Compiler Construction COSC 3351.001
Computer Science
Fall 2015

A. COURSE INFORMATION

Course number/section: COSC 4353/001
Class meeting time: MWF 10:00-10:50AM
Class location: IH-158
Course Website: bb9.tamucc.edu (Blackboard)

B. INSTRUCTOR INFORMATION

Instructor: Ismail Alihan Hadimlioglu
Office location: CI-339
Office hours: MWF 08:30-9:30AM - Other days by appointment
Telephone: 361-825-3436
E-mail: ismail.hadimlioglu@tamucc.edu
Appointments: To schedule your visits properly, please send me an e-mail beforehand

C. COURSE DESCRIPTION

Catalog Course Description
This course introduces the basic concepts and mechanisms traditionally employed in language translators, with emphasis on compilers. Topics include: strategies for syntactic and semantic analysis, techniques of code optimization and approaches toward code generation.

Extended Course Description
Throughout the course, you will be writing a compiler using software tools and modifying existing components of a compiler. Compiler theory will be studied and you will be exposed to variety of compiler applications such as parsing and semantics analysis.

D. PREREQUISITES AND COREQUISITES

Prerequisites
COSC 3353 Survey of Programming Languages
MATH 2305 Discrete Mathematics I

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)
Compiler Construction - Principles and Practice, Kenneth C. Louden

Supplies
None
F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Analyze compilers and identify their computing requirements
2. Design, implement and evaluate a basic compiler
3. Apply mathematical foundations, algorithmic principles and computing theory to design a compiler
4. Apply design and development principles in the construction of a compiler
5. Understand context-free grammars, parsing, semantic analysis and code generation

G. INSTRUCTIONAL METHODS AND ACTIVITIES

New material and concepts will be presented in the classroom through the use of lecture, tutorials and sample programs. Assignments will be used to review and reinforce topics covered in the classroom. From time to time online lectures and videos might be assigned to students to show some samples.

H. MAJOR COURSE REQUIREMENTS AND GRADING

To assess theoretical knowledge, two midterm exams and a final exam will be provided to the students.

From time to time various assignments will be provided to enhance learning.

It is clear that Project is an important part of this course. Therefore, understanding the topics that we discuss in class and applying the theory to build a compiler is vital. I might ask you to turn in whatever you have at any point of the semester to see if you are on the right track so be prepared and organize your project properly.

I reserve the right to change any assignment, grading scheme, or any other course requirements. I will announce such changes in a timely manner during regular class hours and through Blackboard announcements.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Exams and Final</td>
<td>60% (Exam I, Exam II, Final - 20% each)</td>
</tr>
<tr>
<td>Project</td>
<td>25%</td>
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<tr>
<td>Assignments</td>
<td>10%</td>
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<tr>
<td>Others (online assignments, attendance, performance)</td>
<td>5%</td>
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</tbody>
</table>
## I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>CHAPTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 26, Wednesday</td>
<td>Introduction to 4353</td>
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<tr>
<td>August 28 - September 2</td>
<td>Introduction to Compilers</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>September 4 - September 9</td>
<td>Scanning</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>September 11 - September 16</td>
<td>Scanning / CF Grammars</td>
<td>Chapter 2/3</td>
</tr>
<tr>
<td>September 18 - September 23</td>
<td>Context Free Grammars</td>
<td>Chapter 3</td>
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<tr>
<td>September 25, Friday</td>
<td>Exam I Review</td>
<td></td>
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<tr>
<td>September 28, Monday</td>
<td>Exam I</td>
<td></td>
</tr>
<tr>
<td>September 30 - October 5</td>
<td>Top Down Parsing</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>October 7 - October 12</td>
<td>Top Down Parsing/Bottom Up Parsing</td>
<td>Chapter 4/5</td>
</tr>
<tr>
<td>October 14 - October 19</td>
<td>Bottom Up Parsing</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>October 21 - October 26</td>
<td>Semantic Analysis</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>October 28 - November 2</td>
<td>Semantic Analysis</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>November 4, Wednesday</td>
<td>Exam II Review</td>
<td></td>
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<tr>
<td>November 6, Friday</td>
<td>Exam II</td>
<td></td>
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<tr>
<td>November 9 - November 13</td>
<td>Code Generation</td>
<td>Chapter 8</td>
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<tr>
<td>November 16 - November 20</td>
<td>Code Generation</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>November 23 - November 25</td>
<td>Optimization</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>November 27, Friday</td>
<td>THANKSGIVING</td>
<td></td>
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<tr>
<td>November 30, Monday</td>
<td>Final Exam Review</td>
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<tr>
<td>December 9, Wednesday 8:00am</td>
<td>Final Exam</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor.
J. COURSE POLICIES

Attendance/Tardiness
Success in this course depends on your attendance and participation. I do not take attendance every day the class meets yet I might decide to take attendance at some designated days. If you are not in the room in your seat before I start lecturing, you will not be counted as present that day. Attendance and active participation is essential to successfully completing this course. You are expected to know all material presented in class.

Late Work and Make-up Exams
If you notify me immediately about serious and unavoidable circumstances that can be documented (e.g., with a letter from your doctor), I will discuss options for replacing the missing grade. Excused absences due to school sponsored activities, religious observations, family events, etc. should be discussed in advance. Makeup exams will be different from regular exams. This course uses a late work policy. The following grading scheme will be applied for late labs, assignments, projects and any other submissions:

- 0-1 day: -10
- 1-2 days: -20
- 2-4 days: -40
- 4 days+: No Grade

Extra Credit
Extra credit is not offered so the grading scheme mention in Section H will be used.

Cell Phone Use
You must silence your devices before the class begins.

Laptop Use
You might use your laptops for course-related things such as checking the presentations on your device. You should not work on your labs or assignments in class. The only way you might utilize your laptop is to check the slides I am presenting in class.

Food in Class
As we will be at a lab, it is not permitted to eat or drink in class.

Missed Exam
It is your responsibility to attend the exams on time. If you miss an exam with no excuse no makeup exam will be provided.

Participation
Participation is vital for your success and therefore, make sure you attend and participate the discussions in class.
K. COLLEGE AND UNIVERSITY POLICIES

• Academic Integrity (University)
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

• Classroom/Professional Behavior
  Texas A&M University–Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

• Statement of Civility
  Texas A&M University–Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

• Deadline for Dropping a Course with a Grade of W (University)
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must be submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

• Grade Appeals (College of Science and Engineering)
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

• Disability Services
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116. If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816. http://disabilityservices.tamucc.edu/

• Statement of Academic Continuity
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. OTHER INFORMATION

• Academic Advising
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.