Business Computer Information Systems

Business Computer Information Systems, BCIS

5090. Introduction to Business Computer Information Systems. 1.5 hours. Examines the interaction between information systems and the organizational context. Specific topics to be covered include the strategic role of information systems (IS), interorganizational systems, the Internet and WWW, electronic commerce, reengineering, the human impacts of IS, the management of change, IS development and implementation, and emerging types of information technology. Course work includes lectures, readings, case analyses and discussion, electronic meeting technology, hands-on computer assignments and a team field project.

5100. E-Commerce Systems Technologies. 3 hours. Tools, skills, and understanding of the key technologies used in e-commerce, from basic systems design and networking to web site content-management technologies. Prerequisite(s): BCIS 5090 or equivalent, or consent of the department.

5105. E-Business Site Construction. 1.5 hours. Introduction to the technologies of electronic business web site design. Topics include the principles of web design, use of animation and sound, and the creation of database-driven sites. Prerequisite(s): BCIS 5100 or consent of department.

5110. Structure of Programming Languages. 3 hours. Introduces graduate students to new approaches in programming business applications. Makes use of visual programming tools as well as traditional programming tools such as COBOL. Problem-solving techniques and structured programming are covered early and used throughout the course. Prerequisite(s): BCIS 5100 or equivalent, or consent of department.

5120. Information Systems Development. 3 hours. The foundations of business information systems analysis and design. Concentration on contemporary design methodologies and computer-aided software engineering techniques. Topics include strategic information systems planning, requirements analysis, user interface design, data design, process design, system testing, ethics and system audit ability, control and security. Prerequisite(s): BCIS 5090 or equivalent, or consent of department.

5130. Fundamentals of Presentation Design. 3 hours. Focuses on the concepts, design and delivery of business presentations in today’s challenging business environments. Develops techniques for defining target audiences and meeting their demands, especially senior executive demands. Address issues of written, oral and electronic presentation to these target audiences. Applies the elements and principles of aesthetic design, as well as basics of color theory and its application, to presentations. Requires students to develop an appreciation for both functional and aesthetic design. Prerequisite(s): BCIS 5090 or consent of department.

5420. Foundations of Database Management Systems. 3 hours. An introduction to database and database management systems technology within the framework of a business environment. Topics include the study of analysis, design, development and implementation of database-oriented file organizations in business applications. Prerequisite(s): BCIS 5120 or equivalent, or consent of department.

5600. Visual Information Technologies. 3 hours. The role of visual information systems in organizations. Alternative taxonomies of information systems, in particular, modes of processing. Human-machine information and data access systems. Prerequisite(s): BCIS 5110 or equivalent, or consent of department.

5610. Executive and Decision Support Technologies. 3 hours. An analysis of how computer systems can assist executive decision making and improve productivity. Emphasis is placed on the design, construction, utilization and managerial impacts of executive support systems. Prerequisite(s): BCIS 5120 or consent of department.

5620. Networking and Telecommunications. 3 hours. The purpose of this course is to develop an understanding of the strategic impact on the business organization of the convergence of telecommunications and computer topics. The course includes the design and organizational restructuring issues associated with new technologies in telecommunications. Prerequisite(s): BCIS 5120 or consent of department.

5630. N-Tier Systems. 3 hours. Examines technical and managerial issues associated with the design, development and deployment of client/server computer systems. Topics include architectures, platform connectivity and project management. Prerequisite(s): BCIS 5110, 5120 and 5420, or consent of department.

5640. Object-Oriented Systems. 3 hours. Examines a variety of managerial issues associated with developing and implementing object-oriented system applications within business. Prerequisite(s): BCIS 5120 and 5420, or consent of department.

5650. Emerging Information Technologies. 3 hours. Examines various managerial and technical issues associated with the introduction of new information technologies within the firm. Subjects include environmental scanning for new IT developments, assessment of new IT and legal/ethical issues. Prerequisite(s): BCIS 5120 and 5420, or consent of department.

5660. Data Administration and Project Management. 3 hours. Examines data administration and project management functions including the implementation and acquisition of business computer information systems within the constraints of legal, technological, economic and environmental issues. Topics are analyzed with respect to their impact on the selection, acquisition, utilization and evaluation of business computer information systems. Prerequisite(s): BCIS 5120 and 5420, or consent of department.

5670. International Issues in Information Technology. 3 hours. Discussion and in-depth analysis of contemporary information systems topics with emphasis on the economic and technological impact of computer information systems on the business environment. Prerequisite(s): BCIS 5120 or consent of department.
5680. Web-Based Systems Development. 3 hours. Provides tools, skills and an understanding of technology, business concepts and issues that surround the emergence of electronic commerce on the Internet. In addition to acquiring basic skills for navigating the Internet and creating a personal electronic presence of the World Wide Web, the student will develop an understanding of the current practices and opportunities in electronic publishing, electronic shopping, electronic distribution and electronic collaboration. The student will also explore several of the problem areas in electronic commerce such as security (authentication, privacy), encryption, safeguarding or intellectual property rights, acceptable use policies and legal liabilities. Prerequisite(s): BCIS 5120 and 5420, or consent of department.

5690. Topics in Information Technology. 3 hours. Current issues dealing with the development and use of information technologies in business. Prerequisite(s): BCIS 5120 or consent of department. May be repeated for credit.

