

The background of the slide features a scenic landscape with a city nestled in a valley at the foot of a range of mountains. The mountains are partially obscured by a light mist or haze. In the foreground, there's a mix of green fields and urban development with several buildings.

*Operating Systems!*

# Course Intro & Overview

Prof. Travis Peters  
Montana State University  
CS 460 - Operating Systems  
Fall 2020

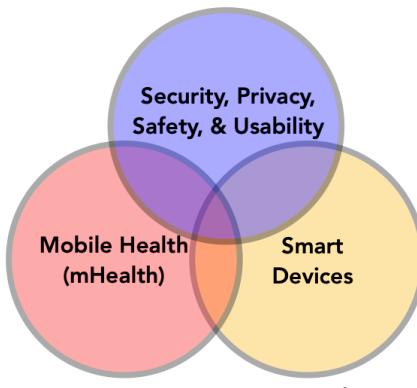
<https://www.cs.montana.edu/cs460>

# Today

- Announcements / Things To Do
  - Check out the course website: <https://www.cs.montana.edu/cs460>  — *github pages*
  - Please fill out the **questionnaire** (see link from course schedule)
- Learning Objectives
  - Figure out *who is this guy...?*
  - Know important stuff and how to find other stuff out
  - Understand what this course is all about and what we'll be doing

# Prof. Travis Peters

Assistant Professor @ Montana State University



email: [travis.peters1@montana.edu](mailto:travis.peters1@montana.edu)

website: <https://www.travispeters.com>

## Research & Teaching

- Systems > Operating Systems, Mobile & Wearable Systems, IoT
- Computer Security > Offensive/Defensive Security; Security by Design; Security Tools
- Wireless Network Security > WPAN, Bluetooth/BLE, Wi-Fi
- Trusted Computing > Trusted Execution Environments (SGX, TrustZone)

## Beyond the prof/researcher/security enthusiast...

- Married (Mary) + Dad (Benjamin, ~8mo.)!
- I do other stuff too...
  - church, reading, running, biking, (amateur) woodworker, netflix, ...
  - currently learning about investing and basic carpentry
- B.S. in Math & CS @ Western Washington University > Bellingham, WA
- Ph.D. in CS @ Dartmouth > Hanover, NH



*NOTE: Mary and I LOVE sharing pictures of Benjamin but we also try to respect Benjamin's personal right to digital privacy. For this reason, we avoid showing his face in public sites and PDFs.*

# Some Names I've Been Called... (*Focus on These*)

- **Dr. Peters**
- **Prof. Peters**
- Mr. Vice President
- Sir
- Dada
- Coach
- Hey You
- Trauis
- Honey
- T\$
- Travy
- T-Bear
- Yo
- Ghost
- Hawk
- Nasty Travis
- **Travis**
- Teach
- Mr. Peters
- Peter
- The Professor
- Larry Bird
- Trevor
- ...

# Course Logistics

- Highlights from the course website...
  - Course Staff
    - Travis Peters (Prof.) – **OPEN** Office Hours (M) 10am, (W) 3pm, (F) 11am + by appointment
    - Reese Pearsall (TA) - Office Hours TBD (~2 hours per week)
  - Discuss admin tools (Website, Zoom, Slack, D2L, Gradescope, ...)
    - Slack: Please use **#classroomchat** to ask questions/have discussions during class
    - Slack: Please update your name/picture
    - Look over FAQs

**NOTE:**

*I will try to post materials in advance. I will always make slides, videos, code, etc. by the end of the class day.*

