COM 800

Approval of department.

COM 800

OPEN only to graduate students. Further study of methods of data collection and analysis. Writing and critiquing research reports.

Organizational Communication II

Spring of odd-numbered years. 3(0-0)

P: COM 815; COM 800 or COM 902.

Organizational communication structure and information processing. The organization's embeddedness in a larger social environment.

Micro and Macro Media

Fall of odd-numbered years. 3(0-0)

P: COM 800 or COM 902.

Perspectives on media processes pertaining to individuals, groups, and large-scale systems. Topics include cognitive processing of media, public opinion and affective responses to media.

Interpersonal Communication

Fall. 3(0-0)

P: COM 800 or COM 902.

Theory and research in interpersonal communication. Role of communication in processes such as interpersonal influence and relationship development.

Independent Study

Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Open only to graduate students in Communication. Approval of department. Individualized study under faculty direction.

Doctoral Dissertation Research

Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 9 credits in all enrollments for this course. Open only to Ph.D. students in Mass Media.

COMPUTER SCIENCE CPS

Department of Computer Science
College of Engineering

Computing Concepts and Competencies

Fall, Spring, Summer. 3(2-2)

Core concepts in computing including information storage, retrieval, management, and representation. Applications from specific disciplines. Applying core concepts to design and implement solutions to various focal problems, using hardware, multimedia software, communication and computer networks.

Introduction to Technical Computing

Fall, Spring. 3(2-2)

P: MTH 101 or MTH 116 or MTH 120 or MTH 124 or MTH 132 or concurrently.

Computing systems and applications. Design and implementation of programs using FORTRAN. Examples from engineering, mathematics and science.

Algorithms and Computing

Fall, Spring. 4(3-2)

P: LBS 115 or MTH 120 or MTH 124 or MTH 132.


Discrete Structures in Computer Science

Fall, Spring. 3(0-0)

P: MTH 133.


Independent Study in Computer Science

Fall, Spring. 1 credit.

A student may earn a maximum of 3 credits in all enrollments for this course. Approval of department; application required. Supervised individual study in an area of computer science.

Selected Topics in Computer Science

Fall, Spring. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Approval of department. Topics selected to supplement and enrich existing courses and lead to the development of new courses.

Computer Organization and Assembly Language Programming

Fall, Spring. 4(3-2)

P: CPS 220, CPS 260. Not open to students with credit in EE 331.

Machine representation of data and instructions. Machine organization, primary storage, registers, arithmetic logic unit, control unit, operations. Assembly language programming, interface to high level languages. Assemblers and loaders.

Data Structures and Programming Concepts

Fall, Spring. 4(3-2)

P: CPS 230, CPS 260.

Data types and structures. Algorithms including searching, sorting and hashing. Program correctness, program analysis, abstract data types including stacks, queues, and trees. Object-oriented programming, introduction to various program libraries.

Automata and Formal Language Theory

Fall. 3(3-0)

P: CPS 280, CPS 290.


Operating Systems

Fall, Spring. 4(3-2)

P: CPS 350; CPS 380 or EE 331. Open only to Computer Science, Computer Engineering, Electrical Engineering, and LBS Computer Science majors.

History and evolution of operating systems. Process and processor management. Primary and auxiliary storage management. Performance evaluation, security, distributed systems. Case studies of modern operating systems.

Computer Architecture

Fall. 4(3-2)

P: CPS 390; EE 331 or CPS 380. Open only to Computer Science, Computer Engineering, Electrical Engineering, and LBS Computer Science majors.

Digital logic and sequential machine design. Computer organization, control unit and arithmetic logic unit implementation. Input-output, memory organization, parallel operations. Digital system simulation.

Computer Networks

Fall, Spring. 4(3-2)

P: STT 351, CPS 320 or EE 331; CPS 410 or concurrently. Open only to juniors or seniors in the Computer Science or Computer Engineering or Electrical Engineering or LBS Computer Science majors.

