



Broward Community College

Course Outline

STATUS: A

COMMON COURSE NUMBER: ETD 2331C

COURSE TITLE: Autolisp Programming

CREDIT HOURS: 3

CONTACT HOURS BREAKDOWN:

Lecture/Discussion 16

Lab 48

Other

Contact Hours/Week 3

CATALOG COURSE DESCRIPTION:

Prerequisite: ETD 1324C, ETD 2350C

Co requisite: None

This course will teach students to use AutoCAD's embedded programming language, Autolisp. Emphasis will be placed on production of small time saving programs to enhance AutoCAD's drafting capabilities. Students will learn proper programming and debugging techniques.

General Education Requirements - Associate of Arts Degree, meets Area(s):
General Education Requirements - Associate in Science Degree, meets Area(s):

UNIT TITLES:

1. Autolisp Building Blocks
2. List Manipulations
3. Defining Functions
4. Input and Output Functions
5. Conditional Expressions
6. Looping Functions
7. External File Processing
8. Changing Data Types
9. Accessing the Drawing Database
10. The Autolisp Environment

11. Entity Handles

I. Course Overview:

Upon successful completion of this course, the students should be able to produce autolisp programs which enhance AutoCAD's capabilities. Evaluate repetitive tasks and produce macros to automate these tasks. Students will learn proper programming and debugging techniques.

II. Units:

Unit 1. Autolisp Building Blocks

General Outcome:

- 1.0 The students should be able to understand basic lisp syntax and mathematical expressions.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Know the various data element types within autolisp.
- 1.2 Understand how the autolisp evaluator works and basic lisp syntax.
- 1.3 Know how to assign a value to a variable and how to determine what values are assigned to variables.
- 1.4 Understand autolisp's mathematical functions and how to use them.

Unit 2. List Manipulations

General Outcome:

2.0 The students should be able to understand why lists are important in autolisp and how to create, extract and manipulate them.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 2.1 Extract elements from lists using the car and CDR functions.
- 2.2 Create new lists, append elements to existing lists, and add lists together.
- 2.3 Do searches through lists to find specific members.
- 2.4 Reverse lists and substitute new elements for old.
- 2.5 Understand autolisp's point related functions.
- 2.6 Understand the concept of association lists and how to manipulate them.

Unit 3. Defining Functions

General Outcome:

3.0 The students should be able to effectively create new functions and commands within autolisp.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 3.1 Define new functions and commands in autolisp and AutoCAD.
- 3.2 Understand the different types of variables within a function.
- 3.3 Use AutoCAD commands within autolisp functions.

Unit 4. Input and Output Functions

General Outcome:

- 4.0 The students should be able to prompt program users for proper input and output messages and results to the screen.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 4.1 Prompt users for input to programs, checking input to make sure it is valid.
- 4.2 Use all of Autolisp's "Get" functions to obtain input.
- 4.3 Use format control characters to format prompts.
- 4.4 Display messages, characters, strings and results of calculations using output functions.

Unit 5. Conditional Expressions

General Outcome:

5.0 The students should be able to use conditional expressions to "branch" their programs depending on conditions.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

5.1 Understand the structure of various conditional statements.

5.2 Know the various relationship predicates used in autolisp (=, / =, <, > ...)

5.3. Understand the use of the AND and OR predicates.

5.4 Understand the predicates used to test variables in autolisp.

5.5 Understand the use of the if and cond statements, their differences, and advantages and disadvantages of each.

5.6 Use the progn expression to group expressions into one unit.

Unit 6. Looping Functions

General Outcome:

6.0 The students should be able to set up looping constructs within a program.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 6.1 Use the repeat and while expressions to perform direct iteration within a program.
- 6.2 Perform list based iterations using the apply, for each and mapcar functions.
- 6.3 Understand the concept of recursive looping.

Unit 7. External File Processing

General Outcome:

7.0 The students should be able to open, close, read from and write to external files.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 7.1 Access external files using the open and close functions.
- 7.2 Read data from external files using the read-char and read-line functions.
- 7.3 Output data to external files using the write-char, write-line and prin expressions.

Unit 8. Changing Data Types

General Outcome:

8.0 The students should be able to change variables from one type to another and manipulate strings.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 8.1 Manipulate text strings.
- 8.2 Convert strings to other variable types.
- 8.3 Change other variable types into strings.
- 8.4 Convert integers into reals and reals into integers.

Unit 9. Accessing the Drawing Database

General Outcome:

9.0 The students should be able to use autocad's drawing database to modify, add, delete and manipulate entities within a drawing.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

9.1 Manipulate selection sets made up of drawing entities.

9.2 Select and manipulate individual entities and their associated databases.

Unit 10. The Autolisp Environment

General Outcome:

10.0 The students should be able to understand system variables and tables well enough to integrate autolisp programs smoothly into autocad.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

10.1 Understand autocad's system variables and their effect on autolisp programs.

10.2 Access and change system variables within programs.

10.3 Access table information for layers, blocks, linetypes, views, UCS, vports and styles.

10.4 Control the display and input devices and obtain information from them.

Unit 11. Entity Handles

General Outcome:

11.0 The students should be able to know the concept of entity handles and their programming potential.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

11.1 Understand the concepts of and use of the "Handles" command within autocad.

11.2 Obtain an entity's name from it's handle designation.