Compiler Writing – CSCI 4800 / CSCI 6800

Fall 2021

Last update: December 1, 2021

Quick Facts

- *All the information in this syllabus is subject to change, especially regarding the schedule and evaluation.*
- Class meets TR 10:00 AM–11:15 PM in Hull McKnight GA Cyber Center, 2301
- The instructor's contact and office hours are at spots.augusta.edu/caubert/#contact.
- You can download this syllabus, but make sure you check spots.augusta.edu/caubert/cw/ periodically.
- For the detail of the planning and evaluations, refer to the planned schedule.
- This course is cross-listed as CSCI 4800 and CSCI 6800, look for 🎓 for information specifics to CSCI 6800.

Direct Feedback

You can post comments of any nature (bug report, recommendation, criticism, …) at etherpad.wikimedia.org/p/CSCI4800. Please, keep in mind:

- Your comment will be anonymous,
- Your comment will be public,
- Anyone with the url can edit the comments.

I will monitor this channel and either post answers there or through email, depending on the nature of the comment.

Presentation

Factual

We will *not* be using an hybrid course model, the class will be fully face-to-face, but we will enforce the University's regulations on social distancing and face covering. You will need a computer with admin rights to install (free) software.

CSCI 4800

This is Compiler Writing – CSCI 4800 - 20444 - A, an undergraduate semester class of 3.000 credits, whose pre-requisite is a minimum grade of C in CSCI 3500 or CSCI 341, and a minimum grade of C in CSCI 3370.

Course Description An examination of compiler techniques used in generating machine code. Topics covered include scanning and parsing, code generating, optimization and error recovery. Programming projects in compiler construction.

☛ CSCI 6800

This is Compiler Writing – CSCI 6800 - 21779 - A, a graduate semester class of 3.000 credits, whose pre-requisite is to be in the graduate program.

Course Description This class examines how programs in existing high-level languages are translated to machine level so that they can correctly and efficiently execute on modern hardware. The class is centered around a significant project where students get hands-on experience implementing the techniques studied in the class. Most techniques studied will be for imperative languages.

Learning Outcomes

Upon successful completion of this class, the student will be able to:

- specify lexical and syntactical structure of languages,
- use regular patterns,
- use parsing techniques,
- design and implement translators,
- use tools to generate lexical analyzers and parsers,
- organize runtime storage for static and dynamic objects,
- generate intermediate code for basic language constructs,
- use parsing and translation techniques for automation of computing tasks,
- ☛ understand the importance and the techniques to achieve compiler correctness,
- ☛ understand a current research problem connected to compilers.

Planned Course Schedule

The week starts on *Monday*.

Week	Date	Note	Topic
1	08/09	-	Syllabus, Introduction
2	08/16	-	-
3	08/23	08/26: **Quiz**	-
4	08/30	-	-
5	09/06	*09/06: Labor Day*, 09/09: **Project**	-
6	09/13	09/16: **Exam**	Review Session
7	09/20	-	-
8	09/27	09/30: **Quiz**	-
9	10/04	*10/04: Midterm*, *10/07 – 10/08: Fall Pause*	
10	10/11	-	
11	10/18	10/21: **Quiz**	-
12	10/25	-	-
13	11/01	11/04: **Exam**	Review Session
14	11/08	-	-
15	11/15	11/18: **Project**	-
16	11/22	*11/24–26: Thanksgiving*	-
17	11/29		-
18	12/06	12/9 (11AM–1PM): **Final**	-

You can also find on-line

- the first study guide.
- the second exam with a possible solution
- the second study guide.

This schedule is subject to change and enhancements, but provide an indication of the pace, assignments, and major deadlines that you will need to plan for the semester.

Homework

- Homework #1
- Homework #2
- Homework #3
- Homework #4
- Homework #5

Code

- 08/17/2021: Call_by_value_reference.c
- 09/09/2021: Bison example files
- 09/13/2021: Solution to project #1.

