# CMPE 318 Principles of Programming Languages

**Department:** Computer Engineering

**Instructor Information**
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**Assistant Information**
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**E-mail:** armin.mehri@emu.edu.tr  
**Office:** 125  
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**Meeting times and places**
- Wednesday 12:30-14:20, Room CMPE 129  
- Friday 10:30-12:20, Room CMPE 129  
- Friday 12:30-14:20, Lab CMPE 137

**Program Name:** Computer Engineering  
**Program Code:** 25

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<th>Course Code</th>
<th>Credits</th>
<th>Year/Semester</th>
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<tr>
<td>CMPE 318</td>
<td>4</td>
<td>2015-2016 Spring</td>
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- **Required Course**  
- **Elective Course**  

**Prerequisite(s):**
- CMPE211 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**
http://cmpe.emu.edu.tr/bayram/courses/318/Teaching/Spring%202016/Main.htm

**Textbook(s)**

**Indicative Basic Reading List**
None.
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
Week 14 Exception Mechanism

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

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<th>Assessment</th>
<th>Method</th>
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<tr>
<td></td>
<td>Midterm Exam(s)</td>
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<td>Final Examination</td>
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<td>Assignments</td>
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**Computation of the attendance grade:** Less than 50%, 0 points. At least 75% attendance, 5 points. Otherwise $5 \times \left(\frac{\text{number of days attended}}{\text{number of days attendance taken}}\right)$. Attendance will start to be taken once the add-drop period has ended.

**Policy on makeups:** For eligibility to take a makeup exam, the student should bring 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, 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 Program Outcomes**

The course has been designed to contribute to the following program outcomes:

a) apply knowledge of mathematics, science, and engineering

b) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

c) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

**Prepared by:** Assoc. Prof. Dr. Zeki Bayram  
**Date Prepared:** 22 February 2016