CPS 4200-03/Spring 2021　　　Systems Programming　　　Dr. Huang

Instructor: Dr. Ching-yu (Austin) Huang
Email: chuang@kean.edu　　　　　　　　　**Website**: http://www.kean.edu/~chuang
Office Hours: https://huang.youcanbook.me/ Tuesday - Thursday: 9:30 – 10:30 am; 3:30 – 4:30 pm
Class: 01 section: **Tue**, **Thurs** (**2:00 - 3:15 pm**), synchronized ONLINE using Blackboard Live Session
Prerequisites: **CPS 3250**　　　**Students without prerequisite(s) must withdraw from the class.**

Unit	Date		Topic	Reading	Assignment	
1	1/19/2021	Tue	Overview class policy and OS, eve account		**Test eve**	1
	1/21/2021	Thur	OS, Unix commands, basic C, size, debugger	Molay Ch 1	**Familiar with vi**	2
2	1/26/2021	Tue	C – function, pointer, address, array		**HW1 start**	3
	1/28/2021	Thur	C – function, arguments			4
3	2/2/2021	Tue	Users, Files, Manual, time, C – file I/O, struct	Molay Ch 2		5
	2/4/2021	Thur	Continue, exercises in C			6
4	2/9/2021	Tue	Directory and file property	Molay Ch 3		7
	2/11/2021	Thur	Continue, exercises in C, midterm 1 coverage			8
5	2/16/2021	Tue	**Midterm 1**		**Midterm 1**	9
	2/18/2021	Thur	Review mid 1 answers, Project assignment, system and design spec.	Simulation	**HW1 due,** Project start	10
6	2/23/2021	Tue	File Systems I , C – call by address, reference	Molay Ch 4	**HW2 start**	11
	2/25/2021	Thur	Continue, exercises in C			12
7	3/2/2021	Tue	File Systems II, device I/O, exercises in C	Molay Ch 4		13
	3/4/2021	Thur	Connection Control, stty, exercises in C	Molay Ch 5		14
8	3/9/2021	Tue	Continue, exercises in C			15
	3/11/2021	Thur	Terminal Control Signal, C – signal	Molay Ch 6		16
9	3/16/2021	Tue	Continue, exercises in C, midterm 2 coverage			17
	3/18/2021	Thur	**Midterm 2**		**Midterm 2,** HW2 due	18
10	3/23/2021	Tue	Review mid 2 answers, Event-Driven Programming I, C – standard I/O	Molay Ch 7	**HW3 start**	19
	3/25/2021	Thur	Event-Driven Programming II, exercises in C	Molay Ch 7		20
11	3/30/2021	Tue	Processes and Programs, exercises in C	Molay Ch 8		21
	4/1/2021	Thur	**Last day to withdraw with 'W' grade**		**0% refund**	
	4/1/2021	Thur	Threads: Concurrent, exercises in C	Molay Ch 14		22
12	4/6/2021	Tue	Servers and Sockets, exercises in C	Molay Ch 11		23
	4/8/2021	Thur	Continue, exercises in C			24
13	4/13/2021	Tue	Memory Management, C – dynamic memory			25
	4/15/2021	Thur	Continue, exercises in C		**HW3 due 4/17**	26
14	4/20/2021	Tue	Review final exam coverage, exercises		**No late submission!!**	27
	4/22/2021	Thur	**Final exam**		**Final**	28
15	4/27/2021	Tue	**School follows Friday schedule**		**No class**	
	4/29/2021	Thur	**Project presentation, review final exam answers**		Project due	29
16	5/4/2021	Tue	**Project presentation**			30

Late revision: 12/31/2020

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- **Content**: Investigation of applied systems level programming as it relates to operating system services and application interface programming. Topics will include: operating system service calls, file I/O, directory structure, memory management, process control, tasks, threads, concurrency, parallelism event driven programming, inter-process communication, sockets, servers and network protocols.
- **Textbook**: Stevens, R., Rago S., <u>Advanced Programming in the Unix Environment. 3rd Edition.</u> Addison-Wesley Professional, 2013. **ISBN-13 :** 978-0321637734.
- **Objectives**: Upon completion of this course, students will be able to:
  - A. Explain operating system services available to systems programmers.
  - B. Design and code systems programs to create, manage and synchronize programs, tasks, threads and processes.
  - C. Utilize operating system services to access and manage I/O devices, files and directories.
  - D. Implement systems programs to control memory management.
  - E. Utilize protocols and interfaces to communicate across computer systems.
- **Course grading**: **2** Midterm (2x 180 pts), Final (180 pts), **3** homework (3x100 pts), **1** project (160 pts)

