

CS3240 Unix System Programming
Fall 2017
Tues – Thurs 1:00 – 2:15
C141 CEAS

INSTRUCTOR PARTICULARS

Instructor: Robert Trenary

Office: B250* CEAS

Office Hours: M-W 1-3, Tues-Thurs, 12:00 – 1:00 and 2:15 to 4:30 except every other Tuesday (Dept meeting) or by appointment. Jonathon Pennington will also keep office hours for you, Mon-Wed 12:30 – 2 in B250. I will tend to come to the classroom early.

E-mail: trenary@wmich.edu

N.B. Another section of 3240 has been added this Fall. Our section is quite full and you may want to be aware of that other opportunity.

* B250 can be found by walking around the Arc of Hope on the second floor with the Needle on your right, then down the Hallway of Doom (HoD), noting the first hallway on your left as the way to the CS wizards, and the general CAE lab through the windows on your right. The first student area (on your right) has a doorway into a warren of offices. Enter and the first office on your left is B250. (These offices are the first along the HoD and just before the Computer Science Dept. office).

TEXT: “Advanced Programming in a Unix Environment”, Stevens. 3rd Edition
See www.cs.wmich.edu/~trenary

GRADED EVENTS:

- Programming Assignments (≈35%)
- Midterm Exams (≈30%) : During the week before Spring break.
- Final Examination: (≈35%) **as per exam schedule.**

We can establish these dates in the first week of the course.

I should remark that the exams reflect the programming assignments so that doing your programs effectively makes you study for the exam.

Catalog Description:

Topics include: program development tools, basic testing, timing, profiling and benchmarking, characteristics of physical devices, memory management, device drivers, pseudo-devices, file structures, file I/O (both buffered and unbuffered), processes, shells, inter-process communications, signals, exceptions, pipes, sockets, shared memory and file and record locking. All topics are viewed from a UNIX system programming perspective.

Prerequisites & Corequisites: Prerequisites: CS 1120 and CS 2230.

Measured Student Outcomes

- Minimal fluency in using Unix System Calls via C programs.
- Good C programming practice including tools such as make, valgrind, gdb, wireshark.
- Knowledge of Unix file and directory organization.
- Understanding of Unix process control and threads
- Understanding and application of Sockets

This course is driven by the programs you write. We (Mr. Pennington and I) have envisioned 6 or 7 assignments:

- Unix Files , Random Access – String Handling – Pointers – malloc – structs - the standard library vs raw I/O (2 parts). This first work is dedicated to getting up to speed with C, Unix system programming, and good programming practice.
- Directory traversal – the Unix file system and underlying data structures, with companion system calls.
- Your own malloc(), calloc(), etc. It's just a library of memory management provided in the standard library.
- A shell. There is no magic – a shell is just a program to launch a program. The twisted problem of reading fork()ed code.
- Threaded sort. Threads are 'lightweight' processes with different synchronization problems.
- Sockets / File Server. Once there was no internet. Now we can have communication between processes on different machines. Unix has grown to accommodate technology and provides 'sockets'.

All work is assigned and submitted via a server, jazz.cs.wmich.edu. ssh credentials are used. BE SURE YOU ARE ABLE TO PULL AND PUSH ASSIGNMENTS AND WORK. DO THAT AS SOON AS YOU CAN. WE WILL DEAL WITH THAT IN CLASS. The first assignment a0 is ready. Please plan to bring your machine to class each day because we can be as lab oriented as possible.

Academic Integrity and this course particularly

Because the programming is so central to this course the below is essential for you to understand. Do your own work and you will (I am confident) have learned something and improved your programming practice.

The following is University Policy and is the policy understood during Academic Integrity hearings.

Students are responsible for making themselves aware of and understanding the University policies and procedures that pertain to Academic Honesty. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. The academic policies addressing Student Rights and Responsibilities can be found in the Undergraduate Catalog at <http://catalog.wmich.edu/content.php?catoid=24&navoid=974> and the Graduate Catalog at <http://catalog.wmich.edu/content.php?catoid=25&navoid=1030> If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Conduct. You will be given the opportunity to review the charge(s) and if you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test. In addition, students are encouraged to access the Code of Honor, as well as resources and general academic policies on such issues as diversity, religious observance, and student disabilities:

- Office of Student Conduct www.wmich.edu/conduct
- Division of Student Affairs www.wmich.edu/students/diversity
- Registrar's Office www.wmich.edu/registrar and www.wmich.edu/registrar/policies/interfaith
- Disability Services for Students www.wmich.edu/disabilityservices.

