SER334: Operating Systems and Networks Syllabus

Catalog Description

Fundamentals of operating systems: run-time environments, process management, scheduling, synchronization techniques, memory management, and file management. Introduces programming concepts and tools for developing operating system modules, system utilities, and low-level applications in POSIX environments.

General Information:

Instructor	Vijay Suthar, vsuthar1@asu.edu
Office Hours	Ground: Poly Campus, Peralta Hall 230X online: https://asu.zoom.us/j/9693646805 M, W 2-4 pm Arizona Time, or by appointment. In order to avoid double-booking, I request that you please send me a quick e-mail (when possible) letting me know when you plan to come to office hours.
Class Meeting Time	Online
Class Website	Canvas, GitHub, YouTube
Communication	Synchronous hours same as office hours. Use slack for asynchronous communication in the appropriate channel. Please allow generally 24 business hours for any response.
Final Exam Date	Last day of classes session B, Fri Dec 6, 2019
Course Coorindator	The base course shell was developed by Ruben Acuña, faculty lecturer. Regardless, **ALL** questions regarding course material and grading **MUST** be directed to the **instructor** for your section of the course. Email: racuna1@asu.edu, (email preferred) , Peralta 230Q. Online: https://zoom.us/my/acuna

Course Outcomes:

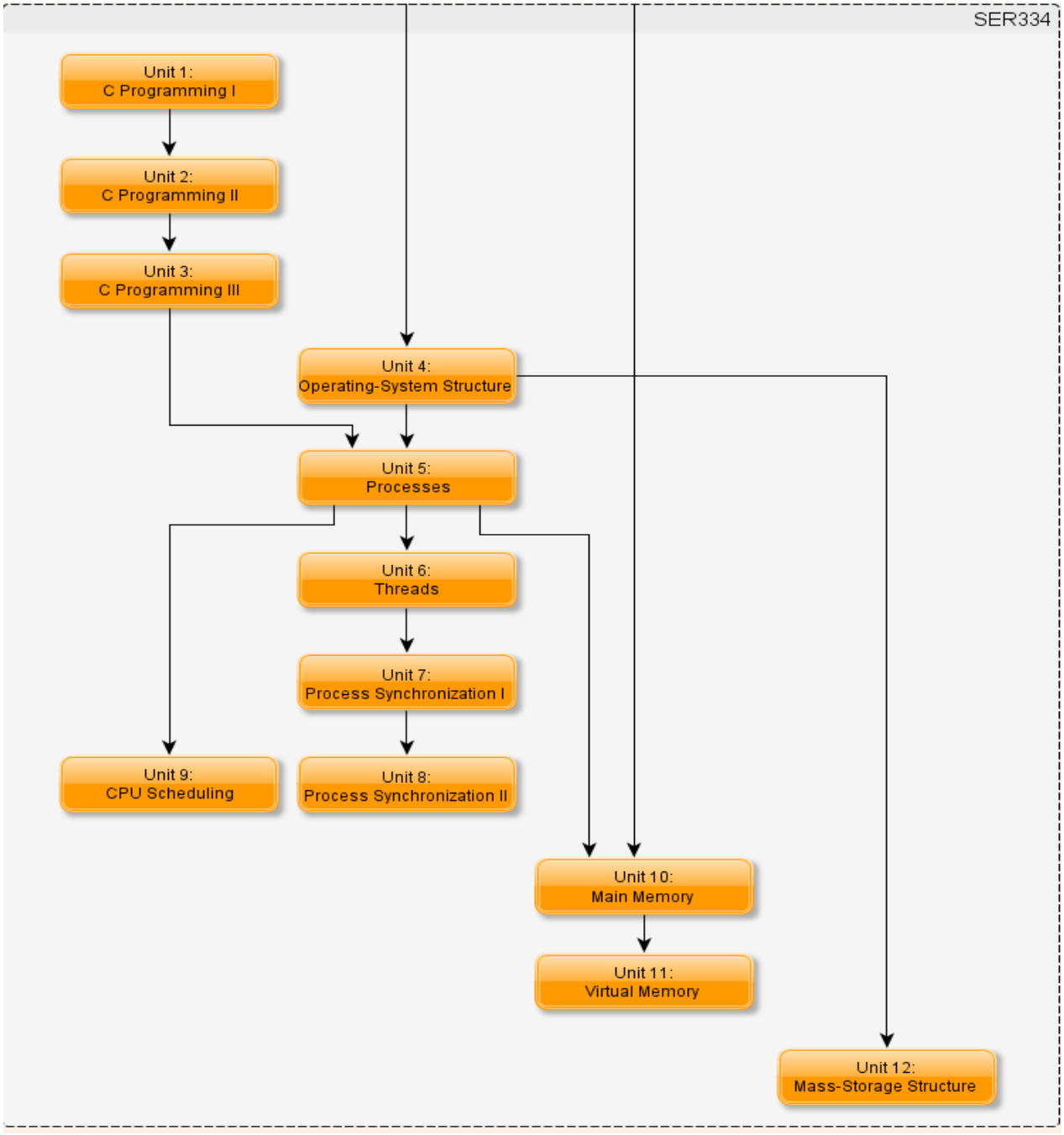
The outcomes of this course are the following:

