Assumption University
Vincent Mary School of Engineering, Science and Technology
Department of Computer Science
Course Outline

CSX4207/ITX4207: Decision Support and Recommender Systems
ITX4287: Selected Topic in Decision Support and Recommender Systems
Semester 1/2024

Course status: Major Elective Course 3 credits
Pre-requisite: CSX 3001 Fundamentals of Computer Programming and
ITX 2007 Data Science

Class Meeting: Sec 541 Mon. 13:30 – 16:30, Room VMS0404
Sec 542 Tue. 9:00 – 12:00, Room VMS0404

Instructor: Asst. Prof. Dr. Rachsuda Setthawong
Office: VMES0306
E-mail: rachsudajmt@au.edu
Office Hours: Mon. 9:00 – 12:00 and Tue. 13:00 – 16:00

Textbook:
- Recommender Systems: An Introduction, Dietmar Jannach, Markus Zanke, Alexander Felfernig and Gerhard Friedrich, Cambridge, 2011

References:
1. Recommender Systems: The Textbook 1st ed., Charu C. Aggarwal, Springer, 2016
2. Hands-On Recommendation Systems with Python, Rounak Banik, Packt, 2018
3. Practical Recommender Systems, Kim Falk, Manning Publications, 2019
4. https://www.kaggle.com/

Course Description:
In the past decade, Recommender Systems (RSs) have become one of the most powerful and popular tools in electronic commerce and social networking. The course introduces students essential concepts required to implement their own Recommender Systems. In particular, it covers the most popular and fundamental techniques for building RSs, such as collaborative based, content-based, knowledge-based and hybrid recommendation approaches. It also includes techniques and approaches used to evaluate the quality of the recommendations, guidelines on matching recommendation technologies and domains, and recent developments and applications of RSs. Emphasis is given on class discussions on recent RSs works and/or technologies as well as project work that students in the class will form a team to develop RS algorithms and/or applications in the course project.

Course Objectives
The main objective of this course is to let students be able to
- understand fundamental concepts, techniques and algorithms used for building Recommender Systems (RSs)
- evaluate quality of RSs

- explore recent developments on RSs
- select appropriate approaches to match RSs applications developed

Moreover, they will be able to have hand-on experience in developing Recommender Systems.

Mark Allocation:

Assignments and Class Discussion	10 %
Mini Projects (2 × 20%)	40 %
Midterm Examination	20 %
Final Examination	30 %
TOTAL	**100 %**

The grades would be officially posted by the Registration Office. All assignments will be returned to students in a timely manner with comments and score.

Other Requirement: 80% attendance is required. If students attend the class less than 80%, students will not be allowed to take Final Exam.

Remark: Regarding **Thailand's Personal Data Protection Act BE 2562 (PDPA)** that it will come into full effect on 1 June 2021, it should be addressed clearly that the students' scores and attendance records will be announced as a whole only in the MS Teams for the purpose of classes' operation and management only. Such information must not be duplicated or re-distributed to other since it will violate the PDPA Act.

Assessment Appeal's Policy: Assessment Appeal's Policy: For any assignments/projects and/or examination(s) (EXCLUDING final examination), the lecturer will announce scores and/or discuss with students about solutions approximately within 1-3 weeks after the submission deadline and/or finishing grading. Students may request the lecturer for an assessment appeal, if any, within 1 week or as specified the appeal's deadline by the lecturer. Otherwise, the grading will be finalized.
Remark: for the assessment appeal's policy of final examination, contact registrar office.

Lecture Schedule:

Weeks	Topics	Chapter
1	– Course Overview	
2	– Introduction to Decision Support Systems (DSS) – Introduction to Recommender Systems (RS) – Non-personalized RSs vs Personalized RSs – Assignment of Articles' Reading	1
3	– Basic Concepts o Weak Points of Non-Personalized RS o Preferences and Ratings o Predictions and Recommendations o Scoring and Ranking o Basic Similarity Measures – *Articles' Presentation and Discussion - 1*	1
4	– User Profiles and Content-based RSs (Part I)	3

	○ User Profiles and User Profiling ○ Term Frequency and Invert Document Frequency (TF-IDF) ○ How to Generate Recommendation Using Content Based Approach – Assignment of Articles' Reading	
5	– User Profiles and Content-based RSs (Part I) – *Cont.* ○ A Technique for User Preference Profiling based on user behaviors on Facebook page categories ○ Pros and Cons of Content-based RSs ○ Vector Space Model and Recommending Items Using Nearest Neighbors ○ Case Study ○ Available Tools – *Articles' Presentation and Discussion - 2*	
6	– Content-based RSs (Part II) and Evaluation Measures ○ Text Classification Methods ○ Additional Algorithms: Decision Tree ○ Limitations of Content-based Recommendation Methods ○ Evaluation Measures – **Mini Project 1's Announcement**	3
7	– Collaborative RSs ○ Collaborative Recommendation ○ User-based Nearest Neighbor (NN) Recommendation ○ Measures to Determine Proximity between Users ○ Neighborhood Selection ○ Item-based Nearest Neighbor (NN) Recommendation ○ Pros and Cons of CF Based Approach – Problems with CF Based Approach	2
8	– Model-based collaborative based filtering algorithms: ○ Association Rule Mining ○ Probabilistic Recommendation Approaches ○ Slope One Predictor ○ Matrix Factorization Methods – **Mini Project 2's Announcement**	2
Midterm Examination (Aug. 7, 2024. 12:00 – 14:00)		

Weeks	Topics	Chapters
9	– Knowledge Based RSs – Part I o Main Idea and Definition of Knowledge Based Filtering o Motivation and Main Advantages of Knowledge-based RS o A Constraint Satisfaction Problem (CSP) o Using Defaults – Knowledge-based Recommendation Algorithm: Constraint Based – Assignment of Articles' Reading	4
10 (Aug. 26, 27)	– **Mini Project 1's Presentation**	
11	– Knowledge Based RSs – Part II o Conjoint Analysis o Knowledge-based recommendation Algorithm: Critiquing – Pros and Cons of Knowledge based RS – *Articles' Presentation and Discussion - 3*	4
12	– Hybrid Recommender Systems – Types of Hybrid Recommender Systems	5
13	– Evaluating Recommender Systems – Assignment of Articles' Reading	
14	– Review – *Articles' Presentation and Discussion - 4*	
15 (Sep. 23, 24)	– **Mini Project 2's Presentation**	
Final examination (Oct. 11, 2024. 13:00 – 16:00)		

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