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# SYLLABUS, FALL 2019

## 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  
Office location: CSE 348  
Telephone: (352) 505 1563  
Please contact via Elearning message  
or send email to [sanders@cise.ufl.edu](mailto:sanders@cise.ufl.edu) with COP5556 in the subject line  
Office Hours: Th 1:55-2:45 or by appointment

### TEACHING ASSISTANTS AND GRADERS

TBA

### COMMUNICATING WITH THE INSTRUCTION STAFF

- Question of general interest: discussion in Elearning (can be seen by entire class)
- Question about assignments after grading: comment on assignment (question and responses can be seen by instructor and TAs)
- Other issues (Canvas message 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](http://elearning.ufl.edu)

## CLASS/LABORATORY SCHEDULE

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

## MEETING LOCATION

NEB 102

## 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**

## 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 are expected to either attend class or watch the videotaped lectures. 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 1-6 30%  
     The three lowest scores from Assignments 1-6 will be dropped.  
 Assignment 7 20%

## 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  
     In class Tuesday, October 15  
 Final Exam  
     Wed. December 10, 2019, 7:30 AM - 9:30 AM

This is the time determined for our course by the registrar. All students must take the exam 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 a 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.

**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 three scores from assignments 1-6 will be dropped. However, be aware that each assignment builds on 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 7 is a resubmission of assignment 6 after correcting errors. Assignment 7 will not be dropped. Note that a late submission of Assignment 6 may prevent you from receiving useful feedback for Assignment 7.

## STUDENTS REQUIRING ACCOMMODATIONS

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure 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](mailto:rbielling@eng.ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto: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](mailto: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](mailto: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](mailto: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](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf).

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