ISC 1057 Syllabus
Computational Thinking

Fall 2017

Instructor:	Professor Janet Peterson **email:** jpeterson@fsu.edu **Office:** 444 DSL **Office Hours:** Tuesday 11-12 , Thursday 12:30-1:30
Teaching Assistants:	Ryan Learn & David Robinson **email:** rjl09c@my.fsu.edu & djr16@my.fsu.edu **Office:** DSL 481B & DSL 421D
Class:	TR 2-3:15 p.m.
Location:	217 HCB
Text:	*9 Algorithms That Changed The Future: The Ingeneious Ideas That Drive Today's Computers* John MacCormick, Princeton University Press, 2012; Paperback ISBN 978-0-691-15819-8; cost $< \$15$
Notes, Homework, etc	ISC1057 Blackboard site & my teaching webpage: people.sc.fsu.edu/∼jpeterson/

Course Description. It is clear that computers can almost imitate human-like intelligence. The evidence of this is everywhere around us: movie, book and music recommendation systems; programs that allow us to experiment on models of the earth; driverless cars,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. Knowledge of a computer programming language is not required nor will it be taught.

Topics Covered. This course investigates the logical thinking that is involved in developing algorithms to answer questions such as the ones listed below.

- How can our written history be digitized so that it can be searched?
- How can search engines give us ranked results in seconds?
- How can we securely enter information on the internet or sign a document digitally?
- How can computer programs be written to solve games such as chess?
- How can a computer program identify a fingerprint or a person's photo?
- How can we download a Netflix movie at the same time as thousands of other people?
- How can we find patterns in data or in a set of objects?

Course Objectives. By the end of this course, students will demonstrate the ability to:

- analyze problems drawn from real-world scenarios by interpreting and evaluating data and applying appropriate mathematical, statistical, logical, and/or computational models or principles, using appropriate technology, and explaining the results;
- use computational thinking to frame questions, look at different ways to solve problems, and determine what insight can be gained;
- demonstrate how computations can be viewed as an alternative to theory and experiments in scientific research;
- identify concepts that make computing complicated tasks possible;
- explain some of the logic behind existing computational approaches for various problems of interest to science and society.

Final Grade Determination. Your grade for the course will be determined by class participation, homework, a midterm project and a take-home final. The distribution of grading for the course is:

- Class Participation - 5%
- In-class Quizzes - 15%
- Homework - 50%
- Project - 15%
- Final - 15%

The in-class quizzes will be taken using the app **Socrative** which you will access through your smart phone. Quizzes will be given almost daily and are typically given at the end of each lecture. No make-up quizzes are given. For the in-class quiz grade we will average your top 20 quizzes so you will be allowed to drop some scores. The class participation portion of your final grade will be determined by the percent of ALL daily quizzes that you attempt. Your score on the quiz does not affect the class participation grade; essentially we are using the quiz for attendance. Assigned homework must be done individually and submitted by the due date unless you are using your late homework days. **You will have a total of 7 late homework days throughout the semester** unless extenuating circumstances arise. Weekly homework assignments are typically available on Tuesdays and due on Thursday of the next week. Homework assignments consist of problems similar to the examples discussed in the lecture and assist the student in understanding the material. You will be able to drop one homework assignment during the semester. The midterm project is much more involved than homework assignments and serves 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. For each project, several choices of topics will be suggested to accommodate the varied interests of students. Students may work alone or in pairs on the project.

We will use the forum **Slack** for online communication concerning this course. This is in lieu of the TAs holding office hours. An introduction will be given at the end of the second lecture. It is a free service and an app can be downloaded to your smart phone.

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://fda.fsu.edu/Academics/Academic-Honor-Policy.)

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.

- Please note that instructors may be asked to collect and report data on student learning outcomes for the Liberal Studies competency for SACS accreditation purposes.

- 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 guide for the course and is subject to change with advance notice."