5700. Strategic Use of Information Technology. 3 hours. Provides an overview and understanding of the issues involved in the strategic management of the information assets of organizations. Examines a broad range of issues and problems associated with the management of information technology (IT) and information systems (IS) and their alignment with the strategic goals of the organizations. Focuses on the managerial rather than the technical issues and views IS from the perspective of managers at all levels. Prerequisite(s): Completion of Foundation and Technology Sequence course work and within 9 hours of graduation.

5800. Cooperative Education Internship. 1-3 hours. Supervised work in a job related to student’s career objective. Prerequisite(s): student must meet employer’s requirements and have consent of department chair or BCIS master’s coordinator. Pass/no pass only; cannot be used as a support course.

5900-5910. Special Problems. 1-3 hours each. Open to graduate students who are capable of developing a problem independently. Problem chosen by the student and developed through conferences and activities under the direction of the instructor. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Graduate Advising Office prior to registration.

6010. Seminar in Business Administration. 3 hours. Covers one or more special fields. May be repeated for credit, and two or more sections may be taken concurrently.

6650. Seminar in Man-Machine Studies. 3 hours. The study of computer information systems in the context of their interaction with human users, including an examination of how the human user makes decisions and is supported or inhibited in that task by the orientation and design of information systems.

6660. Comparative Information Systems Theory. 3 hours. Comparative study of present theories with particular attention to the role of computer-based information systems in the organizational policy of business, government and other institutions. Prerequisite(s): consent of department. May be repeated for credit.

6670. Topics in Information Systems. 3 hours. Topics of historical, current and future relevance in the design, development, installation and management of computer-based information systems are examined using readings, case studies and lectures. Prerequisite(s): consent of department. May be repeated for credit.

6900. Special Problems. 1-3 hours. Research by doctoral students in fields of special interest. Includes project research studies and intensive reading programs, accompanied by conferences with professors in fields involved. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Graduate Advising Office prior to registration.

6910. Special Problems. 1-12 hours. Research by doctoral students in fields of special interest. Includes project research studies and intensive reading programs, accompanied by conferences with professors in field involved. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Graduate Advising Office prior to registration.

6940. Individual Research. 1-12 hours. Individual research for the doctoral candidate. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Graduate Advising Office prior to registration.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Graduate Advising Office prior to registration.

Management Science, MSCI

5010. Statistical Analysis. 1.5 hours. Basic descriptive and inferential statistics; includes frequency distributions, averages, dispersions, index numbers, time-series analysis, probability, theoretical distributions, sampling distribution, estimation, tests of significance, chi-square, regression and correlation, analysis of variance and sample design. Prerequisite(s): MATH 1190 or equivalent. This course meets the deficiency requirement of statistics (MSCI 3700 and 3710) for MBA candidates, and may be counted as part of a graduate program in a field other than business administration.

5180. Introduction to Decision Making. 3 hours. Emphasis on model assumptions, applying the correct statistical model and interpreting the results. Topics include simple regression, multiple regression (e.g., qualitative variable coding, model building) and experimental design (e.g., completely randomized design, randomized block design, multi-factor designs). Prerequisite(s): MSCI 5010 or equivalent.

5210. Model-Based Decision Making. 3 hours. Explains how model-based decision support systems aid managerial decision processes. Attention will be paid to the how and why such a model is used in a support system environment. Course topics include the use of mathematical, statistical and business models that are embedded in decision support systems for dealing with both structured and semi-structured decision problems. Students identify opportunities and problems for which the use of modeling will enhance a decision maker’s chance of success. Different type of models and decision structuring techniques will be compared and contrasted, and appropriate techniques will be illustrated to analyze real-life situations. Prerequisite(s): MSCI 5010 or equivalent.
5220. Statistical Sampling. 3 hours. Introduction to sampling theory and applications. Attention is focused on major survey sampling techniques, including cluster, ratio, stratified and simple random sampling. Principal concepts and methods of acceptance sampling that are useful in quality control are presented, including operating characteristic curves, and single, double and sequential sampling plans for attributes and variables. Prerequisite(s): MSCI 5180 or consent of department.

5230. Non-Parametric Statistics for Business Research. 3 hours. Analysis of business research data that is categorical or ordinal (ranked or scaled) and is therefore not suitable for computations such as means and standard deviations. Topics include measurements of consumer preferences, market segmentation, labor or job grades, racial and sex classifications, and exempt characteristics and performance ratings. Single and multiple sample techniques are discussed. Prerequisite(s): MSCI 5010 or equivalent, or consent of department.

5240. Data-Based Decision Systems. 3 hours. A survey of time-series analysis techniques is presented. Topics include smoothing techniques and Box-Jenkins methodology. Prerequisite(s): MSCI 5180 or consent of department.

5250. Statistical Techniques in Simulation. 3 hours. An examination of construction and use of simulation models in business. Random number and process generators, construction of simulation models, introduction to special purpose simulation languages and research project. Prerequisite(s): MSCI 5010 or consent of department.

5260. Problem Solving and Decision-Making Process. 3 hours. Development of analytical techniques essential to effective solution of problems involving risk and uncertainty; integrative and unified treatment of classical Bayesian and normative decision theory as conceptual foundations for the development of decision techniques. Prerequisite(s): student must be within 9 hours of graduation.

5310. Reliability and Life-Data Analysis. 3 hours. Principal topics in reliability and life-data analysis are covered, including statistical failure models, probability plotting, hazard plotting, series systems, competing risks, censored data and accelerated life tests. Applications to advanced technology industries and software reliability are included. Prerequisite(s): MSCI 5180 or consent of department.