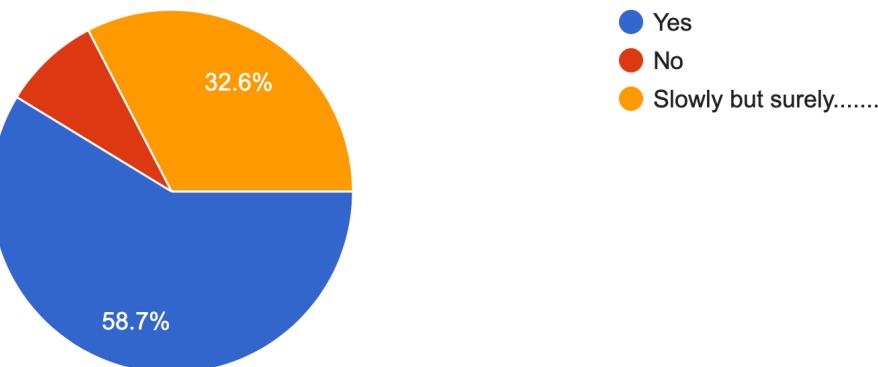
# Course Logistics (cont.)

- Highlights from the course website...
  - What you need to know
    - Basics of a computer system (e.g., bytes, addresses, CPUs, memory, modes of operation, and what assembly language is)
    - C, gdb, make, and basics of the Linux/Unix commandline
    - Experience with large code bases spanning many source files

# Questionnaire – Some Results So Far...

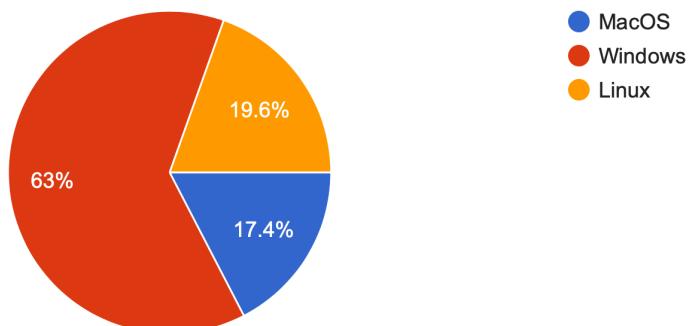
Have you looked over the course website?

46 responses



What type of OS do you primarily use to do your CS work?

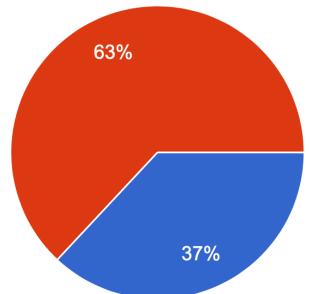
46 responses



# Questionnaire – Some Results So Far...

What is your preferred way to attend class this semester?

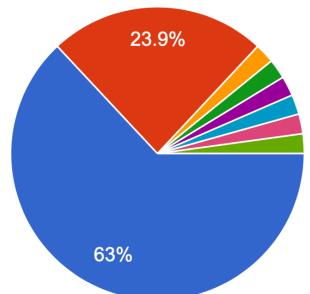
46 responses



- Hybrid Face-to-Face (attend class in-person 1 time per week on a designated day)
- 100% Online (would prefer to never set foot in the physical classroom)

If you are NOT required to attend classes in person, will you choose to not come to class (physically)?

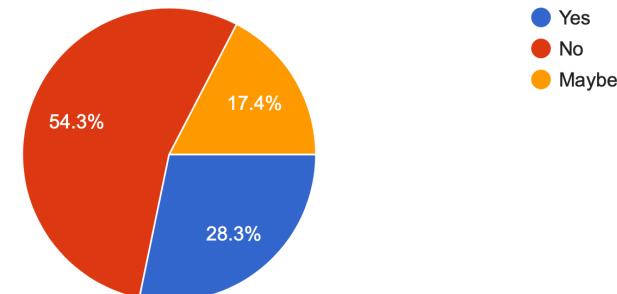
46 responses



- Yes
- No
- I'm waiting to see what happens once everyone is back to school
- Maybe... if I wake up on time
- Depends on Coronavirus levels in the community
- I would like to attend classes in person.
- I'm not a morning person
- I would like the option but need flexibility

If I nor the TA are physically present in our classroom, would you still find it beneficial to attend class in person?

