

(Syllabus)

[1] (Basic Information)					
<u>(Course Information)</u>					
/	2023 / 2		(Campus)		(Seoul Campus)
(Year/Semester)					
(Course No.)	55911	(Class No.)	01	(Credit)	3
(Course Title)	(GRAPH NEURAL NETWORKS)	/	(Time/Room)	000 000000 10,11,12(000 000 000000 TUE10,11,12)	
(Course Classification)	(elective major course)	(Lecture Type)		(Lone-teaching course)	
(Course Type)	(Theoretical course)	(Medium of Instruction)		A(ENGLISH A)	
(Accreditation)		(Accreditation of Engineering Education)			
(College)	(Graduate School)	()		AI (Department of Artificial Intelligence)	
(Department)					
e-class (Usage of e-class)	Yes				
<u>(Instructor Information)</u>					
(Name)	(KIM YOUNGBIN)	(Department)		(Department of Imaging Science and Arts)	
(Office Phone No.)	02-820-5937	(Contact No.)		02-820-5937	
E-mail (E-mail)	ybkim85@cau.ac.kr	(Department Phone No.)		02-820-5408	
가 (Office Hour)		(Office Location)		305 305	
(Course Web-site)					

[2] / (Learning Objectives/Outcomes)	
<u>(Course Description)</u>	
Complex data can be represented as a graph of relationships between objects. Machine learning on graphs is an important and ubiquitous task with applications ranging from drug design to friendship recommendation in social networks. This course focuses on the computational, algorithmic, and modeling challenges specific to the analysis of massive graphs.	
<u>(Prerequisites and Co-requisites)</u>	
basic probability / linear algebra	
<u>(Learning Objectives)</u>	
This course will provide an introduction to graph representation learning, including matrix factorization-based methods, random-walk based algorithms, and graph neural networks. During the course, we will study both the theoretical motivations and practical applications of these methods.	
<u>(Learning Outcomes)</u>	
representation learning and Graph Neural Networks; algorithms for the World Wide Web; reasoning over Knowledge Graphs; influence maximization; disease outbreak detection, social network analysis.	
[3] (Course Methods)	
<u>(Teaching and Learning Methods)</u>	
(Teaching and Learning Methods)	가 (Additional Description)
- (Final Exam)	
- (Mid-term Exam)	
<u>(Assignments)</u>	

<u>(Textbooks, Reading, and other Materials)</u>					
(Textbook/Reference)	(Title)	(Author)	/ (Year of Publication/etc)	/ (Publisher/Name of Journal)	/ (No. of Edition)
(Main Textbook)	Graph Representation Learning	William L. Hamilton			
[4] 가 (Student Assessment)					
가 (Assessment Item)	가 (%) (Assessment Ratio)	가 (Additional Description)			
(Attendance)	10				
/ (Participation/Attitude)	10				
(Final Exam)	40				

가 (Assessment Item)		가 (%) (Assessment Ratio)	가 (Additional Description)	
(Mid-term Exam)		40		
[5] (Course Schedule)				
(We ek)	(Instructor)	(Topic & Content)	(Student Assignment)	가 (Additional Description & Instructor Assignment)
1		Introduction		
2		Machine Learning for Graphs		
3		Node Embeddings		
4		Link Analysis		
5		Label Propagation for Node Classification		
6		Graph Neural Networks 1		
7		Graph Neural Networks 2		
8		Midterm Exam		
9		Applications of Graph Neural Networks		
10		Theory of Graph Neural Networks		
11		Frequent Subgraph Mining with GNNs		
12		Generative Models for Graphs		
13		Scaling Up GNNs		
14		GNNs for Science		
15		Industrial Applications of GNNs		
16		Final Exam		
[6] (Guide to Learning)				
Students are expected to actively engage with the material and participate in class discussions. This course requires a good understanding of basic graph theory and neural networks. It is advised to review these topics prior to the start of the course.				
(Previous Exam Samples)				
< 가 >(<Download Additional Sample>)				

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(In pursuant to the Article 71 'Discipline "of the Chung-Ang University Regulations, and Article 47 'Punishment for Cheating during Examination "under Chapter 6 of the Academic Affairs Management Rules, any student caught engaging in academic misconduct during an exam will be subject to disciplinary action.)

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3. / : 가 , , 가
4. : 02-820-6577~9(), 031-670-4816()
(cauable)

In this class, students with disabilities are eligible for reasonable accommodations depending on the type and severity of disability. If you wish to receive accommodations listed below, please contact the Support Center for Students with Disabilities.

1. Visual Impairment: Braille, large print, electronic class materials, volunteer note-taker, adjustments in assessment practices, etc.
2. Hearing Impairment: Volunteer note-taker, stenographer, adjustments in assessment practices, etc.
3. Physical Disabilities/Brain Lesions: Classrooms with wheelchair access, volunteer note-taker, adjustments in assessment practices, etc.
4. Accommodations for students with other psychiatric disabilities or health impairments can be arranged through the Support Center for Students with Disabilities after consultation.
Inquiry: 02-820-6577~9 (Seoul Campus), 031-670-4816 (Anseong Campus)
- KakaoTalk Plus Friend ID: @cauable