

Course Code	CSE 640
Course Name	Collaborative Filtering
Credits	4
Course Offered to	PG
Course Description	Recommender systems have around for sometime. But in recent times with the boom of retail online trade recommendation systems and the hype around the NetFlix competition has made recommender systems a major topic in data mining. In this course we will learn about different aspects of recommender systems with particular emphasis on its algorithms.

Pre-requisites	
Pre-requisite (Mandatory)	Pre-requisite (Desirable)
MTH100 Maths I	MTH100 Maths I

*Please insert more rows if required

Post Conditions			
CO1	CO2	CO3	CO4
Students will be able to demonstrate an understanding of concepts of recommender systems.	Students will be able to implement both primitive (neighbourhood models) and state-of-the-art (latent factor models) algorithms for recommender systems.	Students will be able to implement advanced projects in this area.	

Weekly Lecture Plan			
Week Number	Lecture Topic	COs Met	Assignment/Labs/Tutorial
Week 1	What is a recommender system? Applications and Motivations	CO1	Reading assignment#1
Week 2 and 3	Explicit vs Implicit Ratings – advantages and disadvantages	CO1, CO2	Reading assignment#2
Week 4	Bias Prediction – predicting user and item biases (statistical and optimization based methods)	CO1, CO2	Quiz#1: Implementing bias prediction in class
Week 5 to 7	Rating Prediction – local / neighbourhood models (Including review of some machine learning concepts – clustering, regression, classification)	CO1, CO2	Assignment#1: Implement neighbourhood based models
Week 8 to 10	Rating Prediction – latent factor models / global models (modeling the problem as a matrix completion, theoretical guarantees, algorithms and performances) Rating Prediction – latent factor models / global models (modeling the problem as a matrix completion, theoretical guarantees, algorithms and performances)	CO1, CO2, CO3	Assignment#2: Implement latent factor models
Week 11 and 12	Hybrid models	CO1, CO2, CO3	Assignment#3: Implement hybrid model from papers

Week 13	Student Presentations	CO2, CO3	Quiz#3: Based on paper presentation
Weekly Lab Plan- Not required explicitly			
Week Number	Laboratory Exercise	COs Met	Platform (Hardware/Software)

*Please insert more rows if required

Assessment Plan	
Type of Evaluation	% Contribution in Grade
Quiz	10
Assignment	30
Mid-sem	10
End-sem	10
Project	40
Resource Material	
Type	Title
Textbook	
Reference	Recommender Systems Handbook, Ricci, F., Rokach, L., Shapira, B., Kantor, P.B. (Eds.), Springer,
Reference	Sparse and Redundant Representation: From Theory to Practice, Michael Elad, Springer