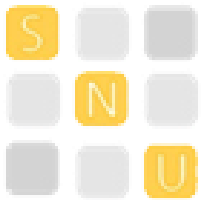
M1522.000800
System Programming

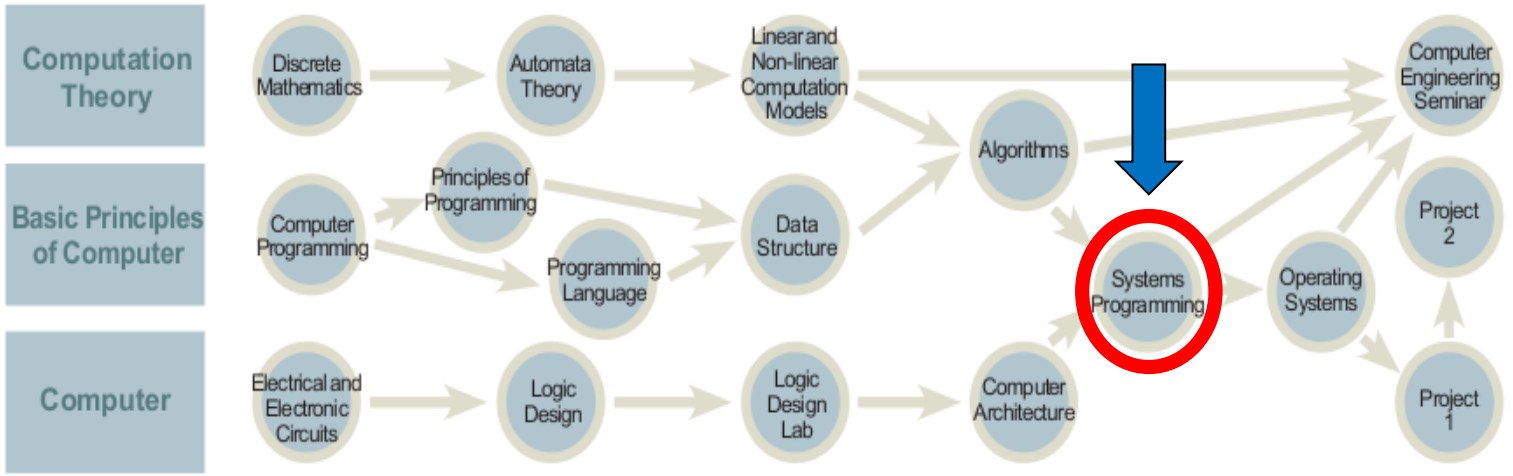
Course Syllabus and Organization



CSE 컴퓨터공학부
Department of Computer Science & Engineering

System Programming?

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



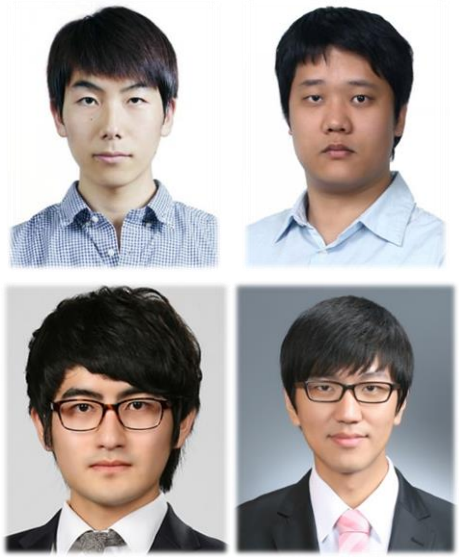
Teaching Staff

- **Instructor** Bernhard Egger
  bernhard@csap.snu.ac.kr

  Office Hours Thursdays, 9-12 in my office (301-403)

- **TA Team** Suwon Oh
  Seungyul Lee
  Changyeon Jo
  Byunghun Kim
  sysprog@csap.snu.ac.kr

  Office Hours Wednesday, 14:00 – 17:30
  in the CSAP lab (301-419)



Course Organization

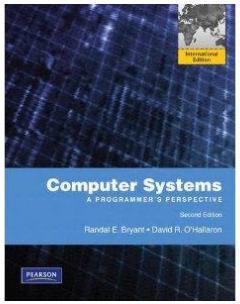
- **Lecture**
  - higher level concepts
- **Labs**
  - provide in-depth understanding of system aspects
  - larger programming assignments
- **Homework Assignments**
  - every week
  - practice knowledge covered in class, small programming assignments
  - **prerequisite to participate in the exam**
- **Exams**
  - mid-term and final
  - test your understanding of system programming concepts & principles

