847 Simulation Models for Transportation Applications
Fall of even years. 3(3-0)
Simulation models for analysis and optimization of transportation systems. Experimentation with planning and traffic simulation models for signal timing and capacity analysis.

849 Transportation Research Methods
Spring. 3(3-0)
Application and interpretation of quantitative methods and design of experiments for transportation research; ANOVA, non-parametric, discriminant analysis, factor analysis, multivariate regression, SPSS.

850 Intelligent Transportation Systems (ITS)
Fall of odd years. 3(3-0) RB: Traffic and Transportation engineering
Technical and policy aspects emerging from the application of advanced technologies to transportation problems. Intelligent Transportation Systems (ITS) user services requirements, available and emerging technologies, case studies of ongoing operational tests, legal institutional and planning issues related to ITS development and deployment.

851 Transportation and the Environment
Spring of even years. 3(3-0) RB: B.S. in Civil Engineering with emphasis on transportation or environmental engineering R: Open only to graduate students in the College of Engineering.
The impact of transportation systems on the environment. Elements of Environmental Impact Statements. Policy options and their consequences. Alternatives for reducing environmental impact.

890 Independent Study in Civil Engineering
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Open only to Civil Engineering master's students. Approval of department.
Research problems of limited scope not pertaining to thesis accomplished under CE 899 or CE 999.

891 Selected Topics in Civil Engineering
Fall, Spring, Summer. 2 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.
Selected topics in new or developing areas of civil engineering.

892 Master's Research Project
Fall, Spring, Summer. 3 to 5 credits. R: Open only to master's students in the Civil Engineering major. Approval of department.
Master's degree Plan B individual student research project. Original research, research replication, or survey and reporting on a research topic.

893 Master's Design Project
Fall, Spring, Summer. 1 to 3 credits. R: Open only to master's students in the Civil Engineering major. Approval of department.
Master's degree Plan B individual student civil engineering design project.

899 Master's Thesis Research
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 24 credits in all enrollments for this course.
Master's thesis research.

990 Independent Study in Civil Engineering
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Open only to Civil Engineering doctoral students
Research problems of limited scope not pertaining to thesis accomplished under CE 999.

999 Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 72 credits in all enrollments for this course.
Doctoral dissertation research.

CLASSICAL STUDIES CLA

Department of Romance and Classical Languages
College of Arts and Letters

120 Latin and Greek Roots of English Words
Spring of even years. 3(3-0)
Prefixes, suffixes, and roots of English vocabulary from Greek and Latin word elements.

140 Greek and Roman Mythology
Fall. 3(3-0)
Introduction to Greek and Roman myths, with emphasis on myth as social discourse and as an influence on ancient poets and thinkers.

210 Greek Civilization
Fall. 3(3-0)
General survey of salient aspects of ancient Greek civilization and modern approaches to its study.

211 Roman Civilization
Spring. 3(3-0) SA: CLA 310
Ancient Roman civilizations and modern approaches to their study.

292 Introduction to Ancient Studies
Fall. 2(1-2) Interdepartmental with Arts and Letters; History of Art; History. Administered by Arts and Letters.
Methods and current trends in the study of the Greek and Roman world. Visits to library and museum collections.

350 Greek and Roman Literature in English Translation
Fall of even years. 3(3-0) R: Not open to freshmen.
Representative works of major Greek and Roman authors.

360 Ancient Novel in English Translation
Spring of odd years. 3(3-0) R: Not open to freshmen.
Translation of the ancient Greek and Roman novel. Interpretation of assigned novels. The role of popular literature in Greco-Roman society.

400 Women in Classical Greek Society
Spring of odd years. 3(3-0) Interdepartmental with Women's Studies. R: Not open to freshmen or sophomores.
Image, role, and status of women in Greek society as seen through literary sources.

491 Topics in Classical Studies
Spring of even years. 3(3-0) P:NM: (CLA 210) R: Open only to juniors or seniors.
Special topics supplement regular course offerings.

499 Senior Thesis
Fall, Spring. 3(3-0) P:NM: (LTN 402) R: Approval of department.
Scholarly research and writing with a focus on specific problems, under faculty supervision.

COMMUNICATION COM

Department of Communication
College of Communication Arts and Sciences

100 Human Communication
Fall, Spring, Summer. 3(3-0)
Process and functions of communication. Principles underlying communication behavior. Practice in analyzing communication situations and in speaking and writing.