Class Policies:

- **This is a hands-on course. Students are required to bring personal laptop every class.**
- Instructional Methods: lecture with slides, student presentations, class discussions and exercises, and project creations.
- **A**: >=940, **A-**: 939-890, **B+**: 889-840, **B**: 839-800, **B-**: 799-760, **C+**: 759-720, **C**: 719-680, **D**: 679-640, **F**: below 640 (C or better is needed for CS and IT majors.)
- It is students' responsibilities to verify all the scores posted on **the class website** that is announced on the first day of the class.
- **Assignments should be based on the school Linux server that is announced on the first day of the class.**
- Mid-Term Progress information will be provided to students by the instructor via KeanWise.
- <u>No late work</u> will be accepted without permission in advance from the instructor. Late work is penalized.
- <u>No make-up exams</u> are provided without documentation of medical or family emergency. Please arrange your schedule for the next 16 weeks to arrive in class on time and prepared.
- Attendance and participation are required.
- <u>All work turned in under your name must be your own.</u> **No credit will be given for an assignment or homework that is copied – in part or in total – from another person**.
- <u>Exam policy</u>: During class examinations, if a student leaves the classroom for any reason during the exam time, **the exam must be turned in before the student departs, concluding the exam for that student**. The student cannot resume the exam on return later. You may not make or take a phone call, text or access the internet during class or a test.
- **Classes may not be audio or digitally captured**, unless permission has been granted by the instructor for that specific class.
- **Public posting of course materials from this class is prohibited**. Materials presented in the classroom are for the personal use of registered students during the semester only. Homework, programs, and other classwork should not be shared, distributed or publicized in any way, for the protection of other students and in respect of the intellectual property rights of the faculty and copyright owners.

Important University Policies and Information:

- The Kean Academic **Calendar** can be found online at https://www.kean.edu/offices/registrars-office/academic-calendar
- **Tutoring and learning Support services**: http://www.kean.edu/content/tutoring-services
- Students should review the **Student Code of Conduct**, as it discusses expectations of appropriate conduct in the classroom: https://www.kean.edu/KU/Code-of-Conduct
- Students are responsible to review and understand the University Academic Integrity Policy available via the following link: https://www.kean.edu/academic-integrity
- Read Kean **Students Rights and Responsibilities** at https://www.kean.edu/offices/disability-services/rights-and-responsibilities
- Register for the university's **emergency notification system** at https://www.kean.edu/offices/university-police-0/campus-alert
- Students must have a **valid Kean email account**. You can request one at https://www.kean.edu/~ocisweb/forms.htm
- **Title IX**: Title IX of the Education Amendments of 1972 (Title IX) prohibit discrimination on the basis of sex in education programs or activities. Sexual harassment in any form will not be tolerated at Kean University. Sexual harassment by students should be reported to the Office of Affirmative Action Programs, Office of the Vice President for Student Affairs or the Office of Community Standards and Student Conduct immediately. Information about the University's Sexual Misconduct Policy may be found at the following: https://www.kean.edu/offices/policies/sexual-misconduct-policy
- **Americans with Disabilities Statement & Non-Discrimination Statement:**
  Kean University is an affirmative action, equal opportunity institution. Students with documented disabilities who may need special instructional accommodations or who may need special arrangements in the event of an evacuation should notify the instructor as soon as possible, no later than the second week of the term. Students may contact the Office of Disability Services in Downs Hall Room 122 or call 908-737-4910 to discuss special needs.
- **Kean University Non-Discrimination Policy Statement:**
  Kean University is an affirmative action, equal opportunity institution.

Syllabus Updates: **Instructor reserve the right to change the syllabus at any time throughout the semester**. All changes will be announced in class and a new syllabus will be electronically available to all students. If you are enrolled in this class past the add/drop date you are subjected to all rules in this syllabus.