CSCI 5232 – 01: CONCEPTS OF PROGRAMMING LANAGUAGES
Spring-2015
Time: Monday 7:00 – 9:50pm
Room: Delta D-241

Quality Enhancement Plan (QEP)
Applied Critical Thinking for Lifelong Learning and Adaptability

Applied Critical Thinking Statement:
This course has been authorized by UHCL as an Applied Critical Thinking (ACT) Course which means that in addition to learning about the specified course content, students will be engaged with some or all of the Elements of Thought and Universal Intellectual Standards of critical thinking. The objective of an ACT course is to develop the student's ability to become skilled at analysis and evaluation by applying a set of intellectual tools that may be effectively used across all disciplines (as well as to the student's personal life). Based on the Foundation for Critical Thinking model (http://www.criticalthinking.org/), critical thinking involves thinking for a *purpose*, asking *questions*, using *information*, applying *concepts*, drawing *inferences and conclusions*, identifying *assumptions*, anticipating *implications and consequences*, and recognizing *points of view.* The Universal Intellectual Standards that are applied to these Elements of Thought of critical thinking in order to develop Intellectual Traits include *clarity, accuracy, precision, relevance, depth, breadth, logic, significance,* and *fairness*.

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   Office Hours: Mon, Wed: 12:00 – 3:00 pm, and by appointment.
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Teaching Assistant (TA):
      TA Office hours: Neha Bethapudi

Mon: 11 – 1 pm	Tue: 12 – 5 pm
Wed: 2 – 4 pm	Thu 10 – 12 pm & 4 – 7 pm
And by appointment	

   Email: BethapudiN8686@UHCL.edu   <or> nehaphani@gmail.com
   Room: D-119 lab (computer lab, first floor Delta building).
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Course Pre-requisite
      CSCI 2315 Data structures

Textbook
 Programming Languages: Principles and Paradigms, Second Edition, A.B. Tucker and
      R.E. Noonan, McGraw-Hill, 2007. ISBN-13: 978-0-07-286609-4.
   References:
       -Concepts of Programming Languages. RW Sebesta, 10th Ed. 2013.

Course Description (and how critical thinking is present):

This course will introduce and study the main *concepts* for programming languages from conceptual point of view; topics will include formal language definition and grammar, lexical and syntactic analysis, parsing, finite state machines, types and names, functions, design techniques and implementation issues for compilers, imperative, object-oriented, functional, and logic programming paradigms. Both numeric and string processing languages will be covered. The course assumes knowledge of at least one imperative language. One of the central questions in this course is "*What are the various and important design and implementation issues I need to identify about various programming languages (PL) and PL paradigms?*" Students will be able to *clearly* and *accurately* specify the *purpose* of stages of the compiling process and the *significant* functions and output of each stage. Moreover, this course explains *significant* and *relevant* language design *concepts* like static type checking, dynamic type checking, strong typing, dynamic name binding, parameter passing by reference, classes, abstract methods, inheritance and their consequences that can be handled in one of multiple ways. For such *concepts*, and their *consequences*, students will use deep analysis and critical thinking to *accurately* understand the material.

Learning Outcomes (SLO):

Upon completion of this course, students will be able to:

1. *Clearly* explain the *purpose* of the five core principles of programming languages: syntax, names, types, semantics, and functions.
2. *Accurately* describe and construct *solutions* with finite state machines, deterministic, non-deterministic, and regular grammar.
3. Explain the *Significance* of the *concept* in each step in the compilation process.
4. *Clearly* describe the *relevant information* on the four major programming paradigms: imperative, object-oriented, functional, and logical.
5. Identify correct and incorrect sentences *accurately* in a given grammar using parse tables.
6. Write *correctly* small programs in LISP.
7. Write *correctly* small programs in Prolog.

Elements of Critical Thinking*

The elements of thought are as follows:
1. All reasoning has a *purpose*
2. All reasoning is an attempt to figure something out, to settle some *question*, to solve some *problem*
3. All reasoning is based on *assumptions*
4. All reasoning is done from some *point of view*
5. All reasoning is based on *data, information* and *evidence*
6. All reasoning is expressed through, and shaped by, *concepts* and *ideas*
7. All reasoning contains *inferences* or *interpretations* by which we draw *conclusions* and give *meaning* to data
8. All reasoning leads somewhere or has *implications* and *consequences*

* Paul, R., and Elder, L. (2009). Critical Thinking Concepts and Tools. Tomales, CA: Foundation for Critical Thinking. And - The Elements of Reasoning and the Intellectual Standards: Helping Students Assess Their Thinking by Richard Paul and Linda Elder. The Critical Thinking Community, http://www.criticalthinking.org/pages/the-elements-of-reasoning-and-the-intellectual-standards/480.