5320. Quality Control. 3 hours. Broad coverage of managerial and statistical aspects of quality control, including quality assurance and quality management. Topic coverage includes problem solving tools, process capability assessment, control charts for variables, control charts for attributes and advanced control chart methods. Prerequisite(s): MSCI 5010 or consent of department.

5900-5910. Special Problems. 1-3 hours each. Open to graduate students who are capable of developing a problem independently. Problem chosen by the student and developed through conferences and activities under the direction of the instructor. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Graduate Advising Office prior to registration.

6000. Theory and Application of Nonparametric Statistics. 3 hours. Analysis of business research data that is categorical or ordinal (ranked or scaled). Topics include linear rank statistics, test of location for single and multiple sample problems, goodness-of-fit tests, measures of association, related samples tests and independent samples tests, rank tests for ordered alternatives and permutation tests. Prerequisite(s): MSCI 5180 or equivalent.

6010. Seminar in Business Administration. 3 hours. Covers one or more special fields. May be repeated for credit, and two or more sections may be taken concurrently.

6710. Theory and Application of Stochastic Modeling. 3 hours. Probabilistic modeling techniques with emphasis on manufacturing and services. Specific topics covered include inventory theory and methods, scheduling, queuing theory, availability, maintainability, reparable, reliability, Markov processes and renewal theory. Prerequisite(s): MSCI 5180.

6720. Experimental Design and Statistical Modeling. 3 hours. Emphasis is focused on both the design and analysis aspects of planned experimentation. Topics include completely randomized designs, block designs, factorial designs, design resolution and fractional factorial designs, response surface analysis, evolutionary operations in process improvement and Taguchi methods. Prerequisite(s): MSCI 5180.

6740. Theory and Applications of Operations Research. 3 hours. Introduction to the theoretical foundations of operation research techniques. Examples and exercises included with an application orientation. Designed to enhance one’s understanding of mathemathical basis of and research in operations research. Covers the two broad areas of deterministic and stochastic models in operation research. An understanding of basic calculus and matrix algebra is assumed. Prerequisite(s): MSCI 5210 or consent of department.

6750. Management Science Seminar. 3 hours. Organizational problems involved in the development and implementation of various management science models, as well as the applicability of the models to different technical problems in varying ecotechnological systems; in-depth study of areas of potential application of the more widely used management science models. Prerequisite(s): consent of department. May be repeated for credit.

6900. Special Problems. 1-3 hours. Research by doctoral students in fields of special interest. Includes project research studies and intensive reading programs, accompanied by conferences with professors in fields involved. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Graduate Advising Office prior to registration.

6910. Special Problems. 1-12 hours. Research by doctoral students in fields of special interest. Includes project research studies and intensive reading programs, accompanied by conferences with professors in field involved. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Graduate Advising Office prior to registration.

6940. Individual Research. Variable credit. Individual research for the doctoral candidate. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Graduate Advising Office prior to registration. May be repeated for credit.
6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. Prerequisite(s): approved applications for specific problems/independent research/dissertation credit must be submitted to the COBA Graduate Advising Office prior to registration. May be repeated for credit.

Business Law
see Finance, Insurance, Real Estate and Law

Chamber Music
see Music

Chemistry

Chemistry, CHEM

5010. Introduction to Graduate Teaching and Research. 2 hours. Topics include university policies, safety in the laboratory, first aid techniques, teaching techniques, audio-visual facilities and operation, use of the university libraries, university/departmental computational facilities, PC facilities and use, and maintaining a research journal. Required for all full-time first-year graduate students. Prerequisite(s): graduate standing in the chemistry department.

5200. Physical Chemistry. 3 hours. A survey of selected topics in physical chemistry, including thermodynamics, mechanics, statistical mechanics, heterogeneous and homogeneous equilibria, and chemical kinetics. Prerequisite(s): CHEM 3520 or consent of department.

5210. Advanced Physical Chemistry. 3 hours. The basic concepts of quantum mechanics are emphasized utilizing several models to aid in the description, such as the square well model, the rigid rotator, the hydrogen atom and the hydrogen molecule ion. The applications of quantum mechanics to chemical systems are considered in terms of resonance, wave mechanics, perturbation and variation methods. Prerequisite(s): pass exemption examination in physical chemistry, or CHEM 5200.

5380. Organic Chemistry. 3 hours. A survey of organic chemistry involving a systematic study of classes of reactions with an integration of fact and theory. Prerequisite(s): CHEM 2380 or consent of department.

5390. Selected Topics in Analytical Chemistry. 3 hours. Topics of current interest, which vary from year to year. Prerequisite(s): consent of department. May be repeated for credit as topics vary.

5450. Advanced Techniques in Analytical Chemistry. 1-3 hours. Methods and instrumentation currently used in the analysis of materials. Presented in modular units of approximately three to four weeks duration. Typical subjects include fundamentals of liquid and gas-liquid chromatography, atomic absorption spectroscopy, polarography and related electroanalytical methods and X-ray fluorescence spectroscopy. Credit: 1 semester hour per module. May be repeated for credit as topics vary. Laboratory fee when laboratory involved.

5460. Surveys of Modern Analytical Chemistry. 3 hours. A survey of modern analytical methods with emphasis on instrumental techniques and data handling, including separation methods, electrochemical methods and spectroscopy. Prerequisite(s): consent of department.

5500. Physical Organic Chemistry. 3 hours. The mechanisms of organic reactions and the effect of reactant structures on reactivity. Prerequisite(s): pass exemption examination in organic chemistry, or CHEM 5380.