Lectures

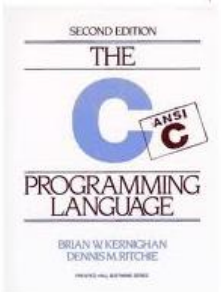
- **Class Time** — Tuesdays, Thursdays 14:00am – 15:15am
  in room 302-208

- **Material** — on eTL
  http://newetl.snu.ac.kr/

- **Textbook** — "Computer Systems: A Programmer's Perspective"
  Randal E. Bryant, David R. O'Hallaron,
  2nd international edition, Pearson, 2011
  → available at the university's bookstore



"The C Programming Language"
Brian W. Kernighan, Dennis M. Richie,
2nd edition, Prentice Hall, 1988



- **Acknowledgements** — slides are based on the cs:app course at CMU

Lab Assignments

- **Teamwork** — unless stated otherwise, you must work alone on all assignments and labs
- **Submission** — follow the instructions in the assignment
- **Late Policy** — 5 grace days for the entire semester

  once grace days are used up, **20% penalty per day**

  Tip: don't spend them all on the first lab
- **Force Majeure** — serious illness, death in family, …

  talk to me to work out a plan how to get back on track

Homework Assignments

- **No teamwork** — work alone on your homework assignments

- **Submission** — - paper handins: drop-off box in class and front of the CSAP lab (301-419)
  - electronic handins: per email to the TA

- **Grading** — homework is checked, but not graded.

  Required number of submissions to participate in the
  - mid-term exam: 5
  - final exam: 5

- **Late Policy** — homework must be submitted by the deadline.

Cheating

- **Cheating is**
  - sharing code
  - copying code from somewhere (previous courses, Internet, …)
  - helping your friend to write an assignment/lab, line by line

- **Penalty for cheating**
  - removal from course with “F” mark
  - notification to department/university

- **If an assignment/lab is too hard for you**
  - ask a colleague to explain the concepts
  - send an email to the TA and have him explain things

Exams

- **Two exams**
  - mid-term
  - final

- **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**
  - 90 minutes
  - closed book
  - one A4 page (front + back) of *handwritten* notes (original, no copy) allowed

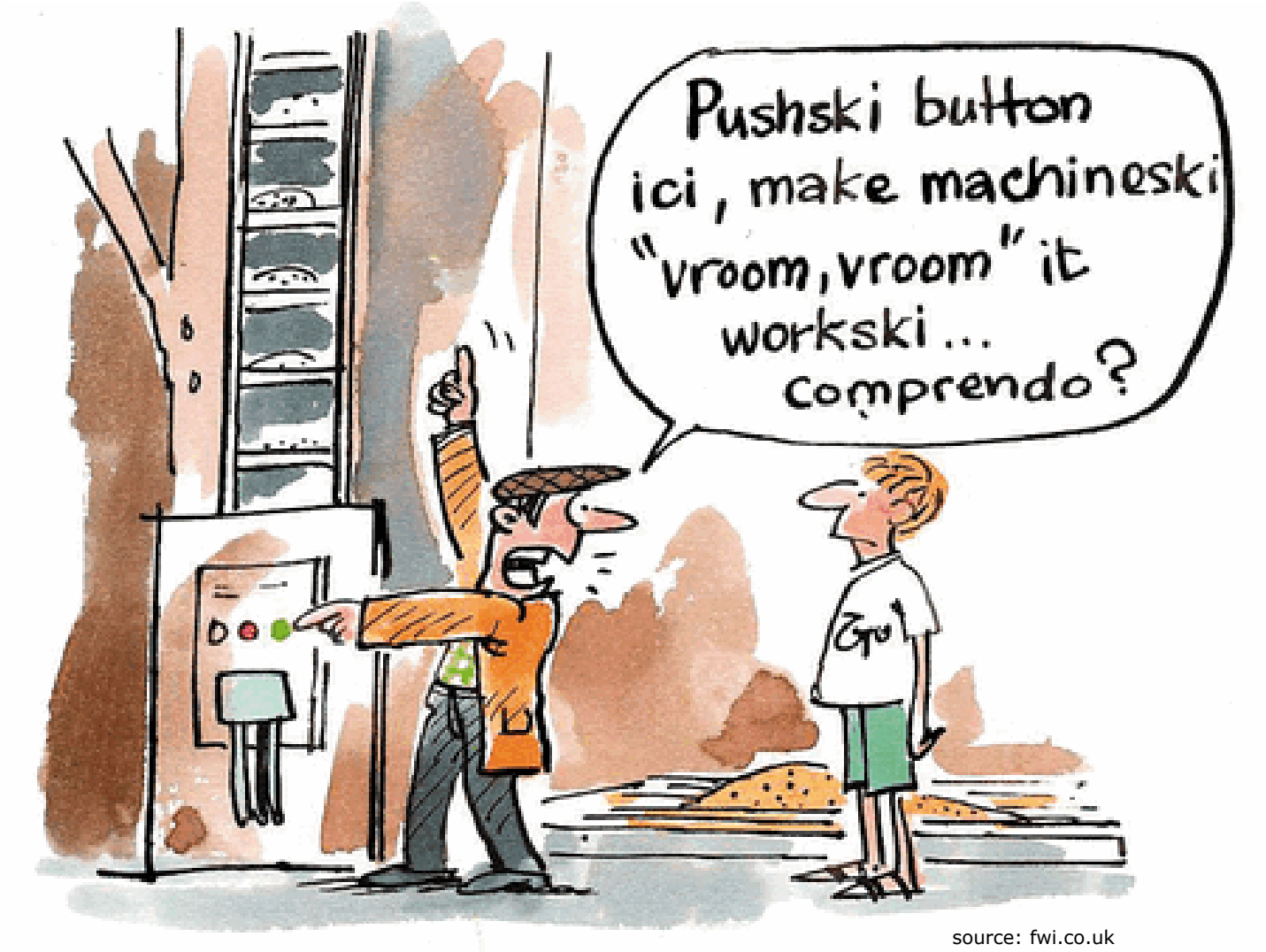
- **You need to submit five (5) homework assignments *in time* to participate in an exam (both for the mid-term and the final exam)**

