KSE 643: Knowledge Engineering and Intelligent Decision Making

Instructor:	Dr. Mun Y. Yi Graduate School of Knowledge Service Engineering Department of Industrial & Systems Engineering
Voice:	042-350-1613
E-Mail:	munyi(at)kaist.ac.kr
Office:	E2-1, Room 1204
Office Hours:	10:30 a.m. – 12:00 p.m. Tue. & Thu. (By appointment via email)
Class Hours:	2:30 p.m. – 4:00 p.m. Tue. & Thu.
Class Room:	E2, B105
Homepage:	http://kirc.kaist.ac.kr/kse643

Course Overview & Objectives

Overview

Knowledge constitutes an integral part of intelligent decision making. People make various decisions about what to do based on what they know. Knowledge engineering plays a pivotal role in integrating knowledge into computer systems in support of intelligent decision making. In particular, this course covers the fundamental concepts, methods, techniques, and tools related to building recommender systems, which is a popular and widespread information filtering system used to improve human decision-making.

Course Objectives

Learning objectives for this course include:
1. To understand the fundamental concepts of knowledge engineering.
2. To learn various methods, techniques, and tools related to building recommender systems
3. To develop essential skills necessary for the design of intelligent decision making systems (e.g., recommender systems, knowledge-based systems).
4. To be aware of key issues surrounding knowledge engineering and recommender systems.

Course Materials

Recommender Systems: An Introduction, written by Jannach et al., published by Cambridge 2011, ISBN 978-0521493369

Supplementary articles and readings will be handed out in the classroom.

Class Schedule

Week 1 (Feb. 26, 28):
Introduction to Class
Introduction to Knowledge Engineering

Week 2 (Mar. 5, 7):
Knowledge-based Systems

Week 3 (Mar. 12, 14):
Overview of Recommender Systems (Ch. 1)

Week 4 (Mar. 19, 21):
Collaborative Recommendation (Ch. 2)

Week 5 (Mar. 26, Mar. 28):
Collaborative Recommendation (Ch. 2)

Week 6 (Apr. 2, 4):
Content-based Recommendation (Ch. 3)

Week 7 (Apr. 9, 11):
Content-based Recommendation (Ch. 3)

Week 8:
Mid-term Exam (Apr. 18)

Week 9 (Apr. 23, Apr. 25):
Mid-term Exam Review
Knowledge-based Recommendation (Ch. 4)

Week 10 (Apr. 30, May 2):
Knowledge-based Recommendation (Ch. 4)
Team Project Proposal

Week 11 (May 7, 9):
Classes off due to conference participation – Makeup classes will be provided
Hybrid Recommendation (Ch. 5)

Week 12 (May 14, 16):
Evaluating Recommender Systems (Ch. 7)

Week 13 (May 21, May 23):
Deep-learning based Recommendation

Week 14 (May 28, 30):
Deep-learning based Recommendation

Week 15 (Jun. 4, 6):
Student Presentations
Class off - National holiday (Jun. 6)

Week 16:
Final Exam (Jun. 13)

This schedule is tentative. It provides a general plan for the course; deviations may be necessary depending on the class progress.

Grading

Your final grade will be calculated as follows:

Graded Students Activities	Weights
Mid-term Exam	25 %
Final Exam	25%
Team Projects	30%
Individual Assignments	15%
Class Participation	5%

Letter grades will not be assigned to individual components of the class requirements. Only points (numerical scores) will be assigned. These numerical scores will be added at the end of the course, and the letter grades will be assigned based on the accumulated scores and the class distribution.

Course Policies

Exams

There will be two exams: mid-term exam and final exam. Each exam will take account of 25% of the total grade. *Absence from an exam will result in a grade of zero unless the exam is missed due to a verifiable illness or family emergency on the exam day and permission from the instructor has been obtained prior to the exam*.

Team Projects

A team project can take one of three different routes: (1) development of a recommender system, (2) write-up of a research paper submittable to a conference, or (3) a combination of the two – that is, develop a recommender system and write a paper together. A team project will need to be proposed and presented on the scheduled class dates. For any of the choices, students are required to work together in a team. A team normally consists of two members. A third member will be added only under special circumstances. Team members in the same team will receive equal points unless there is a series issue regarding the participation of the team members and the issue has been brought to my attention. Students should contact me if the grade distribution among the team members needs to be adjusted.

Individual Assignments

Most of the individual assignments will be done between class meetings as homeworks; however, some assignments may be completed in class (class exercises). When students take on a task, they should be sure to complete it on time. There will be no make-up for missed assignments.

