JOHNS HOPKINS
U N I V E R S I T Y

Programming Languages

Course Information

Programming Languages
EN.605. 629 8VL (3.0 Credits)
Fall 2021 [AE Fall 2021]

Description

This course compares and contrasts a wide variety of features of at least twelve programming languages, including programming language history; formal methods of describing syntax and semantics; names, binding, type checking, and scopes; data types; expressions and assignment statements; statement-level control structures; design and implementation of subprograms; exception handling; and support for objectoriented programming. Students will also learn and write fourweek projects in three programming languages (e.g., Python, Perl, and C#).

Department: PE Computer Science
College: Engineering and Applied Science Programs for Professionals

Expanded Course Description :

Being no different from a spoken language, a programming language is used for providing instructions to a computing device to perform tasks. A language has a vocabulary and a set of grammatical rules to shape and frame the communication between the user and the computing device.

The Programming Languages course compares and contrasts a wide variety of features of numerous old and new programming languages, including programming language history; formal methods of describing syntax and semantics; names, binding, type checking, and scopes; data types; expressions and assignment statements; statement-level control structures; design and implementation of subprograms; exception handling; support for object-oriented programming; and concurrency.

We will survey the fundamental concepts underlying modern programming languages with the goal of understanding paradigms, but not vocational training in any given language. Several examples will be drawn from C, C++, Java, Python, ML, JavaScript, and Scheme.

Instructor

Erhan Guven
✉ eguven2@jhu.edu

Class Times :

Monday, 4:30-7:10 PM EST

Course Location :

VL Zoom

Communication Policy :

I prefer that students contact me via Microsoft Teams Chat. I encourage you to post questions to the **General or Module Channels** in Microsoft Teams so that your classmates can benefit from the answer to your questions as well—your classmates might even know the answer to your question and respond to you first. To send a direct message in Microsoft Teams, select **Chat** on the left-hand menu of Teams and click the **New Chat** icon in the corner above the chat pane. Then type in the name of the instructor/student you would like to message.

If emailing, please be sure to include course number in the subject line. I will make every effort to respond to your inquiry within 24 hours or earlier.

Office Hours :

Office Hours will be available on Zoom Thursday and Sunday of each week from 6:00-7:00 pm Eastern time. Students may click on the scheduling tool link or click Office Hours on the course menu.

Course Structure :

The course materials are divided into modules, one for each week of the course. All course materials and assignments will be housed in Blackboard and Microsoft Teams. The module content can be accessed by clicking **Course Modules** on the left menu. A module will have several sections including the overview, content, readings, discussions, and assignments. You are encouraged to preview all sections of the module before starting. Most modules run for a period of seven (7) days, exceptions are noted in the **Course Outline**. You should regularly check the **Calendar** and **Announcements** for assignment due dates.

Course Topics :

- Introduction
- Syntax and Semantics
- Lexical and Syntax Analysis
- Names, Bindings, and Scopes
- Data Types, Introduction to Meta Language ML
- Expressions and Assignment Statements, Introduction to Scheme
- Statement-Level Control Structures, Scheme Workshop
- Subprograms, Scope and Activation Records
- Implementing Subprograms, Lambda Calculus
- Abstract Data Types and Support for Object-Oriented Programming
- Concurrency
- Exception Handling and Event Handling
- Logic Programming Languages

Course Goals :

Introduce new ways of thinking about programming. Typically, computer science students start out learning to program in an imperative model of programming where variables are created and updated as a program executes. However, there are other ways to program and use programming language paradigms applied to problem solving.

Course Learning Outcomes (CLOs) :

> ⓘ No Course Learning Outcomes are available for this course.

Required Text and Other Materials

Textbooks :

Concepts of Programming Languages, (11th edition) by Sebesta, Addison-Wesley, 2015. ISBN-13: 978-0133943023

Technical Requirements :

You should refer to **Support** on the course menu for a general listing of all the course technical requirements.

Evaluation and Grading

Student Coursework Requirements :

Class Participation (10% of Final Grade Calculation)

You are responsible for carefully reading all assigned material and being prepared for both the Virtual Live classroom sessions and Discussions. The majority of readings are from the course text. You will be responsible for all assigned reading material, whether we cover it in class or not, so prepare questions about parts of the readings not understood. There may also be optional readings recommended from the archival literature.

Assignments (70% of Final Grade Calculation)

Assignments will include real-world problems. Although the Assignments will usually reflect the current material, I will also give on occasion a brain-building problem that may no direct relation to the material but rather may require basic logical reasoning to solve.

Assignments are assigned more-or-less every week and can involve basic materials, further examination of concepts introduced and presented in class and in the textbook, brainteasers, and more challenging questions problems. Problems will be the basis for class discussions as well; be prepared to ask and answer questions and discuss the problems.

