Syllabus for *System-level Programming and Utilities*

CIS 241 Fall 2025

Generated August 20, 2025

Introduction to software infrastructure underlying development of computer programs. Topics include Linux utilities, shell scripting, processes, facilities for programming, the C programming language, libraries, structures, pointers, dynamic memory management, and system calls.
Credits: 3

Contact Information:

Class Time:	MWF, 10:00am - 10:50am
Instructor:	Dr. Erik Fredericks
E-mail:	frederer@gvsu.edu
Office:	D-2-210 MAK
Office Hours:	MWF 11:00am-12:00pm (MAK), in-person or by appointment.
Course Page:	https://efredericks.github.io/gvsu-cis241, Blackboard
Discord:	https://discord.gg/pNaTDKH
Midterm exam:	10/09/2025, 10:00am-11:50am
Final exam:	12/08/2025, 10:00am-11:50am

Course Objectives:

After successful completion of the course the students will be able to:

- Application/Use: Use command-line interface to do basic system operations such as create a directory, modify file permissions, create a link, manage processes, and access a computer remotely.
- Mechanism/Manipulate: Manipulate basic features of a command-line environment such as the 'PATH', which specifies the locations of executable programs, and the 'CLASSPATH', which specifies the locations of Java classes.
- Synthesis/Write: Write basic meta-programs in a shell or scripting language, e.g. to compile statistics for numbers stored in text files.
- Application/Use: Use build-system utilities such as 'make'/'cmake', 'gdb', or 'SCons' to edit, compile, test, time, debug, and profile a C program.
- Synthesis/Construct: Construct programs that access data by using the range of pointer operations and manual dynamic memory management to implement basic ordered binary trees a.k.a. binary search trees (BSTs).

Prerequisites:

- C or better in CIS 163 or C or better in CIS 260

Course Materials:

Primary: Instructor's Lecture Notes, Open Educational Resources, and Handouts (via Blackboard)

*Course Delivery - **In Person**:*

This course will be delivered **in person**. If it becomes necessary to change delivery formats, we will change to an *online synchronous* format.

Grading Proportions:

The last day to drop a course with a grade of "**W**" is **November 7, 2025**.

The CR/NC date is **September 19, 2025**.

Your grade is based on your performance in your homework assignments, term project, exams, participation.

Graded Item	**Weight**
Participation:	25%
Coursework:	45%
Midterm Exam:	15%
Final Exam:	15%
Total	**100%**

A	>=93%	**B-**	>=80%	**D+**	>=67%
A-	>=90%	**C+**	>=77%	**D**	>=60%
B+	>=87%	**C**	>=73%	**F**	<60%
B	>=83%	**C-**	>=70%		

Late Policy:

- Work submitted after the due date will incur 10% late penalty per day, with a minimum penalty of 10%. **No assignment will be accepted more than 3 days late**.
- No assignment will be accepted late after the last day of class regardless of the number of days late.

If you are struggling with meeting deadlines, please contact me as soon as possible!

Coursework:

Coursework in this class consists of in-class assignments (participation) and projects/homework assignments. Assignments are graded for correctness *and* communication. Pay attention to factors including content, organization, clarity/style, and mechanics.

1. All assignments must be completed **individually** (unless otherwise noted).
2. All assignments **must be runnable on EOS** - if it does not work on EOS (but works on your computer) it will not be given special exemptions.

Course Policies and General Information:

(1) The Fred Meijer Center for Writing, with locations at the Allendale and Pew/Downtown Grand Rapids campuses, is available to assist you with writing for any of your classes. Writing consultants, who are fellow GVSU students, are trained to help you with all stages of your writing process, from brainstorming to organizing to editing your papers. Simply bring a draft of your paper, the assignment sheet, and your questions/concerns to any of the Center's locations. Also, through your Gmail account, you have access to online consultations through Google Docs. The Center's services are free and you can drop in and work with a consultant or make an appointment, either through our website or by calling the Center (331-2922). For more information about our services and locations, please visit our website: `http://www.gvsu.edu/wc/`

(2) **Cooperation and cheating**: Be aware of the SCIS policy on academic honesty. Visit the department website (`https://www.gvsu.edu/computing/academic-honesty-30.htm`) for the full statement on academic honesty. Academic dishonesty will not be tolerated. Violations will result in *at least* failure of the assignment. However, violations may also include failure of the entire course and referral to the university resulting in additional consequences, including possible expulsion. You are welcome to discuss assignments with each other or myself, however do not copy answers or plagiarize. If you are unsure of what plagiarism means, please either ask me or visit the department website mentioned above.

(3) Participation is *not* equivalent to attendance. Please ensure you keep up with the in-class assignments to ensure that you are staying current with the class (and receive the credit for it).

(4) **ChatGPT/LLM statement**: I do not mind if you use ChatGPT (or similar) to help you work through problems, however do not simply copy and paste its output into your assignment. This is the same as plagiarism/cheating as you are presenting work that is **not your own**.

(5) Special Needs: If there is any student in this class who has special needs because of a disability, please contact Disability Support Resources at `http://www.gvsu.edu/dsr/` (DSR) at 616-331-2490.

(6) This course is subject to the GVSU policies listed at `http://www.gvsu.edu/coursepolicies/`.

(7) In Case of Emergency Fire: Immediately proceed to the nearest exit during a fire alarm. Do not use elevators. More information is available on the University's Emergency website located at `http://www.gvsu.edu/emergency`.

(8) This syllabus is deprecated in favor of any syllabus uploaded to the course Blackboard page with a *more recent* "generated" date. This version of the syllabus was generated on August 20, 2025.

Course Schedule:

A course schedule of topics project deadlines are included in the table below. This schedule may be adjusted throughout the semester as needed. Note, the order topics are covered is tentative and may be adjusted throughout the semester (most will take more than 1 session).

Module	Lecture/Discussion Topic
August 31st – September 1st, 2025, **Labor Day Recess**	No classes!
October 19th–21st, 2025, **Fall break**	No classes!
November 26th–November 30th, 2025, **Thanksgiving break**	No classes!
1	Introduction
2	Linux (SSH, File Transfers, Navigation)
3	Linux (File Viewing, Editing, and Transferring)
4	Linux (Scripting, Redirection, Piping)
5	Linux (Grep, Wildcards, Compression)
6	Git
7	Linux (Permissions, Processes, Startup Files)
8	Bash Scripting
9	regex, sed, awk
10	C (Intro, Printing, Types)
11	C (Operators, Conditionals, Arrays, Loops)
12	C (Operators, Conditionals, Arrays, Loops)
13	C (Functions, Pointers, Stack Heap, Memory Allocation)
14	C (Input, Structs, 2D Arrays)
15	C (Debugging, Command Line Arguments)
16	C (Make, File IO, Leftovers)
Final Exam	December 8, 10:00 am - 11:50 am