5530. Materials Chemistry. 3 hours. Application of quantum chemical principles to understanding the general behavior of materials. Course will include semiconductors, metals, catalysts and “nano-designed” materials (e.g., quantum wells). Prerequisite(s): CHEM 3520 or equivalent, or consent of department.

5560. Inorganic Chemistry. 3 hours. A survey of inorganic chemistry involving a systematic study of atomic structure, structure and bonding in inorganic and organometallic compounds, and representative inorganic reactions. Prerequisite(s): consent of department.

5570. Selected Topics in Inorganic Chemistry. 3 hours. Topics of current interest, which vary from year to year. Prerequisite(s): consent of department. May be repeated for credit as topics vary.

5580. Selected Topics in Physical Chemistry. 3 hours. Topics of current interest, which vary from year to year. Prerequisite(s): consent of department. May be repeated for credit as topics vary.

5610. Selected Topics in Physical Chemistry. 3 hours. Topics of current interest, which vary from year to year. Topics include ligand field theory, physical methods in inorganic chemistry, group theory and molecular symmetry, and recent advances in transition and non-transition metal chemistry. Prerequisite(s): consent of department. May be repeated for credit as topics vary.

5640. Selected Topics in Organic Chemistry. 3 hours. Topics of current interest, which vary from year to year. Prerequisite(s): consent of department. May be repeated for credit as topics vary.

5650. Kinetics of Chemical Reaction. 3 hours. Reactions and reaction rates; determination of rate laws for simple and complex reactions; deduction of reaction mechanisms; reaction energetics; chain reactions; theories of elementary reaction rates; reactions at extreme rates; extra-kinetic probes of mechanism. Prerequisite(s): consent of department.

5660. Computational Chemistry and Biochemistry. 3 hours. (2;3) Introductory course covering the latest techniques for the study of reactions of interest to chemists and biologists via the use of molecular modeling and quantum mechanical simulations. Prerequisite(s): consent of department.

5700. Thermodynamics. 3 hours. Reversible and irreversible thermodynamics of gases, liquids, solids and solutions; free energy relationships of ideal and non-ideal solutions; introduction to statistical calculation of thermodynamic properties. Prerequisite(s): consent of department.
5710. Advanced Inorganic Chemistry. 3 hours.
An advanced study of the interrelation of structure,
bonding and reactivity of inorganic and organometallic
compounds; basic applications of molecular symmetry
and group theory to chemical problems. Prerequisite(s):
pass exemption examination in inorganic chemistry, or
CHEM 5560.

5800. Procedures and Materials for Science Instruction. 3 hours. (2;4) Problems, techniques and procedures
for classroom and laboratory experiences based on
current science education research. Recommended for
students who desire secondary teacher certification in
a science field. Field experience in the public schools
is a required component. Prerequisite(s): completion
of undergraduate science courses required for certification
and consent of department.

5810. Selected Topics in Chemistry Education. 3 hours.
Topics of current interest that vary from year to year.
Prerequisite(s): consent of department. May be repeated
for credit as topics vary.

5820. Studies in Chemistry Education: Pedagogical
Materials and Curriculum Development. 3 hours.
(2;1) Examines national trends in science education
curriculum, explores issues associated with materials
development and testing as it applies to chemistry
curriculum, and engages students in implementing the
protocols used within the discipline focusing on chemical
demonstration activities.

5840. Chemistry Behind the Elements. 3 hours.
The fundamentals of the universe are based on principles
of periodicity as revealed in the descriptive chemistry of
the elements. Among the areas covered are the character-
istics of the families of elements, when and where each
element was discovered and by whom the discoveries
were made. Also includes the impact these discoveries
have had on society and technological advances.
Pertinent industrial applications of the elements and
materials derived from them are presented.

5880. Learning Theories in Chemistry Education.
3 hours. Survey of chemistry education and preparation
for teaching and learning as they have developed,
along with pertinent research findings and design from
the current literature.

5900-5910. Special Problems. 1-3 hours each.
For students capable of developing a problem indepen-
dently through conferences and activities directed by
the instructor. Problem chosen by the student with the
consent of the instructor.

3 hours each. An introduction to research; may consist
of an experimental, theoretical or review topic. A paper
conforming to recommendations outlined in the “Hand-
book for Authors of Papers in the Journals of the
American Chemical Society” must be submitted for
credit in each course.

5940. Seminar in Current Chemistry. 1 hour. Collo-
quia covering current topics in chemistry. Required
of all full-time graduate students in each semester of
graduate residence. Prerequisite(s): senior standing.
May be repeated for credit. Pass/no pass only.

5950. Master’s Thesis. 3 or 6 hours. May be repeated
for credit. To be scheduled only with consent of depart-
ment. 6 hours credit required. No credit assigned until
thesis has been completed and filed with the graduate
dean. Continuous enrollment required once work on
thesis has begun.

5960. Science Institute. 1-6 hours. Courses for students
accepted by the university for enrollment in special
institute courses. May be repeated for credit, not to
exceed a total of 6 hours in each course.

6010. Seminar for Doctoral Candidates. 3 hours.
Demonstration of competence in a specific area of chemistry
(analytical, organic, physical, inorganic) as evidenced by
criteria established by the faculty of each discipline. May be
repeated for credit. Six credit hours required.

6900-6910. Special Problems. 1-3 hours each. For
doctoral students capable of developing a problem inde-
dependently through conferences and activities directed
by the instructor. Problem selected by the student with the
consent of the major professor.

