CMSE 318 / CMPE 410 Principles of Programming Languages

Department: Computer Engineering

Instructor Information
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Meeting times and places
Tuesday 10:30-12:20, CMPE126
Thursday 10:30-12:20, CMPE126
Friday 16:30-18:20, CMPE239 (Lab)

Program Name: Software Engineering/Computer Engineering	**Program Code:** 29/25

Course Code CMSE 318 / CMPE410	**Credits** 4	**Year/Semester** 2023-2024 Fall

☒ Required Course ☐ Elective Course (click on and check the appropriate box)

Prerequisite(s):
CMSE211/CMPE 211 Object-Oriented Programming

Catalog Description
Formal specification of programming languages: syntax, analysis, and semantics; evolution of programming languages and concepts; names and scope; data representation; evaluation sequence at expression, statement, and subprogram levels; Object Orientation implementation issues; abstraction, inheritance, polymorphism, concurrency, and exception handling; sampling of other paradigms such as functional, logical, scripting, high-performance, etc. as time permits. Weekly homework and lab work are assigned in parallel to lectures.

Course Web Page
https://staff.emu.edu.tr/zekibayram/en/teaching/cmse318cmpe410

Textbook(s)
SEBESTA, Robert W.: Concepts of Programming Languages, 11th Edition, Pearson Intl (Addison-Wesley), 2016. ISBN: 0-321-50968-4.

Topics Covered and Class Schedule
(4 hours of lectures per week)

Week 1	Introduction
Week 2	History
Week 3	Describing Syntax and Semantics
Week 4	Lexical and Syntax Analysis
Week 5	Names, Bindings, Type Checking, Scopes, Data Types
Week 6	Expressions and Assignment Statements
Week 7	Control Structures
Week 8	Functional Programming
Week 9	Subprograms
Week 10	Implementing Subprograms
Week 11	Abstract Data Types and Encapsulation Concepts
Week 12	Support for Object-Oriented Programming
Week 13	Concurrency (Time permitting)
Week 14	Exception Mechanism (Time permitting)

Lab Schedule

Weeks 3-4	C++ data structures
Weeks 5-6	Lexical analysis
Weeks 7-8	Syntax analysis
Weeks 9-12	Haskell programming

Course Learning Outcomes

Upon successful completion of the course, students are expected to have the following competencies:

1. Draw an annotated parse tree for a given input and attribute grammar (SO 1)
2. Have knowledge of various programming languages, their features, history and category (SO 1)
3. Use LR parsing tables for bottom up parsing of a given input (SO 1)
4. Work effectively with context free grammars (SO 1)
5. Draw a parse tree for a sentence in a language, given its grammar (SO 1)
6. Derive a sentence in a language, given its grammar (SO 1)
7. Demonstrate that a specific grammar is ambiguous (SO 1)
8. Write a simple lexical analyzer (SO 1)
9. Write a simple top-down parser (SO 1)
10. Show the contents of the system stack after several function calls (SO 1)
11. Differentiate between static and dynamic scope (SO 1)
12. Trace output of programs with various parameter passing methods (SO 1)
13. Be familiar with the implementation techniques of object-oriented constructs (SO 1)
14. Write and trace simple programs in the Haskell Functional Programming Language (SO 1)

Assessment	**Method**	**No**	**Percentage (Overall)**
	Midterm Exam(s)	1	44%
	Final Examination	1	44%
	Attendance	-	-
	Assignments	4	12%

Policy on makeups: For eligibility to take a makeup exam, the student should bring (send) a doctor's report ***within 3 working days of the missed exam.***

Policy on the NG grade: If you miss two exams with no valid excuse, **and/or** if you attend less than 50% of classes you will be given the NG grade.

Policy on missed labs: There will be no makeup for missed labs. If you cannot attend a lab for some reason, you should contact the assistant *beforehand* so that you can present your work in advance.

Relationship of the course to ABET Student Outcomes

The course has been designed to contribute to the following student outcomes:
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

Prepared by: Prof. Dr. Zeki Bayram	**Date:** 25 September 2023