

Computer Science & Engineering Fall 2014 Undergrad Course Schedule

(Please refer to the Registrar's web page for revisions to the schedule)

48342 CSE 001 010 BREADTH OF COMPUTING (2) TR 7:55-9:10 Korth

Broad overview of computer science, computer systems, and computer applications. Interactive Web page development. Includes laboratory. Not available to students who have taken CSE 12 or ENGR 1.

**48343 CSE 002 110 FUNDAMENTALS OF PROGRAMMING (2) MWF 11:10-12:00
F 9:10-10:00 Chen**

**48344 CSE 002 111 FUNDAMENTALS OF PROGRAMMING (2) MWF 11:10-12:00
F 10:10-11:00 Chen**

Problem-solving and object-oriented programming using Java. Includes laboratory. No prior programming experience needed.

41495 CSE 017 010 PROGRAMMING & DATA STRUCTURES (3) MWF 11:10-12:00 Heflin

Algorithmic design and implementation in a high level, object oriented language, such as Java. Classes, subclasses, recursion, searching, sorting, linked lists, trees, stacks, queues. Prerequisite: CSE 002 and (CSE 001 or CSE 012 or ENGR 010)

**41497 CSE 109 010 SYSTEMS SOFTWARE (4) MWF 11:10-12:00
F 12:10-1:00 Kalafut**

Advanced programming and data structures, including dynamic structures, memory allocation, data organization, symbol tables, hash tables, B-trees, data files. Object-oriented design and implementation of simple assemblers, loaders, interpreters, compilers, and translators. Practical methods for implementing medium-scale programs. Prerequisite: CSE 17 or CSE 18

47482 CSE 130 010 TECHNICAL PRESENTATION (1) R 12:10-1:00 Spletzer

Oral and written communication of information in computer science. Technical writing; structure, style, and delivery of oral presentations; use of visual aids. Prerequisite: CSE 17 or 18.

43182 CSE 216 010 SOFTWARE ENGINEERING (3) MWF 1:10-2:00 Femister

The software life-cycle; life-cycle models; software planning; testing; specification methods; maintenance. Emphasis on team work and large-scale software systems, including oral presentations and written reports. Prerequisite: CSE 109

41500 CSE 252 010 COMPUTERS, INTERNET, & SOCIETY (3) TR 2:35-3:50 Crane

An interactive exploration of the current and future role of computers, the Internet, and related technologies in changing the standard of living, work environments, society and its ethical values. Privacy, security, depersonalization, responsibility, and professional ethics; the role of computer and Internet technologies in changing education, business modalities, collaboration mechanisms, and everyday life. (SS)

41610 CSE 261 010 DISCRETE STRUCTURES (3) MWF 3:10-4:00 Skandera

Topics in discrete structures chosen for their applicability to computer science and engineering. Sets, propositions, induction, recursion; combinatorics; binary relations and functions; ordering, lattices and Boolean algebra; graphs and trees; groups and homomorphisms. Various applications. Prerequisite: (MATH 021 or MATH 031 or MATH 051 or MATH 076).

41621 CSE 262 010 PROGRAMMING LANGUAGES (3) TR 9:20-10:35 Tan

Use, structure and implementation of several programming languages. Prerequisite: CSE 17 or CSE 18

49524 CSE 264 010 WEB APPLICATION DEVELOPMENT (3) MWF 11:10-12:00 Femister

This course will cover the basic knowledge and skills necessary for designing and implementing a web application. Some topics that will be covered are: essential networking concepts, web design principles (design basics, color, navigation, graphics), core implementation technologies (HTML, CSS, the document object model, JavaScript), frameworks (Jquery), server side programming (PHP, Java, AJAX), application areas (mobile clients, social networking). The course will be project centered with students developing a complete web application by the end of the semester. Prerequisite: CSE 017.

