Course Introduction

Lecture 0
March 5th, 2024

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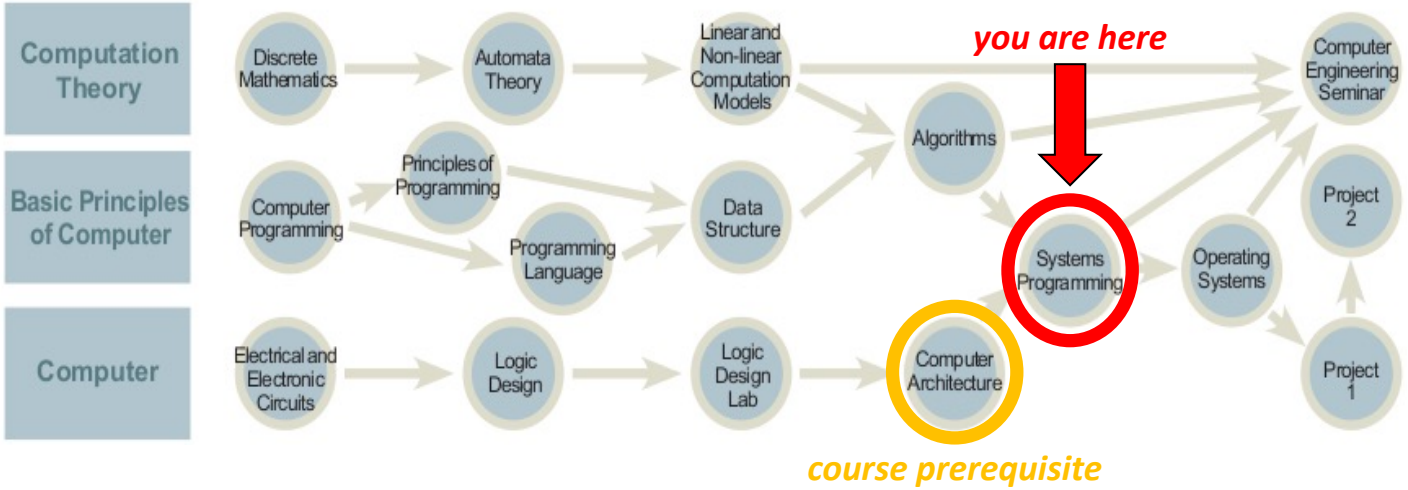
***Slide credits**: Prof. Bernhard Egger (SNU) & [CS:APP3e] slides (CMU)*

System Programming?

- **You (should) know the basics of**
  - programming in various languages, data types, algorithms, and computer architecture
- **In this course, you will**
  - learn more about the API and inner workings of the underlying operating system
  - acquire the knowledge for more advanced courses such as operating systems, compilers, databases, networks, embedded systems, and more
  - become a better programmer



Course information

- **Schedule: Lectures (by Prof.)**
  - 11:00 PM-12:15 PM [Tue/Thur]
  - Lecture Room: #301-118
- **Schedule: Labs (by TAs)**
  - 6:30 PM-8:20 PM [Tue]
  - Lecture Room: #302-105

Course information

- **Schedule: Lectures (by Prof.)**
  - ~~11:00 PM-12:15 PM [Tue/Thur]~~
    New proposal: 11:15 AM-12:30 PM [Tue], 11:00 AM-12:15 PM [Thur]
    - You may leave at 12:15 PM on Tue (no penalty).
    - All lectures will be video recorded and uploaded on eTL.
  - Lecture Room: #301-118

- **Schedule: Labs (by TAs)**
  - 6:30 PM-8:20 PM [Tue]
  - Lecture Room: #302-105

Course information

- **Instructor**
  - Jae Wook Lee (이재욱, jaewlee@snu.ac.kr)
  - Office: Engineering Building #301-506
  - Phone: 02-880-1834
  - Office Hours
    - Thursday 10-11 AM (before Thursday class) or by appointment
    - Both in-person meeting and Zoom meeting are fine.

Course information: (All-star) TAs

- **TA email: snu-arc-sysprog-ta@googlegroups.com**
  - Email goes to all TAs
- **Super-star TAs**
  - Sangwoo Kwon (권상우) – Head TA
  - Young Ook Song (송영욱)
  - Chae Ouk Lim (임채욱)
  - Juseong Hong (홍주성)
  - Yoonjay Hong (홍윤재)
  - Jongheon Jeong (정종헌)






Course information

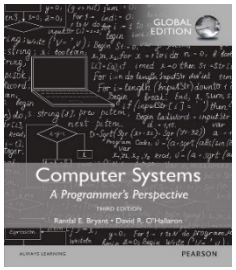
- **This is a junior-level course with the following prerequisites:**
  - Computer Architecture (컴퓨터 구조) – required
  - Basic knowledge of C – recommended

- **This course will be given in English.**
  - All course materials and exams will be in English.
  - All lectures will be given in English.
  - However, **Q&A** can be done and **your answers to exam/lab questions** can be written in **both English and Korean**.

