

CSCE 4650 COMPILER DESIGN
SYLLABUS – SPRING 2026

Instructor:	Dr. Amar M. Maharjan
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Email:	amar.maharjan@unt.edu • Include CSCE 4650 in the subject line. • Always use your official UNT email address.
Locations:	MoWe 2:30PM – 3:50PM NTDP E266
Office Hours:	My office hours are from 1:00 PM – 2:00 PM (NTDP E260J) on Monday and Wednesday . Please feel free to drop in or to set up an appointment by contacting me. If these office hours don't work for you, please let me know, and we can find another time to meet.
Zoom link:	https://unt.zoom.us/j/7033013440
Textbook	<i>Compilers: Principles, Techniques, and Tools</i> , 2nd ed., by Alfred V. Aho, Monica S. Lam, Ravi Sethi, and Jeffrey D. Ullman, Addison Wesley Longman, 2007.
References	<i>Modern Compiler Implementation in Java: Basic Techniques</i> , 2nd ed., by Andrew W. Appel and Jens Palsberg, Cambridge University Press, 2002.
Prerequisite(s)	CSCE 2100, CSCE 2110 and CSCE 3600, each with a grade of C or better.

TAs/IAs: See the Canvas page "[TA/IA Contact and Office Hours](#)".

Catalog Description

Topics include parsing, syntax-directed translation, run-time storage management, error recovery, code generation and optimization. A significant project is required.

Course Outcomes:

1. Given a context-free grammar, build SLR (1), LR (1) and LALR (1) parse tables.
2. Given a context-free grammar, an LR parse table and an input string, show the steps of the parse.
3. Given a language specification for an imperative language, build a parser for the language using tools such as flex and yacc.
4. Integrate semantic actions into the above parser to construct a symbol table, perform type checking, and generate intermediate code.
5. Given a control-flow graph with intermediate 3-address code within each basic block, show the "improved" control-flow graph after hand-optimizing for common subexpression elimination, copy propagation, and dead code removal.

Grading:

Item	% of final grade
Attendance	5.0%
Quizzes	15.0%
Assignments	25.0%
Exam #1	15.0%
Exam #2	20.0%
Exam #3	20.0%

I reserve the right to modify course policies, the course calendar, assignment or project point values, and due dates.

This course has digital components. To fully participate in this class, students will need internet access to reference content on the Canvas Learning Management System, zyBooks, PuTTY (or similar tool) to connect to the CSE servers, and WinSCP (or similar tool) to upload/download files from the CSE servers. If circumstances change, you will be informed of other technical needs to access course content. Information on how to be successful in a digital learning environment can be found at [Learn Anywhere](#).

Grading Policy:

Grades will be posted on Canvas throughout the semester to provide an ongoing assessment of student progress, **though the final assessment will be measured using the weighted average above**. Once a grade is posted on Canvas, students have **two (2) weeks** to dispute the grade (but not in the last assignment/homework or final exam, usually), unless otherwise instructed. The proper channel for grade disputes is to first go to the original grader (either the TA or IA) in an attempt to resolve the issue. If, however, a resolution cannot be reached between the student and the grader, the student shall then go to the instructor, who will have the final say on the grade.

There will be three (3) 80-minute examinations, **the first exam on Wednesday, February 25 (02/25), the second exam on Wednesday, April 01 (04/01), and the third exam on Monday, May 4 (05/04), at 12:30 P.M.** The schedule of these exams is fixed and cannot be changed to accommodate individual circumstances except for a major illness or family emergency. In such cases, arrangements must be made before the time of the exam to take the exam at a different time. Makeup exams will not be given without such prior approval and only for the emergency cases indicated. There will be at least one quiz to review the material covered in class. There will be several written and programming assignments, which will emphasize the theory covered by the lectures. Many of these exercises will be built on each other in the form of a complete implementation of the front-end of a compiler. Therefore, it is imperative that all assignments be done promptly. All the assignments are due at 11:59 pm on the due date. Programming assignments will be accepted up to 24 hours late and a 25% grade reduction penalty will be assessed.

Course Status: All pertinent information about the class (assignments, exam reviews) is available via the class webpage. If there is ever a question as to when something is due, or an additional copy of a course document is needed, ALWAYS check the class webpage. If you feel there is incorrect or missing information on the class website, email the instructor about the problem immediately. Electronic mail (email) will be a major means of communication with the instructor outside of actual classroom discussions.

Please keep this information sheet handy during the semester and always periodically check the class homepage for any course information, including scheduling of programming assignments, exams, and exam reviews.

Class Notes and Programming Examples

The lecture slides will be available on Canvas. The programming examples provided in the class will be on the CSE servers inside my public folder. You will need an SSH client to access the server and an SFTP client to download my examples to your personal computer. An announcement will be posted on Canvas for future reference. There is also a document named **Accessing CSE Servers** on Canvas that shows you how to access these programming examples. You can also bring your own computer to the class and type along with me during the programming demonstrations.