**49441 CSE 265 110 SYSTEM & NETWORK ADMINISTRATION (3) WF 9:10-10:00 Davison
M 9:10-11:00****49443 CSE 265 111 SYSTEM & NETWORK ADMINISTRATION (3) WF 9:10-10:00 Davison
T 9:20-11:10**

Overview of systems and network administration in a networked UNIX-like environment. System installation, configuration, administration, and maintenance; security principles; ethics; network, host, and user management; standard services such as electronic mail, DNS, and WWW; file systems; backups and disaster recovery planning; troubleshooting and support services; automation, scripting; infrastructure planning. Prerequisites: CSE 017 or CSE 018

41624 CSE 303 010 OPERATING SYSTEM DESIGN (3) TR 9:20-10:35 Chuah

Process and thread programming models, management, and scheduling. Resource sharing and deadlocks. Memory management, including virtual memory and page replacement strategies. I/O issues in the operating system. File system implementation. Multiprocessing. Computer security as it impacts the operating system. Prerequisites: ECE 201 or (CSE 201 or CSE 202) and CSE 109.

48950 CSE 307 010 STRUCTURAL BIOINFORMATICS (3) MWF 1:10-2:00 Chen

Computational techniques and principles of structural biology used to examine molecular structure, function, and evolution. Topics include: protein structure alignment and prediction; molecular surface analysis; statistical modeling; QSAR; computational drug design; influences on binding specificity; protein-ligand, -protein, and -DNA interactions; molecular simulation, electrostatics. Tutorials on UNIX systems and research software support an interdisciplinary collaborative project in computational structural biology. Credit will not be given for both CSE 307 and 407. Must have junior standing or higher. Prerequisites: BIOS 120 or CSE 109 or CHM 113 or MATH 231 or consent of instructor.

47483 CSE 313 010 COMPUTER GRAHPICS (3) MWF 9:10-10:00 Huang

Computer graphics for animation, visualization, and production of special effects: displays, methods of interaction, images, image processing, color, transformations, modeling (primitives, hierarchies, polygon meshes, curves and surfaces, procedural), animation (keyframing, dynamic simulation), rendering and realism (shading, texturing, shadows, visibility, ray tracing), and programmable graphics hardware. Prerequisite: CSE 109 or consent of the instructor.

43186 CSE 318 010 INTRODUCTION TO THE THEORY OF COMPUTATION (3) MWF 1:10-2:00 Munoz-Avila

Formal study of theoretical computational models: finite automata, pushdown automata, and Turing machines. Study of formal languages: regular, context-free, and decidable languages. Prerequisites: CSE 261 or MATH 261

49444 CSE 320 010 BIOMEDICAL IMAGE COMPUTING AND MODELING (3) MWF 2:10-3:00 Huang

Biomedical image modalities, image computing techniques, and imaging informatics systems. Understanding, using, and developing algorithms and software to analyze biomedical image data and extract useful quantitative information: Biomedical image modalities and formats; image processing and analysis; geometric and statistical modeling; image informatics systems in biomedicine. Credit will not be given for both CSE 320 and CSE 420. Prerequisites: (MATH 205 or MATH 043) and CSE 017.

41926 CSE 336 010 EMBEDDED SYSTEMS (3) MWF 3:10-4:00 Decker

Use of small computers embedded as part of other machines. Limited-resource microcontrollers and state machines from high description language. Embedded hardware: RAM, ROM, flash, timers, UARTs, PWM, A/D, multiplexing, debouncing. Development and debugging tools running on host computers. Real-Time Operating System (RTOS) semaphores, mailboxes, queues. Task priorities and rate monotonic scheduling. Software architectures for embedded systems. Prerequisite: CSE 17 or CSE 18.

49447 CSE 337 010 REINFORCEMENT LEARNING (3) MWF 10:10-11:00 Munoz-Avila

Algorithms for automated learning from interactions with the environment to optimize long-term performance. Markov decision processes, dynamic programming, temporal-difference learning, Monte Carlo reinforcement learning methods. Credit will not be given for both CSE 337 and CSE 437. Prerequisites: MATH 231 and CSE 109.

