CSCI 331 (Section 1) [001323]
Software Systems
Spring 2025 SYLLABUS

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please use **"CSCI331: "** in the Subject field)
Web Site: http://web.stcloudstate.edu/aanda/cs331.html
Instructor Schedule: http://web.stcloudstate.edu/aanda/Wkly-sched-w25.pdf
(and by appointment)
Student Office Hours: https://minnstate.zoom.us/j/91845917984
Invitation: Student Office Hours Zoom invitation text
{I sometimes won't be available for an office hour - this will usually be because I'm attending a meeting}

Content Delivery and Accessibility: Completely Online-Synchronous
I intend to record all lectures. And, most materials will be available through D2L.
Student submissions of quizzes, assignments, notes, etc. will be via D2L.

CLASS TIME AND LOCATION:
Class: M W: 14:00 - 15:15 Completely Online-Synchronous
Class Zoom link: Invite Link: https://minnstate.zoom.us/j/94579420828

REQUIRED TEXT: * Data Abstraction & Problem Solving with C++, Carrano, Pearson, 6th, 7th, or 8th ed.

SUPPLEMENTARY TEXTS: * File Structures: An Object-Oriented Approach with C++, M.J. Folk, B. Zoellick, G. Riccardi, Addison Wesley Longman, 1998.
[A PDF copy of this text (which is out-of-print) accessible is on our course D2L page in Materials/Content/Primary Textbook: FZR.
(Please use this copy only for this course)]
* Applied Data Structures with C++, Peter Smith, Jones and Bartlett, 2004
* Your CSCI 201 textbook

COURSE DESCRIPTION:
Problem solving strategies and concepts applied in the context of issues associated with the design and implementation of software systems using a combination of current software packages/environments. Subjects addressed include file processing, data modeling and mapping to storage structures, data base systems, and software design and implementation.

STUDENT LEARNING GOALS:
1. gain experience working in a group in various roles on a technical project.
2. gain knowledge updating sequential files as related to data base systems.
3. gain experience designing software systems through a software engineering process including designing algorithms, coding, and testing.
4. write programs and software systems involving trees, blocking/deblocking, sort/merge, updating sequential files, and B+trees.

I Student Outcomes as defined by ABET (CAC):

a) An ability to apply knowledge of computing and mathematics appropriate to the discipline.

c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

d) An ability to function effectively on teams to accomplish a common goal.

e) An understanding of professional, ethical, legal, security and social issues and responsibilities.

f) An ability to communicate effectively with a range of audiences.

i) An ability to use current techniques, skills, and tools necessary for computing practice.

j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems
in a way that demonstrates comprehension of the tradeoffs involved in design choices.

k) An ability to apply design and development principles in the construction of software systems of varying complexity.

II Student Outcomes (Sos) for the Computer Science Program (applicable to this course):

Students will be able to:

1. apply structured principles and good practices to the task of developing software systems.

4. communicate both technical and non-technical aspects of their work in formal and informal situations.

5. apply formal methods to the process of constructing a system and an appreciation of the need to study and develop such methods.

7. analyze various aspects of the process used when designing a system and employ established frameworks to evaluate the completed work.

TOPICS (not necessarily in order of coverage):

* Sequential file processing
* Indexed Files
* Hashed Files
* Tree Structured Files
* Secondary storage media
* Introduction to database
* Software Design Processes and Principles
* Software Development Processes and Principles
* and more...
* (I will expect students to learn the complexities {BigO()} of the operations on the data structures we discuss and to be able to select, based on those complexities, the most appropriate ADT considering the nature of the data and how it will be accessed.)

SLOs:

* Apply structured principles and good practices to the task of developing software systems.
* Communicate both technical and non-technical aspects of their work in formal and informal situations.
* Apply common formal methods to the process of constructing a system and an appreciation of the need to study and develop such methods.

* Analyze various aspects of the process used when designing a system and employ established frameworks to evaluate the completed work.

PREREQUISITES:

[Prereq.: CSCI 220 or ECE 221; CSCI 301 (301 coreq: Math 271)]

I assume that all students in this class have passed the prerequisite CSCI and MATH courses, or their equivalents.

We also assume that you have an operational facility with Unix.

If you have not had ALL of these courses you should drop this course until you have passed all of the prerequisites.

We do not have time for an extensive recapitulation of topics covered in the prerequisite courses.

PROGRAMMING ASSIGNMENTS HOMEWORK AND IN CLASS WORK:

There will be a sequence of programming assignments.
These should be submitted by the time and date as indicated on the respective D2L DropBox.
Assignments not submitted by their deadline may be penalized.

