CMSE462/CMPE462 Functional and Logic Programming

Department: Computer Engineering

Instructor Information
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Assistant Information
Name: TBA
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Meeting times and places
Wednesday 10:30 in room CMPE127
Friday 10:30 in room CMPE127
Wednesday 16:30 in lab CMPE134

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

Course Code CMSE462/CMPE462	Credits 4	Year/Semester 2025-2026 Spring

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

Prerequisite(s):
CMPE318/CMSE318 Principles of Programming Languages

Catalog Description

This course is about the two main declarative programming paradigms, namely functional and logic. Prolog will be taught as a representative of the Logic programming paradigm, and ML will be the language used to demonstrate the functional paradigm.

Course Web Page
https://staff.emu.edu.tr/zekibayram/en/teaching/cmse462-cmpe462

Textbook(s)
Programming in Haskell
Graham Hutton, University of Nottingham
Cambridge University Press, 2007

Learn Prolog Now
by Patrick Blackburn (Author), Johan Bos (Author), Kristina Striegnitz (Author)
College Publications (June 15, 2006)
ISBN-10: 1904987176

Indicative Basic Reading List
None.

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

Week 1	Introduction to functional programming
Week 2	Types and Classes
Week 3	Defining Functions
Week 4	List Comprehensions
Week 5	Recursive Functions
Week 6	Higher Order Functions
Week 7	Lazy Evaluation
Week 8	Introduction to Logic Programming and Prolog
Week 9	Unification, proof search
Week 10	Recursive definitions in Prolog
Week 11	Lists
Week 12	Arithmetic
Week 13	Cuts and Negation
Week 14	Database Manipulation

Lab Schedule

Weeks 3-4	Currying, lists, pattern matching, lambda expressions
Weeks 5-6	List manipulation, arithmetic operations
Weeks 6-7	User defined data types: Trees
Weeks 8-9	Prolog: simple database of relationships
Weeks 11-12	Prolog: list manipulation, arithmetic operations

Course Learning Outcomes

Upon successful completion of the course, students are expected to have the following competencies:
1. Show the internal representation of a list in Haskell or Prolog
2. Determine the type of a Haskell expression
3. Determine the value of a Haskell expression, given certain function definitions
4. Write recursive Haskell functions for manipulating lists
5. Use list comprehensions in Haskell
6. Write higher order Haskell functions
7. Define types in Haskell
8. Find the unifier of two Prolog terms
9. Write Prolog predicates for implementing arithmetic operations
10. Write Prolog predicates for manipulating lists
11. Write Prolog predicates involving the "cut" operator
12. Use higher order logical predicates, such as "call"
13. Write Prolog predicates involving database operations

	Method	How Many	Percentage
Assessment	Midterm Exam(s)	1	42%
	Final Examination	1	42%
	Attendance	--	4%
	Assignments	6	12%

Policy on attendance: Attendance will be taken electronically through the portal. However, manual attendances will be taken at random times to catch cheaters. **If a student is found to register himself/herself online as being present when in fact he/she is not in the class (even once), that student will automatically get zero for the attendance grade. If the behavior is repeated, the student may be referred to the disciplinary committee.**

Computation of the attendance grade: If total attendance is at least 50% of the number of times attendance was taken, then 4 * (number of days attended / number of days attendance taken), otherwise 0. 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.

Prepared by: Prof. Dr. Zeki Bayram	**Date Prepared:** 23 February 2026