6940. Individual Research. 1-12 hours. Doctoral research
of independent nature. May be repeated for credit.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be
scheduled only with consent of department. 12 hours
credit required. No credit assigned until dissertation
has been completed and filed with the graduate dean.
Doctoral students must maintain continuous enrollment in
this course subsequent to passing qualifying examination
for admission to candidacy. May be repeated for credit.

6990-6991. Individual Research. 1-3 hours each.
For postdoctoral fellows to further training and research
experience in developing and solving research problems
independently. Prerequisite(s): consent of department.
May be repeated for credit. Pass/no pass only.

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Communication Studies

Communication Studies, COMM

5080. Introduction to Graduate Study and Research
in Communication Studies. 3 hours. Broad perspective
on communication studies content areas.

5081. Research Methodologies in Communication.
3 hours. Qualitative and quantitative methodologies
for communication studies research.

5220. Organizational Communication. 3 hours. Study
of the transmission of information and ideas within an
organization with emphasis on the problems encountered
in the business world.

5225. Interpersonal Communication. 3 hours.
Contemporary research and theory in the study of
communication patterns found at various stages of
normal interpersonal interactions.

5226. Seminar in Health Communication. 3 hours.
Introduction of communication theories and approaches
related to health care in interpersonal, organizational and
mass communication settings.

5227. Seminar in Intercultural Communication.
3 hours. Provides an opportunity to explore existing
and emerging issues, theories and practices in intercul-
tural communication.

5260. Group Performance. 3 hours. Historical and
contemporary theoretical approaches to group performance
in performance studies and related disciplines; practical
experience in scripting and directing group performance.

5280. Communication and Information in the Class-
room. 3 hours. The study of the major variables in
the communication process and their impact on student
learning and satisfaction. Designed primarily for teachers
of all levels and content specialties.
5320. Quantitative Research Methods in Communication. 3 hours. Experimental and quantitative techniques usable in research in communication.

5325. Communication Theory. 3 hours. A survey of scientific and humanistic perspectives on the communication process and social contexts in which it occurs.

5340. Rhetorical Methods. 3 hours. The use of critical and rhetorical theories in the investigation and evaluation of rhetorical acts and artifacts.

5345. Rhetorical Theory. 3 hours. An examination of significant rhetorical theories and theorists.

5360. Performance Criticism. 3 hours. Theories of value and evaluation in performance studies and their influence on the practice of criticism, in general, and performance criticism, in particular. Contexts range from everyday acts of evaluation to formal, public instances of criticism.

5365. Performance Theory. 3 hours. Historical and contemporary theoretical approaches to performance studies, including theories from related disciplines and their impact on theory and practice in performance studies.

5380. Theory and Research in Persuasion. 3 hours. Recent theory and research on the persuasive process. Includes effects of variables in public, interpersonal, organizational and mass communication contexts.

5425. Gender and Communication. 3 hours. Examination of research and theory in gender and communication, investigating how communication structures gender and how gender affects communication.

5440. Public Address Studies. 3 hours. Research and theory in the critical interpretation and assessment of public discourse.

5460. Narrative Theory. 3 hours. Examination of theories of narrative and narrative structure and their significance. The study of narrative and nonnarrative phenomena, including fiction, drama, film and politics.

5480. Practicum. 3 hours. Training in the teaching of some aspect of communication. Under the supervision of a faculty member, the student prepares and presents instructional units, conducts class discussions and handles administrative matters peculiar to the type of course involved. No more than 3 hours may apply toward master’s degree. Duties performed under teaching fellowships or graduate assistantships do not earn credit in this course.

5481. Graduate Internship. 3 hours. Supervised work in a job related to the student’s major, professional field of study or career objective. Prerequisite(s): 9 graduate hours in communication; two letters of recommendation from professors in department; and consent of internship director.

5520. Communication and Conflict. 3 hours. Examines the role of communication used in managing conflict in its most common contexts: intrapersonal, interpersonal, group, organizational, professional, social and international. Theory and research are examined to develop more effective communication in conflict situations.

5525. Communication and Change. 3 hours. A study of the impact of human communication on the process of change in formal and informal organizations with emphasis on understanding and planning change.

5540. Freedom of Expression. 3 hours. Theories, statutes and cases involving the First Amendment guarantee of freedom of speech.

5560. History of Performance Studies. 3 hours. Philosophies, conventions and techniques that have contributed to the formation of contemporary performance theory. Examines performance approaches from classical to contemporary eras.

5625. Communication Consulting. 3 hours. Examination of organization communication consulting and of communication theorists and practitioners. Opportunities to develop and/or refine training and facilitating skills and unique models of communication consulting.

5720. Communication Style and Competence. 3 hours. Examination of the major theoretical and empirical approaches to style and competence in communication. Issues of conceptualization, assessment, instruction and training in communication style and competence are covered.

5820. Seminar in Communication Processes. 3 hours. Contemporary research and theory in communication processes. Rotating topics. May be repeated for credit as topics vary.

5840. Seminar in Rhetorical Studies. 3 hours. Contemporary research and theory in oral rhetorical studies. Rotating topics. May be repeated for credit as topics vary.

5860. Seminar in Performance Studies. 3 hours. Contemporary research and theory in performance studies. Rotating topics. May be repeated for credit as topics vary.

5880. Seminar in Communication Studies and Research. 3 hours. Rotating topics. May be repeated for credit as topics vary.

5900-5910. Special Problems. 1-3 hours each. For students capable of developing a problem independently through conferences and activities directed by the instructor. Problem chosen by the student with the consent of the department director.

5920-5930. Research Problems in Lieu of a Thesis. 3 hours each.

