California State University, Sacramento
College of Engineering and Computer Science

Computer Science 60:
Introduction to System Programming in UNIX.

Spring 2023 Syllabus. Last update, 1/19/2023 8:40am

Instructor and Contact Information

Ms. Ruthann Biel, M.S. in Computer Science, Sac State.

E-Mail	bielra@gmail.com, bielr@csus.edu *(The csus email is forwarded to the gmail acct.)*
Home Phone	(916) 381-4205 (landline)
Office	RVR-5015 (leave elevator, turn left, just around the corner)
Office Hours:	MTWTh 10:30 - 11:30am. (By appt. during Finals week.)
Zoom Link by Appointment	My personal Zoom Link
Computer Science office	RVR-3018 For advising: Link to CSC Dept Advising PS: I am not an advisor.

My Class Times:

CSC60-01	32426	Brighton Hall - 110	M-W	9:00am - 10:15am
CSC60-04	3548	Riverside Hall - 1002	M-W	12:00 pm - 1:15 pm
CSC60-05	32592	Riverside Hall - 5029	T-Th	9:00am - 10:15am
CSC60-03	32711	Riverside Hall - 1008	T-Th	12:00pm - 1:15 pm

The Final Exam Times: Final Exam Schedule

Then click on 2022-2023 Final Exam Schedule

CSC60, Sec 1	Wed. May 17	8:00am – 10:00am
CSC60, Sec 4	Wed. May 17	10:15am – 12:15pm
CSC60, Sec 5	Tues. May 16	10:15am – 12:15pm
CSC60, Sec 3	Tues. May 16	12:45pm – 2:45pm

DATES FOR THIS SEMESTER. Link to Academic Calendar Spring 2023

Jan 23	Instruction begins
Sept. 5	Monday. Labor Day. Campus is closed.
Jan 23-Feb 3	Spring 2023 Late Registration & Change of Schedule done by electronic form via OnBase
Feb 4-17	Spring 2023 Late Registration & Change of Schedule completed by petition at departments.
Feb 17	**Census Date**. Last day to drop without it showing on transcript
Mar 20-26	Spring Recess
Mar 31	Cesar Chavez Birthday. **Holiday.** Campus Closed.
April 21	**Last day to withdraw or drop courses**
May 12	Last Day of Instruction
May 15-19	Finals Week
May 19-21	Commencement
May 24	Grades Due

TEXTBOOK & COURSE MATERIALS

- All books are available in PDF on Canvas.
- **Required Textbook**: The Linux Programming Interface: A Linux and UNIX System Programming Handbook, by Michael Kerrisk.
- **Recommended Text: by** Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language (ANSI C), Second Edition, Pearson/Prentice Hall, 1988.
- **Recommended Text:** John Shapley Gray, Interprocess Communication in Linux: Nooks & Crannies, 2008. (Optional but great for the devoted. Not in bookstore.)

GENERAL: SOFTWARE & HARDWARE

We will do class/lab work using an open-source free compiler in a LINIX environment. We also will be able to log into campus from home to do class work.

COURSE DESCRIPTION

Prerequisite: Required satisfactory completion of CSC 20 **and** CSC 35 or their equivalents.

Features of the C language commonly used in systems programming, application to systems programming in a UNIX environment. Topics include C preprocessor macros, I/O, bit-manipulation facilities, timesharing system concepts, file permissions, shell script programming, make files and source code control, basic system calls like fork and exec, pointers and dynamic memory allocation, libraries and relocation and linking concepts including assembler handling of symbol tables. Prior knowledge of a C like programming language is presumed.

TOPIC OUTLINE/SCHEDULE

Brief List of Topics:
1. UNIX file system
2. C functions, variables, operators, and expressions
3. Pointers.
4. Standard IO and system-level IO, string handling
5. Dynamic memory management.
6. C preprocessor.
7. Make facility.
8. Static and Dynamic libraries
9. System calls, error handling and recovery.
10. Debugger.
11. Source code control.
12. Signals.
13. Multiprogramming in UNIX, process creation and termination.
14. Pipes.
15. Message queues.
16. Semaphores.
17. Shared memory.
18. Sockets.
19. Remote procedure calls.
20. POSIX threads.

TOPICS COVERED

Students completing this course will be able to
1. Write well-structured, procedurally oriented programs in C,
2. Use a multi-user, time-sharing operating system – Linux
3. Write systems programs in the Linux environment.
4. Understand principles of concurrency
5. Demonstrate the ability to develop a Linux mini-shell application
6. Understand and apply synchronization mechanisms to the critical section problem

Course Requirements: Internet connection (DSL, LAN, or cable connection)

HOW TO DO WELL IN THIS CLASS

- Attend class !!!!!!!!
- I use slides to cover the material, but I say more than is on the slides.
- After class, go over the slides again, and come back with questions if you have them.
- Do the homework!!!!!!
- Keep up with the reading list at the end of the syllabus.
- Do not be afraid to ask questions, either in class, or during office hours.
- If you are struggling with a topic, take steps early to address the problem. Visit the instructor, the free tutoring, or other help.

