Programming Language Concepts

COP 4020   Class # 10935, 10934
MWF, period 6, 12:50pm – 1:40pm
TUR L007
Spring 2023

Instructor:
Dr. Beverly Sanders
Preferred contact is via Canvas
sanders@cise.ufl.edu (put COP4020 in the subject line)
[Note: There is another person named Beverly Sanders at UF.   Please make sure you are contacting the right one.]
Office Hours: W 3-4pm.

Teaching Assistant/Peer Mentor/Supervised Teaching Student:
See Canvas for information

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 how programming languages are constructed and analyze the methodology used to create existing languages. Topics included are: lexical analysis, scanning, programmatic semantics, code generation, and different types of programming languages. 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):
Not applicable. This course is not currently assessed for ABET

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.
- 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
- Concepts of Programming Languages, 12th Edition, Robert W. Sebesta, 2018, Pearson, ISBN 10 | 13: 0134997182 | 978-0134997186

Course Schedule (Tentative)

Week	Date	Topic
1	1/9	Introduction and overview; regular expression; specification and recognition of tokens
2	1/16	No class Monday (MLK Day); review of OOP and Java; lexer implementation
3	1/23	Context-free grammars; parsing algorithms; grammar transformations
4	1/30	Recursive descent parsers; error handling; abstract syntax trees
5	2/6	Visitor pattern; names, scopes, and bindings
6	2/13	Implementing scopes
7	2/20	Semantic analysis
8	2/27	Type systems; composite types
9	3/6	Control flow
10	3/13	No classes (Spring break)
11	3/20	Code generation, JVM
12	3/27	OOP and Design by Contract
13	4/3	Implementation and code improvement
14	4/10	Functional programming
15	4/17	Functional programming
16	4/24	Logic programming

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 TUR L007 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.)

Notice: Our lectures will be audio visually recorded for students in the course to reference after the live recorded session. Students who choose to participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated. A textual "chat" feature is also available during lecture. "Chats" sent through the public channel may be recorded. If you do not wish for you "chat" to be recorded, you must send it through the private channel directly and only to the instructor. Please note, since lecture is a public setting, private chats may or may not be answerable during the live lecture. Virtual office hours should be used for any private discussions that cannot be handled during a lecture session.

Makeups or extensions for graded class activities are provided given appropriate documentation is presented in a timely fashion. Excused absences must be consistent with University policies in the undergraduate catalog and meet University requirements regarding excused absences. Unless it is impossible to do so, documentation should be provided prior to the event. The Dean of Students Office (https://care.dso.ufl.edu/instructor-notifications/) provides rules, guidance, and approval for excuse documentation. Once an excuse has been approved by DSO, appropriate documentation for your instructors will be provided.

In place of late submissions, makeups, and extensions on project assignments, you are allowed to drop multiple project milestones (see below)

Evaluation of Grades

Activity	Percentage of Final Grade
Quiz 1	30% (7.5% for each of the highest 4 quizzes)
Quiz 2	
Quiz 3	
Quiz 4	
Quiz 5	
Quiz 6	
Project milestone 1	30% (7.5% for each of the highest 4 assignments)
Project milestone 2	
Project milestone 3	
Project milestone 4	
Project milestone 5	
Project milestone 6	
Final Complete Project	40%

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. The two lowest milestone scores are dropped. 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 project will be done in groups of one or two students. Quizzes will be taken individually.

Grading Policy
The grading policy will be no harsher than 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.aa.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.aa.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 or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

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
• Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@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/.

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/state-authorization-status/#student-complaint_.