

Syllabus: CSCI465(Principle of Translations)

Semester: Fall 2020

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Online Meeting

When emailing me, you should expect a response within 24-48 hours.

Descriptions:

Principle of translation provides a comprehensive coverage of issues dealing with principles and practice of design and implementation of compilers. In general, compilers convert programs in high-level programming languages to machine code. To this end, the course covers topics in engineering of programming languages, various modeling approaches relevant to faithful translation of a source program into a target program.

Prerequisites:

CSCI 370, and exposure to any high-level programming languages such as C, C++, or Java are required.

Course Objectives:

The objective of this course is to discuss the foundational methods used to construct compiler. Upon successful completion of the course, students should be able to understand the role and key components of conventional compilers. To this end, this course should cover the following areas:

- Overview of Engineering of a Compiler
- Lexical analysis
- Syntax-Directed Translator/Definition
- Symbol tables (Lexical scope, access data structure, etc.)

- Syntax Analysis and Parsing Techniques (Top down Parser and Bottom parser)
- Semantic Analysis using Syntax directed translation and attribute grammar
- Type checking, Type systems, Specification of a simple type checker, etc.
- Run-time Environments (Stack, activation record, etc.)
- Intermediate Code Generations (ICG)
- Code Generation

Textbook(s):

- Compiler Principles, Techniques, and Tools, Jeffrey Ullman et al, Addison-Wesley, 2007

Supplemental Readings:

The Textbook will be supplemented by online materials (e.g., IEEE/ACM Journals and Conference proceeding articles related to the software architecture). UND library provides an access to IEEE/ACM portals.

Assessment Criteria:

A variety of methods will be utilized to assist and evaluate progress in the course. The assessment criteria include (at least) the following elements:

- Two Exams **40%** (20% for each exam, take-home)
- Assignments **5%**
- Compiler Project **45%**
- Presentation **5%**
- Class Discussion **5%**

Assignments:

There will be some assignment (small projects, reading foundational papers. Assignments can be paper and pencil exercises or using tools. Furthermore, assignments provide students a chance to study specific aspect of compiler in more depth.

Submitting the coursework:

All course related work (e.g., assignments, papers, etc.) must be uploaded to the blackboard system.

Exams:

Two exams will be conducted to assess student understanding of the fundamental in software architecture concepts. Exams consists of multiple-choice and essay questions covering the concepts presented in lectures and reading materials.

- Exam 1 (20%) on **October 20** (Take-home)
- Exam 2 (20%) on **December 15** (Take-home)

The Compiler Project & Presentation

There will be a **modest programming project** to build a modest compiler. The compiler project can be done and presented individually or in group (up two students). The complete compiler project will be presented to the class at very last week of the class by the student(s).

Participation & Class Discussion:

You are encouraged to participate in the class discussion by posting **for** each discussion assigned for the specific week. Active participation means to post questions and/or attempt to answer questions.

Rules

1. Please craft a well-written post that says something substantive. Respond specifically, try to limit generalizing, and provide facts for readers. While we want to hear your opinions, part of them should be backed by facts. Provide no more than 1 useful web link to support your post. The interaction on discussion boards allows your instructor to hear other people's opinions. Discussions should include life experiences related to what we are studying and should be interesting because it goes beyond what we are studying, to include what is happening in the field.
2. You should also keep in mind that discussion boards are meant to be conversations, where each post builds on the previous comment. Good response posts are response posts that do not only agree or disagree. When you read another student's post, you have the ability to expand the conversation. To do that, you can reference material or, when appropriate, relate it to your own life, industry, or other experience.

3. Don't procrastinate. Participate early, and not at the deadline. Your postings should be spread throughout the week.
4. Don't solicit answers to the exams or assignment questions.

Course Grading Policy:

