

# CSE 4254 (Approved): Programming in Lisp

## Course Description

Lisp programming for students well-versed in programming with another language.

**Prior Course Number:** CSE 459.31

**Transcript Abbreviation:** Lisp Prgrmng

**Grading Plan:** Satisfactory/Unsatisfactory

**Course Deliveries:** Classroom

**Course Levels:** Undergrad

**Student Ranks:** Junior, Senior

**Course Offerings:** Autumn

**Flex Scheduled Course:** Never

**Course Frequency:** Every Year

**Course Length:** 14 Week

**Credits:** 1.0

**Repeatable:** No

**Time Distribution:** 1.0 hr Lec

**Expected out-of-class hours per week:** 2.0

**Graded Component:** Lecture

**Credit by Examination:** No

**Admission Condition:** No

**Off Campus:** Never

**Campus Locations:** Columbus

**Prerequisites and Co-requisites:** CSE 2231

**Exclusions:** Not open to students with credit for CSE 459.31

**Cross-Listings:**

**The course is required for this unit's degrees, majors, and/or minors:** No

**The course is a GEC:** No

**The course is an elective (for this or other units) or is a service course for other units:** Yes

**Subject/CIP Code:** 14.0901

**Subsidy Level:** Baccalaureate Course

## Programs

Abbreviation	Description
BS CSE	BS Computer Science and Engineering

## Course Goals

Be competent with basic components of Common Lisp, such as s-expressions, data structures, and program flow.
Be familiar with the Lisp family of programming languages, with particular emphasis on ANSI Common Lisp.
Be familiar with the Lisp top-level and debugger.
Be exposed to the functional programming paradigm.

## Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Data structures	3.0							

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Program control and structure	3.0							
Functions	2.0							
I/O and symbols	2.0							
Numbers and macros	1.0							
Advanced topics, style, tricks, and review.	3.0							

## Representative Assignments

Write a recursive function which will collapse a list, accepting a list of atoms or lists of arbitrary depth as a parameter and returning a list of atoms, e.g., (collapse '(a b (c (d ((e) f))) should return (a b c d e f).
Write a function find equivalents, e.g., (equiv-classes '((a b) (b c) (d e))) should return ((a b c) (d e)), without using iteration or assignment.
Write a program useful for some real application demonstrating understanding of data structures. Past examples include a wine catalog and food pairing program, a video game, and a graphics manipulation program.

## Grades

Aspect	Percent
Introductory and basic skill-building labs	60%
Labs for solving real problems with Lisp as the implementation language	40%

## Representative Textbooks and Other Course Materials

Title	Author
<i>ANSI Common Lisp</i>	Paul Graham

## ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
*	a	An ability to apply knowledge of mathematics, science, and engineering.
	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
**	c	An ability to design a system, component, or process to meet desired needs.
	d	An ability to function on multi-disciplinary teams.
**	e	An ability to identify, formulate, and solve engineering problems.
	f	An understanding of professional and ethical responsibility.
	g	An ability to communicate effectively.
	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
*	i	A recognition of the need for, and an ability to engage in life-long learning.
	j	A knowledge of contemporary issues.
**	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

## BS CSE Program Outcomes

<b>Course Contribution</b>		<b>Program Outcome</b>
*	a	an ability to apply knowledge of computing, mathematics including discrete mathematics as well as probability and statistics, science, and engineering;
	b	an ability to design and conduct experiments, as well as to analyze and interpret data;
**	c	an ability to design, implement, and evaluate a software or a software/hardware system, component, or process to meet desired needs within realistic constraints such as memory, runtime efficiency, as well as appropriate constraints related to economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability considerations;
	d	an ability to function on multi-disciplinary teams;
**	e	an ability to identify, formulate, and solve engineering problems;
	f	an understanding of professional, ethical, legal, security and social issues and responsibilities;
	g	an ability to communicate effectively with a range of audiences;
	h	an ability to analyze the local and global impact of computing on individuals, organizations, and society;
*	i	a recognition of the need for, and an ability to engage in life-long learning and continuing professional development;
	j	a knowledge of contemporary issues;
**	k	an ability to use the techniques, skills, and modern engineering tools necessary for practice as a CSE professional;
**	l	an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
*	m	an ability to apply mathematical 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;
**	n	an ability to apply design and development principles in the construction of software systems of varying complexity.

**Prepared by: Bruce Weide**