The University of Georgia

Department of Computer Science

Course Information Sheet

CSCI 4560

Evolutionary Computation and Its Applications

Brief Course Description (50-words or less)	An in-depth introduction to evolutionary computation methods and an exploration of research problems in evolutionary computation and its applications which may lead to work on a project or a dissertation.
Extended Course Description / Comments	The course is appropriate both for students preparing for research in evolutionary computation, as well as science and engineering students who want to apply evolutionary computation techniques to solve problems in their fields of study.
Pre-Requisites and/or Co-Requisites	CSCI 2720 or CSCI 2725
Required, Elective or Selected Elective	Selected Elective Course
Approved Textbooks (if more than one listed, the textbook used is up to the instructor's discretion)	Author(s): A.E. Eiben and J.E. Smith Title: *Introduction to Evolutionary Computing* Edition: Corrected second printing 2007 ISBN-13: 978-3-540-40184-1
Specific Learning Outcomes (Performance Indicators)	This course presents a survey of topics in evolutionary computation. At the end of the semester, all students will be able to do the following: 1. Formulate a problem as an evolutionary computation search/optimization by specifying representations, selection and variation operators. 2. Write a program or use a package to implement an evolutionary algorithm. 3. Conduct evolutionary optimization experiments and properly report and discuss the results. 4. Effectively present an evolutionary computation article to an audience. 5. Review and critique evolutionary computation articles. 6. Reason about the schema theorem and the theory of evolutionary computation.

Relationship Between Student Outcomes and Learning Outcomes

		Student Outcomes										
		a	b	c	d	e	f	g	h	i	j	k
Learning Outcomes	□	●	●							●		
	□	●		●						●		
	□	●		●						●		
	□	●					●					
	□	●								●		
	6	●								●		

Major Topics Covered
(Approximate Course Hours)

3 credit hours = 37.5 contact hours
4 credit hours = 50 contact hours

Note: Exams count as a major topic covered

Introduction (5-hours)

Components of an Evolutionary Algorithm (2.5-hours)

Genetic Algorithms (4.5-hours)

Evolution Strategies (2.5-hours)

Evolutionary Programming (2.5-hours)

Genetic Programming (2.5-hours)

Learning Classifier systems (3.5-hours)

Parameter Control (2.5-hours)

Multi-modal Problems(2.5-hours)

Multi-objective Evolutionary Optimization (2.5-hours)

Hybridization and Memetic Algorithms (2.5-hours)

Working With Evolutionary Algorithms (3.5-hours)

Theory (3.5-hours)

Paper Presentations (10-hours)

Course Master Dr. Khaled Rasheed