CSE 120: Principles of Operating Systems
Lecture 1: Introduction

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University of California, San Diego
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Welcome

- In this class, we will explore
  - Basic concepts of operating systems (OS)
  - Design, implementation, structure
  - Principles that apply to all operating systems
- Today
  - Introductions
  - Class organization

Introductions: Teaching Staff

Instructor: Prof. J. Pasquale

Teaching Assistants

- **Amy** Lin
- **Jefferson** Chien
- **Steven** Wu
- **Om** Pandiyaraju
- **Sananya** Majumder
- **Mohit** Shah
- **Amardeep** Ramnani
- **Darren** Yeung
- **Brandon** Saldanha

Course Organization

- Lectures on Mon/Wed, 5PM and 6:30PM
  - Sec A: M/W 5:00-6:20 Sec B: M/W 6:30-7:50
- Discussion Sections, Fri 3PM and 4PM
  - Sec A: Fri, 3:00-3:50 Sec B: Fri, 4:00-4:50
- All online: canvas.ucsd.edu/courses/42787
- Programming Assignments: 4
- Exams: Midterm and Final

Schedule

- Jan 19 (Thu) PA1
- Feb 2 (Thu) PA2
- Feb 6 (Mon) Midterm (in class) - tentative
- Feb 23 (Thu) PA3
- Mar 9 (Thu) PA4
- Mar 18 (Sat) Final (common, 7-10pm)