A program must compile to receive any credit. (Which implies that a successful strategy is to always maintain available the last successfully compiling version as you are developing incrementally)
Keep in mind that I expect all programs to produce correct output given error-free input.
Check your output before submitting your final copy (The grader will ignore all but your final submission.
Don't assume that a program which produces any output, without terminating abnormally, is correct.
Are the output and test results what you expected?
Test your program carefully and extensively.
You have not fully tested your program if you have not executed every line of code.
Preconditions and postconditions must be consistent and well-defined.
The code should satisfy the postconditions if the preconditions are met.
Conversely, if a precondition is violated, that exception should be detected and handled.

The grade you get on a program is based on the code, the documentation and how well it is tested.
To receive better than a C on a program it must do more than produce correct output given correct input.
By this I mean your program must be robust, well documented, well tested and well written.

Your grade on the group projects will also be based on how well you cooperate with, contribute to, and participate in the group you are assigned to.
Your contributions to your group's efforts will be assessed by your other group members. Based on your group peer assessments:
* "Boat anchors" will be significantly penalized by up to a whole letter grade.
* "Heroes" will be significantly rewarded by up to a whole letter grade.

AI:
Artificial Intelligence (AI) is a tool available to the public. Within this course, you are expected to submit assignments and discussions that are your original thought. Within this course, you are encouraged to explore how AI may impact routine tasks within our profession. The use of AI for brainstorming, outlining, or creating support for your academic assignments is allowable in this course. Submitting AI-generated assignments as your own original thought is considered to breach our Academic Integrity practices and should not occur. Please ask me if you are unsure of where AI and Academic Integrity intersect in this course. Please refer to the Academic Integrity policies that apply to all courses within our institution.

Any time you use AI, you are required to submit a document in which you describe:

- Which components of your submission were AI generated or assisted?
- What were your sequence of prompts?
- Reflect on how effective the AI assistance was with respect to accuracy and efficiency. (was it worth your time to be using AI in this context?)

ACADEMIC HONESTY:

You are expected to do your own homework.

If you copy someone else's work or allow someone else to copy your work, you are being academically dishonest and will be subject to severe disciplinary action which may include any or all of: no credit for the work in question, a failing grade for the course, notification to the university that you have violated your Code of Conduct.

Use of recording devices during exams is prohibited.

If you must quote or paraphrase another source, citation is essential, otherwise plagiarism has been committed.

You are expected to be familiar with your rights and obligations as outlined in the Student Code of Conduct - specifically the Prohibited Student Conduct section, and the Academic Integrity policy within.

STUDYING IN GROUPS:

I encourage you to study with someone else in the class, but when you prepare the final documents to turn in be sure that it is your own work and that you understand it.

If you represent someone else's work as your own (without citing them as a source), or allow someone else to turn your work in as theirs (without citing you as a source), you will have committed academic dishonesty and will receive an F.

ATTENDANCE:

You are responsible for knowing what happens at each class meeting. You should expect to spend *a lot of time* on this class. This is not an easy class. If you are having trouble in class, I expect to see you in my office. If you don't tell me you are having troubles how do you expect me to know? If you can't come during my office hours, please make an appointment with me for another time.

EXAMS:

* There will be one or two midterm exams and a **comprehensive** final exam.
* Exams will be based on the presentations in class as well as on the assigned readings and the assignments.
* Make-up exams will be given in only in extreme (or university sanctioned) circumstances and only with prior notification to the instructor.

GRADING:

Your grade will be determined by the contributions of your scores on assignments, quizzes, intermediate and final exams.
Makeup of tests, quizzes, and exams are by prior arrangement only.

APPROXIMATE POINTS:

Assignments	35%
Sectional Exam(s)	25%
Comprehensive Final Exam	40%

FINAL EXAM: Section 1: Monday, May 5, 12:20 - 14:35 as a D2L Quiz.

CAVEAT:
I reserve the right to amend the contents of this syllabus with notification.