5950. Master’s Thesis. 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

Community Service

Community Service, COMS

5100. Social Evolution of Contemporary Volunteerism. 3 hours. An analysis and review of the social evolution of contemporary volunteerism from revolutionary times to the present. Study of the current issues, definitions and trends in the field of professional management.

5200. Leadership Theory and Practice for Public/Private Sector. 3 hours. Overview of organizational leadership theory and practice for volunteer managers. Students examine and develop a range of skills in a number of interpersonal areas: group dynamics, decision making, managing differences, and leadership and influence.
5400. Volunteer Management Concepts and Applications. 3 hours. Analysis and review of day-to-day applications of management principles to the administrative and operating practices of contemporary volunteer programs in the public, not-for-profit sectors. Focus on volunteer program management and organization including targeting, recruiting, training, supervising, motivating, counseling, retaining and recognizing volunteer workforces. Students who have received credit for this course at the undergraduate level may not re-take it for graduate credit.

5500. Community Resource Mapping and Collaboration. 3 hours. Analysis of systems that measure community assets and resources; explore the means of identifying and approaching potential collaborative community partners; focus on the development of joint proposals and/or business plans. An ecological approach is used to analyze the full range of human service agencies: health, social, educational, diagnostic, enrichment, religious, civic and legal. Students have an opportunity to do field work with agency staff on assigned community projects.

5600. Volunteer Program Planning and Evaluation. 3 hours. A seminar designed to provide students with the basic skills necessary to systematically design and plan volunteer programs and to evaluate their effectiveness. Special emphasis will be given to measuring program outcomes. Students who have received credit for this course at the undergraduate level may not re-take it for graduate credit.

5610. Topics in Volunteer Management. 3 hours. A graduate seminar devoted to the investigation, analysis and discussion of issues in contemporary volunteerism.

5800. Community Service Internship. 3 hours. Supervised work in a community agency that is directly related to the student’s major, professional field or career objective. Duties, learning objectives, reporting and supervisory functions will be agreed on beforehand by the agency and the student. Prerequisite(s): student must meet the employer’s requirements and have consent of the program director.

5900. Special Problems. 1-3 hours. Open to graduate students who are capable of developing a problem independently. Problems are chosen by students and approved in advance by the instructor. Prerequisite(s): consent of instructor.

Composition, Music
see Music

Computer Education and Cognitive Systems
see Technology and Cognition

Computer Engineering
see Computer Science and Engineering
5760. Design for Fault Tolerance. 3 hours. Introduction to the hardware and software methodologies for specifying, modeling and designing fault-tolerant systems supported by case studies of real systems. The material presents a broad spectrum of hardware and software error detection and recovery techniques that can be used to build reliable networked systems. The lectures discuss how the hardware and software interplay, what techniques can be provided in COTS hardware, what can be embedded into operating system and network communication layers, and what can be provided via distributed software layer and in the application itself. Prerequisite(s): CSCE 5730.

6620. Advanced Real-Time Operating Systems. 3 hours. Seminar course intended to further the knowledge of operating systems design and development. Focuses on distributed and real-time systems, with scheduling, time, and security as the mainstays. This is an advanced graduate level course that covers in detail many advanced topics in operating system design and implementation. It starts with topics such as operating systems structuring, multi-threading and synchronization and then moves on to systems issues in parallel and distributed computing systems. Prerequisite(s): CSCE 5460.

6650. Advanced Compiler Optimization. 3 hours. Current research issues and advanced topics involving both the principles and pragmatics of compiler systems specification, design and implementation. Prerequisite(s): CSCI 5550.

6790. Advanced Topics in Wireless Communications and Networks. 3 hours. Research issues in the design of next generation wireless networks: cellular systems, medium access techniques, signaling, mobility management, control and management for mobile networks, wireless data networks, Internet mobility, quality-of-service for multimedia applications, caching for wireless web access, and ad hoc networks. Prerequisite(s): CSCE 5510.

Computer Science, CSCI

5010. Introduction to Computer Applications. 3 hours. Use of the computer as a tool in other disciplines. Emphasis is on familiarization with the capabilities of packaged programs such as statistical libraries. Preparation of input for and interpretation of output from these programs. Introduction to programming. May not count toward a major in computer science.

5020. Computer Methods. 3 hours. Use of software tools for the solution of problems in a variety of disciplines. Prerequisite(s): 3 hours of computer science. May not count toward a major in computer science.

5030. Problem-Solving in High-Level Languages. 4 hours. Algorithms, pseudocode, flow charts, structured techniques of problem-solving and program design using high-level programming languages. Prerequisite(s): 6 hours of mathematics and/or statistics. Leveling course for computer science majors.

5170. Current Research in Computer Science. 1 hour. Weekly seminar series covering current research topics in computer science, including presentations of active research projects by faculty, graduate students and visitors. Required of all full-time graduate students in their first fall semester of graduate study. Pass/no pass only.

5200. Automata Theory. 3 hours. Deterministic and non-deterministic finite automata, regular expressions and sets, context-free grammars and pushdown automata, Turing machines as acceptors, enumerators and computers, Church's thesis, universal Turing machines and the halting problem, the Chomsky hierarchy and intractable problems. Prerequisite(s): CSCI 3400 or equivalent.

5220. Introduction to Computer Security. 3 hours. Theory and practice of computer security, stressing security models and assurance. Security goals, threats and vulnerabilities. Cryptography, program security and operating system security issues. Basic network security. Planning, policies and risk analysis. Prerequisite(s): CSCI 3100 or consent of instructor.

