

# University of Central Florida

## School of Electrical Engineering & Computer Science

### COP 3402: Systems Software

#### Spring 2015

### Syllabus

**Instructor:** Andrew Harn

**E-Mail:** harn.andrew@knights.ucf.edu

**Lecture meetings:** Tu & Th 1:30 p.m. – 2:45PM (HPA1 125)

**Office hours:** Thursday 3:00 – 4:00PM (HEC 202)

**TA :** TBA

**Office hours:**

**email:**

**Graders :** TBA

**Course Outline:** This course is designed to provide a fundamental understanding of real and virtual machines as a language processor and the implementation of compilers. We will study the processor as an instruction interpreter. Compilers, assemblers, linkers and loaders, and virtual machines will be presented as systems software for program development. An introduction to Operating Systems will be given.

**Course Topics:** Introduction to compilers and interpreters, virtual machines, computer architecture and assemblers, loaders and linkers, macro-processors, run time environment and operating systems

**Prerequisites:** COP 3502 – Computer Science I

**Required text:**

*Compilers: Principles, Techniques, & Tools*, Second Edition by Alfred V. Aho, Monica S. Lam, Ravi Sethi, and Jeffrey D. Ullman. Addison Wesley, 2007

**Style of Class Meetings:**

Class Meetings consist of the instructor giving a basic overview of the topic

**Grading Policy:**

- (20%) **Exam #1**
- (20%) **Exam #2**
- (20%) **Final Exam**
- (35%) **Programming project**
  - (5%) Module 1
  - (10% Each) Module 2, 3, and 4
- (5%) **Recitations**

All Exams are closed book and closed notes.

**Letter grades:** 90-100: A, 80-89: B, 70-79: C, 50-69: D, Below 50: F.

**Note:** Any academic dishonesty (including, but not limited to: cheating, copying and/or plagiarism) with respect to any exam or assignment in this class will result in a grade of **F**, following by the usual procedures for dealing with such behavior, as described in the *UCF Golden Rule : a handbook for students*.

**The Semester Plan:** (Tentative)

- System Software
- Computer System Structure
- Virtual machines
- Compilers and interpreters
- **Exam #1**
- Syntax analysis
- Grammars and parsing
- Code generation
- **Exam #2**
- Assemblers and ELF (Executable Linkable Files)
- Linkers and loaders
- Operating System Structure
- Interrupt Handling
- **Final Exam (Tuesday, May 05, 2015 1:00 PM – 3:50 PM)**

**Programming project**

The programming project consists in implementing a compiler for a tiny programming language. The compiler must generate code for a virtual machine. The project will be divided in four modules: 1 - Virtual Machine implementation, 2 - Scanner, 3 - Parser and Code Generation (Part 1) and 4 - Parser and Code Generation (Part 2). Details will be given out well before the due dates for each part of the project.

To pass this course, you **must** successfully complete at least modules 1, 2, and 3 of the project. No exceptions.

This project must be written in C (**not C++**) on a UNIX system. The standard for this class will be the Linux system in the main computer lab called Eustis. You are welcome to write and test code on some other system, if you wish, but it will be graded on Eustis and if it does not work there, it does not work. You will be given an Eustis account at the beginning of the semester, and instructions on how to access your account can be found here:

<http://www.cs.ucf.edu/courses/cop3402/fall2014/EustisTutorial.Fall2014.doc>

Each module will have a due date and points will be subtracted for submission after that date (1 day late: 10% off; 2 days late: 20 % off; 3 or more days late: Not accepted). In general, this project will give you a better understanding of the data structures and programming techniques used to build compilers and also provide you with experience in developing and debugging a complex software project.

**Spring 2014 Holidays are:**

**Martin Luther King Jr. Day: January 15**

**Spring Break: March 9 – March 13**