

**COMMUNICATION CAS
ARTS AND
SCIENCES**

**College of Communication
Arts and Sciences**

192 Environmental Issues Seminar
Fall, Spring. 1 credit. A student may earn a maximum of 4 credits in all enrollments for this course. Interdepartmental with Natural Science; Agriculture and Natural Resources; Engineering; Social Science. Administered by College of Natural Science. R: Open only to students in the College of Agriculture and Natural Resources or College of Engineering or College of Natural Science or College of Communication Arts and Sciences or College of Social Science. Approval of college.

Environmental issues and problems explored from a variety of perspectives, including legal, scientific, historical, political, socio-economic, and technical points of view.

299 Media Writing
Fall, Spring, Summer. 3(1-4)
Writing for mass media.

492 Special Topics
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 16 credits in all enrollments for this course. R: Approval of college.

Varied topics pertaining to the study of communication processes.

131 Introduction to Technical Computing
Fall, Spring. 3(2-2) P:M: (MTH 103 or MTH 110 or MTH 116 or LBS 117 or MTH 124 or concurrently or MTH 132 or concurrently or LBS 118 or concurrently) SA: CPS 131

Use of computing systems for technical communications and problem solving in engineering, mathematics, and science. Development and use of mathematical models suitable for computer representation, solution, graphical display, and animation.

231 Introduction to Programming I
Fall, Spring. 4(3-2) P:M: (LBS 118 or concurrently or MTH 124 or concurrently or MTH 132 or concurrently or MTH 152H or concurrently) RB: (CSE 131) SA: CSE 230

Introduction to object-centered programming using C++. Design, implementation and testing of programs to solve problems in engineering, mathematics and science. Programming fundamentals, functions, classes, arrays, and pointers.

232 Introduction to Programming II
Fall, Spring. 4(3-2) P:M: (CSE231) and (LBS118 or MTH124 or MTH132 or MTH152H) SA: CSE 330

Continuation of object-centered programming using C++. Development of classes and reliable software. Data structures and their encapsulation; stacks, queues, lists, trees, and hash tables. Algorithms operating on data structures. Object-oriented design and programming.

240 Informatics
Fall, Spring, Summer. 3(3-0) P:M: (CSE 103 or CSE 131 or CSE 231) and (MTH 103 or MTH 116 or MTH 124 or MTH 132 or LBS 117) or designated score on Mathematics placement test. R: Approval of department.

Digital representation of objects such as numbers, signals, and 3D shapes. Algorithms that operate on digital objects. Storage devices and network distribution of digital objects. How information systems support various applications.

260 Discrete Structures in Computer Science
Fall, Spring. 4(4-0) P:M: (MTH 133 or MTH 126 or MTH 153H or LBS 119) SA: CPS 260

Propositional and first order logic. Equivalence, inference and method of proof. Mathematical induction, diagonalization principle. Basic counting. Set operations, relations, functions. Grammars and finite state automata. Boolean algebra. Truth tables and minimization of Boolean expressions. Applications to computer science and engineering.

290 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: Approval of department; application required. SA: CPS 290

Supervised individual study in an area of computer science.

291 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: Approval of department. SA: CPS 291

Topics selected to supplement and enrich existing courses and lead to the development of new courses.

320 Computer Organization and Assembly Language Programming
Fall, Spring. 4(3-2) P:M: (CSE 232 and CSE 260) SA: CPS 320 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.

331 Algorithms and Data Structures
Fall, Spring. 4(3-2) P:M: (CSE 232 and CSE 260) R: Open only to students in the Department of Computer Science and Engineering or Computer Engineering majors or the LBS Computer Science coordinate major or the Computer Science disciplinary minor.

Linear data structures, trees, and graphs and algorithms which operate on them. Fundamental algorithms for searching, sorting, string matching, graph problems, and their analysis.

370 Software Engineering
Fall, Spring. 4(3-2) P:M: (CSE 232 and CSE 260) R: Open only to students in the Department of Computer Science and Engineering or the Computer Engineering major or the LBS Computer Science field of concentration or the LBS Computer Science coordinate major or the Computer Science disciplinary minor. SA: CPS 470, CSE 470

Software life cycle including specification, design, coding, testing, and verification of a software product. Stepwise refinement and rapid prototyping. Software portability, reusability and maintenance.

410 Operating Systems
Fall, Spring. 4(3-2) P:M: (CSE 232 and CSE 260) and (CSE 320 or ECE 331) R: Open only to students in the Department of Computer Science and Engineering or the Computer Engineering major or the LBS Computer Science field of concentration or the LBS Computer Science coordinate major or the Computer Science disciplinary minor. SA: CPS 410

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.

420 Computer Architecture
Fall, Spring. 4(3-2) P:M: (CSE 232 and CSE 260) and (CSE 320 or ECE 331) R: Open only to students in the Department of Computer Science and Engineering or the Computer Engineering major or the LBS Computer Science field of concentration or the LBS Computer Science coordinate major or the Computer Science disciplinary minor. SA: CPS 420

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 CSE
SCIENCE AND
ENGINEERING**

**Department of Computer
Science and Engineering
College of Engineering**

101 Computing Concepts and Competencies
Fall, Spring, Summer. 3(2-2) SA: CPS 100, CPS 130

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 networks.

103 Introduction to Databases in Information Technology
Fall, Spring, Summer. 3(2-2) P:M: (CSE101) R: Approval of Department.

Core concepts in database organization and use including information storage, retrieval, management, and representation via databases. Application of database concepts to develop and implement solutions to various problems including Web-to-database issues inherent in e-commerce.