Grades

Students will be evaluated using four different types of evaluation:

1. Homework assignments will be given during the course of the semester: they are not expected to be handed back, and won't be graded, but quizzes with questions taken or inspired from those assignments will be given. Those quizzes are closed book and timed (± 10 min.).
2. Projects will be carried at home.
3. There will be in-class exams, held during the regular class periods.
4. The final exam will take place during the exam period.

Refer to the planned schedule for precise dates, and to Brightspace/D2L to get your current grades.

🎓 Graduate students will be evaluated using a different modality that will be discussed at the beginning of class.

Your grade will be computed as follows:

Quizzes (×3)	10%
Project (×2)	10%
In-class Exams (×2)	40%
Final Exam	40%

using the following course grade scale:

Below 65	65–70	70–79	80–89	90–100
F	**D**	**C**	**B**	**A**

Refer to the Course Requirements for information about late or missed evaluations.

Format, Teaching Philosophy & Requirements

Format and Procedures

Lectures are devoted to general explanations of the concepts and ideas underlying the topic at stake. All practical work, coding, programming, testing, etc. will be carried at home or in the lab portion if there is one.

Homework assignments will assist the students in making sure they understand classes expectations and the content of the lecture, as well as to practice their coding and problem-solving skills. The progression of the students will be regularly tested and assessed through quizzes and exams. Active and relevant participation during the lectures is appreciated.

Teaching Philosophy

It is our mutual interest for you to succeed: I love to share knowledge and to expand it by helping students, and students want to gain a useful and agreeable experience that will prove valuable in their future endeavors. To this end, here is:

What I'm expecting from you

- Check periodically your email account and read the email I send.
- Read this entire syllabus carefully.
- Participate actively in all class discussions.
- Do the homework wisely: read your notes before starting the homework assignment, make sure you understand it completely before considering it done.
- Come prepared and on time to classes, exams and quizzes.

What you should expect from me:

- Clear and accessible lectures.
- Fair and impartial grading.
- Availability, during office hours, by appointment, and by email.
- Open hear to your suggestions to improve this class.
- Commitment to the principles of universal design.
- Transparency, as my student evaluation as well as many past exams and their solutions, are shared with you.
- Dedication to your success!

You can have a look at my Quick Reflexion on Course Evaluations, that contains my previous student evaluations, and at my "Definitive" Study Guide.

Course Requirements

- Attendance is not mandatory. However, if you come to class, come on time, and stay until the end of the lecture: late arrival and early departure disturb the learning experience for everyone.
- No laptop or similar electronic device is allowed during the lectures. This policy will help you to improve your grades, increase memorization and to be more respectful of your fellow students.
- You are responsible for all course material, whether or not you attend lectures or do the assigned reading or coursework.
- It is the student's responsibility to initiate a withdrawal before midterm, but I reserve the right to withdraw a student that missed too many meetings, or is performing poorly, after being given two chances to explain themselves.
- A student not withdrawn from a course who stops attending class (or who never attends class) is subject to receiving a grade of **WF** or **F**.
- All coursework is individual coursework.
- Any student missing the final exam without an documented excuse (brought to our undegraduate study director Anthony Lawrence or to the dean of Students) or who has not taken action to withdraw will receive a grade of **F**. In case of an documented emergency at the time of the final, the student may be allowed to receive a grade of **I**.
- No make up quizzes, project or exam will be allowed. In case of a documented excuse (cf. previous item), the instructor may offer to place the weight of the missed evaluation onto another evaluation's weight.

In case of conflict, the proper etiquette is to reach out to me, and if no solution can be found, then we should turn to our undegraduate study director Anthony Lawrence or to the dean of Students to help as an ombudsman.

Practical Information

Lab Space

For this class, you will need to access a computer. You can either:

- Visit one of the Computer Labs,
- Use your personnal computer.

