

**PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY**

(Autonomous)

Kanuru, Vijayawada-520007

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)****IV B Tech – I Semester****Information Retrieval Systems**

<b>Course Code</b>	20AM4702D	<b>Year</b>	IV	<b>Semester</b>	I
<b>Course Category</b>	PEC	<b>Branch</b>	CSE (AI&ML)	<b>Course Type</b>	Theory
<b>Credits</b>	3	<b>L-T-P</b>	3-0-0	<b>Prerequisites</b>	Data Structures
<b>Continuous Internal Evaluation</b>	30	<b>Semester End Evaluation</b>	70	<b>Total Marks</b>	100

<b>Course Outcomes</b>		
<b>Upon Successful completion of course, the student will be able to</b>		
<b>CO1</b>	Describe the core concepts and architecture of information retrieval systems to differentiate them from other information systems.	<b>L2</b>
<b>CO2</b>	Apply appropriate data structures and indexing techniques to build efficient text retrieval components in information retrieval systems.	<b>L3</b>
<b>CO3</b>	Use algorithms for stemming and thesaurus construction to improve the accuracy and relevance of text analysis and retrieval processes.	<b>L3</b>
<b>CO4</b>	Analyze various string searching algorithms to assess their benefits and constraints in information retrieval applications.	<b>L4</b>

Contribution of course outcomes towards achievement of program outcomes & Strength of correlations (3: Substantial,2: Moderate,1: Slight)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
<b>CO1</b>	2												
<b>CO2</b>	3											2	
<b>CO3</b>	3											2	
<b>CO4</b>		3									2		

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## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)

### IV B Tech – I Semester

<b>Syllabus</b>		
<b>Unit No</b>	<b>Contents</b>	<b>Mapped CO</b>
<b>I</b>	<b>Introduction to Information storage and retrieval systems:</b> Domain Analysis of IR systems, IR and other types of Information Systems, IR System Evaluation, Information Retrieval System Capabilities, Basics of Data Structures and Algorithms related to Information Retrieval Systems	CO1
<b>II</b>	<b>Inverted Files and Signature Files:</b> Introduction, Structures used in Inverted Files, building an Inverted file using a sorted array, Modifications to the Basic Techniques. <b>Signature Files:</b> Concepts of Signature files, Compression, Vertical Partitioning, Horizontal Partitioning.	CO1, CO2, CO4
<b>III</b>	<b>Cataloguing and Indexing:</b> History and Objectives of Indexing, Indexing Process, Automatic Indexing, New Indices for Text, Lexical Analysis and Stoplists <b>Data Structures:</b> N-Gram Data Structure, Hypertext and XML Data Structure	CO1, CO2, CO4
<b>IV</b>	<b>Stemming Algorithms and Thesaurus Construction:</b> Types of Stemming algorithms, Experimental Evaluations of Stemming, stemming to Compress Inverted Files. <b>Thesaurus Construction:</b> Features of Thesauri, Thesaurus Construction, Thesaurus construction from Texts	CO1, CO3, CO4
<b>V</b>	<b>String Searching Algorithms:</b> Introduction, Preliminaries, The Naive Algorithm, The Knutt-Morris-Pratt Algorithm, The Shift-Or Algorithm, The Karp-Rabin Algorithm.	CO1, CO3, CO4

<b>Learning Resources</b>	
<b>Text Books</b>	
1.	Modern Information Retrieval, Ricardo Baeza-Yates & Berthier Ribeiro-Neto, 2nd ed., 1999, Addison-Wesley
2.	Information Storage and Retrieval Systems: Theory and Implementation, Gerald J. Kowalski & Mark T. Maybury, 2nd ed., September 30, 2000, Springer (Kluwer Academic)
<b>References</b>	
1.	Information Retrieval: Implementing and Evaluating Search Engines, Stefan Büttcher, Charles L. A. Clarke, Gordon V. Cormack, 1st Edition, 2010, The MIT Press.
2.	Information Retrieval: A Health and Biomedical Perspective, William Hersh, 4th Edition, 2022, Springer.
<b>E-Recourses and other Digital Material</b>	
1.	<a href="https://www.analyticsvidhya.com/blog/2015/04/information-retrieval-system-explained/">https://www.analyticsvidhya.com/blog/2015/04/information-retrieval-system-explained/</a>
2.	<a href="https://www.analyticsvidhya.com/blog/2017/11/information-retrieval-using-kdtree/">https://www.analyticsvidhya.com/blog/2017/11/information-retrieval-using-kdtree/</a>
3.	<a href="https://medium.com/analytics-vidhya/information-retrieval-part-1-extracting-webpages-a9d0b715535d">https://medium.com/analytics-vidhya/information-retrieval-part-1-extracting-webpages-a9d0b715535d</a>