

EMBRY-RIDDLE AERONAUTICAL UNIVERSITY
Department of Computing and Mathematics
COURSE OUTLINE FOR

Course No.: CS332
Cr Hrs: 3

Title: Organization of Programming Languages

Lecture Hours: 3

Laboratory Hours: 0

COURSE DESCRIPTION:

A comparative study of different programming paradigms. Students program in several languages chosen to illustrate the essential features of the paradigms studied. Formal language concepts are also introduced.

Prerequisite:

CS 225, CS 222.

GOALS:

The purpose of this course is to familiarize students with the mechanics of programming languages through a comparative study of different programming paradigms (e.g. Imperative, Declarative). To give students an opportunity to learn and program in several languages (e.g. Pascal, C, C++, Lisp, Prolog). To also introduce the formal language concept.

PERFORMANCE OBJECTIVES:

1. Familiarity with historical aspect of programming languages.
2. Understand the criterias for evaluating a programming language.
3. Understand the concept of formal languages.
4. Distinguish between different grammars and construct the syntax diagrams and BNF (and EBNF) notations.
5. Understand different programming paradigms and their features.
6. Compare and contrast among different paradigms.
7. Learn and program in several languages.
8. Categorize certain languages with their features.
9. Learn the philosophy underlying language design.

10. Understand different terms like type, type checking, and pointers.
11. Understand how procedure activation, different parameter passing methods, types of expression evaluations, and scope rules work.
12. Get more in-depth knowledge of features in object oriented languages.
13. Learn object oriented thinking and concepts like derived classes and information hiding.
14. Understand and use elements of functional languages and concepts like different expression evaluation, type and type checking for functional languages.
15. Learn basic syntax and program in LISP.
16. Get familiar with logical programming language concepts.
17. Introduction to Prolog.
18. Get familiar with basic concepts in concurrent processing.
19. Present features and concepts of a popular programming language.

TEXTBOOK:

Sethi, Ravi, *Programming Languages, Concepts and Constructs*, 2nd Edition, Addison Wesley, 1996.

SUGGESTED SUPPLEMENTAL MATERIALS:

- *Concepts of Programming Languages*, Third Edition, Robert W. Sebesta, Addison-Wesley, 1996.
- *Essentials of Programming Languages*, Daniel P. Friedman, MIT Press, 1992.

PREREQUISITE KNOWLEDGE BY TOPIC:

TOPIC	CLASS HOURS	COURSE OBJECTIVES
• History of Programming Languages	3	a. Foundation of programming languages b. Developmant of new languages from previous ones

CS332

- Formal languages Concepts 10
 - a. Grammar of programming languages.
 - b. Syntax structure
 - c. Recognition machines

- Imperative Programming (Pascal, C, C++) 10
 - a. Structured programming at statement level
 - b. Types, data representation
 - c. Procedures, parameter passing, scope
 - d. Binding, visibility
 - e. Object Oriented programming

- Declarative Programming 10
 - a. Functional Programming, Lisp
 - b. Logic Programming, Prolog

- Concurrent Programming 5
 - a. Issues concerned with concurrent programming

- Hour Exams 4

LABORATORY:

None.

COMPUTER USAGE:

Occasional use as a learning tool in the classroom.

GRADING SYSTEM:

- Midterm 20%
- Quizzes and homeworks 15%
- Small programming assignments 20%
- Report and Presentation 20%
- Final Exam 25%

ESTIMATED CONTENT:

Skills: %
Content: %