Any course materials prepared for evaluation for grades must be **turned in Blackboard in PDF or .ipynb format (Jupyter Notebooks).** All assignments are due according to the dates in the Calendar. If there is a legitimate reason why an assignment is going to be late and this can be known in advance (i.e., excluding illness) then the instructor must be

notified of such. Illness is a legitimate excuse for lateness but please let me know as soon as possible and we can make arrangements for delivery. NO ASSIGNMENTS WILL BE ACCEPTED IF SUCH NOTIFICATION WAS NOT MADE.

Refer to the **Assignment Guidelines** for more information.

Quizzes (20% of Final Grade Calculation)

Quizzes will be given online in Blackboard system, to be completed without collaboration or use of materials other than lecture notes and the textbook. A quiz will be around 30 minutes duration, can be taken only once in a time window of a determined due day.

Grading Policy :

EP uses a +/- grading system (see "Grading System", *Graduate Programs* catalog, p. 10).

Score Range	Letter Grade
100-98	= A+
97-94	= A
93-90	= A−
89-87	= B+
86-83	= B
82-80	= B−
79-77	= C+
76-73	= C
72-70	= C−
69-67	= D+
66-63	= D
<63	= F

Policies

Additional Resources :

Personal Wellbeing
If you are struggling with anxiety, stress, depression or other mental health related concerns, please consider connecting with the Johns Hopkins Student Assistance Program (JHSAP). If you are concerned about a friend, please encourage that person to seek out our services. JHSAP can be reached at 443-287-7000 or https://jhsap.org/

Tutoring Website

Johns Hopkins Engineering for Professionals offers a tutoring connection network that allows students to connect with other Johns Hopkins Engineering students or alumni for tutoring services. This service allows students to search a list of courses to "Find a Tutor" or complete a profile to "Become a Tutor." More information about this service can be found on the tutoring website (https://tutor.ep.jhu.edu/).

Deadlines for Adding, Dropping and Withdrawing from Courses

Students may add a course up to one week after the start of the term for that particular course. Students may drop courses according to the drop deadlines outlined in the EP academic calendar (https://ep.jhu.edu/student-services/academic-calendar/). Between the 6th week of the class and prior to the final withdrawal deadline, a student may withdraw from a course with a W on their academic record. A record of the course will remain on the academic record with a W appearing in the grade column to indicate that the student registered and withdrew from the course.

Academic Misconduct Policy

All students are required to read, know, and comply with the Johns Hopkins University Krieger School of Arts and Sciences (KSAS) / Whiting School of Engineering (WSE) Procedures for Handling Allegations of Misconduct by Full-Time and Part-Time Graduate Students.

This policy prohibits academic misconduct, including but not limited to the following: cheating or facilitating cheating; plagiarism; reuse of assignments; unauthorized collaboration; alteration of graded assignments; and unfair competition. Course materials (old assignments, texts, or examinations, etc.) should not be shared unless authorized by the course instructor. Any questions related to this policy should be directed to EP's academic integrity officer at ep-academic-integrity@jhu.edu.

Students with Disabilities - Accommodations and Accessibility

Johns Hopkins University values diversity and inclusion. We are committed to providing welcoming, equitable, and accessible educational experiences for all students. Students with disabilities (including those with psychological conditions, medical conditions and temporary disabilities) can request accommodations for this course by providing an Accommodation Letter issued by Student Disability Services (SDS). Please request accommodations for this course as early as possible to provide time for effective communication and arrangements.

For further information or to start the process of requesting accommodations, please contact Student Disability Services at Engineering for Professionals, ep-disability-svcs@jhu.edu.

Student Conduct Code

The fundamental purpose of the JHU regulation of student conduct is to promote and to protect the health, safety, welfare, property, and rights of all members of the University community as well as to promote the orderly operation of the University and to safeguard its property and facilities. As members of the University community, students accept certain responsibilities which support the educational mission and create an environment in which all students are afforded the same opportunity to succeed academically.

For a full description of the code please visit the following website: https://studentaffairs.jhu.edu/policies-guidelines/student-code/

🏛️ Classroom Climate

JHU is committed to creating a classroom environment that values the diversity of experiences and perspectives that all students bring. Everyone has the right to be treated with dignity and respect. Fostering an inclusive climate is important. Research and experience show that students who interact with peers who are different from themselves learn new things and experience tangible educational outcomes. At no time in this learning process should someone be singled out or treated unequally on the basis of any seen or unseen part of their identity.

If you have concerns in this course about harassment, discrimination, or any unequal treatment, or if you seek accommodations or resources, please reach out to the course instructor directly. Reporting will never impact your course grade. You may also share concerns with your program chair, the Assistant Dean for Diversity and Inclusion, or the Office of Institutional Equity. In handling reports, people will protect your privacy as much as possible, but faculty and staff are required to officially report information for some cases (e.g. sexual harassment).