Students who take this class must be prepared to submit electronic copies of all assignments. The University expects that all students will be evaluated and graded on their own work. If you use language, data or ideas from other sources, published or unpublished, you must take care to acknowledge and properly cite those sources. Failure to do so constitutes plagiarism.

Throughout the term you will be required to solve problems. Solutions are to consist of YOUR OWN WORK! Learning can certainly take place through discussions regarding assignments, and you may ask for hints or ideas; however, when discussion is occurring, THE WRITING OF ASSIGNMENT SOLUTIONS SHOULD NOT TAKE PLACE DURING THAT DISCUSSION. You are to write your own solutions. Here are additional rules to follow, when writing your solutions that are to be submitted for a grade:

- Do not look at or copy material that someone else has written for the same or similar solution.
- Do not give your solution in part or whole, either in hardcopy or electronic form, to anyone else.
- Do not put yourself in a position of having access to another's files or work.
- Do not give another person access to your files or work.

Additional University Policies

Each of these federal statutes, policies and statements affirms that we aspire to be a community of academics and professionals who value the diverse perspectives and experiences each individual brings to WMU. These differences contribute to our rich and vibrant environment, where we strive to broaden our understanding of complex issues and gain new insights of the world. Although our perspectives, ideas and opinions may vary, each person is valued and treated respectfully.

Please refer to the University's policy statement regarding Sexual and Gender-Based Harassment and Violence, Intimate Partner Violence, and Stalking Policy available from the following website:

www.wmich.edu/sexualmisconduct

The Faculty Senate Religious Observances Policy

The complete policy statement is available from the following website:

http://www.wmich.edu/facultysenate/downloads/MOA0702_religious_observances_final.pdf

WARNING – The University is a dangerous place where your ideas will be challenged and offensive statements will be heard. It is an equal opportunity forum for all. Mutual respect is the guiding principle. Please see

wmich.edu/sites/default/files/attachments/u370/2016/Civility%20Stmt.7-27-16_0.pdf

The Civility statement affirms the value of each individual as a member of the university community. It further reminds us that ad hominem attacks directed towards the individual, rather than the position or idea, do not contribute to an environment allowing individuals to flourish. The (new) University President Montgomery has indicated his concern with the atmosphere of discourse that can be poisoned as at Charlottesville (home of the University of Virginia) this summer. We should all work to keep our University the unique enterprise that defines its sense of community.

Disability Services for Students (DSS)

Both in compliance with and in the spirit of the Americans with Disabilities Act (ADA), we would like to work with you if you have a disability that is relevant to your work in this class. If you have a documented disability and wish to discuss academic accommodations, please contact your instructor in a timely fashion with your DSS verification card. You may also contact the Office of Disability Services for Students if you need to register with the DSS office, 269-387-2116 (or at wmich.edu/disabilityservices).

Thee and Thy Name

Western Michigan University recognizes that some students use first names other than their legal names to identify themselves. As an inclusive and diverse community, WMU allows students to use a preferred first name different than their legal name for certain purposes and records in the course of university business, communication, and education.

The legal name will continue to be used where required by law or university requirements. All student information will continue to be linked to both legal name and preferred name for the purposes of university records.

<https://wmich.edu/registrar/policies/preferred-name>

Course Norms (Non-academic Requirements)

Please respect the learning opportunity for you classmates. Do not disrupt learning by arriving late, leaving early, or by being inattentive or disruptive in class. **Don't make or receive cell phone calls, text messages, and email;** turn off reminder alarms and your cell phone ringer. If you need to work for other classes or personal business, **don't do it in this class.** It is very hard for a student to avoid watching a screen in front of them. Take the time off if you need to do something more important than attending class. *If you think you may have difficulty meeting these or other academic requirements, please contact your instructor using e-mail, as soon as possible before or immediately after the problem occurs. Contact your instructor if you will miss or be late for a class meeting, if you have material submission problems, miss or anticipate missing course deadlines, or have personal problems that affect your work in this class.*

Rules for Active Shooter Situations *in Priority Order*

- 1) Get Away ! Know your exits.
- 2) Barricade.
- 3) Attack.
- 4) Hide as a last resort.

I am sorry to have to mention the above but ... the ongoing march of the species does not always seem like progress.