

Programming Language Concepts

COP 4020

Sections: 6620 [F2F], OFLO [Online 100%]

Class Numbers: 11157 [F2F], 28779 [Online 100%]

Class Periods: MWF 6th period [12:50 to 01:40 PM EST]

Location: CSE A101 | Zoom [see daily Modules in Canvas]

Academic Term: Spring 2021

Instructor:

Pete Dobbins

CSE E474

pjd@cise.ufl.edu

352.294.6685

Virtual Office Hours [VOH]: MW 4th period [10:40 – 11:30 AM], R 10th period [05:10 – 06:00 PM]

- Per UF policy, all office hours will continue to be held virtually via Zoom.
- Here is Pete's Zoom link: <https://ufl.zoom.us/j/4755418272>
- VOH will *begin Monday, January 18, 2021*.
- During the **first week of classes, Wednesday, January 13, 2020 4th period** [10:40 – 11:30 AM EST] I will hold VOH to get things kicked off. If you any questions, please swing by the Zoom session and we will chat.

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Please contact TAs/PMs through the course MS Teams chat. Announcements will be posted in MS Teams. Invitations to our Team will be sent out after drop/add has ended. Within our Canvas course shell you will find the VOH schedule (Modules/General Course Info/Weekly VOH Schedule) and Zoom links for each staff member.

- Blake Anderson
- Grant Boicheff
- Hosung Lee
- Abinai Pasunuri
- Calvin Yang
- Yichi Zhang

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. (M) 3 credit hours

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 language. 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

There are no materials or supply fees for this course beyond the textbook. See the *Required Textbook* section below for purchasing details.

Professional Component (ABET):

See the table provided in the *Relation to Program Outcomes* section that follows. Note this course is not tracked as part of the accreditation process at this time.

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	
2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	
4. An ability to communicate effectively with a range of audiences	
5. 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.	
6. An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.	
7. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course. Note this course is not tracked as part of the accreditation process at this time.

Optional Textbooks and Software

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

Supplemental Textbook

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

Course Schedule

Here is a general schedule for the semester. Please refer to the *Canvas Announcements* and *Modules* for final details about each topic, exact dates, and the specific schedule we implement this semester. Note, under *Modules*, individual lectures are listed using the format: **year / month / date | L##: General Topic**.

Dates	Week	Topics	Chapters
2021 / 01 / 10 - 01 / 16	1	Introduction, OOP, Unit Testing	
2021 / 01 / 17 - 01 / 23	2	Regular Expressions	
2021 / 01 / 24 - 01 / 30	3	Lexical Analysis, CFGs	
2021 / 01 / 31 - 02 / 06	4	Parsing	
2021 / 02 / 07 - 02 / 13	5	Parsing, Semantic Analysis	
2021 / 02 / 14 - 02 / 20	6	Semantic Analysis	
2021 / 02 / 21 - 02 / 27	7	Naming, Scoping, Binding	
2021 / 02 / 28 - 03 / 06	8	Type Systems	
2021 / 03 / 07 - 03 / 13	9	Kotlin	

2021 / 03 / 14 - 03 / 20	10	Haskell	
2021 / 03 / 21 - 03 / 27	11	Rust	
2021 / 03 / 28 - 04 / 03	12	OCaml	
2021 / 04 / 04 - 04 / 10	13	Java Class Files	
2021 / 04 / 11 - 04 / 17	14	Generating Byte Code	
2021 / 04 / 18 - 04 / 24	15	Classes End	-
2021 / 04 / 25 - 05 / 01	16	Final Exams Week	-

Attendance Policy, Class Expectations, and Makeup Policy

General policies can be found here: <http://www.cise.ufl.edu/~pjd/admin/policies/course.html>. You are expected **know and follow** all of these policies. In order to be successful in this course, you should attend lecture. There is no replacement to the experience of seeing the material presented during lecture.

Live lectures will be *presented synchronously* in our assigned classroom [F2F] and simultaneously streamed virtually via **Zoom: MWF 6th period [12:50 to 01:40 PM EST]**. University policy states that you should attend using the medium [F2F or online] of your registered section. If you would like to change sections, please adjust your schedule accordingly through course registration [<https://one.ufl.edu/>] or speak with CISE Academic Advising [<https://www.cise.ufl.edu/academics/advising-information/>].

In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom [F2F] interactions.

- You are required to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
- This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations.
- Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
- Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom.
- If you are experiencing COVID-19 symptoms ([Click here for guidance from the CDC on symptoms of coronavirus](#)), please use the UF Health screening system and follow the instructions on whether you are able to attend class. [Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms.](#)

Here are course specific points of significance for our lecture process this semester.

- You are responsible for all material covered during lecture.
- Lecture attendance will not be taken (attendance is not mandatory).
- Lectures will be recorded and posted in Canvas (see the disclaimers and notice that follow).

Disclaimer #1: many Zoom sessions are being held campus-wide to deliver courses and the demand for recorded materials is high. It is possible there will be delays while completing the recording and posting (distribution) process. *I will post live lecture recordings as soon possible [under the corresponding Canvas Module],* however if you want to ensure that you see the lecture as soon you are able, you should participate in the synchronous live lecture.