49449 CSE 340 010 DESIGN & ANALYSIS OF ALGORITHMS (3) TR 10:45-12:00 Korth

Algorithms for searching, sorting, manipulating graphs and trees, finding shortest paths and minimum spanning trees, scheduling tasks, etc.: proofs of their correctness and analysis of their asymptotic runtime and memory demands. Designing algorithms: recursion, divide-and-conquer, greediness, dynamic programming. Limits on algorithm efficiency using elementary NP-completeness theory. Credit will not be given for both CSE 340 (MATH 340) and CSE 441 (MATH 441). Prerequisites: (MATH 022 or MATH 032) and (CSE 261 or MATH 261)

49453 CSE 347 010 DATA MINING (3) TR 1:10-2:25 Lopresti

Overview of modern data mining techniques: data cleaning; attribute and subset selection; model construction, evaluation and application. Fundamental mathematics and algorithms for decision trees, covering algorithms, association mining, statistical modeling, linear models, neural networks, instance-based learning and clustering covered. Practical design, implementation, application, and evaluation of data mining techniques in class projects. Credit will not be given for both CSE 347 and CSE 447. Prerequisites: CSE 017 and (MATH 231 or ECO 045)

48337 CSE 350 010 NETWORKING FOR SMART GRID (3) MW 11:10-12:25 Kishore

The self-healing, adaptive, and secure smart grid will require sophisticated communications networks. Ranging from the networking of in-home appliances and smart meters to the integration of components across the grids, several communications and networking technologies will partake in the development and maintenance of the grid. This course aims to overview these key technologies and, in the process, will convey several core concepts behind communications and network engineering. The goal will be to study approaches that will enable secure, real-time, two-way communications across the numerous entities within the grid so that it can 1) heal itself; 2) operate efficiently; and 3) engage customers in its improved operation. Course discussion will focus on several types of networks: home networks, smart meters and Automated Meter Reading Infrastructure (AMRI), wireless mesh networks, sensor networks, metropolitan and wide area networks. The course will also cover related topics in the design and implementation of the Supervisory Control and Data Acquisition (SCADA) system and the IntelliGrid architecture, an open-standards and requirements-based approach for integrating data

networks and equipment in smart grids. The course will address relevant overlaps with telecommunications technologies (e.g., Ethernet, G.hn, WiMAX, Wi-Fi, Zigbee, TCP/IP, etc.) and how these approaches may be used to enhance grid functionality and response.

49464 CSE 360 010 INTRODUCTION TO MOBILE ROBOTICS (3) TR 7:55-9:10 Spletzer

Algorithms employed in mobile robotics for navigation, sensing, and estimation. Common sensor systems, motion planning, robust estimation, bayesian estimation techniques, Kalman and Particle filters, localization and mapping. Credit will not be given for both CSE 360 and CSE 460. Prerequisites: MATH 023 or MATH 205 or MATH 231.

41945 CSE 379 010 SENIOR PROJECT (3) T 12:10-1:00 Spletzer

Design, implementation, and evaluation of a computer science capstone project conducted by student teams working from problem definition to testing and implementation; written progress reports supplemented by oral presentations. Prerequisite: senior standing and CSE 130.

CSE 392 INDEPENDENT STUDY (1-3)

An intensive study, with report of a topic in computer science which is not treated in other courses. May be repeated for credit. Prerequisite: consent of instructor.

Computer Science and Business

41936 CSB 313 DESIGN OF INTEGRATED BUSINESS APPS (3) MW 2:10-4:00 KALAFUT

Integrated Product Development (IPD) Capstone Course II. This course extends the industry-based project initiated in CSB 312 into its implementation phase. Detailed design, in-house system construction and delivery, commercial software options, and systems maintenance and support. The practical component of the course is supplemented by several classroom-based modules dealing with topics that lie at the boundary of computer science and business. Formal, oral, and written presentations to clients. Prerequisite: CSB 312.