|  |  |
| --- | --- |
| MONO | **DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING****NATIONAL INSTITUTE OF TECHNOLOGY PATNA** Ashok Raj Path, PATNA 800 005 (Bihar), India |
|  Phone.: 0612 – 2372715, 2370419, 2370843, 2371929, 2371930, 2371715 Fax – 0612- 2670631 Website: [www.nitp.ac.in](http://www.nitp.ac.in/) |

**CSX452 *Recommendation Systems***

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

**Pre-requisites:** Fundamental knowledge of algorithms and AI

**Objectives/Overview:**

* Explaining the importance and working of the recommendation system.
* The course focuses on the applicability of the recommendation system in various areas like books, research papers, tourist places, television programs etc.
* The course explains major techniques of recommendation system like content based filtering, collaborative filtering, knowledge-Based recommender systems, demographic recommender systems, hybrid and ensemble-based recommender systems, evaluation of recommender systems, etc.

**Course Outcomes:**

At the end of the course, a student should:

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Outcome** | **Mapping to POs** |
| 1. | To learn the goal and applicability of recommendation system in various fields. | PO4, PO5 |
| 2.  | To acquire knowledge of basics of content based recommendation system. | PO2, PO3 |
| 3. | To learn various types of memory based collaborative recommendation techniques. | PO2, PO3 |
| 4. | To gain knowledge of model based collaborative filtering techniques used in recommendation system. | PO2, PO3 |
| 5. | To develop skills of ensemble and hybrid recommendation systems. | PO2, PO3 |
| 6. | Understanding of the evaluation of the recommendation system. | PO2, PO3 |

**UNIT I: Lecture: 1**

Recommender Systems Function, Recommendation Techniques, Recommender Systems

as a Multi-Desciplinary Field,Challenges.

**UNIT II: Lecture: 12**

Basic Components of Content-Based Systems, Preprocessing and Feature Extraction,

Learning User Profiles and Filtering, Nearest Neighbor Classification.

**UNIT III: Lecture: 12**

User-Based collaborative filtering, Similarity Function Variants, Variants of the Prediction

Function, Item-Based Collaborative filtering, Comparing User-Based and Item-Based

Methods, Strengths and Weaknesses of Neighborhood-Based Methods.

**UNIT IV: Lecture: 8**

Rule-Based Collaborative Filtering, Association Rules, Naive Bayes Collaborative

Filtering, Neural Network, Singular Value Decomposition, Stochastic Gradient Descent,

Regularization.

**UNIT V: Lecture: 5**

Weighted Hybrids, Switching Hybrids, Cascade Hybrids, Feature Augmentation Hybrids,

Meta-Level Hybrids, Feature Combination Hybrids.

**UNIT VI: Lecture: 5**

General Goals of Evaluation Design: Accuracy, Coverage, Confidence and Trust, Novelty,

Serendipity, Diversity, Scalability, Segmenting the Ratings for Training and Testing,

Accuracy Metrics in Offline Evaluation.

**Text/Reference Books**

1. *Recommender Systems: The Textbook.* Charu C. Aggarwal, Springer.
2. *Recommender Systems Handbook.* Francesco Ricci, Lior Rokach, Bracha Shapira, Paul B. Kantor, Springer.