Academic Integrity:

This course follows UNT's policy for Student Academic Integrity which can be found at <https://policy.unt.edu/policy/06-003> as well as the [Cheating Policy for the Department of Computer Science and Engineering](#). Specifically, the first instance of a student found to have violated the academic integrity (i.e., cheating) policy will result in a grade of "F" for the course and have a report filed into the Academic Integrity Database, which may include additional sanctions. Individual programming assignments and quizzes given outside of the lab in this course are meant to be problem-solving exercises and must be the sole work of the individual student.

You should not work with other students on shared program solutions or use program solutions found on the Internet or use answers from Generative AI/LLMs such ChatGPT, Gemini or Copilot. Specifically, you should never copy someone else's solution or code, and never let a classmate examine your code. A sophisticated program will be used to compare your work to the work of all other students (including students in past classes). If you are having trouble with an assignment, please consult with your instructor, TAs, IAs, or Peer Mentors associated with the class. You must do your own work on participation and challenge assignments as well as exams. There should be no ambiguity here. In case the above description and in-class discussion of appropriate and inappropriate collaboration do not answer all of your questions, please meet with your instructor and look at the university Student Rights and Responsibilities web page.

A more complete policy will be made available soon, but for now be aware the "unauthorized" use of any person or technology that assists in a student's assignment, project, or paper is considered cheating under the UNT Student Academic Integrity Policy (UNT Policy 6.003). Unless a professor or instructor gives explicit "authorization," AI cannot be used to assist in the completion of assignments, projects, or papers. Doing so will result in a "cheating" violation. Again, if uncertain contact the instructor prior to using AI tools.

Attendance Policy:

Attendance is required and highly recommended that you attend every lecture in order to be successful. A student who misses class is still responsible for finding out what was discussed, learning the material that was covered, and obtaining the homework that was assigned on the missed day. The instructor is not responsible for re-teaching material missed by a student who did not attend class. Therefore, each student is accountable for and will be evaluated on all material covered in this course, regardless of attendance. If there are extenuating circumstances preventing you from attending the class, please notify your instructor so that you can work together to ensure your success in learning the material.

Course Evaluation

The Student Perception of Teaching (SPOT) survey is a requirement for all organized undergraduate classes at UNT. This short survey will be made available to you at the end of the semester, providing you with a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider SPOT to be an important part of your participation in this class.

Also, the ABET survey, which is separate from the SPOT, may be available at the end of the semester. The purpose of this survey is to give you the opportunity to give feedback on the course. Your feedback gives the instructor and department feedback that is used as part of ABET accreditation.

ADA Statement:

The University of North Texas makes reasonable accommodations for students with disabilities. To request accommodations, you must first register with the Office of Disability Access (ODA) by completing an application for services and providing documentation to verify your eligibility each semester. Once your eligibility is confirmed, you may request your letter of accommodation. ODA will then email your faculty a letter of reasonable accommodation, initiating a private discussion about your specific needs in the course.

You can request accommodations at any time, but it's important to provide ODA notice to your faculty as early as possible in the semester to avoid delays in implementation. Keep in mind that you must obtain a new letter of accommodation for each semester and meet with each faculty member before accommodations can be implemented in each class. You are strongly encouraged to meet with faculty regarding your accommodations during office hours or by appointment. Faculty have the authority to ask you to discuss your letter during their designated office hours to protect your privacy. For more information and to access resources that can support your needs, refer to the [Office of Disability Access](https://studentaffairs.unt.edu/office-disability-access) website (<https://studentaffairs.unt.edu/office-disability-access>).

Acceptable Student Behavior

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The university's expectations for student conduct apply to all instructional forums, including university and electronic classrooms, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at <http://deanofstudents.unt.edu>.

Emergency Notification & Procedures:

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials or changes in the calendar per the [Emergency Notifications and Procedures Policy](#).

Syllabus Revisions

This syllabus may be modified as the course progresses, should the instructor deem it necessary. Notice of changes to the syllabus shall be made through Canvas and/or class announcement.

Tentative Schedule (subject to change):

<i>Date</i>	<i>Topic</i>	<i>Chapter</i>	<i>Lecture</i>
01/12, 01/14	Introduction	1-2	1-2
01/21, 01/26	Lexical Analysis	3	3-4
01/28 02/02 02/04, 02/09 02/11 02/16	Syntax Analysis Context-Free Grammars Top-Down Parsing Bottom-Up and LR Parsing Using Ambiguous Grammars Parser Generators	4	5 6 7-8 9 10
02/18, 02/23 02/25 03/02 03/04, 03/16	Syntax Directed Translation Attribute Grammars Exam #1 Implementation Semantic Actions in Parser Generators	5	11-12 13 14 15-16
03/09 – 03/15	Spring Break		
03/18, 03/23 03/25, 03/30 04/01	Intermediate Code Generation Three-Address Code Type Checking Exam #2	6	17-18 19, 20 21

04/06, 04/08	Control Flow		22-23
04/13	Run-Time Environments	7	24
04/15, 04/20	Code Generation	8	25-26
04/22, 04/27, 04/29	Machine Independent Optimizations	9	27-29
05/04	Exam #3		30

Important Dates:

01/12: First Day of Class

01/19: Martin Luther King Jr Holiday (no classes)

03/09 – 03/15: Spring Break (no classes)

05/01: Reading Day (no classes)

05/08: Last Day of Session

See [UNT Spring 2026 Semester Calendar](#)