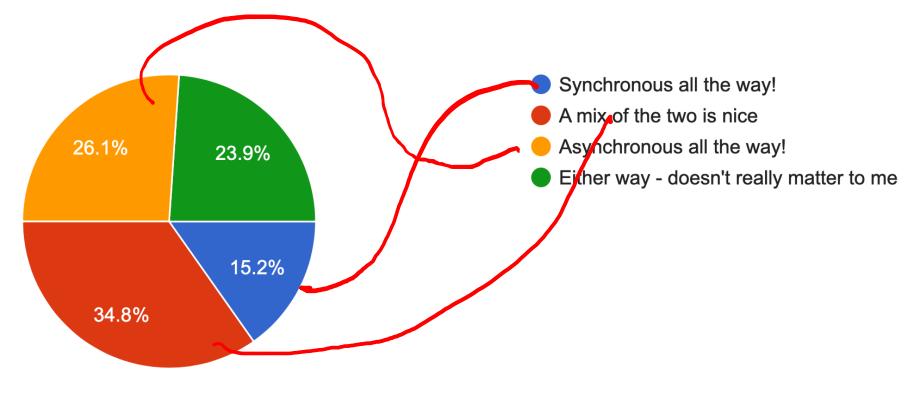
46 responses



- Yes
- No
- Maybe

In your experience so far, do you prefer synchronous or asynchronous classes?

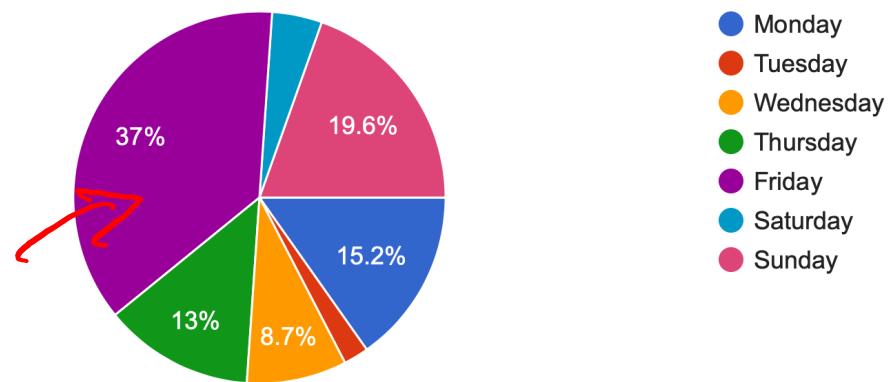
46 responses



# Questionnaire – Some Results So Far...

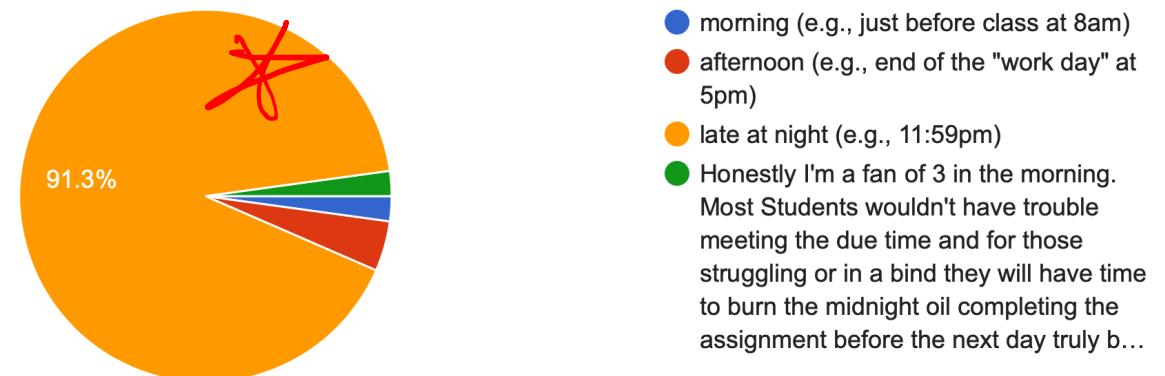
What DAY OF THE WEEK would you prefer to have programming assignments due?

46 responses



What TIME OF DAY would you prefer to have programming assignments due?