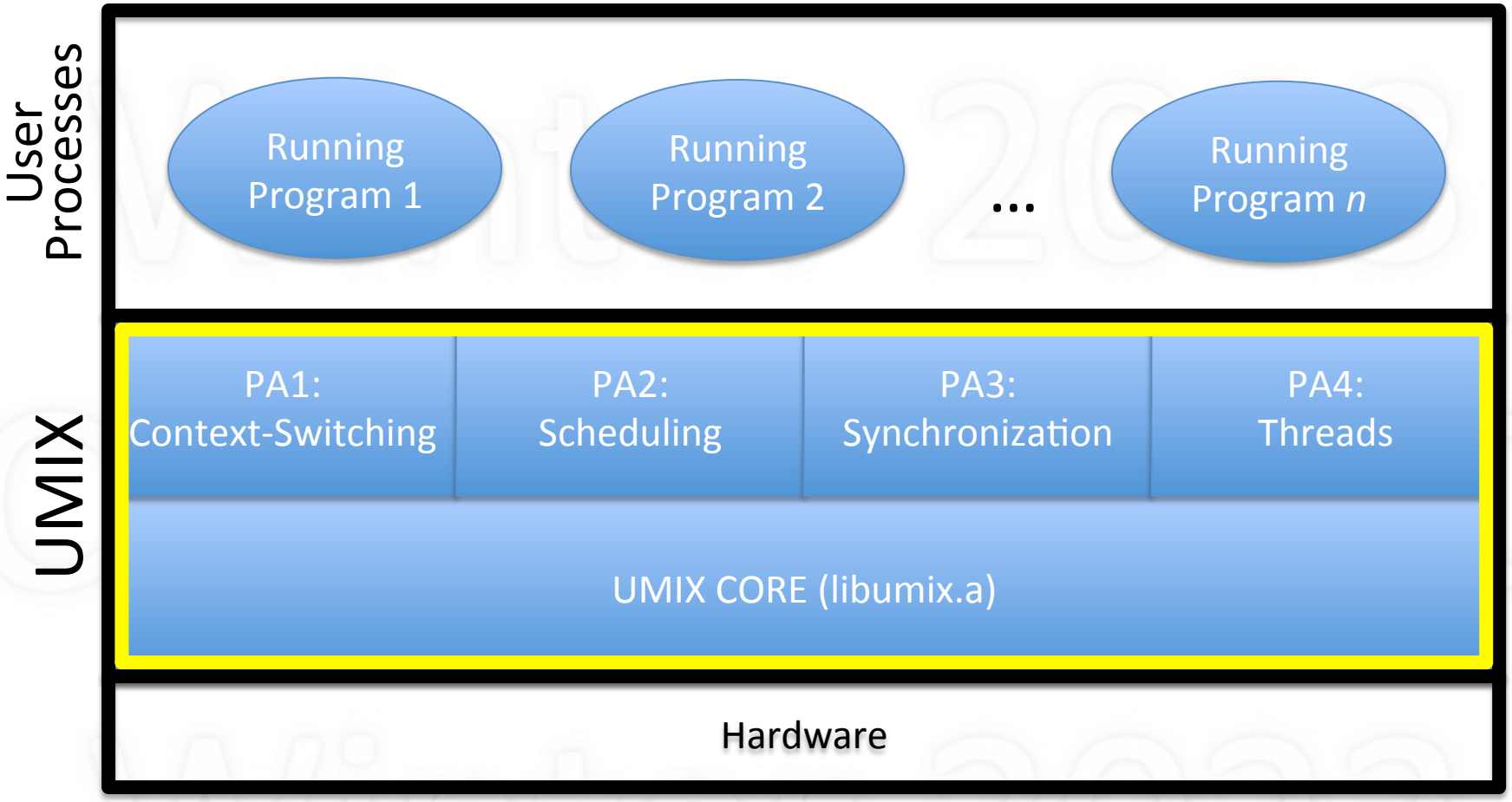
Lectures

- Lectures are key: Don't miss them
  - Designed to motivate topics
  - Highlight what is most important
- Exam questions come directly from lectures
  - Lecture notes + what is said in class
- Book is important as a back-up reference
  - To fill in details
  - Provide an alternative explanation

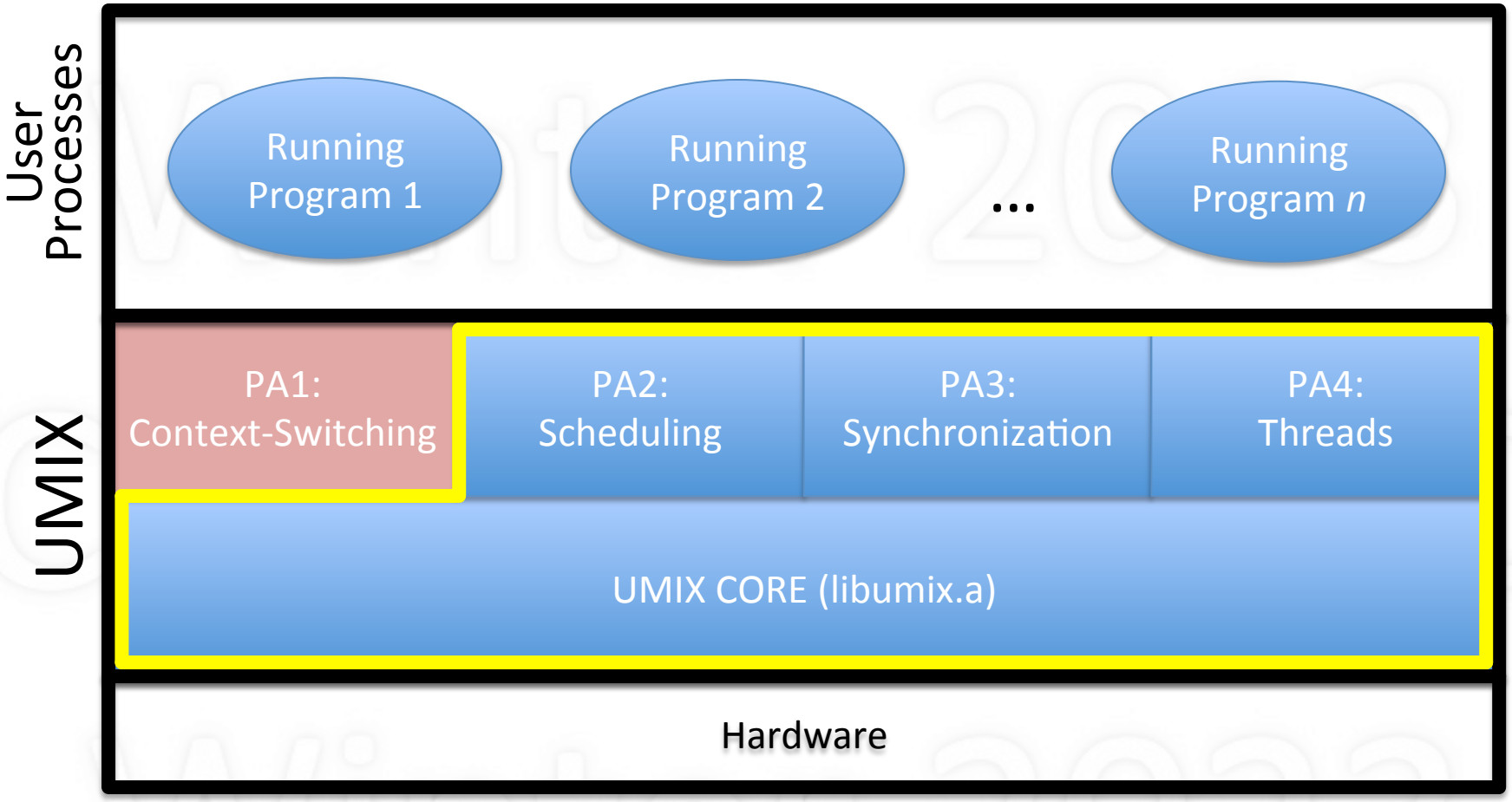
Programming Assignments (PAs)

