CSCI 8150: Advanced Numerical Methods and Scientific Computing
Course Syllabus, Fall 2011

INSTRUCTOR: Dr. Thiab R. Taha, e-mail: thiab@cs.uga.edu, Tel: 542-3477

OFFICE: Boyd Graduate Studies Research Center, Room 545

OFFICE HOURS: T, Th: 11:00 - 11:50 AM or by an appointment

PREREQUISITE: CSCI 4140/6140 or CSCI 4150/6150 or Permission of the Department.

LECTURES: Monday period 4 and Tu, Th   period 72, Room 306 Boyd, GSRC on Monday; Tu, Th, Room 581 Aderhold.

TEXT: Notes, assigned reading materials and papers.

COURSE OBJECTIVES OR EXPECTED LEARNING

OUTCOMES: This is a computationally oriented course for solving scientific problems that arise in science and engineering. Students will learn different numerical techniques for solving differential equations. They will learn how to design and implement efficient sequential and parallel algorithms for solving important problems in their field of study. In addition, students will learn how to use visualization tools to study and evaluate the numerical results.

TOPICS COVERED: Numerical methods for solving ordinary and partial differential equations: finite difference, iterative, finite element, pseudo spectral, method of lines and multi grid methods; Introduction to high performance computing and parallel algorithms; GPU and Grid computing; Visualization tools.

HOMEWORK: Will be assigned and collected in lectures. No late homeworks will be accepted.

Note: Projects will be assigned for each student according to his/her interest. Projects and homeworks will be implemented on the available high performance systems.

GRADING:

- Homeworks 25%
- Midterm Exam 25%
- Final Exam: this will be in a form of a take home test that requires solving scientific problems using computers. 25%
- Project and Presentation(s) 25%

MAKE UP TESTS: No make up tests.

Unexcused test absences result in a score of zero for the missing test. Excused absences require extenuating circumstances and advance notice; the missing grade will be replaced by the Final Exam grade. All adjustments to any grade must be made within 3 days of the work being returned in class. Absolutely no adjustments and no late work will be accepted after the last class period.

Note: The course syllabus provides a general plan for the course; deviations announced to the class by the instructor may be necessary.

ACADEMIC HONESTY: All academic work must meet the standards contained in "A Culture of Honesty." Students are responsible for informing themselves about those standards before performing any academic work. The link to more detailed information about academic honesty can be found at: http://www.uga.edu/honesty/ahpd/culture_honesty.htm

The Department Policy applies: see overleaf.