Computer network architectures and models. Medium access control. Physical, data link, network, transport, and session layers. Local-area and wide-area networks.

Artificial Intelligence and Symbolic Programming

Fall. 4(3-2)

P: CPS 330, CPS 360. Open only to Computer Science, Computer Engineering, and LBS Computer Science majors.

Machine intelligence. Heuristic programming. Representation and control in LISP and PROLOG. Applications to search, rule-based diagnosis, and parsing.

Design of Intelligent Systems (W)

Spring. 4(2-2)

P: CPS 440; CPS 320 or EE 331. Open only to seniors or graduate students in a College of Engineering or Computer Science major. Completion of Tier I writing requirement. Not open to students with credit in CPS 479 or CPS 478.

Intelligent system applications such as natural language, machine vision, or a diagnostic expert system. Team development, software engineering, project management.
450. Translation of Programming Languages
Spring, 4(3-0)
P: CPS 330, CPS 360, CPS 320 or EE 331. R: Open only to Computer Science, Computer Engineering, and LBS Computer Science majors.

452. Organization of Programming Languages
Fall, 4(3-0)
P: CPS 330, CPS 360; CPS 320 or EE 331. R: Open only to Computer Science and LBS Computer Science majors.
Organization of programming languages including language processors, syntax, data types, sequence control, storage management. Comparison of language features from the functional, imperative, logical and object-oriented paradigms.

470. Software Engineering
Fall, Spring, 4(3-2)
P: CPS 330, CPS 360; CPS 320 or EE 331. R: Open only to juniors or seniors in the College of Engineering Computer Science or Computer Engineering major or in the Lyman Briggs School Computer Science major.
Software life cycle including specification, design, coding, testing, and verification of a software product. Stepwise refinement and rapid prototyping. Software portability, reusability and maintainability.

472. Computer Graphics
Spring, 3(2-2)
P: CPS 330, MTH 314. R: Open only to Computer Science and LBS Computer Science majors.
Graphics hardware and software. Fundamental algorithms. Two- and three-dimensional imaging geometry and transformations. Curve and surface design, rendering, shading, color, and animation.

474. Vector and Parallel Programming
Fall, Spring, 3(2-2)
P: CPS 430, MTH 314. R: Open only to Computer Science and Electrical Engineering, Computer Engineering, and LBS Computer Science majors.

478. Software Engineering Project (W)
Spring, 4(2-4)
P: CPS 470 R: Open only to seniors or graduate students in a College of Engineering Computer Science major. Completion of Tier I writing requirement. Not open to students with credit in CPS 449 or CPS 479.
Development of a large software system in a team setting. Software development with emphasis on rigorous specification, design, implementation, testing, maintenance, and documentation.

479. Software Tools for Concurrent Systems (W)
Fall, Spring, 4(2-4)
P: CPS 330, CPS 360; CPS 422 or CPS 474. R: Open only to seniors or graduate students in a College of Engineering Computer Science major. Completion of Tier I writing requirement. Not open to students with credit in CPS 449 or CPS 479.
Design, development and application of software tools for parallel and distributed systems. Program development, debugging, performance monitoring, simulation, data and control flow analysis, and visualization.

480. Database Systems
Spring, 4(3-2)
P: CPS 330, CPS 360, CPS 320 or EE 331. R: Open only to Computer Science, Computer Engineering, and LBS Computer Science majors.
Storage and access to physical databases including indexing, hashing, and range accesses. Data models, query languages and transaction processing, recovery techniques. Object-oriented and distributed database systems. Database design.

490. Independent Study in Computer Science
Fall, Spring, 1 credit. A student may earn a maximum of 3 credits in all enrollments for this course. R: Open only to Computer Science majors. Approval of department; application required. Supervised individual study in an area of computer science.