Major Activities that Promote Critical Thinking:

1- Writing slide presentation (*MS PowerPoint ppt slides*) on the most important three *concepts* in the five core principles of programming languages: syntax, names, types, semantics, and functions in **connection** with the compilation process steps. This will address the first and the third SLOs. This assignment focuses on **connections**: Students will make **connections** to related concepts of the compilation process and core concepts of programming language upon researching the programming language literature.

2- Writing a term paper. This is a group assignment. Each group will write and submit a term paper about the *concept* and *purpose* of the finite state machine and regular grammar. In this assignment, students will make **connections** to the particular problems in grammar and finite state machines. This assignment assesses the second SLO.

Assessment: Excellent: 90% - 100%
                Acceptable: 60% - 89%
                Unacceptable: 0% - 59%

SLOs #1 to #3 will be assessed by the two ACT activities discussed above. The primary C of the four C's to be assessed is **connections**.

General Course Outline

Week 1	Overview and Grammars Chapter 1
Week 2	Lexical analysis, syntax analysis, finite state automata, regular expression, Chapter 2 and 3, and notes
Week 3	Lexical and Syntactic Analysis continued Chapter 3
Week 4	Finite State Machines Notes, and Chapter 2 and 3
Week 5	Parsing Notes Names and Types Chapters 4 and 5
Week 6	Parsing Notes Names and Types Chapters 5 and 6
Week 7	Semantics and semantic interpretation chapters 7 and 8
Week 8	Functions Chapters 9 and 10
Week 9	Spring Break – No Classes
Week 10	Midterm Exam
Week 11	Memory Management Chapter 11
Week 12	Imperative Programming Chapter 12
Week 13	Object-Oriented Programming Chapter 13
Week 14	Functional Programming Chapter 14, and notes
Week 15	Logic Programming Chapter 15, and notes
Week 16	Final Exam

Grading and Evaluation

Homework & Quizzes   30%
Midterm exam   30%
CT activity   5%
Final exam   35%

Important dates:

Midterm exam: Monday March 23th
Final exam: Monday May 11th

[General Notes](#)

- Blackboard will be used in this course to post course material, announcements, and any handouts. Students are expected to review and read class material from Blackboard and from the book before coming to class. The material will be posted on the course Blackboard before class time. This is a face-to-face course conducted as lectures and presentations.

- All submissions and deliverables of assignments are due at the beginning of the class (*first ten minutes*) in the due date. Some assignments will be submitted online in Blackboard.

- Class attendance is expected. It is the student's responsibility to get the material discussed, announcements, handouts, or anything conducted during a missed class meeting.

- Some course materials and handouts, e.g. homework paper, will be distributed in the class and may not be posted electronically on Blackboard.

- Participations and discussions from students are highly encouraged and will be rewarded.

- All class assignments: 30% taken off per day penalty on late submissions. For example, if the homework is graded out of 150 points, then 30% (or 45 points) will be taken from whatever grade you make if you submit one day late.

- There will be quizzes given in the course. Usually quizzes will be announced one week before. Sometimes, quizzes will be announced in the same day at the beginning of the class.

- Makeup of exams and quizzes will be very restricted, and is allowed only under a documented (appropriate documents) legitimate excuse that is to the discretion of the instructor.

- Students with special needs and disability should contact the instructor as soon as possible and contact Disability Services Office at 281-283-2627 website: www.uhcl.edu/disability

- Academic Honesty: HONESTY CODE of UHCL states: **I will be honest in all my academic activities and will not tolerate dishonesty.** Students and Faculty are bound to the honor code; therefore, academic dishonesty will not be tolerated in this class! See the UHCL catalog for more details. You are encouraged to become familiar with the policy of academic dishonesty found in the UHCL official student handbook. **All submissions are considered completely 100% your own work.** Sharing the course material after finishing this course is not allowed. Any violation of the dishonesty rules will result in filing *Academic Dishonesty Form* and subtracting 10 points of total course grade for each incident. (resource: you can check this resource which includes a tutor on academic integrity and honesty: virtual academic integrity library Vail: http://www-apps.umuc.edu/vailtutor/).

Some important dates:

Spring Regular 15-Week (January 20, 2015 - May 4, 2015)
January 20, 2015	First Class Day - Regular 15-Week Session
March 16 - 22, 2015	University Holiday - Spring Break
April 14, 2015	Last day to Drop/Withdraw-Regular 15-Week Session
May 4, 2015	Last Day of Class - Regular 15-Week Session
May 5 - May 11, 2015	Face-to-Face Final Exam Period
May 28, 2015	Grades available over E-services Online