ATTENDANCE

You must take the mid-term and the final at the scheduled time unless you have a good reason. If you cannot attend the mid-term or the final for any reason, you are expected to arrange with me **in advance**. Either:

- Discuss your situation with me.
- Call me at home (916-381-4205)
- Send me email at bielra@gmail.com or bielr@csus.edu

Class attendance will be considered in your grade.
If you miss a class, you are responsible for knowing all the material that has been covered in class. (Check the Weekly Summaries on Canvas). In addition, you are responsible for knowing any important information announced in class; such information includes (but is not confined to) the date of the mid-term, what material will be covered on the mid-term and on the final exam. In short, absence from class is no excuse for failure to know any material or for not knowing when a mid-term is given. I will post test dates and other material on Canvas.
If you notify me of illness, especially of Covid-19, I will show great flexibility in dealing with you.

LATE ASSIGNMENTS

You will receive a due date for each assignment. There will be a list of dates indicating the number of points to deduct for various turn-in dates. At the end of that list, there will be a time when Canvas will be locked and you have missed the last date for assignment submission. I would rather you do the work than skip the work. On the other side, I shouldn't be grading Lab2 assignment at the end of the semester!

Example Sample List:

Assignment 1x:
Due by Feb 2
Late by Feb 16 -1
Late by Mar 2 -2
Late by Mar 14 -3
Late by Mar 28 -4
After Mar 28, this assignment will not be accepted.

BASIS OF GRADE

The date of the mid-term is mentioned with an approximate date in this handout. This handout does not list the material to be covered on the mid-term and on the final exam. I will announce the mid-term's date in class at least a week in advance. (It usually is the eighth week, after I take a poll of who has exams and when.) The material to be covered on the mid-term and on the final will also be announced in class, and a Study Guide will be provided. I will not give incompletes under ordinary circumstances.

Your grade will **approximate** the following scheme.

Class Attendance & Participation	5%
Assignments & Lab Work	45%
Exams:	
Mid-Term	20%
Final	30%

My assignment of grades:

95-100 = A	
90-94 = A-	
87-89 = B+	*Follow the pattern of B-/B/B+*
83-86 = B	for grades in the seventies or below.
80-82 = B-	

I do not give extra credit. I do not round grades beyond 0.5. Nor do I curve grades. You get the grade you earn from your attendance, homework, and test scores.

BEHAVIOR IN THIS CLASS

- No Cheating. Although you may engage in general discussions with other students, you are expected to write your own programs. The word "general" implies that the discussions are not at the level of detail of C statements. "Taking someone else's program, copying it, and putting your name on it" is considered cheating. Loaning the program makes you part of the deception. The Computer Science Dept. policy on cheating is at: http://www.ecs.csus.edu/wcm/cpe/pdfs/Academic%20Integrity%20Form.pdf
- This class is described in the catalog as a Discussion. That means I need you to interact, make comments, ask questions, so it is not just me droning on with Power Point.
- Behavior on campus and in class in general. Hornet Honor Code

RULES CONCERNING PROGRAMS

One of the first lines of each program or function which you write or contribute, you will add a Comment with your name.
The next line of each program will be a Comment with the assignment name.
(Example: Lab 2).
You will submit programs to Canvas, following the explicit directions given for each assignment. Every Assignment will have a list of the files that need to be submitted.
Each program will be graded according to several criteria:

- Does the program produce the correct output?
- Were all required techniques used?
- Were all required comments included?

DROP INFORMATION

- Drop Class Dates are on the calendar, page 2, of this syllabus.
- Feb 17, Census Date. Census date is the last date to drop class without receiving a "W"
- The withdrawal deadline is the last date for the course to appear in the transcript as a W. W does not affect GPA.
- It is ***your*** responsibility to ensure that your idea of your class schedule agrees with the on-line version.
- If you just disappear in the middle of the semester without withdrawing properly, I am required to assign you a grade of "WU" which then converts to an "F" on your transcript. If you have major problems in your life, I may be able to work with you to finish this class, but only if you talk with me about arrangements. https://www.csus.edu/indiv/l/lundp/drop.htm

INFORMATION ON ASSIGNMENTS & TESTS

Assignments will be discussed in class and posted on Canvas. Tests, (**the midterm and the final)**, will be open book and open note. Sharing with classmates will not be allowed during a test. No compilers will be allowed either. If you forget a detail during a test and want to look it up, that is rather like a real-life situation. If you expect to look it ALL up, I can tell you students before you have tried that, and they have gotten test grades of about 50%. There will not be enough time to learn it and/or look it all up during the test period. The tests will be administered during class time. They may be on Canvas, they may be on paper, depending on the Covid situation.

TENTATIVE SCHEDULE. It is your job to keep up with the reading!