46 responses



# What Does “Operating System” Make You Think?

- Examples of an OS?

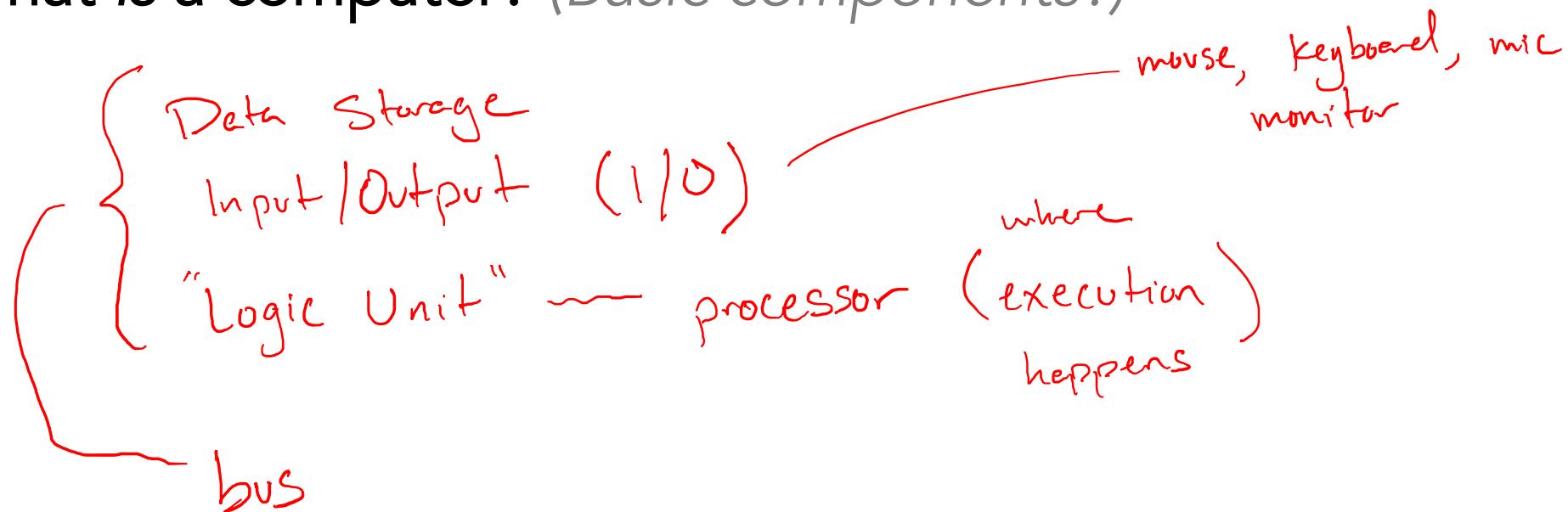
Windows , OSX , Linux , Unix /  
Android , iOS  
distributions  
( Fedora, Ubuntu, -- )

“GNU”

# What Does “Operating System” Make You Think?

- OS has something to do with computers...

What *is* a computer? (Basic components?)