- 90 - 100% **A**
- 80 - 89% **B**
- 70 - 79% **C**
- 60 - 69% **D**
- 00 - 59% **F**

Late Submissions Policy

- You must submit discussion board postings during the time frame indicated in by the instructor. Discussion board submissions will not be accepted for credit after the deadline.
- If you need extra time, you may submit assignments, excluding discussion board postings, up to **one week** after the assignment due date. Submitting work up to one week late will receive a penalty of 10 percent applied to the grade achieved on the late assignment regardless of the day of the week on which the work is submitted. Submitting assignments more than one week late will receive a grade of zero on the assignment unless you have made prior arrangements with the instructor.
- I will accept assignments more than one week late if you have made prior arrangements with me and I agree to an extension. Submitting work late will receive a penalty of 10 percent applied to the grade achieved on the late assignment. You must meet the deadline agreed upon in advance. If you do not meet the agreed upon deadline, you may receive a grade of zero on the assignment.
- I will accept late work without prior arrangement in the case of extenuating circumstances (such as hospitalization, childbirth, major accident, injury or bereavement). If you suffer such a circumstance, you must notify me as soon as possible of the extenuating circumstance that prevented you from submitting work on time and determine a deadline with me for submitting the work. In these instances, I will waive the late penalty. If you do not meet the deadline arranged with me, you will receive a grade of zero on the assignment.

ANSI Resources

- [ANSI C \(BNF\)](#)
- [ANSI C\(XBNF\)](#)

Accommodations

The University of North Dakota is committed to providing equal access to students with documented disabilities. To ensure access to this class and your program, please contact Disability Services for Students (DSS) to engage in a confidential discussion about accommodations for the classroom and clinical settings. Accommodations are not provided retroactively. Students are encouraged to register with DSS at the start of their program. More information can be obtained by emailing UND.dss@UND.edu or by phone at 701.777.3425

Drops & Withdrawals:

Students should not assume that the instructor will administratively drop the student for non-attendance. Withdrawal from the course is the responsibility of the student. Should a student decide to withdraw from the course, simply not attending class sessions, rather than formally withdrawing from the course, may result in an 'F' on the student's transcript.

Academic Honesty

We expect complete academic honesty as specified by the **University of North Dakota Code of Student Life**. We expect all students to be aware of these issues and the possible consequences. Students will receive no credit for any assignment/exam completed under the context of scholastic dishonesty. Additionally, other disciplinary actions may be taken, including but not limited to suspension from the University. A written record of any scholastic dishonesty will be kept in the student's academic file housed in the Department of Electrical Engineering.

As stated by the Registrar, students are expected to maintain scholastic honesty. Scholastic dishonesty includes but is not limited to cheating on a test, plagiarism, and collusion.

1. Cheating on a test includes, but is not restricted to:
 - Copying from another's test.

- Processing or using material during a test not authorized by the person giving the test.
 - Collaborating with or seeking aid from another student during a test without authority.
 - Knowingly using, buying, selling, stealing, transporting, or soliciting in whole or in part the contents of an unadministered test.
 - Substituting for another student or permitting another student to substitute for oneself to take a test.
 - Bribing another person to obtain an unadministered test or information about an unadministered test.
2. Plagiarism means the appropriation, buying, receiving as a gift, or obtaining by any means another person's work and the unacknowledged submission or incorporation of it in one's own work. This includes appropriation of another person's work by the use of computers or any electronic means.
 3. Collusion means the unauthorized collaboration with another person in preparing written work offered for credit.

COVID-19 SYLLABI INFORMATION

All members of the University community have a role in creating and maintaining a COVID-19 resilient campus. There are several expectations that all community members, including students, are asked to follow for the safety of all: maintain physical distancing of at least 6 feet while in UND facilities, wear face coverings during interactions with others and in the classroom, wash their hands often and use hand sanitizer, properly clean spaces that they utilize, and if experiencing any symptoms, stay home and call their health care provider. Students electing not to comply with any of the COVID related requirements will not be permitted in the classroom and may be subject to disciplinary action. We encourage all members of the University community choose to model positive behavior both on- and off-campus. Information regarding the pandemic and UND's efforts to create a COVID resilient campus is available on the COVID-19 blog (<http://blogs.und.edu/coronavirus/>). Please subscribe to stay up to date on COVID related information. Students who test positive for COVID-19 or are identified as a close contact are expected to immediately self-isolate/quarantine. If you have tested positive for COVID19 or have been placed in quarantine due to being identified as a close contact or trave, we strongly recommend that you report the information to the Office of Student Rights and Responsibilities at **701.777.2664** or online at

<https://veoci.com/veoci/p/w/ss2x4cq9238u>. Doing so will ensure students have the support they need to continue with their academic goals and to protect others.

24/7 Help Desk

The [24/7 Help Desk](#) provides assistance to resolve technical problems. This Help Desk is available 24 hours a day, every day of the year.

Disclaimer

This syllabus is intended to suggest the outline of the course; it is not absolute. Changes to the syllabus, should they occur, will be announced in class.