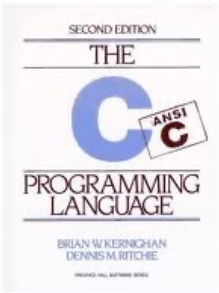
- **Course materials will be distributed through eTL.**

Course Textbook

- **"CS:APP3e"** **"Computer Systems: A Programmer's Perspective"**
  Randal E. Bryant, David R. O'Hallaron,
  3rd global edition, Pearson, 2015
  [must have] **ISBN-13: 978-1292101767 (English version)**
  ISBN-13: 979-1185475219 (Korean version)



- **"K&R"** **"The C Programming Language"**
  Brian W. Kernighan, Dennis M. Richie,
  2nd edition, Prentice Hall, 1988
  [optional] **ISBN-13: 978-0131103627**
  (consider if you lack C programming skills)



- **Acknowledgements** **slides based on material from the CS:APP textbook**

Course Organization

- **Lectures**
  - You must attend the lecture **in person**.
  - Video recording will be provided for your study (no live streaming)
  - This course uses the electronic attendance system. If you did not check in by mistake, you can request correction to TA at the end of the class. (Later requests for correction will not be granted.)
- **Labs**
  - 1 (the basics) + 4 programming assignments
  - Provide in-depth understanding of system aspects
- **Exams**
  - Midterm and final exams
  - Test your understanding of system programming concepts & principles

Course Schedule (subject to change)

Week	Date	Lecture Topic	Reading (Ch)	Lab
1	03/05 (Tue)	Class Opening and Organization		*(no lab)*
	03/07 (Thu)	Introduction to System Programming	1	
2	03/12 (Tue)	Concepts of Unix Programming	Unix (link will be given)	The Basics
	03/14 (Thu)	Input/Output: Unix Filesystem Concepts		(Overview: 03/12)
3	03/19 (Tue)	Input/Output: Direct and Buffered I/O	10.0-10.4, 10.10	I/O Lab
	03/21 (Thu)	Input/Output: Files and Directories, Kernel Implementation	10.6-10.9, 10.11-10.12	(Overview: 03/19)
4	03/26 (Tue)	Memory Management: Virtual Memory Recap	9.0-9.7	
	03/28 (Thu)	Memory Management: Dynamic Memory Allocation I	9.9-9.9.5	
5	04/02 (Tue)	Memory Management: Dynamic Memory Allocation II	9.9.6-9.9.14, 9.11-9.12	
	04/04 (Thu)	The Runtime Environment: Life Cycle of a Program	7.0-7.3	Memory Lab
6	04/09 (Tue)	The Runtime Environment: Linking and Loading I	7.4-7.6	(Overview: 04/09)
	04/11 (Thu)	The Runtime Environment: Linking and Loading II	7.7-7.15, 9.8	
7	04/16 (Tue)	The Runtime Environment: Library Interpositioning		
	04/18 (Thu)	Process Management: Processes	8.0, 8.2, 8.4	
8	04/23 (Tue)	Process Management: Exceptional Control Flow I	8.1, 8.5	*(no lab)*
	04/25 (Thu)	Buffer		
9	04/30 (Tue)	**Midterm examination**		
	05/02 (Thu)	Process Management: Exceptional Control Flow II		
10	05/07 (Tue)	Process Management: Interprocess Communication		Shell Lab
	05/09 (Thu)	Network Programming: Concepts and API		(Overview: 05/07)
11	05/14 (Tue)	Network Programming: Programmer's View		
	05/16 (Thu)	Network Programming: Webservices I	11.0-11.3	
12	05/21 (Tue)	Network Programming: Webservices II	11.4	
	05/23 (Thu)	Concurrent Programming: Concurrency	12.0-12.2	
13	05/28 (Tue)	Concurrent Programming: Threads and Threading Models	12.3-12.4	Network Lab
	05/30 (Thu)	Concurrent Programming: Races and Synchronization I	12.5-12.6	(Overview: 05/28)
14	06/04 (Tue)	Concurrent Programming: Races and Synchronization II	12.7-12.8	
	06/06 (Thu)	Memorial Day		
15	06/11 (Tue)	**Final examination**		
	06/13 (Thu)			