	Course Outcome	**Program Outcome**
CO-1	Construct programs such as operating system modules, system utilities, and low-level applications which use POSIX libraries such as threading and file management.	PO-SER1
CO-2	Describe and distinguish operating system concepts in run-time environments, process management, scheduling, synchronization techniques, memory management, and file management.	PO1
CO-3	Describe and simulate algorithms and mechanisms in operating systems including processor schedulers, synchronization tools, memory allocation, and disk scheduling.	PO1
CO-4	Analyze operating system design problems, design a solution, and articulate justification for their solution.	PO1

Course Structure:

The material in this course is separated into modules. Most modules correspond to one chapter from the textbook. Each week typically covers two modules. Each module is comprised of instruction (videos, sample problems), followed by an exercise (to cement the concepts), and a homework assignment (to really practice). Most assignments are programming. **You are expected to engage with course using the following flow: Instruction → Exercise → Homework.**

Time to complete a module varies, but it is typically nine hours to complete instruction, exercise, and homework. Modules without a programming assignment will take considerably less time because programming is intensive. You are encouraged to do load balancing between the modules that require lots of time, and those that require less.



Course Materials:

Readings: The required text is: A. Silberschatz, P. B. Galvin, G. Gagne, *Operating System Concepts*, 9th edition, Wiley, 2013 – ISBN number – 9780470917732 – get the latest HARD COPY edition. A used copy of the text is acceptable. A physical copy of the book is strongly recommended - **you will be allowed to use it on exams** (**electronic copies will not be permitted**).

Other:

Communication: This class uses a communication tool called Slack to manage course communications. Please make Slack the first place you look for new information regarding the course. It is expected you will check Slack at least once

every day, as will the instructional staff each evening. Do NOT expect that we will be on Slack at other times, though we may occasionally pop-in to provide help and see how you are doing. Staff will be accessible synchronously on Slack as stated on the Contact Information page in Canvas. In general, office hours will be offered simultaneously face to face, and on Slack. During office hours, students across all communication platforms will be assisted in FIFO order.

- **Canvas Note: do not use the comment feature on any submission (e.g., short answer or programming), we do not use it because Canvas does not have a way to track what has been answered.**

Prerequisites:

- SER222: Core Data Structures with OOP (corequisite; C or better if completed)
- SER250 (or CSE230): Microcomputer Architecture and Programming (with C or better)

It is your responsibility to know the background material defined by the outcomes of these courses. If you did not take these courses recently (as defined by the SE major map), or you did not do well when you took them, you will need to spend time to review the material.

Please review ASU's Academic Calendar (https://students.asu.edu/academic-calendar) for details on important Registrar dates such as: adding/dropping/withdrawing from courses, etc.