Grading

- **Grading**

Homework assignments	prerequisite for exams
Labs	35%
Mid-term exam	25%
Final exam	35%
Participation	5%
Attendance	5%
Total	105%

Language



source: fwi.co.uk

A Word of Advice

- **System Programming is hard**
  - a tiny mistake/oversight can crash the system
- **Programming requires 20% talent, 30% knowledge, and 50% experience**
  - take every opportunity you have to program (homework assignments, labs, your own ideas, …)
- **This course is hard and requires a lot of time/effort**
  - read the book *before* coming to class
  - unfortunately, I cannot read minds. Ask if you don't understand!
  - start the labs early and ask if you have difficulties

On the positive side: at the end of this class, you will be a better programmer and understand how things run!

Course Schedule

Week	Date	Lecture Topic	Homework (due)	Labs
1	03/03 (Tue) 03/05 (Thu)	Introduction to System Programming		VM Installation Lab
2	03/10 (Tue) 03/12 (Thu)	The Runtime Environment: Linking and Loading	HW#1	Buffer Overflow Lab
3	03/17 (Tue) 03/19 (Thu)	Process Management: Concepts	HW #2	
4	03/24 (Tue) 03/26 (Thu)	Process Management: Scheduling	HW #3	Kernel Driver Lab
5	03/31 (Tue) 04/02 (Thu)	Process Management: Exceptions and Synchronization, API	HW #4	
6	04/07 (Tue) 04/09 (Thu)	Memory Management: Virtual Memory	HW #5	Recitation
7	04/14 (Tue) 04/16 (Thu)	Memory Management: Swapping & Paging, Dynamic Memory Allocation	HW #6	Recitation
8	04/21 (Tue) 04/23 (Thu)	Mid-term examination	HW #7	Memory Lab

Course Schedule

Week	Date	Lecture Topic	Homework due	Labs due
9	04/28 (Tue) 04/30 (Thu)	Memory Management: Swapping & Paging, Dynamic Memory Allocation		Memory Lab
10	05/05 (Tue) 05/07 (Thu)	Memory Management: Garbage Collection	HW#8	Shell Lab
11	05/12 (Tue) 05/14 (Thu)	System I/O: Files and Directories, Access Control	HW #9	
12	05/19 (Tue) 05/21 (Thu)	Network Programming: Concepts and API	HW #10	Proxy Lab
13	05/26 (Tue) 05/28 (Thu)	Concurrent Programming: Threads	HW #11	
14	06/02 (Tue) 06/04 (Thu)	Concurrent Programming: Thread Synchronization	HW #12	Recitation
15	06/09 (Tue) 06/11 (Thu)	Final examination	HW #13	*No lab*
16	06/16 (Tue) 06/18 (Thu)	Make-up classes		