- Instructional operating system: UMIX
  - UMIX = **U**ser-**M**ode UN**IX**
  - Developed specifically for this class
- 4 assignments on building parts of UMIX OS
  - Each builds on previous, of increasing complexity
- Only works on ieng6.ucsd.edu
  - If you are enrolled, you should have an account
  - Log in as soon as possible to make sure

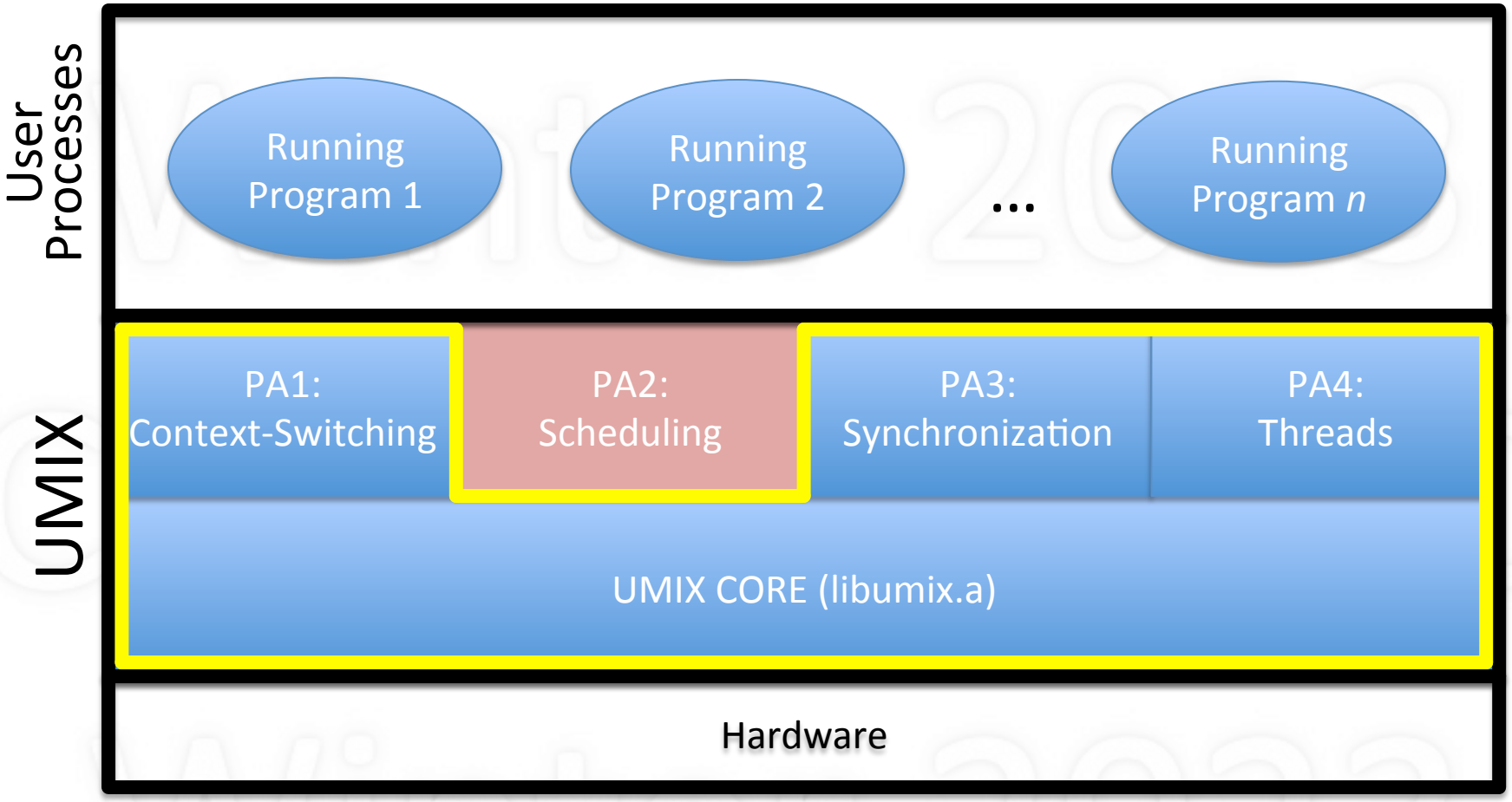
UMIX Structure



UMIX Structure: Working on PA1



UMIX Structure: Working on PA2



All Work on ieng6 / cs120wi23

- To get credit, you must do **all** of your work:
  - on **ieng6** server (remote ssh OK)
  - in your **cs120wi23** partition (prep cs120wi23)
  - in **pa<N>** folder of your ieng6/cs120wi23XX acct

```
[cs120wi23xx@ieng]:~:$ getprogram1
     Creating Programming Assignment 1 directory
     Installing Programming Assignment 1's files
     Installation complete
[cs120wi23xx@ieng]:~:$ ls
     CSE120-Results      pa1
[cs120wi23xx@ieng]:~:$ cd pa1
[cs120wi23xx@ieng]:pa1:$ ls
     Makefile       mycode1.h      pa1b.c         pa1e.c         umix.h
     aux.h          pa1.txt        pa1c.c         pa1f.c
     mycode1.c      pa1a.c         pa1d.c         sys.h
```