If you need room to engage in a synchronous class, you can go to (this information may need to be updated)

- The University Hall (UH) lounges on the 2nd and 3rd floor,

- The Academic Success Center UH156, including UH157 and UH160,
- The Butler room in the Jaguar Student Activities Center (JSAC) from 10AM to 3PM

Getting Help

I should be your first point of contact for any question regarding the content of this class, but many other resources are available:

- If you are food insecure, you are not alone, and the Open Paws Food Pantry will help you.
- For tutoring resources, consult the Academic Success Center (or "ASC"). It can help you, among other things, in the areas of time management, test preparation and study strategies.
- The Testing & Disability Services (or "TDS") can help you–and me!–accommodate this class.
- The Student Counseling & Psychological Services (or "SCAPS") is here to assist students with a variety of personal, developmental, and mental health concerns.
- The Writing Center can help you with any written, oral, or multimedia project.
- To get help with technologies, refer to our Instructional Technology Support correspondent Sienna Sewell, whose contact can be found on the Continuity webpage.
- Carrer Services offers tips for facilitating employer recruitment, prepare for professional school, etc.

ACM Club

The Augusta University chapter of the A.C.M is one of the university's best resources for Computer Science, Information Technology and Cyber Security students. It provides a platform to network with other students in similar majors; presenting countless opportunities to expand not only the people you know, but also a fantastic place to learn and ask questions. Because of Covid-19, we will only be holding meetings virtually in our Discord server. If you are interested in joining these meetings, or you have any questions about Computer Science or Cyber Security, feel free to join through our link.

Covid

The University has implemented specific requirements to minimize exposure to COVID-19 and support the safety of all during the pandemic. These requirements apply to all persons on campus (faculty, staff, students, and visitors). These requirements are subject to change. Visit jagwire.augusta.edu/coronavirus/ and augusta.edu/covid-resources/ for the latest details.

If you are unsure about the procedure to adopt, please refer to the protocols - guidelines. If you need to miss class to self-isolate or get tested, please notify me at your earliest convenience.

Where to Go for More Information About COVID-19?

- Augusta University COVID-19 resources
  - Campus Reopening: augusta.edu/covid-resources/
  - Resource page for students: augusta.edu/student-affairs/student-resources/
  - COVID-19 resources on Jagwire jagwire.augusta.edu/coronavirus/
- Guidance on symptoms and getting tested
  - Free virtual screenings: augustahealth.org/covid-19
  - AU Health System COVID-19 Hotline: 706-721-1852
  - Student Health Clinic: 706-721-3448 or augusta.edu/shs/

Legal and Recommendations

Academic Integrity

The University's Student Code of Conduct, the student's manual, the academic regulations as well as the applicable policies are supposed to be known by the students and will be enforced.

Section 5.2, Academic Conduct of the student's manual defines precisely what kind of collaborations are acceptable. As long as you do not lie, cheat, plagiarize, assist others or being assisted by others without authorization, we should not need any of that. If you are unsure about whether or not certain kinds of collaboration are permissible, please ask me.

Universal Design

I am committed to the founding principles of Universal Design, and to make my lecture accessible to every one. Concretely, that means that I'm not requiring you to use a particular Operating System, that I always try to give the information repeatedly, and using multiple channels, that I am available over the phone, email, or in my office. If you are registered with Testing and Disability Services, please see me at your earlier convenience to discuss accommodations.

Campus Carry Legislation

Please be aware of the USG guidance on House Bill 280. Note that you **may not** carry a handgun if high school students are enrolled in the class, and that it is your responsibility to visit the registrar to determine whenever this is the case or not.

Miscellaneous

- Reservation of rights: I reserve the right to change this syllabus without limitation and without prior notice. If I do substantially modify any item or policy, I will notify you during a lecture, or send an e-mail to your augusta.edu e-mail account.
- Download a `pdf` version of this page.
- Contact: caubert@augusta.edu and spots.augusta.edu/caubert/#contact
- Created with debian, pandoc and latex.
- Sources are available upon motivated request.
- You will need a `pdf` reader to consult some of the documents: I recommend choosing an open-source `pdf` reader.