Extended Syllabus
(2024 Fall Semester)

Course Title	Introduction to Recommender Systems	Course Number	CSE4200
Credit	3.0	Enrollment Eligibility	Junior (3rd-year) and Senior (4th-year)
Meeting Times	Wednesday and Friday (09:00 ~ 10:15)	Classroom	TBD

Instructor: Prof. Euhyun Moon	Homepage: https://gordonmoon.github.io
Email: ehmoon@sogang.ac.kr	Telephone: 02-705-8487
Office: AS 813 Office Hours: Tu Th 11:00 ~ 13:00 or by appointment TA: TBD TA Office Hours: TBD	

I. Course Overview

1. Description
Recommender systems enable users to make efficient decisions by providing them with personalized and useful information. This course is designed for students who have taken foundational courses in machine learning. This course provides basic concepts of how to build ML-based recommender systems. In this course, student will learn how to efficiently analyze and process text, graph, numerical, and categorical data that can be used as input for recommender systems. This course covers various types of models, ranging from basic models such as content-based and collaborative filtering to state-of-the-art neural network-based models such as graph neural networks.
2. Prerequisites
As the programming assignments in this course will be implemented in Python language, students are required to possess proficiency in programming using Python. If you have any questions about the prerequisites for this course, don't hesitate to reach out to the instructor.
3. Course Format (%)

Lecture	Discussion	Experiment/Practicum	Field study	Presentations	Other
100 %	%	%	%	%	%

4. Evaluation (%)

Mid term exam	Final exam	Quizzes	Presentations	Projects	Assignments	Participation	Other
30 %	25 %	%	%	25 %	20 %	%	%

II. Course Objectives

Upon course completion, students can be expected to:

- Be able to competent with principles of how machine learning models operate to build AI-based recommender systems
- Be able to design and improve the quality of recommender systems using large-scale data for real-world applications

III. Course Format

In each week, we will hold two classes: Wednesday and Friday from 9:00am to 10:15am

IV. Course Requirements and Grading Criteria

The final course grade will be based on a composite score computed according to the following breakdown:

Midterm exam	30%
Final exam	25%
Term project	25%
Programming assignments	20%

Both midterm and final exams are in-class exam covering all course content to date.

V. Course Policies

General policies:

- Following instructions are graded part of all assignments
- All exams are closed book, closed notes

Lectures and Attendance:

- Attendance is required for all students.
- Please get to know your classmates. Should you miss a lecture, it is your responsibility to review that material with someone who is willing to share their notes with you and then bring follow-up questions to office hours. It is your responsibility to ensure you have all course materials.

Exams:

- The midterm and final exams will be held during the time slot scheduled by the university, thus there should be no scheduling conflicts. The exams may not be taken early and may not be made up.
- Exams are due at the end of the examination period as announced by the instructor. Continuing to work on your exam after the examination period has ended may result in your work being considered late and a reduction in your score, up to and including receiving a score of 0 for the exam.
- In the event of an unavoidable unanticipated absence from an exam, the student should notify the instructor as soon as possible.

Electronic Media:

- Students are responsible for being aware of any announcements made via Cyber Campus or email.
- When communicating with your instructor via email, please be sure to include your name and course name.

Programming Assignments:

- Assignments will be assigned via posting to the Cyber Campus (https://cyber.sogang.ac.kr) in the "Assignments" section.
- All assignments must be submitted/uploaded to the Cyber Campus in the "Assignments" section.
- All assignments are individual exercises. The work submitted by a student is expected to be that student own original work.
- Copying the source code of another student is not allowed. Such a violation may result in academic penalties. For the first occurrence, you will receive a zero and reduction in one letter grade (e.g., A→B, B→C). For the second occurrence, you will receive an "F" in this course.
- It is expected that students are either proficient in Python or have sufficient programming background and experience to become proficient through self-study.
- Office hours are not for general program development. Office hours should be used for specific design questions or specific issues related to the class.

- Programming assignments will be accepted past the due date and time according to the following penalty:

24 hours late	-20%

- No late homework will be accepted after 24 hours from the due date, please plan accordingly.

Academic Integrity:

- It is expected in this course that students are familiar with the academic integrity guidelines of Sogang University as defined by the Office of Academic Administration.
- It is expected that students will only turn in work that is their own, or the work of team to which they have been assigned for a given specific assignment.
- It is expected that students will neither seek nor receive any form of aid, other than from the instructor or proctor, during any exam or quiz.
- In the event that there occurs reasonable doubt about the integrity of any student's work, then that student and said work will be referred to the Committee on Academic Misconduct for adjudication.

VI. Materials and References

Lecture slides will be posted to Cyber Campus (https://cyber.sogang.ac.kr), but are not intended to replace the textbook nor the lectures themselves. Please use the slides as a medium to organize your course notes and as study aids.

Textbook:
Charu C. Aggarwal, Recommender Systems: The Textbook, Springer
William L. Hamilton, Graph Representation Learning Book, Morgan and Claypool
Jure Leskovec, Mining of Massive Datasets, Cambridge University Press

VII. Course Schedule

Week 1	**Learning Objectives**	Introduction to Recommender Systems
	Topics	Overview of recommender systems
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	

Week 2	**Learning Objectives**	Evaluation Metrics
	Topics	Understanding of evaluation methods for recommender systems
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	
Week 3	**Learning Objectives**	Memory-based Recommender Systems (1)
	Topics	User-based & Item-based neighborhood models, clustering and neighborhood-based models
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	
Week 4	**Learning Objectives**	Memory-based Recommender Systems (2)
	Topics	Regression modeling view of neighborhood methods, dimensionality reduction methods, graph-based methods
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	
Week 5	**Learning Objectives**	Model-based Recommender Systems (1)
	Topics	Latent factor models
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	

Week 6	**Learning Objectives**	Model-based Recommender Systems (2)
	Topics	Latent factor models
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	
Week 7	**Learning Objectives**	Neural Network-based Recommender Systems
	Topics	MLP, Neural Matrix Factorization, GNN, Neural Graph Collaborative Filtering
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	
Week 8	**Learning Objectives**	Midterm Exam
	Topics	
	Class Work (Methods)	
	Materials (Required Readings)	
	Assignments	
Week 9	**Learning Objectives**	Click-Through Rate Prediction (1)
	Topics	Click-through rate predication, factorization machines, field-aware factorization machines
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	

Week 10	**Learning Objectives**	Click-Through Rate Prediction (2)
	Topics	Attention mechanism, self-attention mechanism
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	
Week 11	**Learning Objectives**	Sequential Recommender Systems (1)
	Topics	Sequential Recommender Systems
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	
Week 12	**Learning Objectives**	Sequential Recommender Systems (2)
	Topics	Sequential Recommender Systems
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	
Week 13	**Learning Objectives**	Content-based Recommender Systems
	Topics	Content-based Recommender Systems
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides
	Assignments	

Week 14	**Learning Objectives**	Advanced Topics in Recommender Systems
	Topics	Advanced Topics in Recommender Systems
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	
Week 15	**Learning Objectives**	Review and makeup class
	Topics	
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Lecture slides and textbook
	Assignments	
Week 16	**Learning Objectives**	Final Exam
	Topics	
	Class Work (Methods)	
	Materials (Required Readings)	
	Assignments	

VIII. Special Accommodations

IX. Aid for the Challenged Students

If you have a disability that may affect your success in this course and wish to discuss academic accommodations, please arrange a meeting with the instructor on the first day of class.