims to understand information retrieval algorithms and identify challenging problems on the Web. It provides a functional view of information retrieval, types of information retrieval systems, design issues: keyword-based retrieval, file structures, and thesaurus construction. Information retrieval data structures and algorithms: lexical analysis, stemming, term weighting, associative indexing, Boolean operations, and string searching and matching techniques. Applications and case studies. It also aims to cover basic and advanced retrieval models, such as Document modeling and Inverted index construction and compression. Vector space model and ranking methods. Probabilistic and language models. Then, the course will look at the evaluation methods and the relevance feedback, and query expansion. The course also covers the Web Search fundamentals. Examples of topics include Web search engine architecture, Web crawling and indexing, and Web structure, and usage analytics.

Text Book	
Title	An Introduction to Information Retrieval
Author(s)	Christopher D. Manning, Prabhakar Raghavan, Hinrich Schutze
Edition	2nd Edition
Short Name	1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
2	Search Engines: Information Retrieval in Practice	W. Bruce Croft, Donald Metzler, and Trevor Strohman.	2nd Edition	

Instructor	
Name	**Dr. Malak Abdullah**
Office Location	A1-L3

Office Hours	Mon : 10:00 - 12:00 Tue : 12:00 - 13:00 Wed : 10:00 - 12:00 Thu : 12:00 - 13:00
Email	mabdullah@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue : 14:30 - 16:00 Room: منصة الكترونية Section 3: Lecture Time: Sun, Tue : 13:00 - 14:30 Room: منصة الكترونية

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
1742210	Cis221 Fundamentals Of Database Systems	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction to Information Retrieval	From **1**
Weeks 2, 3	Inverted Indices: Dictionary and postings lists, Boolean querying	**Ch2** From **1**
Week 4	Dictionaries, Spell Correction	**Ch3** From **1**
Weeks 5, 6	Scoring, term weighting and the vector space model	**Ch 6, Ch7** From **1**
Weeks 7, 8	Probabilistic IR: the binary independence model, BM25, BM25F	**ch 9** From **1**
Weeks 9, 10	Classification in vector spaces (SVM), Machine learning and Deep Learning	**ch 11+13** From **1**
Weeks 11, 12	Text classification and evaluating models	**ch 8** From **1**
Weeks 13, 14	Web Search Engines, SEOs crawling and indexing	**Ch 19** From **1**

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Able to identify the basic concepts of information retrieval system, unstructured data, retrieval and browsing, query, search engine, web search engine and crawling [1SO1]	15%	Exams and Quizzes, Final Exam
Able to understand how algebraic and statistical models of text can be used to solve problems in IR, with a focus on how Boolean and vector-space models can be applied to the document retrieval problem. [1SO1, 1SO2]	12%	Exams and Quizzes, Final Exam

To illustrate effectiveness and efficiency of information retrieval system and how to evaluate, define the Recall and Precision and other measurements. [1SO3, 1SO4]	23%	Exams and Quizzes, Final Exam
To understand the Indexing strategies which include: determine the term vocabulary, text processing, tolerant retrieval, Inverted file construction and index compression. [1SO3, 1SO4]	30%	Exams and Quizzes, Final Exam
To provide hands-on experience in building search engines and/or hands-on experience in evaluating search engines [1SO2, 1SO5, 1SO6]	20%	Projects

Relationship to Program Student Outcomes (Out of 100%)					
SO1	SO2	SO3	SO4	SO5	SO6
21	12.67	26.50	26.50	6.67	6.67

Evaluation	
Assessment Tool	**Weight**
Exams and Quizzes	30%
Projects	20%
Final Exam	50%

Policy	
Attendance	Attendance is very important for the course. In accordance with university policy, students missing more than 20% of total classes are subject to failure. Penalties may be assessed without regard to the student's performance. Attendance will be recorded at the beginning or end of each class.
Homework and Project	Students are expected to keep up with the material as it is presented and submit assignments on time.
Exams	All exams are online
Policy on makeup tests, late work, and incomplete	Makeup exams are given only if there is solid evidence of a medical or otherwise serious emergency that prevents the student of participating in the exam. Makeup exams will be administered by the department head. Must turn in homework, reports and projects on time. One point per working day will be deducted from the late assignment. Will not accept your work after 5 working days or the solution has been provided.

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