Tentative Schedule: Week	**C Programming Language Topics**	**Unix Topics**
1	C Types, operators & expressions (KR Chapter 2)	Introduction: History (LPI Chapter 1), Introduction: Login, Basic commands
2	Control structures, The C preprocessor, Program structure (KR Chapters 3, 4)	Basic commands (Cont), Programming Tools: Editor, Compiler, Debugger, Source Code Control, Make Utilities
3	Basic I/O, functions (KR Chapters 4, 7)	I/O (LPI Chapters 4, 5), Redirection
4	Arrays, pointers, structures (KR Chapter 5)	Shared library (LPI Chapters 40, 41)
6	Advanced I/O	Unix file system
7	Function pointers (KR Chapter 5)	Unix shell programming

8	Systems programming (LPI Chapter 3)	
9 **Midterm subject to change of week →**	*****Midterm Exam *****	*****Midterm Exam *****
10	Processes & Multiprogramming (LPI Chapters 6, 24, 25, 26)	
11	Signals, pipes (LPI Chapters 20, 21, 22)	
12	Semaphores, shared memory (LPI Chapters 45, 46, 47, 48)	
13	Message queues, sockets, Threads (LPI Chapters 56, 57, 58)	
14	Remote procedure calls (LPI Chapters 56, 57, 58)	
15	Review	Review
16	***** Final Exam *****	***** Final Exam *****

STUDENTS WITH DISABILITIES (SSWD)

Sacramento State is committed to ensuring an accessible learning environment where course or instructional content are usable by all students and faculty. If you believe that you require disability-related academic adjustments for this class (including pregnancy-related disabilities), please immediately contact Services for Students with Disabilities (SSWD) to discuss eligibility. A current accommodation letter from SSWD is required before any modifications, above and beyond what is otherwise available for all other students in this class will be provided. Please be advised that disability-related academic adjustments are not retroactive. SSWD is located in the basement of the library with the entrance being from the alley between the library and the ARC building. Phone is 916-278-6955 and e-mail is sswd@csus.edu. For a complete listing of services and current business hours visit https://www.csus.edu/student-affairs/centers-programs/services-students-disabilities/

Student Health and Counseling Services

Your physical and mental health are important to your success as a college student. Student Health and Counseling Services (SHCS) in The WELL offers medical, counseling, and wellness services to help you get and stay healthy during your time at Sac State. SHCS offers: Primary Care medical services, including sexual and reproductive healthcare, transgender care, and immunizations; urgent care for acute illness, injuries, and urgent counseling needs; pharmacy for prescriptions and over-the-counter products; mental health counseling, including individual sessions, group counseling, support groups, mindfulness training, and peer counseling; athletic training for sports injury rehabilitation; wellness services, including nutrition counseling, peer-led health education and wellness workshops, and free safer sex supplies; violence and sexual assault support services. Most services are covered by the Health Services fee and available at no additional cost.

THE UNIVERSITY READING AND WRITING CENTER

For free, one-on-one help with reading or writing in any class, visit the University Reading and Writing Center (URWC). The URWC can help you at any stage in your reading and writing processes: coming up with a topic, developing and organizing a draft, understanding difficult texts, or developing strategies to become a better editor. Visit their web site (below) to find out how they are working virtually.
https://www.csus.edu/undergraduate-studies/writing-program/reading-writing-center.html.

Covid Information

For recent information about Covid and the Campus response. you may sign in to MySacState for more current information. https://www.csus.edu/return-to-campus/

Support for BASIC NEEDS and HEALTH

If you are experiencing challenges with food, housing, financial, or other unique circumstances that are impacting your education, help is just a phone call or email away! The CARES office provides case management support for any enrolled student. Email the CARES office at cares@csus.edu to speak with a case manager about the resources available to you. Check out the CARES web page.

- Health. Student Health and Counseling Services
  - Please do not go on campus if you are sick…unless you have an appointment at the Health Center.

- **Links to campus policies related to student academics such as:**
  Drop and Withdrawal Policy
  Grading Policy

Links to campus resources, such as:
Academic Advising
Information Resources and Technology
Support Centers and Programs
Reading & Writing Center
Student Rights and Responsibilities

Sexual Misconduct Disclosures And Maintaining A Respectful Learning Environment

Sac State is committed to supporting students and fostering a campus environment free of sexual misconduct and gender-based discrimination. If a student chooses to disclose

to a faculty or staff member an experience related to sexual misconduct which includes, but is not limited to rape, relationship violence, or stalking, all faculty and staff members are obligated to report this disclosure to the university's Title IX Coordinator. Contact Sac State's Title IX Coordinator, Skip Bishop, at (916) 278-5770 or email at william.bishop@csus.edu. Upon receipt of the report, the Title IX Coordinator will contact you to inform you of your rights and options as a survivor and connect you with support resources, including resolution options for holding accountable the person who harmed you. Students who elect not to discuss their experience with the Title IX Coordinator can speak confidentially to the following confidential resources:

Student Health & Counseling Services at The WELL
On Campus Phone Number: 916-278-6461
Website: www.csus.edu/shcs

Campus Confidential Advocate – Laura Swartzen
Email: weave@csus.edu
On Campus Phone Number: 916-278-5850 (during business hours)
WEAVE 24/7 Hotline: 916-920-2952