5230. Secure Electronic Commerce. 3 hours. Electronic commerce technology, models and issues, with emphasis on security issues. Supporting technology such as cryptography, digital signatures, certificates and public key infrastructure (PKI). Security-conscious programming for web-based applications. Exposure to interaction between technical issues and business, legal, and ethical issues. Includes research project.

5250. Programming Languages. 3 hours. Notations for description of language syntax and semantics. Properties of algorithmic languages: scope of variables, binding time, subroutines and co-routines. Data abstraction, exception handling and concurrent programming. Dialects and standardization. Prerequisite(s): CSCI 3400 or equivalent.

5270. Computer-Human Interfaces. 3 hours. Emphasizes human performance in using computer and information systems. Topics for software psychology include programming languages, operating systems control languages, database query facilities, computer-assisted dialogues, personal computing systems, editors, word processing and terminal usage by non-skilled users. Prerequisite(s): CSCI 3400 or equivalent.

5290. Natural Language Processing. 3 hours. Introduction to natural language processing: modern theories of syntax; context-free parsing; transformational syntax and parsing; augmented transition networks; and survey of natural language processing systems. Prerequisite(s): CSCI 3400 or equivalent.

5300. Information Retrieval and Web Search. 3 hours. Covers traditional material and recent advances in information retrieval, study of indexing, processing and querying textual data, basic retrieval models, algorithms and information retrieval system implementations. Covers advanced topics in intelligent information retrieval, including natural language processing techniques and smart web agents. Prerequisite(s): CSCI 3400 or equivalent.

5330. Topics in Computer Science. 3 hours. Advanced study of languages, files and processing techniques with applications selected from reservations systems, inventory systems and other administrative applications, process control, computer-assisted instruction, information storage and retrieval, artificial intelligence, heuristic programming and so forth, depending on class interest. Prerequisite(s): 6 hours advanced courses in computer programming. May be repeated for credit with consent of instructor.

5350. Database Systems Design. 3 hours. Design and implementation issues for large database management systems, security and integrity issues, and physical implementation techniques. Prerequisite(s): CSCI 4350.

5370. Graph Theory for Computer Scientists. 3 hours. Computer science oriented graph theory. Topics include connected and disconnected graphs, Hamiltonian circuits, trees and fundamental circuits, coloring, algorithms and computer programs, switching and coding theory, and electrical network analysis. Prerequisite(s): CSCI 3400 and 4450 or equivalent, or consent of the instructor.
5400. Foundations of Logic Programming. 3 hours. Logic programs, including definite, normal and general types. Inference methods, including forward-chaining, backward-chaining and deduction graphs. Theorem proving and deductive databases. Unification, soundness and completeness of resolution-reification process and PROLOG. Prerequisite(s): CSCI 4410.

5410. Artificial Intelligence. 3 hours. Advanced study of issues relevant in the design of intelligent computer systems. Topics include in this course are search techniques, knowledge representation, issues in natural language processing and the design of expert systems. Prerequisite(s): CSCI 5210 or consent of department.


5420. Computer Graphics. 3 hours. Basic principles for the design, use and understanding of graphics systems. Design and implementation of graphics software packages, applications and algorithms for creating and manipulating graphics displays. Prerequisite(s): CSCI 3400 and one semester of linear algebra.

5430. Methods of Numerical Computations. 3 hours. Introduction to numerical methods and mathematical software for scientific computation. Floating-point number systems, machine precision, cancellation error, conditioning and stability. Linear systems, Gaussian elimination and matrix decomposition. Polynomial and spline interpolation. Numerical integration. Ordinary differential equations. Non-linear equations. Prerequisite(s): calculus (two semesters), linear algebra (one semester) and CSCI 5030, or equivalent programming experience.

5450. Analysis of Computer Algorithms. 3 hours. The study of efficient algorithms for various computational problems. Topics include advanced techniques of algorithm design: divide-and-conquer, the greedy method, dynamic programming, search and traversal, back-tracking and branch-and-bound. Other topics include NP-Completeness theory, including approximation algorithms and lower bound theory, and probabilistic algorithms. Prerequisite(s): CSCI 4450.


5520. Software Development. 3 hours. Systems analysis, software requirements analysis and definition, specification techniques, software design methodologies, performance measurement, validation and verification, and quality assurance techniques. Prerequisite(s): CSCI 4010.

5530. Topics in Software Engineering. 3 hours. Case tools, module implementation, testing, system delivery in the work place, scheduling and budgeting, project management, configuration management, software development tasks and ethical issues. Prerequisite(s): CSCI 3400 or equivalent.

5540. Operating System Design. 3 hours. Advanced topics such as operating system design, job control languages, problems of multiprogramming and multiprocessor, computer networks, interaction, overlays, paging and accounting for resource usage (customer billing and hardware monitoring). System architecture. Interactive computers: time sharing, real-time and process control. Prerequisite(s): CSCI 3600. May be repeated for credit with consent of instructor.

5550. Compiler Design. 3 hours. Formal language specification, lexical analysis, parsing, code generation, error recovery techniques and optimization. Detailed study of two or three compilers. Prerequisite(s): CSCI 5200.

5700. Computer System Architecture. 3 hours. The macro structure and instruction set of computer systems. Survey of characteristic architectures of central processors and systems. Topics selected from mini-, micro-, large-scale and highly parallel computers. I/O control; associative memories; characteristics of storage devices; paging; multiprocessors; terminals. Design of the computer utility and other communications-oriented systems. Prerequisite(s): CSCI 3100 and 3600 or equivalent.

