

Programming Language Concepts

COP4020, Class#21344

Class Periods: T Periods 8-9 (3:00PM – 4:55 PM), R Period 9 (4:05 PM – 4:55 PM)

Location: NRN 1020

Academic Term: Fall 2023

Instructor:

Beverly Sanders

sanders@cise.ufl.edu (IMPORTANT: Include COP4020 in the subject line)

352-294-6667

Office Hours: M 11:00 AM – 12:00 PM or by appointment. (See canvas for zoom link)

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

TBA

Please contact through the Canvas website

Course Description

Introduces programming language principles, including language constructs, design goals, run-time structures, implementation techniques and exposure to a wide variety of programming paradigms. 3 credits

Course Pre-Requisites / Co-Requisites

Prerequisite: COP 3530

Course Objectives

This course will discuss design and implementation of programming languages. Topics include: lexical analysis, parsing, programmatic semantics, code generation, and programming language paradigms. Due to the nature and complexity of this field of study, the course will be time consuming and requires serious dedication on the part of each student. Be careful not to fall behind, success in this course requires consistent effort and practice.

Materials and Supply Fees

None

Relation to Program Outcomes (ABET):

The table below is an example. Please consult with your department's ABET coordinator when filling this out.

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. 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	Medium
3. An ability to communicate effectively with a range of audiences	
4. 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	
5. 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	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	High
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	High

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Required Textbooks and Software

- Crafting Interpreters. Robert Nystrom. 2021. ISBN-13: 978-0990582939, ISBN-10: 0990582930 . This book can be purchased from the usual sources. It is also available to read free on the web at <https://craftinginterpreters.com/contents.html>
- Java >=18 and an appropriate IDE. Junit 5, git
- SML (free download from www.smlnj.org)

Recommended Materials

- Programming Language Pragmatics, 4th Edition, Michael L. Scott, 2016, Morgan Kaufmann, ISBN 10 | 13: 0124104096 | 978-0124104099

Course Schedule

Week	Topic
0	Introduction
1	Lexical analysis and scanning
2	Syntax
3	Parser construction
4	Abstract syntax trees, error handling
5	Names, scopes and bindings
6	Names, scopes, and bindings
7	Semantic analysis
8	Visitor pattern, type systems
9	Composite types
10	Control flow, data abstraction, design by contract
11	Implementation and code improvement
12	Functional programming
13	Logic programming
14	Scripting languages
15	JVM

Attendance Policy, Class Expectations, and Make-Up Policy

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

In order to be successful in this course, you should attend and participate in live lectures. Lectures will be presented synchronously in two modalities, in-person in the classroom and virtually via zoom during the scheduled class time. See the course Canvas page for the zoom meeting information. You must be signed in with your UF account in order to join.

- You are responsible for all material covered during the lecture
- Lecture attendance will not be taken
- Lectures will be recorded and can be found shortly after the class in the Zoom Conferences menu option in Canvas. (Disclaimer: Recordings are made by the zoom platform and I cannot guarantee the quality or availability of the recording. To ensure that you view the complete lecture, attend the live lecture session.)
- Occasional in-class activities for extra credit may be offered. There will be no makeups for these activities.
- No makeup quizzes will be administered. Instead, for excused absences, the final exam grade will substitute for the grade of the missed quiz.
- Excused absences must be documented with an Instructor Notification letter that can be obtained from DSO.
<https://care.dso.ufl.edu/instructor-notifications/>

Evaluation of Grades

Activity	Percentage of Final Grade
Quiz 0	32% (8% for each of the highest 4 quizzes)
Quiz 1	
Quiz 2	
Quiz 3	
Quiz 4	
Quiz 5	
Project milestone 0	28% (7% for each of the highest 4 assignments)
Project milestone 1	
Project milestone 2	
Project milestone 3	
Project milestone 4	
Project milestone 5	
Final Complete Project	24%
Cumulative final exam	16%

There will be six quizzes during the semester. Only the highest four scores will count.

The semester project is split into 6 graded milestones, building into the final submission. Only the highest four scores will count. The project is cumulative: each part of the project will require completion of the previous parts.

Dropping two milestone grades and two quiz grades provides you with flexibility to deal with normal vicissitudes of life, job interviews, etc. No late submissions will be accepted for grading except as required by University policy.

The final exam will be given on the date and time scheduled by the registrar for this course: Dec

Quizzes and exams will be taken individually. The project will be done in groups of one or two students. If the project is done in a group of two, both students are expected to make approximately equal contributions to every submission and both are responsible for the contents of that submission.

Grading Policy

The grading policy will be at least as generous as the following

Percent	Grade	Grade Points
92 - 100	A	4.00
89 - 91.9	A-	3.67
86 - 88.9	B+	3.33
82 - 85.9	B	3.00
79 - 81.9	B-	2.67
76 - 78.9	C+	2.33
72 - 75.9	C	2.00
69 - 71.9	C-	1.67
66 - 68.9	D+	1.33
62 - 65.9	D	1.00
59 - 61.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.ua.ufl.edu/public-results/>.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor in this class.

Academic integrity is taken seriously in this course, which has a zero-tolerance policy for cheating. All discovered incidents of cheating will be reported to SCCR with recommended penalty of an E in the course. All project work submitted should be the work of the submitting student(s), created this semester for this assignment. Students working in pairs must both contribute approximately equal amounts to EACH submission, and both are responsible for the contents of the submission.

You are allowed to:

- discuss high level solutions with other students and
- ask questions in the class slack channel and during office hours
- use code presented in the lectures.

You are NOT allowed to

- Share your code with anyone else (except your official project partner).
- Receive code from others (except your official project partner), including students in previous semesters.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <https://counseling.ufl.edu>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the [Office of Title IX Compliance](#), located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling; <https://career.ufl.edu>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

On-Line Students Complaints: <https://distance.ufl.edu/getting-help/>; <https://distance.ufl.edu/state-authorization-status/#student-complaint>.