Labs

- **Time/Location** — Tuesdays, 18:30 – 20:20 / #302-105
- **What is it for?** — 1st week of assignment: TA will give an overview. Rest of the weeks: TAs will answer your individual questions (like TA office hours).
- **Attendance Policy** — Your attendance is optional.
- **Materials** — Distributed through the eTL and course GitHub
- **Teamwork** — You must work alone on all labs
- **Submission** — Follow the instructions in the assignment
- **Late Policy** — A 20% deduction applied for each 24-hour period of late submission

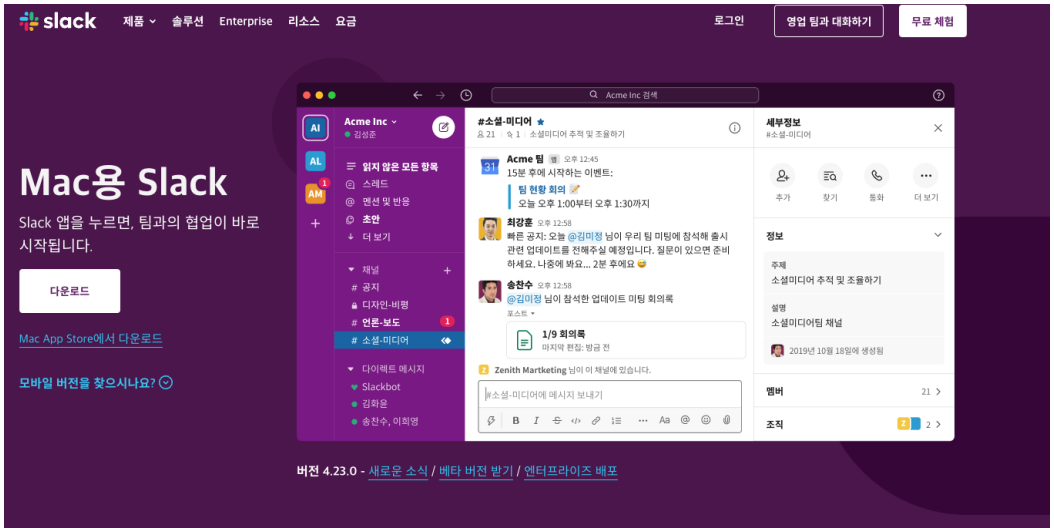
Exams

- **Two exams**
  - midterm and final exam
- **Test your understanding of system programming concepts & principles**
  - blindly memorizing stuff will not help. A lot of the questions will be based on the homework and lab assignments.
- **Exam logistics**
  - closed book
  - answers in English or Korean

Communication Method

- **Open Slack chat for the course**
  - We will use open chat for casual, anonymous communication.
    - Some forbidden nicknames include professor, Prof. Lee, 이재욱 (교수), TA, 조교, Keun Soo Lim, Bonggeun Sim, etc.
  - Everyone is invited, but not required, to join.
    - Using it is completely optional
  - Feel free to ask and answer questions.

- **More details will be announced this week**
  - Mobile app is available



Course Webpage on eTL

- **SNU eTL** — https://etl.snu.ac.kr/
- **Course website** — https://myetl.snu.ac.kr/courses/258189

  Register as an 'Auditor' (청강생) if you do not yet have access do the course website.
- **Information posted** — **Lecture slides, reading assignments, homework assignments, exam info, scores, grades, and course related information.**
- **eTL Discussion boards** — **We are not monitoring discussion boards/chat functions of eTL. Use the course Slack workspace or email the TAs to ask questions or discuss problems related to the course.**

Grading System*

- Midterm: 30%
- Final: 40%
- Lab: 30% (4 times)
- Attendance/Class Participation: up to ±5%

** Subject to change.*

Off-Quota Registration (정원외신청) Policy

- **If you want to register by off-quota application, please apply on mySNU by 11:59pm today (Tue).**
  - We will approve up to 50 more students for registration.
  - Priority will be applied: Major > Double Major > Second Major

- **The policy in Korean:**

  “정원 외 신청(구: 초안지) 신청기간 중 3/4(월)~3/5(화)까지 수강신청 사이트에 신청한 학생들에 대해 명단 파악 후 우선순위(주전공>복수전공>부전공)에 따라 강의실 수용 가능 범위 내에서 3/6(수)에 승인 예정. 승인된 수강생은 3/7(목) 수업부터 출석 필요. 담당교수에게 이메일 등 별도로 연락할 필요없음. 정원외 신청 승인은 최대 50명(총 수강인원 200명) 한도로 함.”