Cleveland State University  
Department of Electrical Engineering and Computer Science

CIS 424/524: Programming Languages

Catalog Description:  
CIS 424/524 Programming Languages (3-0-3)  
Pre-requisite: CIS265  
A short history of programming languages and coding styles precedes the study of a collection of programming paradigms. The major programming paradigms are surveyed, including procedural, functional, object-oriented, graphical-user-interface based, and logic programming. The relationships between syntax, semantics and the compilation process are investigated.

Textbook:  

Coordinator:  
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Expected Outcomes:  
After taking this course, a student is expected to:  
1. Compare and contrast the major paradigms of programming languages.  
2. Understand the methods of describing language syntax and semantics.  
3. Be able to implement an interpreter for a simple language.  
4. Be familiar with aspects of the object-oriented, functional and declarative languages.  
5. Have the ability to learn new languages quickly.

Fulfillment of CS Program Objectives and Outcomes:  
Objectives:  
1. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution  
2. An ability to function effectively on teams to accomplish a common goal  
3. An ability to apply math foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices  
4. An ability to apply design and development principles in the construction of software systems of varying complexity

Outcomes:  
(a) An ability to apply knowledge of computing and mathematics appropriate to the program’s student outcomes and to the discipline  
(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution  
(c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs  
(d) An ability to function effectively on teams to accomplish a common goal  
(h) Recognition of the need for and an ability to engage in continuing professional development  
(i) An ability to use current techniques, skills, and tools necessary for computing practice.
Contribution of Course to Meeting the Professional Component:
Math & Basic Science: 1 credit;
Engineering Topics: 2 credits;
General Education: 0 credit

Prerequisites by Topic:
Data Structures and Algorithms

Topics:
1. Introduction to Programming Languages 3
2. Describing Syntax and Semantics 6
3. Lexical and Syntax Analysis 3
4. Names, Bindings, and Scope 3
5. Data Types 3
6. Expressions and Statements 3
7. Subprograms 3
8. Abstract Data Types and Encapsulation Constructs 3
9. Object-Oriented Programming 5
10. Concurrency (OpenCL) 3
11. Exception and Event Handling 3
12. Functional Languages (ML) 4
13. Logic Programming (Prolog) 3

Total 45

Computer Usage:
Python, ML, Prolog, C#, OpenCL