Fall 2015 Computer Science Advising Newsletter

Five Year CS/MS Program

CS majors can apply for admission to the 5th-year graduate program in Digital Forensics. This option allows students to complete a Master of Science degree with a concentration in Digital Forensics with one extra year of study after finishing the BS degree. In order to qualify, you must be on track to complete 99 credit hours by the end of your junior year and a GPA of 3.0 or more. Applications are due before March 31st of the junior years, so students need to start planning for this program as sophomores. For more information, visit http://www.cs.jmu.edu/forensics/combinedprogram.html or contact Florian Buchholz, Graduate Director.

Freshman Advising

Freshmen, you will be registering on your own for the first time beginning November 4th, and you need to see Professors Norton or Mayfield to determine what to take in the spring.

Dropping Courses

The last day to drop a class with a W grade is Thursday, October 29th. After this date, you may only receive a WP or a WF under extraordinary circumstances at the discretion of the professor.

Advising Appointments

The CS advising team wants to see every non-graduating student this semester:

Freshmen—Please make an appointment to see your advisor individually.

Sophomores and Juniors—Registration for spring semester begins November 4th, so you need to discuss your plans for next semester (and thereafter) with your advisor to make sure that you are on track to graduate on time. See Dr. Buchholz if you are interested in the five-year program.

If you are not sure who your advisor is, you can find out on ecampus.

Spring Schedule

The spring schedule for CS courses is attached with this newsletter. You will see that there are several electives. Descriptions of many of them are included below.

If you are interested in CS/ISAT 461 or CS/ISAT 463, you will have to look for them under the ISAT designators.

Synopsis: Dates and Deadlines

Now to November 4th—Sophomore and juniors should see their advisors
October 29th—Last day to drop a class with a W
November 4th—Spring semester registration begins
Electives

There is still a chance that a section of CS 330 will be offered in the spring by Professor Benton from ISAT, but it may appear in MyMadison late. Don’t count on it, but if it shows up and you are interested, you can adjust your schedule to fit it in.

Besides those listed below, CS 442 Logic in Computer Science will be offered by Professor Mata-Toledo. Please contact him to get more information about this course.

CS/ISAT 344 Intelligent Systems (Grove)

CS344 involves the study of various techniques from Artificial Intelligence and Machine Learning, and their application to real-world problems. Example techniques include decision trees, artificial neural networks, Bayesian inference, and fuzzy logic. Students build models using tools such as the R statistical programming language, and NetLogo. Students work in small teams to develop a capstone project and present it at the end of the semester.

CS 452 Design and Analysis of Algorithms (Buchholz)

Algorithms are central to computing, and this class starts more or less where CS 240 leaves off and continues considering algorithms and their complexity. Besides revisiting several of the algorithms from CS 240 (the standard sorting and searching algorithms), we will consider other related algorithms from several areas of computing, such as computing permutations, medians, and convex hulls. Then we will turn to some other approaches to algorithm design like dynamic programming, greedy algorithms, and iterative improvement algorithms. Towards the end of the course, we will explore the limits of algorithm efficiency by considering lower-bound arguments and comparing the classes P and NP, then looking at some algorithms to solve NP-complete problems that often perform quite efficiently.

There will not be much programming, but we will do some math. This is a good course for anyone interested in grad school.

CS 482 Applications Security (Tjaden)

This will be a seminar class in which we read and discuss research papers each week about different security topics.

CS 482 Security Engineering (Wang)

Popular information security practices, such as OS/software security patching, penetration testing, and tightening system configurations, do not fit well the mold of traditional engineering that emphasizes building stuff. Does information security have a more demonstrable engineering face? CS482 Security Engineering lets you explore the engineering side of information security and experiment with security building. This is a project-oriented course and tentative topics include cryptography engineering (such as TLS programming, code signing, and TPM programming), privacy engineering, fuzz testing, static code analysis, disk and file encryption, and malware engineering. NO extensive programming experience is required for this course and background information, example
code, and detailed instructions will be provided. The methodology and tools from this course will enable you to retrofit existing real-world applications for strong security as well as to build new secure applications.

**CS 458 CyberDefense (Aboutabl)**

A hands-on, lab-based learning experience in which the students engage in a series of modules to perform security assessment, penetration testing, and hardening of networked systems. Each module is structured as follows:

a. A lecture on the protocols/concepts involved and the project description  
b. A 30-minutes in-class test (written or on Canvas) at the end of the module  
c. A report submitted by the student on the implementation of the mini-project

Sample modules include ARP Poisoning, IP tables Firewalls, DNS Security, VPNs, etc.

**CS 470 Parallel and Distributed Systems (Lam)**

This course serves as an introduction to large-scale parallel and distributed systems. Building from the foundation of topics covered in CS 361, we will explore shared memory, cluster, grid, peer-to-peer, and cloud computing models along with parallel software patterns, distributed file systems, and parallel performance considerations. We'll also cover various concrete technologies, including pthreads, OpenMP, and MPI, and students will implement several major programming assignments in those frameworks. As time allows, we may also explore other popular distributed technologies such as Hadoop/MapReduce, Amazon Web Services, and Bittorrent. **Prerequisites:** Grade of "C-" or better in CS 361.  
**Note:** This course qualifies as a system elective in the new CS curriculum.