5750. Parallel Processing and Algorithms. 3 hours. Taxonomy of parallel computers; shared-memory vs. message-passing architectures; theoretical models; parallel algorithm design strategies; parallel data structures; automatic parallelization of sequential programs; communication; synchronization and granularity. Prerequisite(s): CSCI 4450 or 5450.


5800. Internship. 1 hour. Supervised work in a job that meets specific educational and career objectives of the student. Requires submission of a final report summarizing industrial experience gained through the internship. Prerequisite(s): consent of department.

5890. Directed Study. 1-4 hours. Study of topics in computer science by individuals or small groups. A student taking CSCI 4890 or 5890 may work with other students taking these courses on the same topic if the faculty supervisor agrees. The student is to prepare a plan for study of a topic and a plan for evaluation of study achievements. Prior approval by the computer sciences department chair and a graduate faculty member who agrees to supervise the work is required for the plan. Prerequisite(s): 6 hours of computer science with a grade of A or B. Open to students with graduate standing who are capable of developing problems independently. May be repeated for credit.

5900-5910. Special Problems. 1-3 hours each. Independent study and research of a specific problem in a field of computer science or its application. A report is required defining the problem and developing a solution. The work may be supervised by any member of the graduate faculty. Prerequisite(s): 8 hours of computer science with grades of A or B; prior approval of written plan by the faculty supervisor and by the computer science and engineering department chair. May be repeated for credit.
5920-5930. Research Problems in Lieu of Thesis. 2-4 hours each. Independent research of a specific problem in a field of computer science. The work will be supervised by a member of the faculty of the Department of Computer Science and Engineering, and a final written report must be approved by the supervising faculty and the department chair prior to submission to the office of the graduate dean. Prerequisite(s): approval of student’s research plan by a computer science faculty member.

5950. Master’s Thesis. 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

6200. Theory of Computation. 3 hours. Computation by abstract devices, time complexity, inherent complexity of problems, complexity hierarchies, reductions, nondeterminism and NP-completeness, approximation and intractable problems. Prerequisite(s): consent of department.

6250. Advanced Programming Languages. 3 hours. Current research issues in programming languages. Translation of programming languages, formal semantics and program verification, foundations of structured programming, abstraction, declarative systems and special-purpose languages. Prerequisite(s): consent of department.

6260. Computability. 3 hours. Formal languages, grammars and automata, and their relationship to one another. Operations on languages. Unsolvable problems concerning languages. Prerequisite(s): CSCI 5200 and consent of department.

6330. Advanced Topics in Computer Science. 2-3 hours. Advanced topics and current research issues in computer science. Prerequisite(s): consent of department.

6350. Advanced Database Design. 3 hours. Database theory and application. Data models, distributed databases, spatial databases, statistical databases, database machines, knowledge bases, database design theory and self-documenting databases. Prerequisite(s): consent of department.

6420. Advanced Computer Graphics. 3 hours. Research and study of specific problems in the field of computer graphics. The course focuses on topics current to the field and includes, but is not limited to, areas such as design and construction of computer graphics systems, both software and hardware; the theory and use of color and shading; algorithms for solid object modeling; and the use of graphics packages in computer-aided design. Prerequisite(s): CSCI 5420 or consent of department.

6490. Advanced Man/Machine Intelligence. 3 hours. Robotics-based computer hardware and software; intelligent systems in automation; computer interface and control; computer vision in recognition inspection and 3-D interpretation; robot programming languages, algorithms and computational architectures; expert systems in design, diagnosis and planning; simulation languages and methods; and geometric modeling and graphing animation. Prerequisite(s): consent of department.

6520. Advanced Software Engineering. 3 hours. Research and study of specific problems in the field of software engineering. Software development methodology, verification and reliability; software quality assurance and productivity; software engineering economics; models and metrics for software management and engineering; human performance engineering; and software configuration management and control. Prerequisite(s): CSCI 5520 or consent of department.

6720. Advanced Computer Architecture. 3 hours. Computer design problems, control structures and micro-programming, microprocessors, large-scale architectures, multiprocessor systems and interconnection networks, fault-tolerance, language-based architectures, special purpose and application-based systems and performance of systems. Prerequisite(s): CSCI 5700 or consent of department.

6750. Complexity of Parallel Computation. 3 hours. Models of parallel computation — justification and buildability; inherent parallelism and communication costs; techniques for efficient parallelization. Lower and upper complexity bounds; the classes NC and SC; P-complete problems; the parallel computation thesis. Prerequisite(s): CSCI 5450 or 5750.

6780. Advanced Distributed Computing. 3 hours. Selected topics in distributed systems and computer networks. Design of local area networks and multiple network systems; databases, programming languages and operating systems for distributed systems. Prerequisite(s): CSCI 5780 or consent of department.

6781. Advanced Computer Networks. 3 hours. Selected topics in computer networks. Study of current high-speed networks technology; design implementation and analysis of communication protocols; TCP/IP, routing protocols, quality of service and network security. Prerequisite(s): CSCI 5780 or consent of department. May be repeated as topics vary.

6900. Special Problems. 1-3 hours. Independent study and research of a specific problem in a field of computer science. A report defining the problem and developing a solution is required. Problem chosen by the student with the approval of the supervising professor. Prerequisite(s): PhD status. May be repeated for credit with consent of department.

6940. Individual Research. 1-6 hours. To be scheduled by the doctoral candidate engaged in research. May be repeated for credit.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit.

Counseling
see Counseling, Development and Higher Education

see Psychology