

Detailed Course Description - Course Plan Development and Updating Procedures/ Computer Information Systems Department	QF01/0408-3.0E
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Faculty	Faculty of Science and Information Technology	Department	Computer Information Systems
Course Number	0113456	Course Title	Information Retrieval
Number Of Credit Hours	3	Pre-Requisite/Co-Requisite	Advanced Databases

### Brief Course Description

This course includes the following topics:

Introduction to Information Retrieval, Basic Techniques of information retrieval, Tokens and Terms, Static Inverted Indices, Query Processing, Index Compression, Dynamic Inverted Indices, Probabilistic Retrieval , Measuring Effectiveness, Web Search, Advanced Information Retrieval Topics.

Course Goals and Learning Outcomes	
<b>Goal 1</b>	<b>To understand the basic concepts of information retrieval.</b>
Learning Outcomes	1.1 To be able to show a good comprehension to the basic concepts of IR.
<b>Goal 2</b>	<b>To understand how the inverted index works.</b>
Learning Outcomes	2.1 To be able to demonstrate how inverted index works.
<b>Goal 3</b>	<b>To be acquainted with different types of retrieval.</b>
Learning Outcomes	3.1 To be able to show a good understanding of the different types of retrieval.
<b>Goal 4</b>	<b>To grasp the basic concepts of various information retrieval topics.</b>
Learning Outcomes	4.1 To acquire the ability to design and implement a new IR system using the concepts and techniques given in the course.
<b>Textbook</b>	1. Stefan Buttcher, Charles Clarke, and Gordon Cormack. Information Retrieval: Implementing and Evaluating Search Engines. MIT press, <b>2016</b> .
<b>Supplementary References</b>	1. Winfried Gödert , Jessica Hubrich , Matthias Nagelschmidt. Semantic Knowledge Representation for Information Retrieval. De Gruyter Saur. <b>2014</b> 2. Louis Rosenfeld and Peter Morville. Information Architecture: For the web and beyond. O'Reilly Media; <b>2015</b> .

### Course Timeline

Week	Number of Hours	Course Topics	Pages (Textbook)	Notes
01	1 1 1	Introduction To information Retrieval, IR systems, Test collections.	1-33	
02	1 1 1	Inverted Indices, Retrieval and Ranking, Evaluation.	33-84	
03	1 1 1	Characters, N-Grams, European Languages.	84-104	
04	1 1 1	Index Components and Index life cycle, The dictionary, Interleaving Dictionary, Index Construction.	104-137	
05	1 1 1	<b>First Exam 20%</b>		
06	1 1 1	Query processing for ranked retrieval, Lightweight structure.	137-171	
07	1 1 1	General purpose data compression, symbolwise compression, compressing posting lists, compressing dictionaries.	174-228	
08	1 1 1	Batch Updates, Incremental Index Update, Document Deletion, Document Modification.	228-254	
09	1 1 1	Modeling Relevance, Robertson Weighting Formula, Term Frequency, Field weighting.	258-282	
10	1 1 1	Generating queries from documents, language models and smoothing, ranking with language models, passage retrieval and ranking.	286-306	
11	1 1 1	<b>Second Exam 20%</b>		
12	1 1 1	Various types of classifiers.	310-371	
13	1 1 1	Traditional effectiveness measures, TREC, Using statistics, Nontraditional measures	406-463	

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14	1 1 1	Web structure, web crawler, Page Rank Algorithm, Evaluating Web Search	507-522	
15	1 1 1	<b>Project Presentations</b>		
16	1 1 1	<b>Final Exam 50%</b>		

<b>Theoretical Course Evaluation Methods and Weight</b>	Participation = 10% First Exam 20% Second Exam 20% Final Exam 50%	<b>Practical (Clinical) Course Evaluation Methods</b>	Semester Students' Work = 50% (Reports, Research, Quizzes, Etc.) Final Exam = 50%
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<b>Approved by Head of Department</b>		<b>Date Of Approval</b>	
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Extra information (to be updated every semester by corresponding faculty member)

<b>Name of Teacher</b>		Office Number	
Phone Number (Extension)		Email	<a href="mailto:_____@zuj.edu.jo">_____@zuj.edu.jo</a>
Office Hours			