Disclaimer #2: the Zoom platform records these sessions and I cannot guarantee they will not experience errors in the recording process. I have not observed this to be a significant problem. However, you should always be aware that attending the live lecture session is always the best way to ensure you are able to view the complete lecture content.

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 always be answerable during the live lecture. VOH are provided throughout the week to accommodate any private discussions that cannot be handled during a lecture session. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

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 (<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>) and meet University requirements regarding excused absences. There are very few events which would impede your participation in a graded activity warranting an exception, that you would not be aware of well before [at least a few hours] the start of the activity. The Dean of Students Office (www.dso.ufl.edu) provides rules, guidance, and approval for excuse documentation. Once an excuse has been approved by DSO, appropriate documentation will be provided to your instructors.

In place of makeups and/or extensions on project assignments, you are allowed to drop multiple project parts (see below for details).

One homework score [your lowest] will automatically be dropped. *Late homework:* No work can be accepted after a solution is posted. If a solution has not been posted and you submit one day late, there will be a penalty of up to 50% on the graded work. No work that is two days late can be accepted. Note, if the assignment is due at 11:59 PM, then at 12:00 AM the work is one day late.

Evaluation of Grades

Activity		Due Date	Comments	Total Grade Percentage
Homework		various dates	1 drop	20%
Project	Part 1: Lexer	2021 / 02 / 08	15% each for the highest 3 scores [2 drops]	45%
	Part 2: Parser	2021 / 02 / 22		
	Part 3: Interpreter	2021 / 03 / 22		
	Part 4: Analyzer	2021 / 04 / 05		
	Part 5: Generator	2021 / 04 / 12		
Final Evaluation [(re)-submit all parts]		2021 / 04 / 26		35%
			Total	100%

Project Assignments

We will have a semester project split into 5 parts building to the final submission evaluation. Your two lowest project part scores [Part 1 through Part 5] will automatically be dropped. However, the following parts of the project will require the previous part’s completion. The final project evaluation will evaluate the complete project [incorporating both the complete interpreter and compiler].

You may submit any project as many times as you need, however no late submissions will be accepted for grading. Note, dropping project parts provides you with flexibility should exceptions arise.

Completing the project does not require you work in a group. Optionally, you are allowed to work in a group of size 2. Groups are self-managed [you pick your partner]. It is each student's responsibility to manage their individual effort. If you find your group is not working effectively, you are allowed a one-time shift to working individually. This request must be made by March 31, 2021 at 5 PM.

Homework

Homework activities will be *completed individually*. They will be assigned and submitted through Canvas.

Grading Policy

The range used to calculate your final letter grade in our course will be no harsher than this grading scale provided in the following table. Your final point total will be calculated using the percentages given in the *Evaluation of Grades* section. The percent you earn on each activity will be multiplied by the grade points associated with that activity.

Grade Points	Letter Grade	Highest	Lowest
4.00	A	100+	92.00
3.67	A-	91.99	89.00
3.33	B+	88.99	86.00
3.00	B	85.99	82.00
2.67	B-	81.99	79.00
2.33	C+	78.99	76.00
2.00	C	75.99	72.00
1.67	C-	71.99	69.00
1.33	D+	68.99	66.00
1.00	D	65.99	62.00
0.67	D-	61.99	59.00
0.00	E	58.99	0.00

More information on UF grading policy may be found at:

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

Re-Grade Requests

All grading/re-grading issues **must** be resolved within **1 week** of the graded work being returned. You must return exams/projects/quizzes to the person grading the activity in question, along with a **printed (not handwritten) attachment** stating the reasons for the re-grade. Do not write anything on the exam itself or detach (un-staple) the pages from each other. If you do so, your exam/project/quiz will not be re-graded. Note, when requesting a re-grade, the whole exam/project/quiz is subject to the re-grade, not just the portion you specify. We will be happy to discuss the solution and answer any questions, however no change will be made after the allotted week has passed.

Disclaimer

This document is subject to change at the discretion of the instructor, based on unforeseen circumstances (such as pandemics, hurricanes, sub-freezing temperatures... this is Florida after all, rifts in the fabric of time, and so on) occurring during the semester. Any such change would be introduced in order to better accommodate *you* due to the circumstances being experienced.

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request accommodations should connect with the Disability Resource Center <https://disability.ufl.edu/students/get-started/> (352.392.8565, <https://disability.ufl.edu/>). Once registered, the DRC provides documentation to instructors. Students should contact instructors to ensure documentation has been received as well as to discuss accommodation specifics so that everything can be setup. Students with disabilities should follow this procedure as early as possible in the semester, delaying may affect the ability to schedule the accommodation. All exams, quizzes, and so on administered through

the DRC office must follow the course exam structure, being completed on the same date and time as the course exam.

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/>.

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/policies/student-honor-code-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
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@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: <http://www.counseling.ufl.edu/cwc>, 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 Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.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://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.