STEVENS
INSTITUTE of TECHNOLOGY
THE INNOVATION UNIVERSITY®

CS 492: Operating Systems

Instructor: Iraklis Tsekourakis

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About me

- Prof. Iraklis Tsekourakis
  - Grew up in Kavala, Greece
  - Started programming in BASIC/MS-DOS in my last year of elementary school (1995)
  - Moved to the U.S. 5.5 years ago for my graduate studies
  - URL: itsekour.github.io

About me

- Education
  - BS in ECE – Aristotle university of Thessaloniki (2010)
  - MS in CS – Stevens Institute of Technology (2014)
  - PhD in CS – Stevens Institute of Technology (2016)
- Professional Experience
  - Research Associate in CERTH/ITI (Information Technologies Institute) (2011-2012)
    - Software development, Project management, Research

Teaching

- I've been an instructor on
  - Image Processing
  - Machine Learning
  - Intro to Web Programming & Proj. Development
  - Operating Systems

Research

- 3-D Computer Vision
- Machine Learning
- Autonomous Software Agents

Objectives

- Introduction to basic components in operating systems
  - Process management and coordination
  - Memory management
  - I/O
  - File systems
- *Advanced topics*
  - *Distributed systems*
  - *Security*

Outcomes

Process-to-OS communication - How a system call is made and returns

Multi-thread programming - How preemptively scheduled processes and threads provide an abstraction that a program is the only one executing

Synchronization skill - How to use at least one classical synchronization mechanism to solve at least one classical synchronization problem

Virtual memory abstraction - How virtual memory provides an abstraction of physical memory

Input/output abstraction - How an operating system's input/output architecture provides an abstraction that every data source or sink behaves identically

File system algorithms - How the data structures of the UNIX file system serve to map file names to blocks of a storage device

Important Points

- At any point, ask me WHY?
- You can ask me anything about the course in class, during a break, on my office hours, by email
  - If you think a homework is taking too long or is wrong
  - If you're not certain about some topic
  - Etc. etc.

Logistics

- Class webpage: CANVAS
  - https://www.stevens.edu/canvas
- Office hours: Wednesdays 5-7pm
  - North Building 308
- Appointments by email
- CAs office hours: TBA

Resources

- Textbook:
  - Modern Operating Systems, Andrew S. Tanenbaum, 4rth edition (3rd is fine too)
- Slides and more
  - On Canvas

Lectures & Notes

- Lectures may **not** follow text closely
- Lecture notes will be available BEFORE class on Canvas
  - Parts of some slides may be BLANK (in the notes). This is intentional: the blanks will be filled (only) in class.
  - Some material presented in class (e.g., write on board) may NOT appear in the online notes.
  - Take notes when we discuss material not in the slides

Syllabus

Week	Topics Covered	Reading	Assignments
1	Introduction & Outline		
2	Processes	Ch. 2	
3	Threads & Inter Process Comm.	Ch. 2	**Asgn1:** Processes
4	Inter Process Comm. II	Ch. 2	**hw1**: Threads/IPC/Scheduling
5	Scheduling	Ch. 2	**Lab assignment**
6	Scheduling II	Ch. 2	
7	Deadlocks	Ch. 6	**Asgn2:** Deadlocks
8	Virtual Memory + Midterm Overview		**Midterm**
9	Virtual Memory II	Ch. 3	**hw2:** Virtual Memory
10	Virtual Memory & File Systems	Ch. 4	
11	File Systems	Ch. 4	**hw3**: File Systems
12	IO & Disks	Ch. 5	
13	Disks	Ch. 5	
14	Overview/ Presentations		**Extra Credit Projects**

Grading

- Course Evaluation
  - Quizzes 5%
  - Lab 5%
  - Individual Assignments 10%
  - Team Programming Assignments 30%
  - Midterm 25%
  - Final 25%
  - Extra-credit Projects 5%

Grading Policies

- Late submission?
- Random - attendance quizzes
- In class coding exercise
- Assignments: Any sign of collaboration (MOSS or similar software) -> Honor Board
- Midterm surveys and not only: Provide feedback!
- Grading complaints: 7 days
- Extra-credit Projects!!
- Final exam opt-out policy!