Course Name: Data Storage and Retrieval
Course Code: IS313

I. Basic Course Information

Major or minor element of program: Both Major and Minor
Department offering the course: Information Systems Department

Academic level: 300 Level
Semester in which course is offered: Second (Spring) Semester
Course pre-requisite(s): IS211, CS215

Credit Hours: 3
Contact Hours Through:

Lecture	Tutorial *	Practical *	Total
2.5	0.0	1.5	4.0

* 1.5 hours for **either** Tutorial or Practical

Approval date of course specification: January 2015

II. Overall Aims of Course

•For students to gain an understanding of large data structures, index design and retrieval issues
•For students to be able to identify fundamental design tradeoff
•For students to be able to apply their acquired knowledge to real world situations
•To properly understand and handle existing implementations of structures, indices and queries

III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
K1,K10,IS-K17	I7,IS-I19	IS-P18	G2,G7

IV. Intended Learning Outcomes of Course (ILOs)

a. Knowledge and Understanding

On completing the course, students should be able to:

K.1 Describe issues related to data storage and retrieval for search engines.
K.2 Explain efficient techniques to store semi-structured and unstructured data.
K.3 Explain indexing structures, methods and techniques.
K.4 Recognize different types of queries.
K.5 Discuss how to evaluate and rank data retrieved from queries.
K.6 Explain web search basics.
K.7 List the HW and infrastructures related to data storage and retrieval.

b. Intellectual/Cognitive Skills

On completing the course, students should be able to:

I.1 Integrate a search engine to an information system.
I.2 Critique the use of different storage/index/retrieval structures in applications.
I.3 Analyze enterprise needs to cope to latest storage technologies.

c. Practical/Professional Skills

On completing the course, students should be able to:

P.1 Apply the principles of effective information management, organization and presentation to information retrieval of various kinds.
P.2 Apply computing information retrieval skills in computing community environment and industry.

d. General and Transferable Skills

On completing the course, students should be able to:

G.1 Demonstrate ability to work as a team member.
G.2 Show the ability to efficiently use IT resources and general computing facilities.

V. Course Matrix Contents

	Main Topics / Chapters	Duration (Weeks)	Course ILOs Covered by Topic (By ILO Code)			
			K & U	I.S.	P.S.	G.S.
1-	Indexing on disk and B-Trees	1	K2,K3	I2	P1	G1
2-	XML	1	K2			G1
3-	JSON	1	K2,K3	I2	P1	G1
4-	Information Retrieval Principles	1	K1,K4,K5	I1		
5-	Crawling	2	K4			G2
6-	Text Processing	1	K2			G2
7-	Text Indexing	2	K2,K3	I2	P1	G2
8-	Search Engine Optimization	1	K2,K6			
9-	Information Storage Management	3	K7	I3	P2	
10-						
	Net Teaching Weeks	**13**				

VI. Course Weekly Detailed Topics / hours / ILOs

Week No.	Sub-Topics	Total Hours	Contact Hours	
			Theoretical Hours	Practical Hours *
1	Course survey - BTree - Hash tables	2.5	2.5	
2	XML	4	2.5	1.5
3	JSON	4	2.5	1.5
4	IR survey	4	2.5	1.5
5	Crawlers	4	2.5	1.5
6	Crawlers	4	2.5	1.5
7	**Midterm Exam**			
8	Text Processing	4	2.5	1.5
9	Text Indexing	4	2.5	1.5
10	Text Indexing	4	2.5	1.5
11	Search Engine Optimization	4	2.5	1.5
12	Information Storage Management	4	2.5	1.5
13	Information Storage Management	4	2.5	1.5
14	Information Storage Management	4	2.5	1.5
15	**Final Exam**			
Total Teaching Hours		**51**	**33**	**18**

* **No Practical/Tutorial during the first week of the semester**

VII. Teaching and Learning Methods

Teaching/Learning Method	Selected Method	Course ILOs Covered by Method (By ILO Code)			
		K & U	Intellectual Skills	Professional Skills	General Skills
Lectures & Seminars	X	K1,K3,K4,K5	I1,I2		G1
Tutorials					
Computer lab Sessions	X			P1	
Practical lab Work	X				G2
Reading Materials					
Web-site Searches					
Research & Reporting	X	K1,K2,K6			
Problem Solving / Problem-based Learning	X				G2
Projects	X		I2	P2	
Independent Work					
Group Work	X				
Case Studies					
Presentations					
Simulation Analysis		K7	I3		
Others (Specify):					

VIII. Assessment Methods, Schedule and Grade Distribution

Assessment Method	Selected Method	Course ILOs Covered by Method (By ILO Code)				Assessment Weight / Percentage	Week No.
		K & U	I.S.	P.S.	G.S.		
Midterm Exam	[X]	[K1 to K6]	[]	[]	[]	[15%]	7
Final Exam	[X]	[K1 to K6]	[]	[]	[]	60%	15
Quizzes	[X]	[K1 to K6]	[]	[]	[]	[5%]	[]
Course Work	[]	[]	[]	[]	[]	[]	[]
Report Writing	[]	[]	[]	[]	[]	[]	[]
Case Study Analysis	[]	[]	[]	[]	[]	[]	[]
Oral Presentations	[]	[]	[]	[]	[]	[]	[]
Practical	[]	[]	[]	[]	[]	[]	[]
Group Project	[X]	[]	[I1,I2]	[P1]	[G2]	[20%]	[]
Individual Project	[]	[]	[]	[]	[]	[]	[]
Others (Specify):	[]	[]	[]	[]	[]	[]	[]

IX. List of References

Essential Text Books	• [Search Engines Information Retrieval in Practice. Bruce Croft, Donald Metzler and Trevor Strohman • File Structures. Michael J. Folk, Bill Zoellick and Greg Riccardi • Information Storage Management slides]
Course notes	• [Lecture notes]
Recommended books	• [• •]
Periodicals, Web sites, etc …	• [W3schools.com • •]

X. Facilities required for teaching and learning

- [Students' usual compilers, internet in labs]

Course coordinator: [Ass. Prof. Ehab Ezzat]

Head of Department: Ass. Prof. Ehab Ezzat

Date: [January 2015]