

Lecture 0 – Introduction

COSE215: Theory of Computation

Seunghoon Woo

Fall 2023

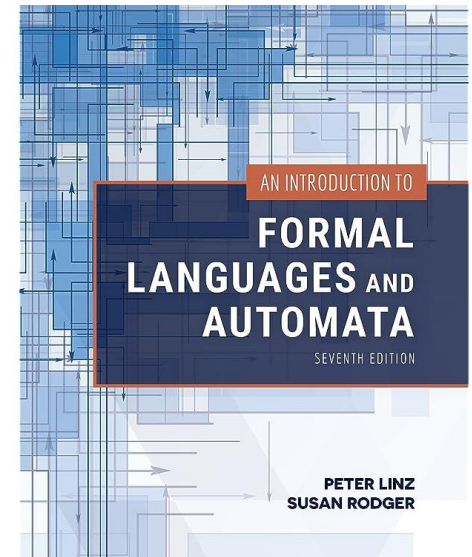
Course Information

- **Instructor:** Seunghoon Woo (우승훈)
 - **Assistant Professor**
Dept. of Computer Science and Engineering @ Korea University
 - **Expertise:** Software Security / Supply Chain Security / Vulnerability Detection
 - **Email:** seunghoonwoo@korea.ac.kr
 - ❖ Any questions are welcome 😊
 - **Office:** Not assigned yet (temporary: Woojung Building 307B)
 - ❖ Meeting: appointment by e-mail
 - **TA:** Pyeongju Ahn (안평주), Heewon Park (박희원)
 - ❖ Pingjuu@korea.ac.kr, paki9977@korea.ac.kr

Course Information

- **Textbook**

- An Introduction to Formal Languages and Automata, 7th Edition, Peter Linz, 2022
- 6th edition also available
- Class materials (slides) will be provided



Class Schedule

- **Aegineung Student Center, Tue/Thu 16:30 – 17:45**
 - Lecture contents and orders can be flexibly tuned

WEEK	CONTENTS
1	Introduction
2	Finite Automata
3	Regular Languages and Regular Grammars
4	Properties of Regular Languages
5	Context-Free Languages
6	Simplification of Context-Free Grammars and Normal Forms
7	Pushdown Automata
8	Midterm Exam

WEEK	CONTENTS
9	Properties of Context-Free Languages
10	Turing Machines
11	Other Models of Turing Machines
12	A Hierarchy of Formal Languages and Automata
13	Limits of Algorithmic Computation
14	Other Models of Computation
15	Class Review
16	Final Exam

Learning Objectives

- **Why do we study the Theory of Computation?**

- I. Theory of Computation is a field that deals with theoretical considerations on the **principles of operation** and **computational possibilities** of computers
 - ❖ What can computers do?

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3. The ideas we will discuss have some immediate and important applications (e.g., programming languages, compilers, operating systems, security, and AI)

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1. Theory of Computation is based on the **principles**

- ❖ What can computers do?

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- ❖ Model math problems

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Grading

- **Midterm exam + Final exam: 70%**
 - Midterm score > Final score: Midterm 40% & Final 30%
 - Midterm score < Final score: Midterm 30% & Final 40%
 - Missing any of the two exams without permission / Cheating => F
- **Assignments: 20%**
 - One Python programming assignment will be given
 - One handwritten assignment will be given (TBD)
 - Failing to submit / Late work / Cheating will result in a penalty to your score
- **Attendance and participation: 10%**
 - Self attendance check: please use **Blackboard** to attend the class
 - Absent more than 1/3 of all classes => F
 - Additional points are awarded for active participation in class

Next Lecture

- **Mathematical Preliminaries and Notations**
 - Sets
 - Functions and Relations
 - Graphs and Trees
 - etc.
- **Basic Concepts for Languages and Grammars**