Sample Syllabus for ISC 1xxx - Computational Thinking

Fall 2016

Instructors: Professor Janet Peterson & Dr. John Burkardt
email: jpeterson@fsu.edu, jburkardt@fsu.edu
Offices: 444 & 445 DSL
Phone: 644-1979
Office Hours: M 11-12, W 2-3, F 11-12

Class: MWF, 10:10-11

Location:

Texts: *9 Algorithms That Changed The Future: The Ingeneious Ideas That Drive Today's Computers*

John MacCormick, Princeton University Press, 2012;
Paperback ISBH 978-0-691-15819-8; cost $< \$15$

Essays by Brian Hayes, downloadable from the
website http://www.americanscientist.org/authors/detail/brian-hayes

---

Course Description. It is clear that computers can almost imitate human-like intelligence. The evidence of is everywhere around us: movie, book and music recommendation systems; programs that allow us to experiment on models of the earth; medical imaging software that can detect tumors that humans can't see. This course asks how computers have gained this ability. The answer includes our detecting patterns in nature, but also patterns in the very way we think. This course will present popular computational methods shaping our lives, and try to explain the ideas that make them work. Students will practice logical thinking by working with versions of these computational methods that affect society and science.

Topics Covered. We begin this course by looking at the cultural differences between different types of scientists who use computers in their work. We then explore some of the ideas that make computing complicated tasks possible such as machine learning, discretization and the discovery of patterns in data. Our next task is to explore what types of problems are amenable to being solved on the computer. Then we will begin exploring the logic behind existing computational approaches for problems as diverse as climate modeling, medical image analysis, genetic descent, modeling galaxies, page rank, and apportionment of voting districts. For each computational approach we will investigate a simplified version of the code's strategy so that we can gain some "hands on" experience.

Final Grade Determination. Your grade for the course will be determined by class participation, homework and group projects. The distribution of grading for the course is:

- Class Participation - 30%
- Homework - 35%
- Group Projects - 35%

The class participation portion of the final grade will be assessed through the use of clicker technology using software such as "socrative". Attendance will count for half of the class participation grade and the remaining half will be determined by short quizzes taken via clicker technology. Assigned homework must

be done individually and submitted by the due date unless approval for a late submission has been approved. Homework assignments consist of problems similar to the examples discussed in the lecture and assist the student in understanding the material. Group projects are much more involved than homework assignments and serve to enhance or expand on the material covered in class. Consequently, students will be expected to work on the project over a longer span of time – typically 3 to 4 weeks. Two group projects will be assigned during the semester. The projects will require a substantial amount of internet research and writing. For each project, several choices of topics will be suggested to accommodate the varied interests of students.

Liberal Studies for the 21st Century Program at Florida State University builds an educational foundation that will enable FSU graduates to thrive both intellectually and materially and to support themselves, their families, and their communities through a broad and critical engagement with the world in which they live and work. Liberal Studies offers a transformative experience; this course has been approved as meeting the Liberal Studies requirements and thus is designed to help you become a critical analyzer of quantitative and logical claims. **In order to fulfill the State of Florida's College mathematics and computation requirement the student must earn a "C" or better in the course.**

University Attendance Policy. Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy. The Florida State University Academic Honor Policy outlines the Universitys expectations for the integrity of students academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to ... be honest and truthful and ... [to] strive for personal and institutional integrity at Florida State University. (Florida State University Academic Honor Policy, found at http://dof.fsu.edu/honorpolicy.htm.)

Americans With Disabilities Act. Students with disabilities needing academic accommodation should:

1. register with and provide documentation to the Student Disability Resource Center; and
2. bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

This syllabus and other class materials are available in alternative format upon request.

For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center

874 Traditions Way

108 Student Services Building

Florida State University

Tallahassee, FL 32306-4167

(850) 644-9566 (voice)

(850) 644-8504 (TDD)

sdrc@admin.fsu.edu

http://www.disabilitycenter.fsu.edu/

Free Tutoring from FSU On-campus tutoring and writing assistance is available for many courses at Florida State University. For more information, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of on-campus tutoring options - see http://ace.fsu.edu/tutoring or contact tutor@fsu.edu.

High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

Syllabus Change Policy "Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guid for the course and is subject to change with advance notice."