You are required to complete the Academic Integrity Agreement quiz on Canvas by the due date or you may be dropped from the course at the instructor's discretion.

Late Homework Policy: All homework is due at 11:59:00pm (Arizona Time). ***Late submissions are not accepted, except as defined under Late Pass below.*** Students choosing to submit on the final day of the deadline are fully responsible for any technical issues (including but not limited to: computer, internet, Canvas) that occur. Late submissions are not given for technical issues. Students are encouraged to submit homework several days in advance of any deadline. Extensions are permitted only when there is a significant, and documented, event (e.g., illness or personal emergency) that prevents the student from completing the assignment. A notice must be submitted to the instructor before the due date or as soon as circumstances allow. Evidence will also be requested in such cases.

Late Pass: A late pass grants an extension of exactly 24 hours to a module's homework. You have ONE (1) late pass that you may use during the semester. To use a late pass, contact a member of the instructional staff via email within 12 hours of the original deadline. They will update Canvas to reflect your personal extension. Due to logistics, the late pass may NOT be applied to homework for Module 12.

Grading:

Performance will be assessed by homework, exercises, and three exams. Their weights are:

	Exercise	HW: Program	HW: A&D	Exam
Unit 0: Introduction	10			
Unit 1: C Programming I	12	30		
Unit 2: C Programming II	12	36		
Unit 3: C Programming III	12	36		
Unit 4: Operating-System Structures	12			
Exam 1				160
Unit 5: Processes	12	36		
Unit 6: Threads	12	40		
Unit 7: Process Synchronization I	12		40	
Unit 8: Process Synchronization II	12	36		
Exam 2				160

Unit 9: CPU Scheduling	12	36		
Unit 10: Main Memory	12			
Unit 11: Virtual Memory	12		40	
Unit 12: Mass-Storage Structure	12	36		
Exam 3				160
Subtotal:	154+**EC**	286	80	480
% of grade	*18%*	*29%*	*8%*	*48%*
Total: 1000 + (EC)				

EC – you will note online that some exercises are worth a bit more and those are the extra credit point possible.

The final letter grade will be determined according to the points obtained as follows:

E	D	C	C+	B-	B	B+	A-	A	A+
0-599	600-699	700-769	770-799	800-829	830-869	870-899	900-929	930-969	970-1000

Homework Drops: No homework will be dropped.

Extra Credit: The course includes an extra exercise (14 points) as part of the standard course schedule. Any points earned will be directly added to your score. These extra points serve either as a way to increase your overall course grade, or they enable skipping an exercise.

Exercise Policies: Exercises should be completed as you finish the instruction in the course. They have a relatively low weight and are graded more leniently so they can be used to develop your skills without worrying too much about your final grade. Do not treat them as simply "more homework", but as an opportunity to try applying concepts before doing a heavily weighted homework, and receive quick feedback in terms of a solution. Assuming you paid attention during video, exercises will **not** take more than 75 minutes to complete. **No exercise questions require a compiler or doing online research** - in fact, doing either of those things will hinder your learning experiences. You should figure out things on your own, or by asking us questions to steer you in the right direction. Exercises are graded with higher level of granularity than homework. For each question:

- 0% points for did not attempt or extremely low effort (e.g., clearly didn't pay attention in lecture, irrelevant answers, copy/paste text from any source (with attribution), etc.)
- 50% points if answer is good try but not correct or complete
- 100% point if answer is correct or very nearly correct.

Programming Homework Policies: Read the PDF file on the Homework page on Canvas for specifics on what your programming submissions should look like. In addition:

- Double check your submissions to ensure they contain source files (e.g., .java, .c) and that every file requested is attached. Your submission file(s) will be put in a folder with the base files attached to the assignment - there is no need to resubmit them.
- Do not use the "submission comment" feature when submitting source file. If you have any remarks about the homework, send the instructor an email or put them in your source code.
- You are allowed unlimited submissions, **only the newest submission will be graded.** If you try to view the homework after submitting it from the Homework page rather than My Grades, you may cause a new submission to be made. This will override your proper submission! ***No late submissions are accepted.***

Standard programming deductions (see HW standards PDF on Canvas):

- If your program fails to compile out-of-the-box, we will deduct 20% from the graded total.

