922. **Interpersonal Communication**
Fall. 3(3-0)
Theory and research in interpersonal communication. Role of communication in processes such as interpersonal influence and relationship development.

990. **Independent Study**
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to graduate students in Communication. Approval of department.
Individualized study under faculty direction.

999. **Doctoral Dissertation Research**
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to Ph.D. students in Communication.

COMMUNICATION ARTS AND SCIENCES   CAS

College of Communication Arts and Sciences

192. **Environmental Issues Seminar**
Fall, Spring. 1(1-0) A student may earn a maximum of 4 credits in all enrollments for this course. Interdepartmental with Natural Science; Agriculture and Natural Resources; Engineering; and Social Science. Administered by 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.

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.

825. **Mass Communication and Public Health**
Fall. 3(3-0) RB: Academic or professional background in mass communication and/or health.
Health communication campaigns in domestic and international contexts. Focus on principles of effective communication.

826. **Health Communication for Diverse Populations**
Spring. 3(3-0) RB: Academic or professional background in mass communication and/or health.
Theory, research, and practice of communicating with specialized populations in clinical and public health contexts. Emphasis on interpersonal and small-group strategies.

892. **Special Topics**
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 16 credits in all enrollments for this course. R: Open only to graduate students in the College of Communication Arts and Sciences or approval of college.
Varied topics pertaining to advanced study of communication processes.

992. **Doctoral Seminar**
Fall, Spring, Summer. 3(3-0) A student may earn a maximum of 15 credits in all enrollments for this course. R: Open only to Ph.D. students in Mass Media and Communication or approval of college.
Topics on theoretical and research issues in communication and mass media.

993. **Research Internship**
Fall, Spring, Summer. 1 credit. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to Ph.D. students in Mass Media.
Participation in faculty research projects.

999. **Doctoral Dissertation Research**
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to Ph.D. students in Mass Media.

COMPUTER SCIENCE AND ENGINEERING   CSE

Department of Computer Science and Engineering
College of Engineering

101. **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 networks.
SA: CSE 100,CSE 130

131. **Introduction to Technical Computing**
Fall, Spring. 3(2-2)
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.
SA: CPS 131

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

232. **Introduction to Programming II**
Fall, Spring. 4(3-2) P: (CSE 231)
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.
SA: CSE 330

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

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.
Supervised individual study in an area of computer science.
SA: CPS 290

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.
Topics selected to supplement and enrich existing courses and lead to the development of new courses.
SA: CPS 291

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

331. **Algorithms and Data Structures**
Fall, Spring. 4(3-2) P: (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.

410. **Operating Systems**
Fall, Spring. 4(3-2) P: (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.
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.
SA: CPS 410