

# GR25624 Advanced Machine Learning/Deep Learning

Fall 2025

Department of Intelligent Information Convergence  
Chonnam National University

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<b>Course Info</b>	GR25624 Advanced Machine Learning/Deep Learning Graduate-level major elective
<b>Instructor</b>	<a href="#">Hyung-Il Kim</a> [Email: <a href="mailto:hyungil.kim@jnu.ac.kr">hyungil.kim@jnu.ac.kr</a> ] from the School of ECE Engineering Building #6-717 (ext. 1762)
<b>Class Meetings</b>	Tuesday 19:30-22:30 Engineering Building #6-106
<b>Office Hours</b>	<a href="#">Google calendar appointment slots</a>
<b>Class Objectives</b>	This course aims to review the fundamental theories of machine learning and deep learning, and to analyze recent advancements such as generative AI and multimodal learning based on research papers.
<b>Prerequisites</b>	Familiarity with basic concepts in machine learning, deep learning, and linear algebra will be helpful, though not mandatory.
<b>Textbook</b>	Lecture notes prepared by the instructor and recent papers published in venues such as NeurIPS, CVPR, ECCV, ICCV, ICML, ICLR, ACL, etc.
<b>Topics</b>	Core and advanced ML/DL concepts, generative models, multimodal learning, AI applications, and ethics.
<b>Evaluation</b>	Homework (40%), Final Presentation (40%), Exam (20%) The specific evaluation criteria and percentages are subject to change.
<b>Lecture</b>	This course consists of the instructor's introduction to fundamental techniques and seminal papers in deep learning and machine learning, combined with student-led presentations of recent research articles.

**Homework** Presentation on the listed papers and recent technologies  
(20 min for presentation, 10 min for Q&A)

**Reading List** [Paper reading list for presentations](#)

**Final Presentation** Students will individually present a problem from their research or area of interest and propose a solution using machine learning and deep learning techniques learned during the semester

**Schedule** The following course schedule is subject to change depending on the progress of course.

Week	Contents	Homework
1	Course Introduction & Overview of ML/DL	
2	Review of Core Machine Learning Concepts	
3	Foundations of Deep Learning	
4	Convolutional Neural Networks (CNNs)	
5	Sequence Modeling & Transformers	
6	Overview of Generative AI	
7	Generative Models (GANs, VAEs)	
8	Midterm exam	
9	Large Language Models (LLMs)	
10	Multimodal Learning: Vision, Audio, Text	
11	Foundations of Multimodal Models	
12	AI in Physical World (Robotics, Embodied AI)	
13	Ethics, Fairness, and AI Safety	
14	Final presentation	
15	Final exam	