- If you do not follow the file submission standards (e.g., the submission contains project files, lacks a proper header), we will deduct 10% off of the graded total.

Grade Appeals:

Students may appeal a scored assessment within one week of the grade's posting online, or by the deadline specified by the grade release announcement, whichever is sooner. Appeals are in email form only (no Canvas nor Slack messages) and must point to specific evidence of why the grade should be revised. Arbitrary "please regrade because I want a higher score" or similar queries will be discarded without a response. The instructor reserves the right to assign a lower score on appeal. For additional information on ASU's grade appeal policy, see https://catalog.asu.edu/appeal.

Absence & Make-Up Policies:

Students unable to take exams, or complete assignments due to a medical condition must present a doctor's signed excuse and notify the instructor as soon as the condition affects the student's work.

Accommodations will be made for religious observances provided that students *notify the instructor at the beginning of the semester concerning those dates*. Students who expect to miss class due to officially university-sanctioned activities should *inform the instructor early in the semester*. Alternative arrangements will generally be made for any examinations and other graded in-class work affected by such absences. Please see ACD 304–04, "Accommodation for Religious Practices" and ACD 304–02, "Missed Classes Due to University-Sanctioned Activities" for more information.

Per SSM 201-02, an instructor may drop a face to face student for nonattendance during the first week of the semester. For an online course, a drop may be initiated for students who do not log into the course shell during the first week.

Classroom Behavior:

Students are expected to participate in the educational process and not be a disruptive element with regard to the learning of others. Safety, self-discipline and respect for others are necessary elements in the educational processes employed in this course. All students should be familiar with the Student Code of Conduct, which can be found at http://www.asu.edu/studentlife/judicial/ .

Academic Integrity and Copyright Laws:

Academic Integrity

Students in this class must adhere to ASU's academic integrity policy, which can be found at https://provost.asu.edu/academic-integrity/policy). Students are responsible for reviewing this policy and understanding each of the areas in which academic dishonesty can occur. In addition, all engineering students are expected to adhere to both the ASU Academic Integrity Honor Code and the Fulton Schools of Engineering Honor Code. All academic integrity violations will be reported to the Fulton Schools of Engineering Academic Integrity Office (AIO). The AIO maintains record of all violations and has access to academic integrity violations committed in all other ASU college/schools.

Specific academic integrity rules for this class are: The Student Academic Integrity Policy of Arizona State University requires each student to act with honesty and integrity and to respect the rights of others in carrying out all academic assignments. There are a number of actions that constitute a violation of the policy. These actions in this course include, but are not limited to:

1) practicing any form of academic deceit;
2) referring to materials or sources or employing devices (e.g., audio recorders, crib sheets, calculators, solution manuals, or commercial research services) not specifically authorized by the instructor for use during tests, quizzes, homework, and class activities;
3) acting as a substitute for another person in any academic evaluation or using a substitute in any academic evaluation;
4) possessing, buying, selling, or otherwise obtaining or using, without appropriate authorization, a copy of any materials intended to be used for academic evaluation in advance of its administration;
5) depending on the aid of others to the extent that the work is not representative of the student's abilities, knowing or having good reason to believe that this aid is not authorized by the instructor;
6) providing inappropriate aid to another person, knowing or having good reason to believe the aid is not authorized by the instructor;
7) submitting the ideas or work of another person or persons without customary and proper acknowledgment of sources (i.e., engaging in plagiarism);

8) permitting one's own ideas or work to be submitted by another person without the instructor's authorization; or attempting to influence or change any academic evaluation or record for reasons having no relevance to class achievement.
9) turning in work/code done by someone else or another pair/group
10) copying work/code done by someone else or another pair/group
11) writing code together with someone else or with another pair/group (unless expressly allowed by the instructor)

