

# Course Overview

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# Introduction of the lecture

**Course Info:** GCT.79900 프로젝트기획 특강 <Natural Language Processing>

Instructor: KyungTae Lim (임경태) <ktlim@kaist.ac.kr>

Teaching Assistant:

- Eden (Yideun) Park (박이든) <edenpakk@kaist.ac.kr>
- 이광빈 <klee166@kaist.ac.kr>

Place/Time: N5 #2332 MW 13:00 PM - 14:30

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# Introduction of the lecture

## Description

Natural language processing (NLP) is the source technology of artificial intelligence, and it is the study of artificial intelligence understanding human language, and researching related services. In this lecture, theories and practices on the basic concepts of natural language processing and core algorithms of natural language processing are conducted.

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# Introduction of the lecture

## Format

How can human language be represented computationally?



Through this course, students will learn how to computationally model human language and apply this knowledge to create innovative NLP applications.

The course will primarily cover foundational concepts of modern natural language processing, such as Word Representation, Deep Learning Architectures for Language Processing, and Generative Language Models (e.g., GPT, LLaMA).

Additionally, the course will culminate in a team project where students design their own Generative AI service and document it in an academic paper.






























# Course Materials

- Course Material: <https://github.com/jujbob/CT-NLP>

CS224N: Natural Language Processing with Deep Learning  
Stanford / Winter 2023

**Note:** In the 2023-24 academic year, CS224N will be taught in both Winter and Spring 2024. We hope to see you in class!

Natural language processing (NLP) is a crucial part of artificial intelligence (AI), modeling how people share information. In recent years, deep learning approaches have obtained very high performance on many NLP tasks. In this course, students gain a thorough introduction to cutting-edge neural networks for NLP.

Instructors	Teaching Assistants				
 Chris Manning	 Abhinav Garg	 Ansh Khurana	 Anuj Nagpal	 Candice Penelton	 Cathy Yang
 John Hewitt Head TA	 Christopher Cross	 David Huang	 Drew Kaul	 Elaine Sui	 Eric Frankel
<b>Course Manager</b>  Amelie Byun	 Gabriel Poesia	 Hans Hanley	 Heidi Zhang	 Hong Liu	 Irena Gao
<b>Course Coordinator</b>  John Cho	 Isabel Papadimitriou	 Jesse Mu	 Lisa Li	 Manasi Sharma	 Rishi Desai
	 Sauren Khosla	 Shai Limonchik	 Siyun Li	 Swastika Dutta	 Tathagat Verma



수디르산 라베찬디란 지음  
전희원, 장승환, 김형준 옮김

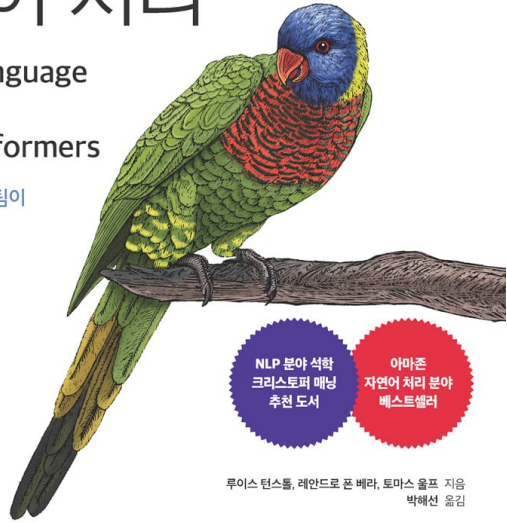
Packt2 한빛미디어

O'REILLY®

## 트랜스포머를 활용한 자연어 처리

Natural Language  
Processing  
with Transformers

허깅페이스 🦜 개발팀이  
알려주는 자연어  
애플리케이션 구축



루이스 텐소들, 레안드로 폰 베라, 토마스 옐프 지음  
박해선 옮김

# Lecture Contents

- We need to adjust lecture contents right now!
  - <https://forms.gle/rnzR7vFCbDzUHLGV6>

## Lecture Schedule

01. Introduction of NLP
02. Text Encoding
03. Word Representation
04. Automatic Writing Evaluation on Linear Regression
05. Recurrent Neural Network for NLP
06. Language Model /codes
07. Chatbot on Sequence to Sequence
08. Transformer-Encoder
09. Transformer-Decoder
10. Pretrained Language Models and BERT
11. Applying BERT
12. GPT
13. Instruction Tuning and Low-Rank Adaptation
14. Midterm
15. Vision-Language Models and its Research Works
16. A poster session of Final Project

01. Course Overview and Pytorch
02. Text Encoding
03. Word Representation
04. Recurrent Neural Network
05. Language Modeling
06. Transformer-Encoder
07. Transformer-Decoder
08. (Encoder) BERT, [ELECTRA]
09. (Encoder) Applying BERT, [SentenceBERT]
10. (Decoder) GPT and Decoding methods [Llama]
11. (Encoder-Decoder) Summarization with and BART [T5]
12. Midterm
13. Instruction Tuning with LoRA [Pef, LIMA]
14. Visual Question Answering [GQA, CLIP]
15. Paper submission due



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# Introduction of the lecture

## Evaluation Criteria

\* The following evaluation criteria may change:

Attendance 10% (2 pt. off for each absence. 2 tardiness equals to 1 absence)

Homework 20%

Midterm 35% (This part is likely to change.)

Project & Essay 35%

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# Introduction of the lecture

## Project & Essay

The team project will involve groups of 1-3 students working on small-scale projects within specific subfields of NLP. The goal is to combine ideas from diverse academic disciplines in computational thinking (CT) to build a novel, interdisciplinary NLP system that has not been proposed before. The final deliverable will be a 4-page paper (or a poster) detailing the system. The project process will include related work presentations and a final project presentation.

[https://2025.aclweb.org/calls/system\\_demonstration/](https://2025.aclweb.org/calls/system_demonstration/)





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# Team Project (35 points)

- There are two different assignments for each team as a team project
- (1) Paper Summary Presentation in English for 30 min
- (2) Writing a short paper (4 pages) at the end of the lecture
  - The topic should be related to NLP areas such as:  
Language Modeling, NLP Application (NER, Parsing, QA, Summarization, Chatbot..)
  - Your paper should suggest a new idea for the selected topic
  - It should be interesting and the content of your paper should consist of:  
“Introduction” --> “Related Works” → (“Dataset”) → “Proposed Method” → “Experiment”
  - I STRONGLY RECOMMEND using OVERLEAF that makes you monitor contributions of each team member
  - For (1) you can pick a paper that's related to your team project

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# Regulations and Rules

- In principle, lectures will be conducted in person.
- On public holidays, we plan to hold online lectures by default. However, is this possible? (To be discussed further.)
- If a lecture is held online, the teaching assistant will notify you in advance.
- According to university regulations, attendance will be recognized if you provide a COVID-19 certificate, internship certificate, or employment certificate.
- In case of class cancellation, make-up classes will be held in the evening as it is difficult to schedule them otherwise (attendance will not be checked).
- 원칙적으로 대면 강의 진행할 예정
- 공휴일의 경우 기본적으로 비대면 강의를 진행하려 합니다. 근데 이거 가능한가요? (추후 협의)
- 비대면으로 강의할 경우 미리 조교 선생님이 연락을 드릴 예정
- 교내 규정에 따라 코로나 증명서 및 인턴, 취업 증명서 가져올 시 출석 인정

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# Regulations and Rules

- You can ask any questions! Just email us!
- In addition to lectures, if you have any concerns related to career, employment, competitions, etc., please email us!

**Thank you.**