University of Oklahoma
College of Engineering

Computer Science 3323

Principles of Programming Languages
Spring 2024 Syllabus

General Information

Class Time: Monday, Wednesday and Friday 11:30 AM – 12:20 AM

Prerequisites: CS 2413, and CS 2813/MATH 2513, and ENGL 3153/BC 2813/ENGR 2002.

Instructor and Office Hours:

Name	Office	Hours	Email
Dr. Temitope OLORUNFEMI	DEH 205	10:00 am - 11:00 am (Monday and Friday)	*temitope.o.olorunfemi-1@ou.edu*

Zoom link: *https://oklahoma.zoom.us/j/92803905486?pwd=S1FBbXFBbmVYZENjZXJyTVRlNDlqUT09*

Learning Management System or website: *canvas.ou.edu*

Important Date: May 10, 2024, 1:30 pm - 3:30 pm (**Final Exam**)

Teaching Assistants, email and Office hours

i. PANJEI Egawati, *egawati.panjei@ou.edu*; Monday (10:00 - 11:00 am), Tuesday (12:00 noon - 1:00 pm), Wednesday (9:00 - 10:00 am), Thursday (9:00 - 10:00 am) at DEH 115

ii. MILLER James, *jpmokc@ou.edu*; Tuesday (2:00-3:00 pm), Wednesday (1:00-2:00 pm), Thursday (3:00-4:00 pm), Friday (2:00-3:00 pm)

Course Description

An introduction to theoretical foundations and paradigms of programming languages. Topics include basic concepts such as lexical analysis, syntax analysis, type systems and semantics, some practical issues such as memory management and exception handling, and programming paradigms such as imperative programming, object-oriented programming, functional programming and scripting.

Lectures will be a mix of traditional lectures, in-class lab time, class discussions, videos and other activities. Participation is required to get the most out of the class. Class projects/labs/assignments will require the design and implementation of complex software systems. A UNIX family operating system will be used along with the GNU Toolchain for most assignments.

Course Goals

This course is meant to provide an experience for the students to view programming as a goal-oriented process. A major component of this course will be learning from one another through challenging open-ended team assignments. Here students will be challenged to think creatively to synthesize potential solutions, devise testing strategies and integrate these solution into their implementations.

Learning Management System

We will use the Canvas learning system. This course website can be reached through *canvas.ou.edu*. Please check this system regularly to keep informed on all announcements, updates, and changes. Note that you can configure Canvas to send you email whenever a new piece of information is posted.You should check the site regularly.

Learning Outcomes

By the end of the semester, the students will be able to apply computer science theory and software development fundamentals to produce computing-based solutions. For more information, see *http://www.abet.org*.

6.1 ABET Student Outcomes

The general learning objectives for this course include the following ABET Outcomes:

i. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

ii. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

iii. An ability to communicate effectively with a range of audiences.

iv. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

v. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

vi. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

vii. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Texts and Materials

The required text is "Crafting Interpreters". *Robert Nystrom. 978-0990582939.* This is a free text and can be obtained here: *https://craftinginterpreters.com/contents.html* . There are quite a few recommended books that go into further detail for those who are interested. Use *https://www.bookfinder.com/* to find reasonable secondhand prices for these texts.

- "Engineering a Compiler." *Keith D. Cooper and Linda Torczon. Morgan Kaufmann. 978-0120884780.*
- "Compilers: Principles, Techniques, and Tools" *Alfred Aho, Ravi Sethi, Jeffrey Ullman, Monica S. Lam. Pearson Publisher. 978-0321486813.*
- "Essentials of Programming Languages." *Daniel Friedman, Mitchell Wand. 978-0262062794.*

Course Expectations and Policies

8.1 Computer Accounts and Software

All students enrolled in class should also have a CS account and access to a Linux-based systems in the CS department. For most computer science students, an account will be automatically created. All code written for this course MUST run using the compilers or interpreters that will be specified for the assignments. It is your responsibility to ensure that your code runs on these systems. For compatibility reasons, we recommend developing and testing on a Linux-based machine.

8.2 Teaching Philosophy & Inclusion Statement

This course revolves heavily around group assignments to encourage peer learning. Your peers will continue to be your peers beyond graduation. It is my goal to create an inclusive classroom that encourages the strengthening of the bonds between you and your peers.

8.3 Class Attendance

You are expected to attend all of the lectures in which you are enrolled. In this class, it means that you will participate in the activities of your team.

