

CS656 Operating Systems Prof. Marty Humphrey

- We will cover the topics of a traditional undergrad OS class:
 - OS structure, processes/threads, synchronization, deadlocks, memory management, file systems, I/O systems, protection/security
- However, at roughly 3x the pace
- What to do with the rest of the time?
 - Discuss papers (old, new)
 - Cover other topics (e.g., distributed OSs)
 - Cover other "hot" topics
- Goal: discover how to build systems and evaluate them
 - Not "just" OSs
 - Focus on **Research** as opposed to undergrad-ish "what is an OS and how does it operate/ behave?"

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Workload

- Readings
 - Generally every class, with short write-up due (next slide)
- Assignments
 - 1st half of class: short-ish programming assignments (Windows Research Kernel or Linux)
 - Midterm exam (closed books, closed notes)
 - Final exam (finals week – closed book, closed notes)
- Final project
 - Research project of your own design (1-2 people)

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Grading

- Assignments (prog assignments, daily submissions): 25%
 - Incl. participation in the course mini-conference
- Final project: 25%
- Class participation: 10%
- Midterm: 20%
- Final: 20%

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Write-up due every class

- Group discussions allowed / encouraged
- Individual submission: A short ASCII sent to me by 10am class day
 - Your own text, must include group members in write-up
 - Subject: subject and class date (e.g., CS656 1/15)
- MANDATORY Format: 2 paragraphs, each 2-5 sentences.
 - Paragraph 1: Overview (what is the paper trying to do? what is potential contribution of paper?)
 - Paragraph 2: Critical analysis: pros *AND* cons (technical flaws? Only describes system, without proper motivation and justification of approach? Comparison with related work? Evaluation? Poorly structured paper?)
 - This is similar in spirit to a review for a program committee
- I might provide another question specific to the paper(s) being read (answer in a third 2-5 sentence paragraph)

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Critical Analysis: Issues to consider in your write-ups

- Will this advance the state of the art?
- Did you learn anything new?
- Does it provide evidence which supports/contradicts hypotheses?
- Experimental validation?
- How readable is the paper?
- Is the paper relevant to a broader community?

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Typical Class

- 2:00 – 2:50: Marty leads class discussion on the day's paper(s) and/or programming assignment
- 2:50 – 3:15: Marty presents material to set up next class

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(rough, tentative) Semester outline

- OS structure: 3 weeks
- processes/threads (incl. scheduling): 2 weeks
- synchronization, deadlocks (incl. dis sys): 2 weeks
- memory management: 1 week
- file systems, I/O systems: 2 weeks
- protection/security: 1 week
- Other: 1 week
- Class mini-conference: 1 week

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More preliminaries

- Course notes will be made available after the day's class

- Intro class survey at the end today (10 min)

- Will be used to finalize the class schedule / topics

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For next class

(wed jan 23 normal time? Fri jan 25 4:15-5:30?)

- Read/Review Chapters 1 and 2

1. Edsger W. Dijkstra
The Structure of the "THE" Multiprogramming System (incl. appendix)
Communications of the ACM 11(5), May 1968.

2. Per Brinch Hansen
The Nucleus of a Multiprogramming System
Communications of the ACM 13(4), April 1970

3. W. Wulf, E. Cohen, W. Corwin, A. Jones, R. Levin, C. Pierson, and F. Pollack
HYDRA: The Kernel of a Multiprocessor Operating System
Communications of the ACM 17(6), June 1974, pp. 337-344.

- Additional question for write-up:

What are the main philosophical differences in design of the THE system, the Nucleus system, and HYDRA?

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