"no plan survives contact with reality"

Classroom Etiquette

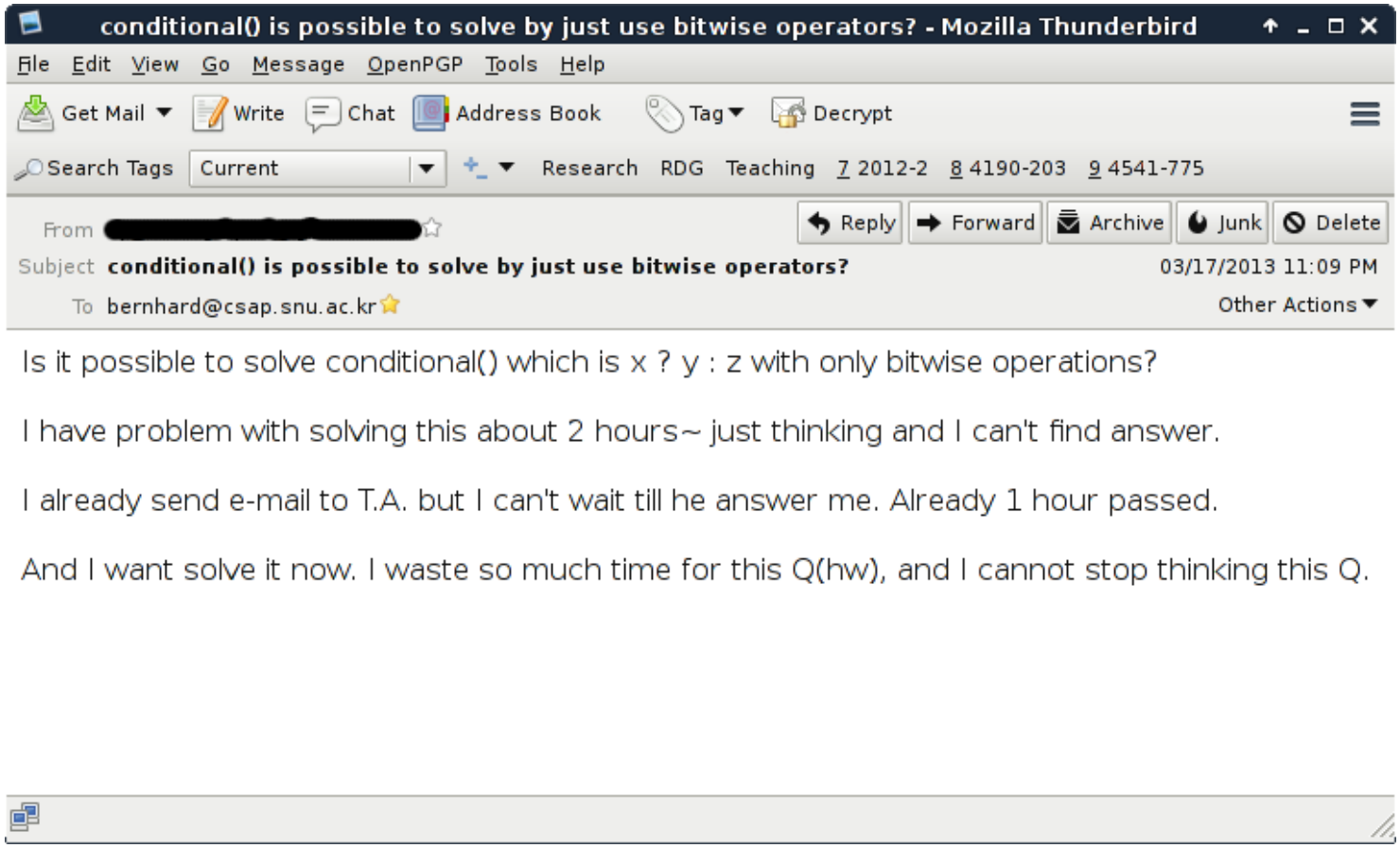
Dos and Don’ts

- Dos
  - come to class to listen, learn, and participate
  - turn your mobile phone on mute during the class

