7235 Advanced Software Engineering (3) Prereq.: CSC 7135. Formal testing, validation and verification techniques; in-depth study of formal specification languages and techniques.

7300 Algorithm Design and Analysis (3) Characteristics of algorithms, algorithm existence, design, implementation, and complexity of algorithms; algorithm case studies.

7333 Machine Learning (3) F Prereq.: CSC 4444. Fundamental principles of machine learning; inductive learning; explanation-based learning; computational approach to Boolean function learning; learning formal methods, and recursive theories; neural network learning and genetic algorithms; applications of machine learning.

7351 Computational Models for Mobile Robots (2) Prereq.: CSC 4351 or equivalent. Automatic generation of LL (1), LR (1), LALR (1) parsers, syntax directed translation of high-level control structures, error recovery, optimization of branching, local code optimization using directed acyclic graphs, loop optimization, global data flow analysis, and object-code optimization.

7370 Graph Algorithms (3) V Prereq.: MATH 4711 or equivalent. Graph layout algorithms; networks; application of network flow techniques; polynomial time algorithms and NP-completeness; dynamic graph drawing.

7373 Algorithms for Parallel and Distributed Computing (3) Prereq.: CSC 7300 or equivalent. Parallel algorithms for searching, sorting, pattern matching, network overlays, and other problems; implementation and efficiency measures of the algorithms on different machines, and VLSI systolic arrays.

7374 Computational Models for Mobile Robots (3) Prereq.: CSC 7300. Computational tools for design, analysis, and implementation of algorithms for robotic applications: existing computational paradigms, constraint representation and real-time modeling for robotic vision; image understanding, geometric reasoning, navigation, and sensor-fusion problems for mobile robots.

7375 Robot Vision (3) Prereq.: CSC 3102 or equivalent, and CSC 7370. Computational aspects of vision; utilization of techniques from computational geometry, combinatorics, probability theory, and artificial intelligence; visual recognition and classification.

7380 Computational Geometry (3) Prereq.: CSC 7300 or equivalent. Data structures and algorithm design techniques for geometric applications: geometric reasoning searching, Voronoi diagrams; proximity; intersections of geometric objects; applications of computational geometry.

7381 Computational Aspects of VLSI CAD (3) Prereq.: CSC 7300 or equivalent. Overview of VLSI design and fabrication process; abstract model of VLSI; combinatorial optimization algorithms; circuit partitioning; placement and floor planning; global routing; detailed routing; and circuit compaction.

7402 Data Base Management Systems (3) Prereq.: CSC 4402. Implementation of database systems (physical model and its mapping to conceptual model); data structures and their query language, connection control, distributed databases; advanced database systems.

7420 Parallel and VLSI Computation (3) F Prereq.: CSC 3102 and MAC 2312 or both. Design of parallel algorithms for parallel computation; physical implementation of VLSI chips.

7442 Mining and Knowledge Discovery (3) Prereq.: CSC 7333. Introduction to data mining and knowledge discovery in databases; data cleaning, statistical techniques, association rule learning; time series and spatial data mining algorithms, clustering algorithms, data visualization.

7443 Scientific Information Visualization (3) Prereq.: CSC 7300 or equivalent. Study of computer visualization principles, techniques, and tools used for exploring and understanding information; includes visualization algorithms, techniques, and applications.

7444 Advanced Artificial Intelligence (3) Prereq.: CSC 4444. Temporal and nonmonotonic logic; truth maintenance systems; probabilistic reasoning; deductive databases; automatic learning, and tutoring; story understanding; structure of domain expert systems.

7446 Soft Computing (3) Prereq.: CSC 4446 or permission of instructor. Use of fuzzy paradigms in applications; fuzzy sets and fuzzy logic, neural computing, and evolutionary programming; applications in image processing, database systems, and decision making, and other areas; software and simulation tools for problem solving in the soft-computing arena.

7450 Graph Theory and Performance Evaluation of Parallel Computers (3) Prereq.: CSC 3102 or equivalent and CSC 7300. Parallel programming techniques; message passing, shared memory, interprocess synchronization; performance evaluation; prediction of parallel architectures and algorithms; scalability analysis.

7481 Information Retrieval Systems (3) Prereq.: CSC 3102 or equivalent. Also offered as LIS 7610. Topics include commercially available retrieval systems, text content analysis, query processing models and current research problems.

7500 System Modeling and Computer Simulation (3) Prereq.: CSC 2263 or equivalent. Construction and use of mathematical models of simulation; computer models; simulation techniques; applications of simulations; examples and case studies from physical, social, and life sciences, engineering, business, and information sciences.

