494 Practicum in Communication Research and Instruction
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to sophomores or juniors or seniors in the Department of Communication. Approval of department; application required.
Structured participation in departmental research teams and applied practice in the community.

800 Applied Communication Research I
Fall. 3(3-0)
Communication research methods and strategies used commonly in practical research settings

801 Communication Research I
Fall. 4(4-0)
Communication research strategy and methodology. Scientific process. Derivation and test of hypotheses. Methods of research design.

802 Communication Research II
Spring. 4(4-0) RB: (COM 801)
Further consideration of communication research strategy and methodology. Topics include systems theory, cybernetics, and transactional approach.

815 Organizational Communication I
Fall. 3(3-0)
Emphasis on dyadic and group processes and organizational intervention strategies. Topics include managing diversity, organizational structure, and communication productivity.

820 Communication Theory and Process
Fall. 3(3-0)
Role that theory plays in different areas of communication scholarship.

821 Mass Communication Theory and Research
Fall, Spring. 3(3-0) SA: TC 821
Current mass communication research and theories, including exposure patterns, diffusion of news and social effects of mass media.

828 Cross-Cultural Communication
Spring. 3(3-0)
Problems in communicating across cultural boundaries, focusing on the processes, theories, and methods in the study of intercultural communication.

830 Applied Communication Research II
Spring. 3(3-0)
Thesis production. Reporting and evaluating the results of communication research.

855 Codes and Code Systems
Spring. 4(4-0)
Structure and function of verbal and nonverbal communication. Relationship between discourse and context. Generation of meaning through interaction.

860 Persuasion
Fall. 3(3-0)
Use of messages to gain compliance and effect social change. Persuasion and attitude change from classical theories to contemporary situations.

874 Communication in Logistics
Fall. 1(1-1) R: Open only to students in the Master of Science in Logistics.
Development of effective interpersonal communication skills. Oral communication in business settings. Use of appropriate technology for management presentations.

890 Independent Study
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Approval of department.
Individualized study under faculty direction.

893 Internship
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to graduate students in Communication.
Supervised experience in an applied-communication setting.

899 Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 14 credits in all enrollments for this course. R: Open only to graduate students in Communication.
Master's thesis research.

901 Communication Research Design I
Fall. 4(4-0) RB: One introductory research design or statistics course. R: Open only to doctoral students.
Methods of data collection and analysis. Writing and critiquing research reports.

902 Communication Research Design II
Spring. 4(4-0) RB: (COM 901) R: Open only to graduate students.
Further study of methods of data collection and analysis. Writing and critiquing research reports.

915 Organizational Communication II
Spring of odd years. 3(3-0) RB: (COM 815)
Organizational communication structure and information processing. The organization's embeddedness in a larger social environment.

921 Micro and Macro Media
Fall of odd years. 3(3-0)
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.

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.
Doctoral dissertation research.

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.

292 Applications in Environmental Studies
Fall. 2(1-2) Interdepartmental with Natural Science; Agriculture and Natural Resources; Engineering; Social Science. Administered by College of Natural Science. P:M: (NSC 192) R: Open only to students in the Specialization in Environmental Studies.
Community engagement project. Projects vary depending on student's major and area of environmental interest.

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.

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.

Doctoral dissertation research.

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) 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.

131   Technical Computing and Problem Solving
Fall, Spring. 3(1-3) P:M: (MTH 124 or concurrently or MTH 132 or concurrently or LBS 118 or concurrently) or (MTH 152H or concurrently) SA: CPS 131

Use of computing systems for technical problem solving in engineering and science.

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 3-D 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 and methods of proof. Basics of counting. Set operations, relations, functions. Grammars and finite state automata. Discrete probability. 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 Architecture
Fall, Spring. 3(3-0) P:M: (CSE 232 and CSE 260) SA: CPS 320 Not open to students with credit in ECE 331.

Boolean algebra and digital logic. Combinational and sequential circuits. Representations of data and instructions. Architecture and major components of computer systems. Assembly language programming and interfacing to high level languages. Assembler and linker processing.

331   Algorithms and Data Structures
Fall, Spring. 3(3-0) 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, graphs and algorithms which operate on them. Fundamental algorithms for searching, sorting, string matching, graph problems. Design and analysis of algorithms.

335   Object-oriented Software Design
Fall, Spring. 3(3-0) P:M: (CSE 232 and CSE 260) R: Open only to students in Computer Science or Computer Engineering or the LBS Computer Science field of concentration or the LBS Computer Science coordinate major or the Computer Science disciplinary minor. SA: CSE 370

Development of large software products, libraries, and product families. Object-oriented programming using inheritance and polymorphism. Design methods. Specification and the use of contracts to design reliable software. Configuration management and life-cycle issues.

410   Operating Systems
Fall, Spring. 3(3-0) 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

Principles and evolution of operating systems. Process and processor management. Concurrent processes and threads. Primary and secondary storage management. Case studies of modern operating systems.

420   Computer Architecture
Fall, Spring. 3(3-0) 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

Organization and architecture of computer systems. Arithmetic Logic Unit and control unit implementations. Hardwired and microprogrammed control. Pipelined processors; data and branch hazards. Memory hierarchy and storage devices. Input-output and peripheral devices. Advanced architectures.

422   Computer Networks
Fall, Spring. 3(3-0) P:M: (STT 351 or ECE 280) and (CSE 320 or ECE 331) and (CSE 410 or concurrently) R: Open only to students in the Department of Computer Science or the Computer Engineering or LBS Computer Science major or the LBS Computer Science coordinate major or the Computer Science disciplinary minor. SA: CPS 422

Computer network architectures and models. Physical media and signaling. Data link protocols. Medium access control. Routing and IP. Transport services including TCP/UDP. Network applications. Local-area and wide-area networks.

435   Software Engineering
Fall. 3(3-0) P:M: (CSE 320 and CSE 331 and CSE 335) R: Open only to students in the Department of Computer Science or the Computer Engineering or LBS Computer Science major or the LBS Computer Science coordinate major or the Computer Science disciplinary minor. SA: CSE 470

Software lifecycle including specification, design, coding, testing, and verification of a software product. Stepwise refinement and traceability. Software maintenance and documentation.