

Course Code	20DS4703D	Year	IV	Semester	I
Course Category	PEC	Branch	CSE (Data Science)	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Mathematics, Machine Learning
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes		
Upon Successful completion of course, the student will be able to		
CO1	Describe key concepts, methods, and evaluation techniques of recommender systems to understand their applications.	L2
CO2	Apply collaborative, content-based, and knowledge-based recommendation techniques to build basic recommender models and generate personalized recommendations.	L3
CO3	Apply hybrid recommendation strategies, evaluation techniques, and community-based approaches to enhance the effectiveness and personalization of recommender systems.	L3
CO4	Analyze and evaluate recommender system techniques and metrics to enhance personalization and trust	L4

[illegible]

Syllabus		
Unit No	Contents	Map ped CO
I	Introduction: 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	Collaborative Filtering: 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	Content-based recommendation: 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	Hybrid approaches: 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	Evaluating Recommender System: 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
Text Books
<ol style="list-style-type: none"> 1. Recommender Systems: An Introduction, Jannach D., Zanker M., Felfering A., 1st Edition, 2011, Cambridge University Press 2. Recommender Systems Handbook, Ricci F., Rokach L., Shapira D., Kantor B.P., 1st Edition, 2011, Springer
References
<ol style="list-style-type: none"> 1. Recommender Systems For Learning, Manouselis N., Drachsler H., Verbert K., Duval E., 1st Edition, 2013, Springer
E-Recourses and other Digital Material
<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses/106/105/106105188/ 2. https://www.coursera.org/specializations/recommender-systems