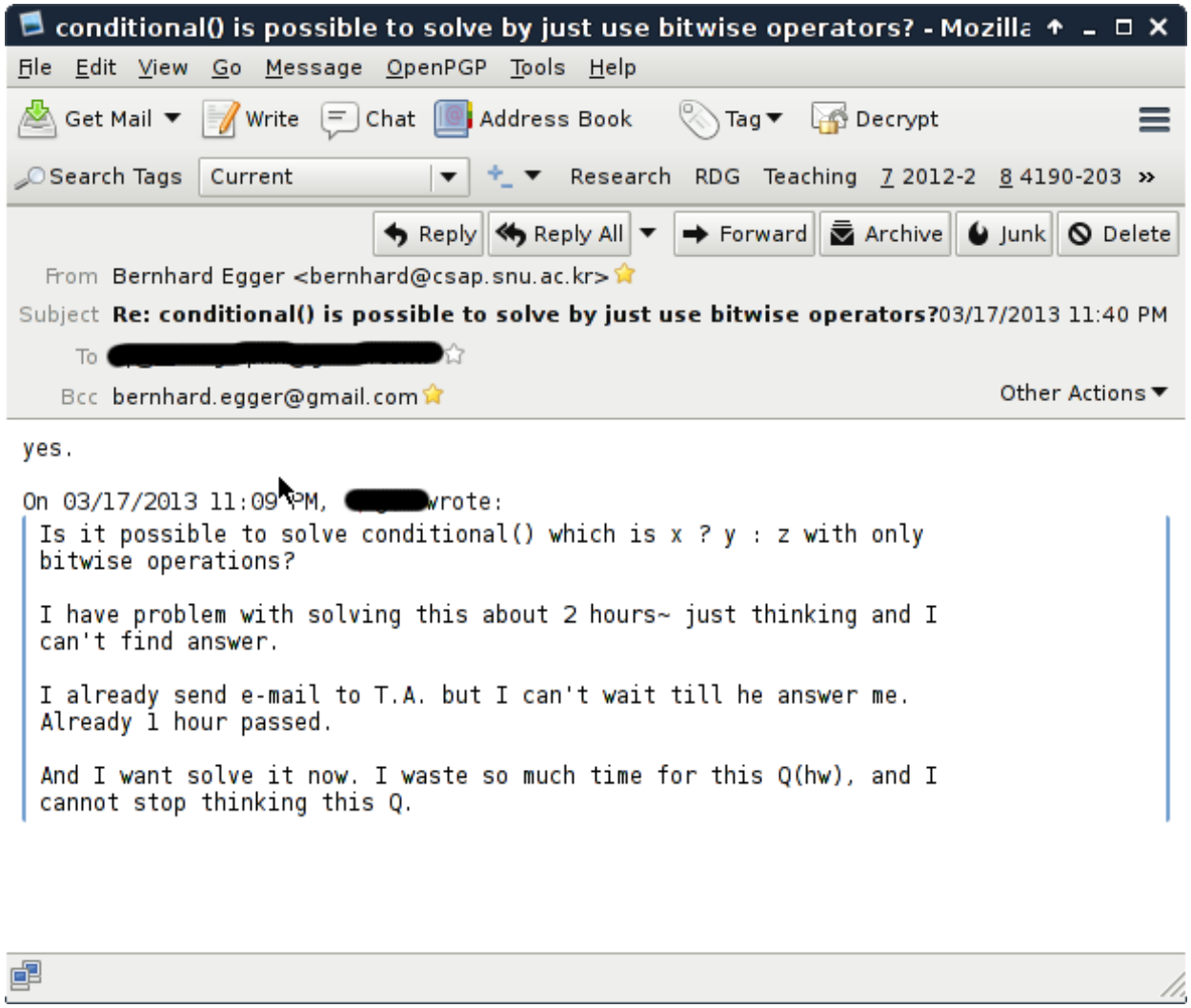
- Don’ts
  - no food and drinks allowed in the classroom / lab
  - no hats, baseball caps, etc (*except* cover for religious reasons)
  - play with your mobile phone, tablet, laptop

E-Mail Etiquette

Example



The Answer



Don’ts

- Meaningless subject
  - “URGENT”
  - “I need help”
- Empty body
  - Subject: Need help with the data lab
- No/impolite greetings, salutation
  - Hi, prof!
- Smileys, emoticons, excessive use of puctution, etc
  - Help me please ^**^ ☺ ORZ…..!!!!
- Expecting an answer within 1 hour

Dos

- State your name, student-number, and class
- Use a meaningful subject
- Be polite
  - salutation
    - Dear Prof. Egger
    - Dear TA
  - greetings
    - Best,
Bernhard Egger
2003-30778
- Write some content!