

Department of Computer and Information Science
Descriptions of Elective and Graduate Courses for Spring 2010
Updated 20 October 2009

Undergraduate Elective Offerings

* denotes special topics offering

[CSci 345-01: Information Storage and Retrieval, Dr. Yixin Chen](#)

[CSci 361-01: Introduction to Computer Networks, Dr. Tobin Maginnis](#)

[CSci 390-01: *C++ Programming for Majors \(meets with CSci 259\), James Church](#)

[CSci 490-01: *Software Design and Scala Programming, Dr. Conrad Cunningham](#)

[CSci 533-01: Analysis of Algorithms, Dr. Stephen Rice](#)

[CSci 581-01: *Web Programming, Dr. Tobin Maginnis](#)

[CSci 582-01: *Advanced Robotics, Dr. Yixin Chen](#)

Graduate-level Offerings

* denotes special topics offering

[CSci 533-01: Analysis of Algorithms, Dr. Stephen Rice](#)

[CSci 581-01: *Web Programming, Dr. Tobin Maginnis](#)

[CSci 582-01: *Advanced Robotics, Dr. Yixin Chen](#)

[Engr 596-06: *Software Design and Scala Programming \(meets 490-1\), Dr. Conrad Cunningham](#)

[Engr 654-01: Information Systems Principles, Dr. Dawn Wilkins](#)

[Engr 661-01: Computer Networks II, Dr. Paul Ruth](#)

[Engr 691-62: *Scientific Data, Dr. Phillip Rhodes](#)

CSci 345-01: Information Storage and Retrieval

Instructor: Dr. Yixin Chen (ychen@cs.olemiss.edu)
Assistant Professor, Computer and Information Science

Time/Room: 1:00 MWF, Weir 235

Prerequisites: CSci 211

Textbook: *An Introduction to Information Retrieval*, C. D. Manning, P. Raghavan, and H. Schütze, Cambridge University Press, 2008. ISBN: 0521865719
<http://informationretrieval.org>

Description:

This course introduces, at a fundamental level, various components of modern information retrieval systems including document delineation, index construction, vector space model, ranking, relevance feedback, evaluation.

This course also covers text clustering, text classification, Web search basics, and link analysis.

The goal of this course is to introduce students to the basic knowledge of modern information retrieval (IR) systems. Students are expected to understand the basic components of IR systems and the algorithmic aspect of information retrieval. Upon completion of this course, students should be able to explain the basic structure and components of IR systems; develop basic IR algorithms; understand the Web search, web crawling and indexes.

CSci 361-01: Introduction to Computer Networks

Instructor: Dr. Tobin Maginnis (ptm@pix.cs.olemiss.edu)
Associate Professor, Computer and Information Science

Time/Room: 10:00 MWF, Weir 235

Prerequisites:

Textbook:

Description:

CSci 390-01: Special Topics in Programming, (C++ Programming for Majors)

Instructor: James Church (jcchurch@olemiss.edu)
Graduate Instructor, Computer and Information Science

Time/Room: 2:00 MWF, Weir 235

Prerequisites:

Textbook:

Description:

CSci 490-01: Special Topics (Software Design and Scala Programming)
Engr 596-06: Special Topics (Software Design and Scala Programming)

Instructor: Dr. Conrad Cunningham (cunningham@cs.olemiss.edu)
Professor and Chair, Computer and Information Science

Time/Room: 2:30 TuTh, Weir 235

Prerequisites: CSci 490-01: CSci 211 and CSci 223
Engr 596-06: Graduate standing in Computer Science

Graduate students will have additional elements of their assignments and projects.

Textbook: Martin Odersky, Lex Spoon, and Bill Venners. *Programming in Scala: A Comprehensive Step-By-Step Guide*, Artima, Inc. (<http://www.artima.com>), 2008. ISBN-13: 978-0981531601

Description:

This special topics course will examine concepts and techniques for software design and reuse in the context of contemporary object-oriented programming languages such as Scala. Planned topics include data abstraction, design contracts, Scala programming, unit testing, inheritance (single, multiple, and mix-in), polymorphism, design patterns, software frameworks, and components.

