

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

(Autonomous)

Kanuru, Vijayawada-520007

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (Data Science)**

**III B.Tech II Semester**

**Recommender Systems**

<b>Course Code</b>	23DS4601C	<b>Year</b>	III	<b>Semester</b>	II
<b>Course Category</b>	PEC	<b>Branch</b>	CSE (Data Science)	<b>Course Type</b>	Theory
<b>Credits</b>	3	<b>L-T-P</b>	3-0-0	<b>Prerequisites</b>	Introduction to Data Science
<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 key concepts, methods, and evaluation of recommender systems and their applications to understand their role and effectiveness		<b>L2</b>
<b>CO2</b>	Apply collaborative, content-based, and knowledge-based recommendation techniques to build basic recommender models and generate personalized recommendations.		<b>L3</b>
<b>CO3</b>	Apply hybrid recommendation strategies, evaluation techniques, and community-based approaches to enhance the effectiveness and personalization of recommender systems.		<b>L3</b>
<b>CO4</b>	Analyze and evaluate recommender system techniques and metrics to enhance personalization and trust		<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
CO1	2												
CO2	3												
CO3	3												
CO4		3									2		

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Syllabus		
Unit No	Contents	Map ped CO
I	<b>Introduction:</b> Recommender system functions, Linear Algebra notation: Matrix addition, Multiplication, transposition, and inverses, covariance matrices, Understanding ratings, Applications of recommendation systems, Issues with recommender system.	CO1
II	<b>Collaborative Filtering:</b> User-based nearest neighbour recommendation, Item-based nearest neighbour recommendation, Model based and pre-processing based approaches, Attacks on collaborative recommender systems.	CO1, CO2
III	<b>Content-based recommendation:</b> High level architecture of content-based systems, Advantages and drawbacks of content-based filtering, Item profiles, discovering features of documents, obtaining item features from tags, representing item profiles, Methods for learning user profiles.	CO1, CO2, CO4
IV	<b>Hybrid approaches:</b> Opportunities for hybridization, Monolithic hybridization design: Feature combination, Feature augmentation, Parallelized hybridization design: Weighted, Switching, Mixed, Pipelined hybridization design: Cascade Meta-level, Limitations of hybridization strategies.	CO1, CO3, CO4
V	<b>Evaluating Recommender System:</b> Introduction, General properties of evaluation research, Evaluation designs, Evaluation on historical datasets, Error metrics, Decision-Support metrics, User-Centered metrics.	CO1, CO3, CO4

Learning Resources
<b>Text Books</b>
<ol style="list-style-type: none"> <li>1. Recommender Systems: An Introduction, Jannach D., Zanker M., Felfering A., 1st Edition, 2011, Cambridge University Press</li> <li>2. Recommender Systems Handbook, Ricci F., Rokach L., Shapira D., Kantor B.P., 1st Edition, 2011, Springer</li> </ol>
<b>References</b>
<ol style="list-style-type: none"> <li>1. Recommender Systems for Learning, Manouselis N., Drachsler H., Verbert K., Duval E., 1st Edition, 2013, Springer</li> </ol>
<b>E-Recourses and other Digital Material</b>
<ol style="list-style-type: none"> <li>1. <a href="https://nptel.ac.in/courses/106/105/106105188/">https://nptel.ac.in/courses/106/105/106105188/</a></li> <li>2. <a href="https://www.coursera.org/specializations/recommender-systems">https://www.coursera.org/specializations/recommender-systems</a></li> </ol>

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