ICI201  *Introduction to Computer Science (Honors Section)*  

**Fall 2010 Description and Syllabus**

If you are interested, come to the classes which meet MWF 9:20-11:15AM in BUS-209 and on Monday afternoons 4:15-5:15PM in the ES-B19 lab. This course is open to all who are willing and able to learn a lot more than is covered in a traditional introduction to computer science programming course in return for exercising the extra initiative to engage in seminar-style classroom learning and out-of-class effort at problem solving and reading to independently find out subject details. Early in the course, we cover the material on image processing that is the focus of regular ICSI201, so switching back and forth will not be much of a problem during the first few weeks. To register, select the lab and then lecture of ICSI201 with instructor S. Chaiken.

4 Credit Hours: 3 hours lecture and 2 hours laboratory per week. Out-of-class reading, homework, writing and projects. This is an honors/accelerated version of ICSI201. Besides substituting for ICSI201, it will provide 4 Honors College credit hours for students in the UAlbany Honor's College. This course is suitable for students who, having done computer programming, taken programming courses or taken calculus, physics, pre-engineering, robotics, etc., found that they like and are good at problem solving challenges that involve numbers, calculations, symbols, geometry, logic, machinery, puzzles, etc. TCSI201 covers the same topics as ICSI201, but at a faster pace, in greater depth, and with additional applications and opportunities for creativity. Numerics and some geometry and algebra will be involved, and these skills are common to mathematics and other physical sciences. Details will be reviewed as needed. Mastery of some exact rules will be required in order to use them creatively. We will develop, practice and improve the skills in solving problems through the use of careful logical thinking, patience and debugging that is characteristic of computer science and programming.

The small class honor's format enables some innovative college teaching methods to be employed, including active learning lectures with both individual and group quizzes, and in-class exercises often utilizing the computer. Performance in the in class lecture and lab activities counts for 15% of the grade.

Short answer homework problems and questions which function to help you better solidify content you have read, heard or figured out will be done on online systems. Together they count for another 15% of the grade. You answers will be checked immediately and you will then be invited to retry the question or correct the solution. Another 30% of the grade will be based on individually done programming projects, each spanning one or two weeks, and the remaining 40% will be based on two midterms and one final examination.

The laboratory meetings will provide needed instructional time for enrichment applications and technology, beginning with the image processing component of the multimedia computing material used in the regular ICSI201 course and some work with programming simple LEGO Mindstorms robots in Java. They will begin by emphasizing efficient usage of the technology and for debugging/problem solving skills. Additional or optional times may be scheduled, using Google Calendar, according to student time availability.

The amount and content of the additional honors material will partly depend on the class rate of progress and interests. It will include use of Unix command line and professional tools (Eclipse) for Java programming, additional emphasis on creating one's own Java classes, recursion, beginning data structures, and programming problems based on both deterministic and probabilistic simulation, science, finance, graphics involving fractals and recursion, and robotics and/or computer games. The students will be encouraged to discuss their interests and ideas for supplemental topics so they might be included. Web and/or Java standard GUI programming, deeper coverage of object oriented design, Java libraries, elementary networking are possibilities here. However, solid and fluent fundamental skill with programming is the chief objective.
Instructor:

Name: Professor Seth Chaiken  Email address: sdc@cs.albany.edu  Office: LI-67A for now. Office Hours: 5-6 per week, TBA Voice phone: 518-442-4282 (If I'm not in, please leave me voicemail - email may be faster though)

This Fall, I am also teaching an advanced undergraduate and graduate level operating systems course in which the students will delve into reading, modifying and extending the Linux kernel code, to experience current practical applications of the principles they will study in the textbook and in abstract problems.

Class meetings:

There are three lectures per week: Monday, Wednesday and Friday from 9:20AM until 10:15AM in Business Administration room Basement 209, and one laboratory meeting per week: Monday from 4:15PM to 5:15 in Earth Science Building room Basement 19 (ES B19). It is very important that you attend class - it is where most of the material that you need to know is presented, demonstrated and discussed. Although there is substantial overlap with the material in the books, additional material and techniques are presented in the classes. Also, you are responsible for all announcements made in classes.

Required Text and other Materials.

1. Starting Out with Java: From Control Structures through Data Structures, 1/e, by Tony Gaddis and Godfrey Muganda. ISBN-10: 0321421027, Addison-Wesley/Pearson, 2007. We will cover approximately the first 6 chapters, chapter 8 (arrays), chapter 9 (classes), parts of chapter 10 (strings and other types), chapter 15 (recursion, supplemented by notes and Web sources), chapter 16 (sorting and searching), chapter 19 (array based lists), plus assorted topics beyond. This book actually covers more than the first year of Java programming in computer science, but it costs just a little more than Gaddis' version that only covers the first semester. I've picked this book because it states and explains the facts of the subject in a very clear, direct and complete way. It gives you the opportunity to look ahead or use more advanced information as quickly as possible, and function as a reference for creating usable Java programs for research projects, games, Web animations, or more advanced computer science courses.

2. An account on Pearson CodeMate to accompany the above textbook. This provides quizzes and programming problems involving complete programs of various sizes. Homework done and immediately graded under CodeMate counts for 10% of the your course grade.

3. An account on Turingscraft CodeLab. CodeLab provides exercises to write various parts of programs according to English descriptions. Homework done and immediately graded under CodeLab counts for 5% of your course grade.

4. Online books, some online reference manuals, and assigned readings in other literature to be announced. This will include lecture notes and software libraries, available free on the Web, supporting the regular ICSI201 course.