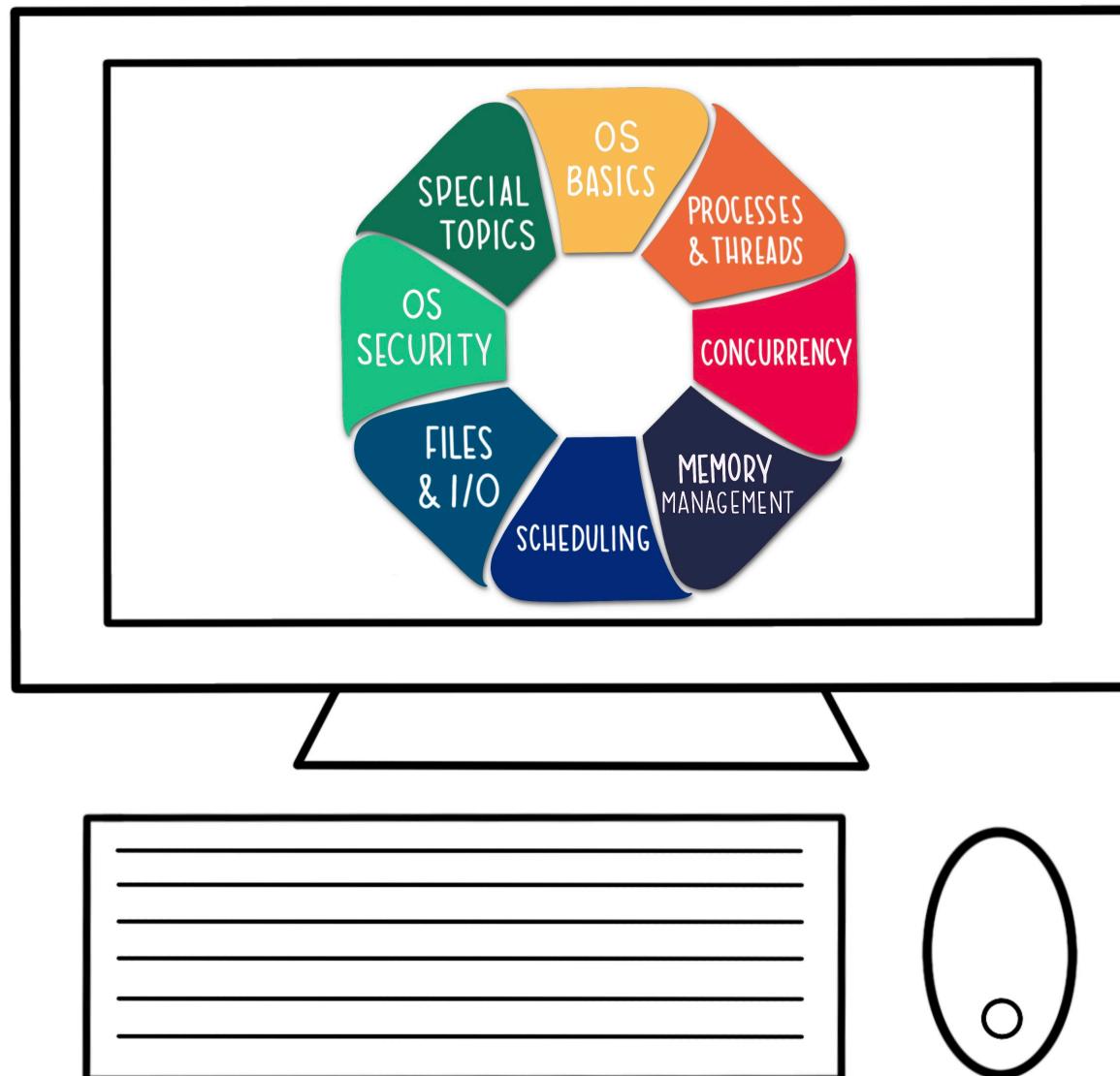
# What Does “Operating System” Make You Think?

- OK... So what is an OS?

# What Does “Operating System” Make You Think?

- Different *types* of systems & OSs?

