
SYLLABUS, FALL 2020

COP5556 PROGRAMMING LANGUAGE PRINCIPLES

CATALOG DESCRIPTION

History of programming languages, formal models for specifying languages, design goals, run-time structures, and implementation techniques, along with a survey of principal programming language paradigms. (3)

PRE-REQUISITES AND CO-REQUISITES

COP 3530 Data Structures and Algorithms (or equivalent undergraduate course).

COURSE OBJECTIVES

Students will gain both a conceptual understanding of specification and design issues in programming languages and their implementation, and hands-on experience implementing a compiler or interpreter for a small programming language.

INSTRUCTOR

Dr. Beverly A. Sanders
Telephone: (352) 505 1563
Zoom office Hours: T 1:55-2:45 or by appointment

GRADER

Madhav Sodhani

COMMUNICATING WITH THE INSTRUCTION STAFF

- Question of general interest: course discussion board in Elearning or Slack channel
- Question about assignments after grading: comment on assignment submission in canvas. (Can be seen by both the instructor and the grader)
- Other issues (Canvas message (preferred) or email to instructor with COP556 in subject line)

MEETING TIMES

T 8-9 (3:00pm-4:55pm), R 9 (4:05-4:55pm)
Videos of lectures will be available at elearning.ufl.edu

ONLINE COURSE RECORDING

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who 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 and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

CLASS/LABORATORY SCHEDULE

Three 50-minute class sessions per week (on two days.)

MEETING LOCATION

Online: See the course canvas page for details.

TEXTBOOKS AND SOFTWARE REQUIRED

TEXTBOOKS

Title: Programming Language Pragmatics
Author: Michael L. Scott
Publication date and edition: **2016, Fourth Edition** (earlier editions are NOT adequate)
ISBN 9780124104099

Title: Syntax and Semantics of Programming Languages
Author: Ken Slonneger and Barry Kurtz
This book is out of print but the author has posted it online at
<http://www.cs.uiowa.edu/~slonnegr/plf/Book>
Chapters 1,3,5,8, and 11

SOFTWARE

Java 8
ASM (an open source java bytecode manipulation framework)
SMLNJ
Git
Chrome browser (for HonorLock proctoring of exams)

COURSE OUTLINE (GIVEN TOPICALLY RATHER THAN CHRONOLOGICALLY)

- Specification of programming languages
 - Syntax

- Semantics
 - Operational Semantics
 - Denotational Semantics
 - Axiomatic Semantics
 - Attribute Grammars
- Issues in language design
 - Names, scope, and binding
 - Types
 - Control Flow
 - Control Abstractions
- Programming language paradigms
 - Data abstraction and object-oriented programming (examples: Java, Smalltalk, C++)
 - Non-imperative paradigms
 - Functional languages (examples: Scheme, ML, Haskell)
 - Logic programming (example: Prolog)
 - Dynamic and scripting languages (examples: lua, csh, Python, Ruby, Perl, tcl, etc.)
 - Concurrent programming (examples: Java, SR, OpenMP)

ATTENDANCE POLICY, CLASS EXPECTATIONS, AND MAKE-UP POLICY

Students in this course are adults and responsible for managing their time. This means keeping up with the lectures and turning assignments in on time. Except as required by University policy, no extensions to deadlines will be granted and no makeup exams will be given. Excused absences must be consistent with university policies in the Graduate Catalog (<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance>) and require appropriate documentation.

Students are expected to read all announcements and discussions on elearning. The latter are actively monitored by the course staff and often contain useful clarifications and hints for the assignments.

EVALUATION OF GRADES

Exams 50%

Midterm 15%

Final exam 35%

Assignments 1-5 30%

The two lowest scores from Assignments 1-5 will be dropped.

Assignment 6 will count 20% and may not be dropped.

Assignment 6 will have a resubmission option to improve the grade.

GRADING POLICY

Grades will be curved.

More information on UF grading policy may be found at:

<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

EXAM SCHEDULE

Midterm (Synchronous online using HonorLock)

Thursday, October 29, 2020. 10:40-12:30. (tentative, to be confirmed)

Final Exam (Synchronous online using HonorLock)

Friday, December 18, 2020, 10am-12pm

This is the final exam time determined for our course by the registrar. All students must take the exam (online) at this time. No early exams will be given.

HOMEWORK AND PROJECT DESCRIPTION

A homework assignment will be assigned approximately every two weeks. Each assignment will include part of an ongoing project to implement a compiler for a small programming language. The compiler must be written in Java. The target language is java byte code and we will use the ASM byte code framework to help with code generation. Eclipse is the recommended IDE as there is a convenient plug-in for ASM.

Submitted homework will be graded by subjecting it to as collection of JUnit tests and scored as a percentage of passed tests. Understanding the specification and carefully and thoroughly testing your own code is expected. Students are also required to turn in a git repository containing the history of their project development. (Assignments must NOT be visible in a public repository.)

No extensions to deadlines will be granted (except as required by University regulations) **and no late assignments will be accepted.** However, in order to allow you to deal with unforeseen events, job interviews, reduce stress, etc. the lowest two scores from assignments 1-5 will be dropped. However, be aware that each assignment builds on and includes code written in previous ones, so even if you do not submit an assignment in time to receive a score for it, it still must be done. It is your responsibility to ensure that your submissions conform to the instructions and are submitted on time. Low grades due to careless mistakes will not be regraded.

Assignment 6 will be the complete compiler and may not be dropped. It will also count double. For assignment 6 only, there will be an opportunity to resubmit after correcting errors in order to improve your grade.

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/>.

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.

All work submitted in this course must be your own and produced exclusively for this course this semester. Violations will be taken seriously and are noted on student disciplinary records. These rules imply the following specific requirements for this class:

Sharing your project with another student is also a violation of the honor code. You may not share any part of your project with another student, or use any part of another students project in yours, even if that part of the project has already been graded.

Do not post your project on a web site (e.g. public repository on github) where it is visible to others.

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:

<http://registrar.ufl.edu/catalog0910/policies/regulationferpa.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>.