Scala is a relatively new programming language developed by Martin Odersky and his team at EPFL in Switzerland. It is beginning to find usage in industry in such companies as twitter.com. Scala programs execute on the Java Virtual Machine (JVM) and can interoperate with Java programs and libraries. Scala does, however, have a richer set of object-oriented features than Java. Scala programs also tend to be less verbose than Java programs. Although Scala is a multiparadigm language supporting functional, object-oriented, and concurrency-oriented approaches, this course will focus on effective use of object-oriented features, much of which is applicable to other languages such as Java, C++, and C#.

CSci 533-01: Analysis of Algorithms

Instructor: Dr. Stephen Rice (rice@cs.olemiss.edu)
Assistant Professor, Computer and Information Science

Time/Room: 1:00 TuTh, Weir 106

Prerequisites: CSci 433 or CSci 502 or full graduate standing in computer science

Textbook: Cormen, Leiserson, Rivest, and Stein, *Introduction to Algorithms, Third Edition*, MIT Press, 2009, ISBN-13: 978-0262033848

Description:

This is a continuation of the CSci 433/502 course on algorithms and data structures, with greater emphasis on techniques for analyzing the running time of algorithms.

CSci 581-01: Special Topics in Computer Science I (Web Programming)

Instructor: Dr. Tobin Maginnis (ptm@pix.cs.olemiss.edu)
Associate Professor, Computer and Information Science

Time/Room: 12:00 MWF, Weir 235

Prerequisites: Either CSCI 211 and 223 or Graduate Standing in Computer Science

Graduate students will have additional assignments/tests and may supervise undergraduate lab exercises.

Textbook: Larry Ullman. *PHP 6 and MySQL 5 for Dynamic Web Sites*, Peachpit Press, 2007. ISBN-13: 978-0321525994

Description:

Study of Web architecture and programming tools. Analysis of public-port protocols such as HTTP, embedded browser languages, browser extensions and interoperability. Server-side Web components, design, tuning, and security. Server components include HTTP, XMPP, Common Gateway Interface, database engine, and extensions.

The "public facing" Internet continues change how computers are used to solve problems and automate solutions. Rather than having a collection of computers performing isolated tasks and subsequently sharing data over the network, Web programming permits the use of ubiquitous thin-client computing wherein all applications share a uniform graphical user interface. Legacy applications are encapsulated with Web servers and users browse intra-company, or the public Internet, to use applications and view results.

Course topics:

1. Introduction to HTTP and Web programming paradigms
2. Browser types, incompatibilities, and solutions
3. The Apache Web-server
4. Common Gateway Interface, PHP overview, dynamic Web sites, and PHP programming
5. Standard Query Language and MySQL
6. Error handling and debugging
7. PHP and MySQL
8. Cookies and sessions
9. Security Methods
10. Making Universal Web sites
11. Web Frameworks

CSci 582-01: Special Topics in Computer Science II (Advanced Robotics)

Instructor: Dr. Yixin Chen (ychen@cs.olemiss.edu)
Assistant Professor, Computer and Information Science

Time/Room: 9:00 MWF, Weir 106

Prerequisites: CSci 211 and CSci 223

Textbook: None

Description:

The goal of this course is to provide students hands-on experience in the application of artificial intelligence to the design, constructing, and programming robots that are driven by micro-controller (LEGO NXT mobile robots) and EEG/EMG (brain/muscle wave) sensor units. For undergraduate students, the expectation is to understand the algorithmic aspect of robotics and AI. Graduate students are expected to understand the mathematical aspects of the problem-solving and learning paradigms in addition to implementation of a system. Upon completion of this course, students should be able to develop a robotic system using LEGO NXT; to understand the role of knowledge representation, problem solving, and learning in intelligent-system engineering; and to explain the basic concepts in brain-computer interface (BCI).

Engr 654-01: Information Systems Principles

Instructor: Dr. Dawn Wilkins

Associate Professor, Computer and Information Science

Time/Room: 11:00 TuTh

Prerequisites:

Textbook:

Description:

Engr 661-01: Computer Networks II

Instructor: Dr. Paul Ruth

Assistant Professor, Computer and Information Science

Time/Room: 1:00 MWF

Prerequisites:

Textbook:

Description:

Engr 691-62: Special Topics in Engineering Science (Scientific Data)

Instructor: Dr. Phillip Rhodes

Assistant Professor, Computer and Information Science

Time/Room: 4:00 ThTh

Prerequisites:

Textbook:

Description: