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Date:

CS54XX11 Information Retrieval

L-T-P-Cr: 2-0-2-3

Pre-requisites: Mathematics, Programming language, Database Management Systems, minimal concepts of NLP.

Objectives/Overview:

- To review information retrieval systems.
- To illustrate retrieval metric and query expansion.
- To describe query languages and properties.
- To discuss concepts of web crawling and web retrieval.
- To introduce taxonomy and ontology concepts

Course Outcome:

After completing the course, students will able to:

Sl. No	Outcome	Blooms Taxonomy level
CO1	Illustrate the different query properties	2
CO2	Compare different search engine ranking techniques	2
CO3	Analyze the different retrieval metrics for retrieval evaluation	3
CO4	Construct a search engine	4
CO5	Describe different ontology and taxonomy architectures and processes	2

Mapping of Course outcome with Program Outcomes

Course Outcome	Program Outcome											
	P O 1(E ng g.	P O 2(Pr ob le	P O 3 (D es ig	P O 4(in ve sti	P O 5(M od er	P O 6(T he en	P O 7(E nv ir	P O 8(Et hi	P O 9(In di vi	PO 10(Co m mu nic	PO 11(Pr oje t Ma	PO 12(Life Lon g Lea

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CO1	H											
CO2	H									M		
CO3	H	H								M		
CO4	H	H								M		M
CO5	H	H								M		M

- H – High M – Medium L - Low

UNIT I: Introduction to Information Retrieval:

Lectures: 8

Introduction:

Information Retrieval Early Developments, Information Retrieval in Libraries and Digital Libraries, IR at the Center of the Stage, The IR Problem, The IR System, The Web

Modeling:

IR Models, Classic Information Retrieval, Other Models

UNIT II: Retrieval Evaluation and Query Expansion:

Lectures: 10

Introduction, Retrieval Metrics, Implicit Feedback Through Global Analysis, Query Expansion based on a Similarity Thesaurus, Query Expansion based on a Statistical Thesaurus

UNIT III: Queries: Languages and Properties

Lectures: 10

Query Languages, Keyword-Based Querying, Beyond Keywords, Structural Queries, Query Protocols Query Properties, Characterizing Web Queries, User Search Behavior, Query Intent Query Topic, Query Sessions and Missions, Query Difficulty

UNIT IV: Web Retrieval and Web Crawling:**Lectures: 8**

Introduction, The Web, Search Engine Architectures, Search Engine Ranking, Managing Web Data, Search Engine User Interaction, Browsing, Beyond Browsing, Web Crawling

UNIT V: Taxonomy and Ontology:**Lectures: 6**

Creating domain specific ontology, Ontology life cycle
Distributed and Parallel IR: Relationships between documents, Identify appropriate networked collections, Multiple distributed collections simultaneously, Parallel IR - MIMD Architectures, Distributed IR – Collection Partitioning, Source Selection, Query Processing

Text/Reference Books

1. Baeza-Yates and Ribeiro-Neto, Modern Information Retrieval, Addison-Wesley.
2. William B. Frakes, Information Retrieval: Data Structures and Algorithms.
3. Manning, Raghavan and Schutze, Introduction to Information Retrieval, Cambridge University Press