8.4 Class Email

Urgent announcements will be sent through Canvas email. It is your responsibility to:

- Regular read your university-supplied email or have it forwarded to a location where you do regularly read email. I will send out a test message during the first week of class. If you do not receive this message, it is your responsibility to get the problem resolved.
- Have your email program set up so that replying to your email will work correctly. You can send email to yourself and reply to yourself to test this. If you need assistance in accomplishing any of these tasks, contact 325-HELP. You are responsible for reading emails within 24 hours.

*Please put **CS3323** as the first word in the subject line of your email.*

Learning Activities, Assignments, and Assessment

The work in this course will be divided into several components including: programming assignments, reading assignments, group programming assignments, exams, and participation activities.

Programming assignments will be individual coding challenges covering - or preparing for- the material in class. Similarly, reading assignments will be written assignments or in-class quizzes covering material in the book. Homeworks and readings will be in support of the labs and exams.

Group Lab or Projects will be opportunities to combine the knowledge gained from the readings and homework assignments to synthesize a deliverable. Team members will be randomized for each programming assignment and will be graded on mastery of material, team effort and individual participation.

A midterm and a final exam will cover the material in the lectures and assignments to assess your understanding of the content.

Participation points will be awarded to activities that are in support of your peers' education in the course. A running list of activities and opportunities will be made available. This will include (but not be limited to) activities such as being a peer grader for an assignment, creating written or video or in-person tutorials on tools or topics or problems or readings, or similar activities negotiated beforehand.

9.1 Assigning Grades

- Quiz: 20%
- Programming Assignments: 20%
- Projects/Labs: 40%
- Midterm: 10%
- Final: 10%

9.2 Grading Scale

The letter grade thresholds will be no higher than the following; they may be lower at the discretion of the instructors. For example, an 89.99 is a B. The final letter grading for the course will be as follows: A $\geq$ 90%, B = 89-80%, C = 79-70%, D = 69-60%, F = $<$ 60%. The instructor will round all averages to two significant figures (69.5 will round to 70 and 69.4 will round to 69) to determine the student's letter grade in the course (70 = C, 69 = D). There is no curve in this course. The instructor reserves the right to make linear adjustments to quiz and final exam grades in cases were a quiz or exam question was found to be in error or unreasonably difficult.

9.3 Grading Questions

If there is a dispute about the grading of a homework problem, you may stay after class the day the tests are returned to discuss it. If you cannot stay at this time, return the paper to me and stop by during my office hours. Once a homework has been removed from the classroom after it has been returned, the grade is final and will not be changed, even if it is found to be in error.

9.4 Canvas Grade Summary

Canvas has a grade book that is used to store the raw data that is used to calculate your course grade. It is the responsibility of each student in this class to check their grades on Canvas after each project or homework is returned. If an error is found, bring the grading document to me, and I will correct it.

Course Policies

10.1 Make-up Policy

Although the Instructor does not expect a student to miss an assignment, if a student does miss an assignment for a legitimate, verifiable reason, the Instructor will work with the student to provide an opportunity for make-up work.

10.2 Absences

Attending every lecture is highly recommended and expected. Not attending class will have an indirect negative effect on your grade. If low attendance to lectures becomes problematic, the instructor reserves the right to use attendance as extra-credit. There will not be assigned seating in the lecture, but students are expected to sit next to their study group partners to facilitate communication during problem solving sessions in class.

10.3 Civility

All students are expected to follow proper classroom behavior and treat other students and the instructor with respect. If the instructor deems a student's actions or behavior disruptive to the class, the students will be asked to leave the class for that day.

10.4 Emergency Contact

In case of family or medical emergencies, students should send an email (*temitope.o.olorunfemi-1@ou.edu*). Once the emergency has passed, the student can meet will the instructor to discuss what material/assignments the student has missed and what steps would beneficial to aid the student in continued success in the course.

10.5 Changes in the Syllabus

As the course develops, it might be desirable/necessary to make appropriate changes in aspects of this syllabus. The Instructor reserves the right to make changes if desirable or necessary.