PA Deadlines

- Generally at 11:59PM on Thursdays
  - PA1 Jan 19 week 2
  - PA2 Feb 2 week 4
  - PA3 Feb 23 week 7
  - PA4 Mar 9 week 9
- Note: ITS may not be available on weekend
- PA deadlines are absolute: *no exceptions*
  - Due to required UMIX updates for next PA

How Your PAs Are Graded

- Programs are graded by UMIX Grader
  - Runs after PA is over (some time after deadline)
  - Runs a series of tests
  - At least one test per requirement in specification
- Results will be deposited in CSE120-Results
  - Output of test
  - Score
- You can appeal if you think score incorrect

Appealing Your PA Grade

- Must be based on your contentions that
  - UMIX Grader made a mistake
  - Your program's behavior is actually correct
- State clearly, explicitly, and in detail
  - **What** you believe the UMIX Grader got wrong
  - **Why** your program's behavior is actually correct
- You have 3 days to make an appeal
  - After that, no appeals will be accepted

After Your Appeal

- Your program will then be *manually* graded
  - You are liable for any/all problems found
  - Including ones missed by UMIX Grader
- Clerical errors are still errors
  - A stray print statement can cause total failure
  - A bad character can cause a compile failure
- Can only grade what you hand in (no changes)
- Cost of appeal: 1 point (but can gain it back)

Collaboration Policy

- OK to discuss
  - what the assignment is about, what is being asked, …
  - your approach, general design, abstract algorithms, …
  - how to test, what kinds of tests, …
- What is NOT OK: sharing any actual **code**
- What you submit must be **your own work**
- The only non-personally developed code you are allowed to use is what is provided to you via the getprogram**N** (N = 1, 2, 3, 4) script

Academic Integrity

- What you submit must be your own
- PAs/exams are easily doable in given time
- Consequences of cheating are very high

Academic Integrity Violations

- On Programming Assignments
  - Having code you did not design/write yourself
  - Allowing your code to be viewed by others
  - Allowing your account to be used by others
  - Downloading/uploading code from/to websites
- On Exams
  - Not taking the exam by yourself, on your own
  - Communicating with anyone during an exam

Exams

- Midterm will be in class, mid-quarter
- Final is on Saturday *before* start of finals week

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Grading

- 4 Programming Assignments 30%
  - progressive: 3 + 6 + 9 + 12 = 30
- Midterm Exam (insurance) 30% or 0%
- Final Exam 40% or 70%

- Your final grade will be based *solely* on above
- Grading is on an absolute scale, post adjusted

Resources

- Class website
  - cseweb.ucsd.edu/classes/wi23/cse120-a
- Piazza (discussion, lectures, PAs, book)
  - piazza.com/ucsd/winter2023/cse120/home
- Canvas (zoom access, videos)
  - canvas.ucsd.edu/courses/42787
- Computer system (programming assignments)
  - ieng6.ucsd.edu

Textbooks

- *Operating System Principles*, 2022 (Pasquale)
  - Required, and FREE!
- Not required, but good backup references
  - *Operating System Concepts*, 10th Ed., Wiley, 2018 (Silberschatz, Galvin, Gagne) – 8th or 9th ed. OK too
  - *Operating Systems: Three Easy Pieces*, (Arpaci-Dusseau and Arpaci-Dusseau) – free at www.ostep.org

Piazza

- Online forum for asking / answering questions
- Depository for all class documents
  - Lecture slides
  - Programming assignment specifications
- To be enrolled on Piazza, you MUST:
  - register your FULL name: first AND last name
  - register your UCSD email account: xxx@ucsd.edu
- DO NOT POST SOLUTION CODE ON PIAZZA

Any Questions?

Reading

- OSP: Chapter 1
  - Do the exercises! (suggested, not required)
- OSC: Chapters 1 and 2
  - Lecture-related: 1.1, 1.12, 2.1, 2.3, 2.8, 2.11
  - Hardware background : 1.2, 1.3
  - Recommended: 1.4-1.11, 2.2, 2.4-2.7, 2.9-2.10