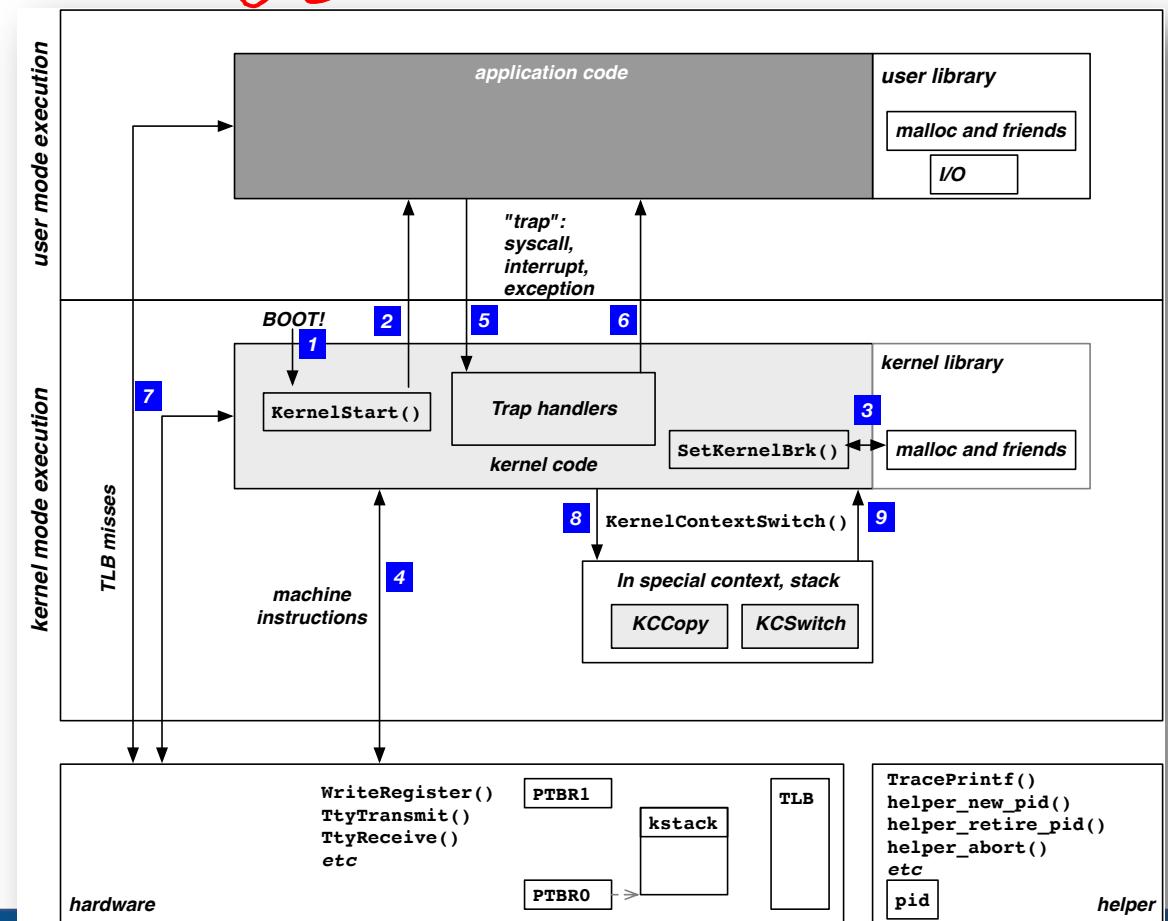
# A Glimpse At Where We Are Going...



# A Glimpse At What You'll Do

(The important part!)

- Yalnix! ( $\approx 6$  checkpoints)
  1. sketch/pseudocode kernel data structures, traps, syscalls, major functions
  2. get yalnix to boot (setup virtual memory + interrupt vector) & run “Idle” process
  3. get a true “Init” process to run
  4. implement fork(), exec(), wait()
  5. implement some I/O
  6. implement remaining syscalls  
(e.g., Process Coordination, I/O, IPC, Synchronization)
  7. extras for grad students?! 😊



**NOTE:** The website and D2L have more information on the actual breakdown.

# A Glimpse At What You'll Do (cont.)

- Early/Solo Programming Assignments (x3)
  - Getting familiar with tools  
(VMs, C programming, Makefiles, GDB, Git, ...)
  - Process management  
(practice with `fork()`, `exec()`, `wait()`, ...)
  - Concurrency  
(practice with synchronization, deadlock avoidance, ...)
- Exams (x2)
  - see also: “*What are exams like in Operating Systems (CSCI 460)?*” in FAQ

*NOTE: The website and D2L have more information on the actual breakdown.*

# Next Time... *(read chapters 1 & 2)*

- Review details of a computer system
  - Processors
  - Memory
  - I/O
  - ...
- 30,000' view of operating systems
  - Processes & Threads & Concurrency
  - Managing Memory
  - Scheduling
  - File Systems & I/O
  - Security
  - ...