University Policies

11.1 Academic Integrity

Cheating is strictly prohibited at the University of Oklahoma, because it devalues the degree you are working hard to get. As a member of the OU community, it is your responsibility to protect your educational investment by knowing and following the rules. For specific definitions on what constitutes cheating, review the Student's Guide to Academic Integrity at `http://integrity.ou.edu/students_guide.html` . To be successful in this class, all work on exams and quizzes must be yours and yours alone. You may not receive outside help. Should you see someone else engaging in this behavior, I encourage you to report it to myself or directly to the Office of Academic Integrity Programs. That student is devaluing not only their degree, but yours, too. Be aware that it is my professional obligation to report academic misconduct, which I will not hesitate to do. Sanctions for academic misconduct can include expulsion from the University and an F in this course, so don't cheat. It's simply not worth it.

All work submitted for an individual grade, such as quizzes, should be the work of that single individual: not their friends or tutor. **Please ask me if you are in doubt before you collaborate with others. You have to work individually unless it is stated that a collaboration is allowed**.

- Do not show another student a copy of your homework or individual projects before the submission deadline. The penalties for permitting your work to be copied are the same as the penalties for copying someone else work.
- If you choose to do your work on your computer, make sure that your computer account is properly protected. Use a good password, and do not give your friends access to your account or your computer system. Do not leave printouts, or thumb drives around a laboratory where others might access them.
- Upon the first documented occurrence of collaborative work, I will report the academic misconduct to the Campus Judicial Coordinator. The procedure to be followed is documented in the University of Oklahoma Academic Misconduct Code (`http://integrity.ou.edu/summary_of_the_process.html`). In the unlikely event that I elect to admonish the student, the appeals process is described in `http://www.ou.edu/provost/integrity-rights/` .
- If you work with anyone else in completing an assignment, you must include that person's name on the submitted work. Failure to list a student you worked with on the assignment is a violation of academic integrity. If I find that the submitted work appears to be plagiarized, all students involved will be invited to my office individually to explain the work and/or perform similar work. The instructor will

determine whether plagiarism occurred based on the match between the depth of understanding of the material displayed in the assignment and the individual interviews.

[See `http://integrity.ou.edu/faculty_guide.html`]

- Programming projects may be checked by software designed to detect collaboration. This software is extremely effective and has withstood repeated reviews by the campus judicial processes.
- Tutors can be an excellent source of support for students who are having difficulty in the class, but only if the tutor is aware of the distinction between teaching students the material so that they can do their own work, and doing work for students. Tutors who do work for students are not only failing to help the students learn, they are abetting academic misconduct. Examples of misconduct include: If your tutor is sitting behind you while you are typing and methodically telling you what to enter, he or she is abetting academic misconduct. If your tutor is emailing files containing partial or complete programming projects to you, you will commit academic misconduct if you use those lines in your program. More effective use of tutoring services is to do problems that are similar to the assigned work, instead of doing assigned work. For example, it would be fine to work unassigned problems from the textbook with a tutor. This requires significant discipline, both on the part of the tutor and the part of the student. Copying from a tutor is as unacceptable as copying from another student. If your tutor doesn't know how to teach properly, please ask them to call or visit me and I will provide training and guidance. If you are tutoring someone else in the class, you can be accused of academic misconduct if this person copies your work.
- Cheating is strictly prohibited at the University of Oklahoma, because it devalues the degree you are working hard to get. As a member of the OU community it is your responsibility to protect your educational investment by knowing and following the rules. For specific definitions on what constitutes cheating, review the Student's Guide to Academic Integrity at `http://integrity.ou.edu/students_guide.html`.

  To be successful in this class, all work on exams and quizzes must be yours and yours alone. You may not receive outside help. On examinations and quizzes you will be informed about permissible study aids. Should you see someone else engaging in this behavior, I encourage you to report it to myself. That student is devaluing not only their degree, but yours, too. Be aware that it is my professional obligation to report academic misconduct, which I will not hesitate to do. Sanctions for academic misconduct can include expulsion from the University and an F in this course, so don't cheat. It's simply not worth it.
- Feel free to discuss all assignments with the instructor or the TAs. However, do not discuss, look at, or copy another student's solution to a Zyante or lab assignment. Doing so is considered cheating. For group projects, communication is expected between group members. However, communication about the solution to a project between groups is disallowed. Doing so is considered cheating.
- You may make use of the net as a reference as you are working on assignments. For projects, these references must be explicitly documented in your code. However, downloading or deriving specific solutions from the net is considered cheating.

11.2 Religious Observance

It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty. [See Faculty Handbook 3.15.2 (`https://apps.hr.ou.edu/FacultyHandbook#3.15.2`).]