491. Selected Topics in Computer Science
Fall, Spring, 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open only to College of Engineering Computer Science majors. Approval of department. Topics selected to supplement and enrich existing courses and lead to the development of new courses.

492. Computer Vision
Fall, Spring, 3(3-0)
P: CPS 330, MTH 314, STT 441. R: Open only to Computer Science or Electrical Engineering majors.

493. Computer System Performance and Measurement
Spring of odd-numbered years, 3(3-0) Interdepartmental with Electrical Engineering.
P: CPS 410, STT 441. R: Open only to Computer Science or Electrical Engineering majors.
Analysis of computer system performance. Computer system architecture, operating systems, memory and address space organization, multiprocessing, operating system services, computer measurement tools, and analytical tools.

494. Modelling and Discrete Simulation
Fall of even-numbered years, 3(3-0) Interdepartmental with Electrical Engineering.
P: CPS 430, STT 441. R: Open only to Computer Science or Electrical Engineering majors.

495. Algorithms and Their Hardware Implementations
Spring, 3(3-0) Interdepartmental with Electrical Engineering, Administered by Electrical Engineering.
P: CPS 330, STT 441. R: Open only to Computer Science or Electrical Engineering majors.
Algorithms for mathematical models, petri nets, model validation, random variable generation, analysis of simulation data. Case studies.

812. Advanced Operating Systems
Spring, 3(3-0)
P: CPS 410, CPS 420. R: Open only to Computer Science or Electrical Engineering majors.
Parallel and distributed operating systems. Load sharing, scheduling, reliability, recovery, memory management. Distributed file systems, distributed agreement, and object-oriented operating systems.

813. Logic Design Principles
Fall, 3(3-0) Interdepartmental with Electrical Engineering, Administered by Electrical Engineering.

814. Formal Methods in Software Development
Fall of odd-numbered years. 3(3-0)
P: MTH 422. R: Open only to Computer Science or Electrical Engineering majors.
Formal specification languages, including verification with development. Design and the implementation of term project.

820. Advanced Computer Architecture
Fall, Spring, 3(3-0) Interdepartmental with Electrical Engineering.
P: CPS 410, CPS 420. R: Open only to Computer Science or Electrical Engineering majors.
Instruction set architecture. Pipelining, vector processors, cache memory, high bandwidth memory design, virtual memory, input and output. Benchmarking techniques. New developments related to single CPU systems.

822. Parallel Processing Computer Systems
Spring, 3(3-0) Interdepartmental with Electrical Engineering.
P: CPS 410. R: Open only to Computer Science or Electrical Engineering majors.
Massively parallel SIMD processors, multiprocessor architectures, interconnection networks, synchronization and communication. Memory and address space management, process management and scheduling. Parallel compilers, languages, performance evaluation.

824. Advanced Computer Networks and Communications
Fall, 3(3-0)
P: CPS 422. R: Open only to Computer Science or Electrical Engineering majors.
Advanced topics in emerging computer networking technologies, including high-speed wide area networks and local area networks, wireless and mobile computing networks, optical networks, and multimedia networking.

830. Design and Theory of Algorithms
Fall, Spring, 3(3-0)
P: CPS 330, CPS 360. R: Open only to Computer Science or Electrical Engineering majors.
Analysis of algorithms. Algorithm design techniques. Efficient algorithms for classical problems. Intractable problems and techniques to handle them.

835. Algorithmic Graph Theory
Fall, 3(3-0)
P: CPS 330, CPS 360, MTH 314. R: Open only to Computer Science or Electrical Engineering majors.
Graph theory. Graph algorithms. Topological aspects of graphs such as finding paths, network flow, spanning trees and matching.

836. Design of Parallel Algorithms
Spring, 3(3-0)
P: CPS 420, CPS 430. R: Open only to Computer Science or Electrical Engineering majors.
Current research topics and issues. Models of parallel computation. Implementation of algorithms on SIMD and MIMD machines. Relationship to VLSI.