Resource Links:

- D2L Brightspace
- SCSU Student Resources for Online Learning
- SCSU Zoom Resources
- SCSU Student Information for Attending Classes Off-Campus
- SCSU: The Write Place
- SCSU Information Technology Services
- SCSU Medical Clinic
- SCSU Counseling and Psychological Services
- SCSU Library
- SCSU Student Code of Conduct

Additional SCSU student resources, curated and compiled by the Academic Affairs office, are presented in:
Fall 2023 Student Instructional Resource and Support Guide

Peer Wellness Coaching:
https://www.stcloudstate.edu/healthwellness/get-healthy/peer-coaching.aspx

SAFETY:

All students are encouraged to critically reflect on the course topics and to raise questions to the class and to the professor. Please be respectful to one another by not presenting your question in a hostile manner. Open dialogue on course content is encouraged, but attacks on classmates or me are not. Please set up a time to talk with me if you have questions about this policy or if you believe this policy is being violated. You may also report hostile, biased or threatening behavior to www.stcloudstate.edu/oea/

There are many offices on campus that provide additional support and/or information outside of class including:

American Indian Center: www.stcloudstate.edu/aic
Multicultural Student Services: www.stcloudstate.edu/mss
Center for International Studies: www.stcloudstate.edu/internationalstudies
Additional Student Services Offices: https://www.stcloudstate.edu/campuslife/student-services.aspx

What to do if you have experienced sexual assault, rape, domestic violence, sexual harassment or stalking:

Please read this resource:

[https://www5.stcloudstate.edu/Policies/SCSU/Viewer.aspx?id=60]

Your professors fulfil the role of mandatory reporters. If you want to speak confidentially, see the above link for a list of confidential options.

Accommodations Statement

An affirmative action, equal opportunity employer, and educator, St. Cloud State University is committed to a policy of nondiscrimination in employment and education opportunity and works to provide reasonable accommodations for all persons with disabilities.

If you have a disability, or think you may have a disability, you may want to contact Student Accessibility Services to begin the conversation or request official accommodations. Visit the Student Accessibility Services website for more information or contact them at 320-308-4080 or Room 202 of Centennial Hall.

Student Accessibility Services works with students with disabilities and faculty members to identify reasonable accommodations. If you have previously been approved for accommodations through Student Accessibility Serves, please contact me so we can develop an implementation plan together.

Accommodation Process

- Student Accessibility Services is St. Cloud State's program that provides accommodations for students with disabilities. The goal of Student Accessibility Service is to support students with documented disabilities in getting equal access to SCSU courses, programs, and events through a collaborative process to provide appropriate and reasonable accommodations.
- After a Semester Accommodation Request is approved, Accommodation Letters will be emailed to notify professors of any students who have approved accommodations. Please read over the attached documents as these will be helpful for you in better understanding their accommodations. We welcome any questions or concerns you may have. Below are some commonly used forms and procedures you may see:
    - Testing Accommodations for students who receive a reduced distraction environment and extended time on timed assessments.

All discussions will remain confidential.

Student Office Hours:

The time that I have listed as office hours is time for you. It is time that I have dedicated to be available for whatever you need. This does not mean that I will stare sadly out the window waiting for a student to come – I will be doing other work. What it does mean is that the second you show up, that work goes away and the time is yours. We can talk about the course, the department, some other topic, grad school, etc. I am available for you during that time. Additionally, if my door is open at other times, feel free to drop by – I'm in my office often. If I am in but can't talk right then, I'll let you know and we can chat at a different time. I am available via Zoom and in my office during my Student Office Hours.

Violence Statement

In the event that you choose to write or speak about having survived sexualized violence,
including rape, sexual assault, dating violence, domestic violence, or stalking,
and specify that this violence occurred while you were an SCSU student,
federal and state education laws require that, as your instructor,
I notify the Title IX officer, Ellyn Bartges.

She (or her designee), will contact you to let you know about accommodations and
support services at SCSU and possibilities for holding accountable the person who harmed you.

If you do not want the Title IX Officer notified, instead of disclosing this information to your instructor,
you can speak confidentially with the following people on campus and in the community.

They can connect you with support services and discuss options for holding the perpetrator accountable.

SCSU's Gender Violence Prevention Program 320.308.3995 Lee LaDue

Central Mn Sexual Assault Center (Community program) 320.251.4357 24-hour hotline

SCSU's Counseling and Psychological Services 320-308-3171

If you are a survivor or someone concerned about a survivor and need immediate information on what to do, please go to:
http://www.stcloudstate.edu/womenscenter/

Our Land Commitment *(link to more information)*
St. Cloud State University is committed to developing a land acknowledgment that is not just words but actions.
We will actively promote education among our faculty, staff, and students on Indigenous issues, including research on the historical and ongoing harms impacting our Indigenous communities.
We will also clearly outline our goals to make a positive and lasting contribution to efforts to build relationships with the Tribal Nations represented within our local and broader community.
St. Cloud State University commits to creating a substantive and empathic land acknowledgment, demonstrating our continued commitment to action.