11.3 Reasonable Accommodation Policy

There is not specific language for the Reasonable Accommodation policy to be included in the syllabus. It is good to become familiar with the policy and describe it in your own words. Including the link to

Disability Resources Center is encourage, http://www.ou.edu/drc/home.html . [See Faculty Handbook (https://apps.hr.ou.edu/FacultyHandbook#5.4).]

Students requiring academic accommodation should contact the Disability Resource Center for assistance at (405) 325-3852 or TDD: (405) 325-4173. For more information please see the Disability Resource Center website http://www.ou.edu/drc/home.html Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

11.4 Title IX Resources and Reporting Requirement

For any concerns regarding gender-based discrimination, sexual harassment, sexual assault, dating/domestic violence, or stalking, the University offers a variety of resources. To learn more or to report an incident, please contact the Sexual Misconduct Office at 405/325-2215 (8 to 5, M-F) or smo@ou.edu. Incidents can also be reported confidentially to OU Advocates at 405/615-0013 (phones are answered 24 hours a day, 7 days a week). Also, please be advised that a professor/GA/TA is required to report instances of sexual harassment, sexual assault, or discrimination to the Sexual Misconduct Office. Inquiries regarding non-discrimination policies may be directed to: Bobby J. Mason, University Equal Opportunity Officer and Title IX Coordinator at 405/325-3546 or bjm@ou.edu. For more information, visit http://www.ou.edu/eoo.html.

11.5 Adjustments for Pregnancy/Childbirth Related Issues

Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact your professor or the Disability Resource Center at 405/325-3852 as soon as possible. Also, see http://www.ou.edu/eoo/faqs/pregnancy-faqs.html for answers to commonly asked questions.

11.6 Final Exam Preparation Period

Pre-finals week will be defined as the seven calendar days before the first day of finals. Please refer to OU's Final Exam Preparation Period policy (https://apps.hr.ou.edu/FacultyHandbook#4.10).

Emergency Protocol

During an emergency, there are official university procedures that will maximize your safety.
http://www.ou.edu/emergencypreparedness/procedures

12.1 Severe Weather

If you receive an OU Alert to seek refuge or hear a tornado siren that signals severe weather:

1. LOOK for severe weather refuge location maps located inside most OU buildings near the entrances
2. SEEK refuge inside a building. Do not leave one building to seek shelter in another building that you deem safer. If outside, get into the nearest building.
3. GO to the building's severe weather refuge location. If you do not know where that is, go to the lowest level possible and seek refuge in an innermost room. Avoid outside doors and windows.
4. GET IN, GET DOWN, COVER UP.
5. WAIT for official notice to resume normal activities.

Link to Severe Weather Preparedness - Video: https://vimeo.com/237922159

12.2 Fire Alarm/General Emergency

If you receive an OU Alert that there is a danger inside or near the building, or the fire alarm inside the building activates:

1. LEAVE the building. Do not use the elevators.
2. KNOW at least two building exits
3. ASSIST those that may need help
4. PROCEED to the emergency assembly area
5. ONCE safely outside, NOTIFY first responders of anyone that may still be inside building due to mobility issues.
6. WAIT for official notice before attempting to re-enter the building.

Link to OU Fire Safety on Campus - `https://vimeo.com/125093634`

12.3 Armed Subject/Campus Intruder

If you receive an OU Alert to shelter-in-place due to an active shooter or armed intruder situation or you hear what you perceive to be gunshots:

1. GET OUT: If you believe you can get out of the area WITHOUT encountering the armed individual, move quickly towards the nearest building exit, move away from the building, and call 911.
2. HIDE OUT: If you cannot flee, move to an area that can be locked or barricaded, turn off lights, silence devices, spread out, and formulate a plan of attack if the shooter enters the room.
3. TAKE OUT: As a last resort fight to defend yourself.

Link to OU Fire Safety on Campus - `http://www.ou.edu/emergencypreparedness/procedures/active-shooter`

12.4 Mental Health Support Services

If you are experiencing any mental health issues that are impacting your academic performance, counseling is available at the University Counseling Center (UCC). The Center is located on the second floor of the Goddard Health Center, at 620 Elm Rm. 201, Norman, OK 73019. To schedule an appointment call (405) 325-2911. For more information please visit *http://www.ou.edu/ucc*.