A common question in programming courses is the use of code that is "googled" or found on popular sites such as StackOverflow. Items 5 and 7 pertain to this situation. Most programmers use reference examples, found in print or online. This is fine as a practice but is not acceptable in situations where you are using code to proxy your understanding of the coding concepts applied in that assessment (i.e. lab or in-class activity). First, if you are uncertain if it is allowable or not, verify directly with the instructor before submitting the assignment. Second, if it is allowable, you are still required to a) adhere to all originating author's constraints on the use and licensing of the code, and b) provide proper attribution (full URL to the code snippet or bibliographic reference to a print item). Failure to do so constitutes a violation of this Academic Integrity Policy.

Students may be allowed to work in small teams on lab and in-class assessments. You are to work with your partners and only your partners as directed by the instructor; receiving assistance from anyone else other than your partners, the graders, teaching assistants, approved tutors or the instructor is considered a violation of this Academic Integrity Policy. Further, on any paired/group assessments you remain individually responsible for the entire solution – you must understand it fully, and there will be no differentiated grades awarded between the individuals in the pair/group. From an ethics standpoint, you have a professional responsibility to your partner to give your best effort on each programming assignment. Failure to do so will be considered an ethics violation.

The penalty for an Academic Integrity Violation (cheating) on an in-class assessment or lab will be a reduction of a course letter grade for the first offense, and failure of the course for a second offense. The penalty for an Academic Integrity Violation (cheating) on an exam is immediate failure of the course. The penalty for an ethics violation will be a zero for the in-class assessment or lab. All violations will be referred to the Dean's Office of the Ira A. Fulton Schools of Engineering.

Students should not release (to GitHub, friends, etc.) any of their completed assignments, in order to ensure that they do not cause an AIP violation during a future semester. If a student in a later class submits your work, you and they will be held accountable.

Copyright

Course content, including lectures, are copyrighted materials and students may not share outside the class, upload to online websites not approved by the instructor, sell, or distribute course content or notes taken during the conduct of the course (see ACD 304–06, "Commercial Note Taking Services" and ABOR Policy 5-308 F.14 for more information).

You may not post any course material (including but not limited to slides, exercises, and assignments), even excerpts, to an external site without the instructor's written permission. If this occurs, you may be penalized for Academic Dishonesty or IP infringement.

You must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum, material that is not the student's original work, unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on the grounds of suspected copyright infringement.

Policy against threatening behavior, per the Student Services Manual, SSM 104–02:

Students, faculty, staff, and other individuals do not have an unqualified right of access to university grounds, property, or services. Interfering with the peaceful conduct of university-related business or activities or remaining on campus grounds after a request to leave may be considered a crime. All incidents and allegations of violent or threatening conduct by an ASU student (whether on- or off-campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students.

Warning of Offensive Class Materials

Some content in this course may be deemed offensive by some students. If you find any material objectionable you may consult with the instructor or your Program Chair to identify appropriate accommodations.

Disability Accommodations:

Suitable accommodations will be made for students having disabilities. Students needing accommodations must register with the ASU disabilities resource Center and provide documentation of that registration to the instructor. Students should communicate the need for an accommodation in sufficient time for it to be properly arranged.

Harassment and Sexual Discrimination:

Arizona State University is committed to providing an environment free of discrimination, harassment, or retaliation for the entire university community, including all students, faculty members, staff employees, and guests. ASU expressly prohibits discrimination, harassment, and retaliation by employees, students, contractors, or agents of the university based on any protected status: race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information.

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at https://sexualviolenceprevention.asu.edu/faqs.

Mandated sexual harassment reporter: As an employee of the University I am considered a mandated reporter and therefore obligated to report any information regarding alleged acts of sexual discrimination that I am informed of or have a reasonable basis to believe occurred.

ASU Counseling Services, https://eoss.asu.edu/counseling, is available if you wish to discuss any concerns confidentially and privately.

Change Notice:

Any information in this syllabus may be subject to change with reasonable advance notice.