The bucknell connection

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A Note From the Editor...

This issue of the Bucknell Connection is to inform you of your computer science elective choices for the Spring 2010 semester. Make special note of ENGR 139 as described on page 2.

Please continue to reach out and learn about your future classes, internships, professors, and your opportunities after college. In addition to making use of your advisor and classmates, be sure to get involved with our student group, the Association for Computing Machinery (ACM). For more information talk to your officers or class representative:

President - Erica Lange
VP - Dan Medani
Treasurer - Alex Tang
Secretary - Michelle Daniels
Senior Rep - Leah Antkiewicz
Junior Rep - Andy Hallagan
Sophomore Rep - Aurimas Liutikas
First year Reap - TBA

Spring Electives

Compiler Optimization

CSCI 331 MWF 9:00 - 9:52
Professor Wittie
Prerequisites: CSCI 208

Compilers are the computer programs which translate one language to another. Compiler optimization is the process of improving compiler output for run-time, memory usage, code robustness, or general security concerns. This course will offer insight into how optimizations work and hands-on experience in adding them to an existing compiler.

We will take an existing C- compiler and profile it to find the places where optimizations can be added. The project will be structured as a challenge to improve the output of the C- compiler. You will be able to apply an assortment of optimization techniques to the compiler to see what produces the most improvement. You can speed test your compiler against mine and your classmates. You will have the option of working in C, C++, or Java.

Graphs, Their Algorithms, and Software Engineering

CSCI 334 MWF 1:00 - 1:52
Professor Haggard
Prerequisites: CSCI 206

Come and explore classical problems of graph theory involving paths, cycles, trees, and graph coloring. The focus in studying these problems is to find algorithm solutions that can be implemented. Students will work in programming teams not only to implement algorithms but also to find effective visualizations and animations (new this year) for the solutions.

The implementations will be aided by design patterns and a carefully designed interface that will be used by all teams to enhance portability of the code. Javadoc and UML will be part of the documentation requirements.

The final product for a team will be a version of GraphWorks II. This course is well suited to helping you polish your programming skills in a team environment.

Computer Networks

CSCI 363 MWF 12:00 - 12:52
Lab R 1:00 - 2:52
Professor Perone
Prerequisites: CSCI 311
Co-requisites: CSCI 315 or permission from the instructor.

Computer Networks is a fun course that is highly relevant for today's computing professionals. This course studies the software side of networking. The primary emphasis is on protocols for routing and transport, and also networked applications. We cover a number of the traditional protocols such as IP, TCP, UDP, ARP, and ICMP, among others. Most importantly, however, we study the conceptual framework that drives the development of protocols. The course has a weekly lab where the students learn to program in C and have hands-on experiences with networked applications. A pre-lab assignment is used as a foundation for each lab, and problem sets are used to exercise the theoretical aspects of the course. Depending on student interest, there may be a term project.

Computer Graphics

CSCI 367 MWF 11:00 - 11:52
Lab T 3:00 - 4:52
Professor Wenner
Prerequisites: CSCI 204 and at least junior standing.

This course is the study of the computer graphics algorithms that are the foundation for application programs that produce computer-generated media, such as special effects in movies, business presentations, internet content, and many other products. It is the task of these algorithms to calculate the exact value that should be displayed on each of the millions of pixels using complex three-dimensional computer models. Specific algorithms studied will cover scan conversion, visible line determination, 3D viewing projection, and lighting calculations, among others. Hardware characteristics are examined down to the chip level. There is also a retrospective of 50 years of CG graphics. The course includes a weekly lab, which introduces students to 2D and 3D modeling using OpenGL.

Technical Written and Oral Communication

ENGR 139 TR 8:00 - 9:30
Professor Meng
Prerequisites: Computer Science Major, not in the first year.

Students in this course will write professional and technical documents in multiple forms such as your resume, memos and research surveys among others. In particular, each student will be asked to write two research papers in technical conference format and present the papers in the class. This is excellent training for your future career and the class counts as a W2.

Special note: Students in the 2010, 2011, and 2012 classes who haven't taken ENGR 139 yet have the option of taking ENGR 139, or a different W2 course to fulfill one of their W2 requirements. If you choose to take ENGR 139 as one of your two W2 courses, please make sure to take it in the spring 2010 as it is not expected to be offered in the future.

ACM/Department Activies

Student Talks

So far this semester there have been two student talks. In late September, we had a joint presentation on summer research by Dan Medani BS CSE '10 and Andy Hallagan BS CSE '11. Dan presented results with simulations of Hindmarsh-Rose neurons. He studied how dynamic self-regulation of input impedance of a bi-stable neuron may provide insight into information propagation through a larger network. He won the third place award in the 2009 National Biomedical Engineering Society Meeting for his presentation on this research.

Andy talked about the automated translation of models described in an XML-based language to Python or C++ for the ns-3 simulator. In October, Bryan Ward BS CSE '10 gave a tutorial on Ruby on Rails, which has has used in summer research and independent studies.

Fall Picnic