Please note that the assignments except for the team project assignments are all individual assignments, meaning that all your printouts and other outcomes submitted for these assignments **must be entirely based on your own work. Students may not share any ideas or materials for these individual assignments.** Any student who violates this rule or who knowingly assists another to violate this rule shall be subject to academic discipline.

Class Participation

Students are expected to study the assigned course readings for a given day before coming to class and actively participate in the class activities. During class, students may be asked to solve problems related to the assigned readings or called upon to discuss issues covered in the assigned readings. The quality of solving problems, answering questions, and discussing readings will significantly determine class participation credit. In addition, criteria for the credit include attendance, punctuality, and attitude toward learning. Tardiness disrupts the flow of class activities and often leads to having to repeat announcements or instructions. Entering and leaving the room during class similarly distracts both students and instructor and conveys a disregard for the material being discussed. Those students who are not paying attention to the class material may be asked to leave the classroom. During class, I encourage you to engage in critical thinking, to challenge ideas without showing disrespect for others' ideas. Please use judgment when raising issues in class - do not waste the class's time on a personal matter - instead see the instructor one-on-one. Effective participation has much more to do with the quality than with the quantity of your interaction. In other words, those who attempt to dominate air time for its own sake without contributing to the advancement of the discussion will not be rewarded for it. Those students who severely interrupt with or disrupt normal course activity will be awarded no participation points. Please note that you are required to turn off your mobile phone or put it in manner mode before the class starts.

Attendance will be taken regularly. The instructor can take attendance by calling out student names or by requesting students to sign the attendance sheet. It is the student's responsibility to respond to the roll call or sign the attendance sheet. STUDENTS WHO ARE NOT IN THE CLASSROOM FOR THE ENTIRE CLASS PERIOD WILL BE MARKED ABSENT. After three unexcused absences, each absence will be penalized with 1 class participation point. **If you miss 20 percent (7 classes in total) or more of the scheduled class sessions, a penalty of one letter grade for each additional absence will be exacted.** If you anticipate excessive absences, you must submit a written request and receive prior approval from the instructor before the last day to change the schedule.

Lecture Notes

Class slides will be prepared for each topic and will become available from the class homepage before the topic is covered. A hard copy of the slides will be also distributed at the beginning of class on the day when the topic is introduced so that it can be used as a lecture note. The slides are not meant to replace the textbook. They are created to highlight major points for class discussions. You will still need to study the assigned text and additional materials even if they are not highlighted by the slides.

Electronic Devices

The use of a cellular phone, tablet, notebook, and similar other electronic devices is strictly prohibited during class. Use of these devices for any reason during a test or exercise is grounds for an automatic grade of zero and potentially academic discipline. Please make a habit of turning off any ringer or alarm device before the class starts.

Academic Misconduct

It is the responsibility of every student at KAIST to adhere steadfastly to truthfulness and to avoid dishonesty, fraud, or deceit of any type in connection with any academic program. The following examples illustrate conduct that violates academic integrity, but the list is not intended to be an exhaustive compilation of academic misconduct behaviors.

1. Giving or receiving unauthorized assistance, or attempting to give or receive such assistance, in connection with the performance of any academic work.
2. Unauthorized use of materials or information of any type or the unauthorized use of any electronic or mechanical device in connection with the completion of any academic work.
3. Access to the contents of any test or examination or the purchase, sale, or theft of any test or examination prior to its administration.
4. Use of another person's work or ideas without proper acknowledgment of source.
5. Intentional misrepresentation by word or action of any situation of fact, or intentional omission of material fact, so as to mislead any person in connection with any academic work (including, without limitation, the scheduling, completion, performance, or submission of any such work).
6. Offering or giving any favor or thing of value for the purpose of influencing improperly a grade or other evaluation of a student in an academic program.
7. Conduct intended to interfere with an instructor's ability to evaluate accurately a student's competency or performance in an academic program.

Whenever a student is uncertain as to whether the conduct would violate academic responsibility rules, the student should seek clarification from the instructor prior to engaging in such conduct. Any academic misconduct will be treated consistent with the KAIST policies.

Team Sign-up Form

As specified in the syllabus, students are required to work together to complete the team project assignments. A team normally consists of two members. A third member will be added only under special circumstances. Each team must submit this sign-up form by March. 12, 2019 (Tue). Only one copy per team needs to be submitted. Note that it is not allowed to change the team membership until all the assignments are completed, once the team is formed.

Team Name: _____

Student Name	Email Address	Phone Number	Signature