Principles of Computer System Design
EEL 5737/EEL 4736   Section CAMP
Class Periods: MWF period 4, 10:40-11:30
Location: Online
Academic Term: Fall 2020

Instructor:
Renato Figueiredo
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(352) 392-6430
Office Hours: Available from instructor's web site, http://byron.acis.ufl.edu

Course Description
This class provides a broad introduction to the main principles and abstractions for engineering hardware and software systems, and in-depth studies of their use on computer systems across a variety of designs, be it in operating system, a client/server application, a database server, or a fault-tolerant disk cluster. This is a 3-credit course.

Course Pre-Requisites / Co-Requisites
Digital design (EEL4712 or equivalent); introduction to programming or data structures/algorithms (EEL4834 or equivalent), or instructor approval. Programming in a high-level language

Course Objectives
The design of hardware and software in computer systems ranging from personal devices to large-scale distributed, networked computers is an increasingly complex undertaking and requires understanding not only of individual sub-systems, such as the micro-processor, but also the interactions among sub-systems. This class provides a broad introduction to the main principles and abstractions for engineering computer systems, and in-depth studies of their use on computer systems across a variety of designs, be it an operating system, a client/server application, a database server, or a fault-tolerant disk cluster.

Design/programming assignments and a project will be assigned in this class. These entail an exploration of a topic related to the design of a computer system through implementation of a prototype. The assignments and project will require significant software programming using the Python high-level language.

Required Textbooks and Software
- Title: "Principles of Computer System Design"
- Author: Jerome E. Saltzer and M. Frans Kaashoek
- Publication date and edition: Morgan Kaufmann, first edition, 2009
- ISBN number: 9180123749574

Student personal computers will be used in assignments. Students will be expected to use open-source Python development environment, either natively on their computers, or within a virtual machine (VM) with the Linux operating system

Course Schedule
Week 1:   Systems and complexity, fundamental abstractions, naming introduction/Chapters 1, 2
Week 2:   Names and layers, Unix file system case study/Chapter 2/Quiz #1
Week 3:   Client/service modularity, NFS case study/Chapter 4
Week 4:   Virtualization abstractions, virtual links/Chapter 5/Quiz #2
Week 5:   Memory modularity, virtual memory/Chapter 5/Quiz #3
Week 6:   Virtual processor threads/Chapter 5/Exam #1
Week 7:   Designing for performance, scheduling/Chapter 6/Quiz #4
Week 8:   Network properties, network layers/Chapter 7/Quiz #5

Week 9:   Network case studies, fault tolerance/Chapters 7, 8/Quiz #6
Week 10:   Redundancy/Chapter 8/Quiz #7
Week 11:   Atomicity/Chapter 9/Exam #2
Week 12:   Atomicity, logs/Chapter 9
Week 13:   Class project review and discussion
Week 14:   Logs, atomicity locks/Chapter 9/Quiz #8
Week 15:   Transactional memory, course review for final exam/Chapters 2, 4, 5, 6, 7, 8, 9

Online Course Recording
Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Attendance Policy, Class Expectations, and Make-Up Policy

This class will be presented online using Zoom and requires access to a working webcam and stable internet connection. I prefer that students keep their camera on during the class so that I can see you as I would during normal face-to-face classes. Studies show that if we can see each other's faces then we will have more engagement, more student success, and more faculty success. However, this is not a requirement. I understand if on certain days you can't have your camera on due to internet bandwidth limitations, other family members, health issues, or any other reasons.

Excused absences must be in compliance with university policies in the Graduate Catalog (http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance) and require appropriate documentation.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Quizzes (8)	100 each	10%
Design assignments (4)	100 each	30%
Midterm Exams (2)	100 each	40%
Final Exam	100	20%
		100%

Grading Policy
Letter grades will be assigned based on the distribution curve of final numeric grades of the class.

More information on UF grading policy may be found at:
http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades

Students Requiring Accommodations
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is

important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Graduate Program Coordinator
• Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*: https://care.dso.ufl.edu.

On-Line Students Complaints*: http://www.distance.ufl.edu/student-complaint-process.