200 Methods of Communication Inquiry
Fall, Spring, Summer. 4(3-2) P:NM: Completion of University mathematics requirement.
Nature and conduct of communication inquiry. Significant questions about communication and finding systematic answers.

225 An Introduction to Interpersonal Communication
Fall, Spring, Summer. 3(3-0)
Principles and practices of interpersonal communication. Emphasis on effective and responsible interpersonal communication.

240 Introduction to Organizational Communication
Fall, Spring, Summer. 4(4-0)
Theories, systems, structures and processes of organizational communication. Organizational cultures. Communication in multinational organizations and in individual, leadership, supervisor-subordinate and small group situations.

275 Effects of Mass Communication
Fall, Spring, Summer. 3(3-0) Interdepartmental with Telecommunication. Administered by Department of Telecommunication. RB: (TC 100) R: Not open to freshmen.
Major social effects of mass media on audience behavior. Political communication. Media effects on children. Message strategies producing attitude change. Interrelationships between mass media and interpersonal communication.

315 Information Gathering and Interviewing Theories
Fall of odd years. 3(3-0) R: Open only to juniors or seniors.
Information gathering as a relational process. Interaction through the asking and answering of questions.

325 Interpersonal Influence and Conflict
Fall, Spring. 3(3-0) R: Open only to juniors or seniors in the Colleges of Business, Communication Arts and Sciences, and Education.
Theories, processes and models of interpersonal influence and conflict. Topics include conflict resolution, persuasion, and compliance-gaining.

340 Leadership and Group Communication
Spring. 3(3-0) R: Open only to juniors or seniors in the Colleges of Business, Communication Arts and Sciences, and Education.
Theory and research on dyadic and group relations within organizations. Topics include leadership, motivation, networks, decision making, and organizational taxonomy.

375 Audience Response to Media Entertainment
Spring. 3(3-0) R: Open only to juniors or seniors in the Colleges of Business, Communication Arts and Sciences, and Education.
Theory and research on audience responses to media entertainment. Topics include models of audience responses, reactions to violence in media, and children and the media.

391 Topics in Verbal, Intercultural, or Gender Communication
Fall, Spring. 4(4-0) A student may earn a maximum of 8 credits in all enrollments for this course. P:NM: One 200 level course in Communication. R: Open only to juniors or seniors in the Colleges of Business, Communication Arts and Sciences, and Education.
Verbal interaction, cultural diversity or gender communication.

399 Special Topics in Communication
Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to juniors or seniors in the Colleges of Business, Communication Arts and Sciences, and Education.
Contemporary issues in communication.

425 Communication in Close Relationships (W)
Fall, Spring. 4(4-0) P:M: (COM 225 or COM 325) P:NM: Completion of Tier I writing requirement. R: Open only to juniors or seniors or graduate students in the Department of Communication.
In-depth treatment of current research and of theoretical and methodological issues.

440 Organizational Communication Structure (W)
Fall. 4(4-0) P:M: (COM 240 and COM 340) P:NM: Completion of Tier I writing requirement. R: Open only to juniors or seniors or graduate students in the Department of Communication.
Systems approaches to information processing and communication structures in organizations.

475 Communication Campaign Design and Analysis (W)
Fall. 4(4-0) P:M: (COM 275) P:NM: Completion of Tier I writing requirement. R: Open only to juniors or seniors or graduate students in the Department of Communication.
Design and analysis of campaigns presented through mediated channels including electronic and print media.

490 Independent Study
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course. R: Not open to freshmen or sophomores. Approval of department; application required.
Directed study under faculty supervision.

493 Internship
Fall, Spring, Summer. 1 to 7 credits. A student may earn a maximum of 7 credits in all enrollments for this course. R: Open only to juniors or seniors in the Department of Communication. Approval of department; application required.
Supervised practical experience in a professional environment.

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 Communication Programs and Evaluation
Fall. 3(3-0)
Communication audits, training and development, and focus groups as they apply to the evaluation of communication programs and institutions. Related topics include interviewing, questionnaire design and formative evaluation.

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) P:NM: (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)
Theoretical models of communication with emphasis on the applications of communication theory to various professional communication areas.

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.

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) P:NM: One introductory research design or statistics course.
Methods of data collection and analysis. Writing and critiquing research reports.

902 Communication Research Design II
Spring. 4(4-0) P:NM: (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) P:NM: (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 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; 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.
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 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 MTH 124 or MTH 132 or MTH 152H) 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: (CSE 231) 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.

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.

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.