

# Course Syllabus

## Evolutionary Computation (CAP 5512)

### Spring 2007

- **Instructor:** Dr. Ivan Garibay, UT 556, 407-882-1163, [igaribay@cs.ucf.edu](mailto:igaribay@cs.ucf.edu) (please include CAP5512 on the subject line of all emailed correspondence)
- **Prerequisites:** Graduate standing or instructor permission. No knowledge of biology or evolutionary search is assumed. Computer programming ability in some language is necessary for the projects.
- **Class Times:** Tuesdays and Thursdays, 4:30 PM – 5:45 PM
- **Class Location:** BA 0212
- **Final Exam Period:** April 26, 4:00 PM – 6:50 PM
- **Office Hours:** Before or after classes and by appointment at the UCF Office of Research and Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826 (UCF Research Park, University Towers Building).
- **Textbook:** *Evolutionary Computation: A Unified Approach*, Kenneth A. De Jong, ISBN-10:0-262-04194-4; ISBN-13: 978-0-262-04194-2

### Summary:

This course has two main objectives:

1. **To teach the subject matter of evolutionary computation** with emphasis on discussing theoretical foundations, applications, and current active areas of research. Evolutionary Computation (EC) is a stochastic search method based on evolutionary biology. EC has been successfully applied to a variety of problem domains such as optimization and learning. This course will provide the students with the knowledge to implement EC algorithms, discuss trade-off between variations of EC algorithms, and discuss issues related to the application of EC algorithms to a particular problem.
2. **To provide experience with the research process**  
Students will be asked to read, review, present and discuss papers from scholarly publications. Two homeworks will provide experience to implement and/or use evolutionary algorithms and apply them to practical problems. The students will be asked to work throughout the course in a student-selected final class project. This project must be proposed, implemented, written-up as a paper, presented to the class, and peer reviewed by other students. In this way, the students will gain experience in the complete research cycle.

This course will be structured as follows:

1. Two papers will be assigned each week. You will be asked to read the papers and write a one page summary/critique/comparison of the papers each week. These summaries will made up 15% of your final grade. Late summaries will not be accepted. You may drop two summaries.
2. Each week two students will be asked to present the papers for that week to the class in an oral presentation. This presentation will include summarizing the paper and leading a discussion on the paper topic. These presentations will made up 20% of your final grade.
3. You will have two homework projects during the first half of the course. All programming can be done in any programming language. These homeworks will be worth 25% of your final grade.
4. Throughout the class you will work on a final research project. Before the middle of the course each student proposes an individual project. The proposed ideas are discussed in one or more individual meetings and one particular project is agreed upon between the instructor and the student. During the second half of the course, the student carries out the agreed project. The student writes up his/her work in a 8 to 10 pages paper (in the style of a conference paper). Towards the end of the semester all students will be ask to present their project to the class. The project due date, students must bring three extra copies of their project to be distributed to other three students to be anonymously peer reviewed. The last day of classes all students must bring their written reviews. Your final project grade will be partially based on the peer reviews of your work and the reviews that you write about other students projects. All projects will be compiled into a class book and published as an EECS Technical Report and also in the class website. Copies of this book will be distributed to all students. This final research project is worth 40% of your final grade.

## Grades:

Your final grade of this class will be determined as follows:

Paper Summaries (you may drop two)	15%
Presentations	20%
Homeworks	25%
Final project, paper and presentation	40%

- No make-ups will be given
- You may drop two lowest paper summary grades. Late summaries will not be accepted

- If you need to reschedule a paper presentation, please let me know one week before your originally scheduled presentation date.
- Homework and project code that does not compile or run will receive an automatic zero. Late homeworks and projects will have grades reduced by 10% per day.

The grading policy is as follows:

A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	Otherwise

The instructor reserves the right to lower the grade boundaries at the end of the term. Grade boundaries will not be increased. Class attendance and class participation will be considered in borderline cases.

### **Important Dates:**

- First lecture – Tuesday, January 9, 2007
- **Project proposal approved – Tuesday, February 27, 2007**
- **Project Update – Tuesday, March 20, 2007**
- **Projects due – Tuesday, April 10, 2007**
- Last lecture – Thursday, April 19, 2007
- Project peer reviews due – April 26, 2007
- Distribution of course book – April 26, 2007
- Grades due – Thursday, May 3, 2007