7501 Advanced Computer Networks (3) Prereq.: CSC 4501 or equivalent. Design and analysis of computer networks; routing algorithms and protocols; switch and router architectures; traffic flow management and error control; scheduling and quality of service; modeling and performance evaluation; queuing theory applied to computer networks; selected issues in high-speed network design.

7502 Advanced Computer and Network Security (3) Prereq.: CSC 4601. Secret sharing; secret sharing homomorphism; verifiable secret sharing; electronic voting; advanced cryptography; anonymity on the net; wireless security.

7540 Distributed Systems (3) Prereq.: CSC 4101. Networking and inter-networking; client-server model; remote procedure calls; processes and processes in distributed systems; distributed file systems; transaction-processing techniques; and distributed systems for high performance computing.

7560 Computational Methods (3) Prereq.: CSC 4362 or equivalent. Synthesis, implementation, and analysis of numerical algorithms; basic optimization concepts and techniques in context of abstract scheme.

7600 High Performance Computing I (3) V Prereq.: CSC 4362. Finite difference schemes for partial differential equations; parallel algorithms for scientific computing; important algorithms for parallel computer; high performance computing technology.

7610 Design Issues in High-Speed Networks: Multicast, Pricing and Control (3) Prereq.: CSC 4501. Multicasting architectures, protocols, and applications; ATM and Internet solution; scalable reliable multicast; distributed sensor networks; Internet pricing and economics of communication; game-theoretic approaches to control.

7602 Wireless Networks (3) Prereq.: CSC 4501. Radio systems and ad-hoc wireless networks; relevant concepts in terms of mobility, migration, and service levels and their impact on system design; wireless network communication; packet radio techniques; ad-hoc networks; nomadic computing; issues in cellular networks; TCP/IP over wireless.

7610 High Performance Computing II (3) V Prereq.: CSC 7600 or equivalent. Finite difference schemes for molecular dynamics; classical deterministic simulations; combinatorial optimization: algorithms for quantum molecular dynamics; scientific applications in high performance computing.

7620 Finite Difference Schemes (3) Prereq.: CSC 4501. Finite difference schemes for partial differential equations; parallel algorithms for massively parallel computers; simulated annealing and routing algorithms.

7700 Special Topics in Computer Science (3) Prereq.: May be taken for a max. of 12 hrs. of credit when topics vary. Specialized areas of computer science; advanced computer science algorithms for parallel computation; physical implementation of VLSI chips.

7701 Sensor Networking Concepts (3) Prereq.: CSC 4501 and 7500. Self-organizing sensor networks; querying, and data aggregation; real-time and application communication protocols; sensor network security.

7703 Telecommunications Networks (3) Prereq.: CSC 4501. The convergence of traditional voice-centric telecommunication networks, applications-focused distributed middleware architectures, and the Internet; traditional telecommunications; telephone and ISDN architectures; Signal System 7; distribution of application processing in the Advance Intelligent Network; new frameworks for Internet-based core architectures; proposals to generalize the existing telephony architecture.

7800 Computer Science Research Seminar (1) V May be taken for a max. of 12 hrs. of credit when topics vary. Pass/fail grading. Student presentation and discussions on research topics in computer science.

7999 Selected Readings in Computer Science (1-3) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit.

9000 Dissertation Research (1-12 per sem.) $7414 grading.

CONSTRUCTION MANAGEMENT • CM

Registration in any course above CM 2121 is restricted to students admitted to a senior college with a declared CM major or minor. A grade of "C" or better is required in all CM prerequisite courses.

1010 Construction Graphics and Nomenclature (3) Credit or registration in MATH 1350 or 2 hrs. lecture. Lab. Graphic communication concepts and techniques relating to construction processes and nomenclature.

1020 Engineering Graphics and Mechanical Engineering (2) 4 hrs. lab. Credit will not be given for both this course and CM 1030. Not open to construction management majors. Construction drawings, visualization and communication of creative design concepts; introduction to engineering drafting and USA Standards Institute standards; freehand sketching; three-dimensional forms used in solution of engineering problems; use of solid modeling software in design and design communication.

1030 Construction Safety (3) Construction safety relating to accident causation; contractual obligations; project management and coordination.

1030 Engineering Graphics (2) Prereq.: CM 2121. Emphasis on both heavy and industrial equipment.

2110 Construction Planning and Scheduling (3) Prereq.: CM 3100 or both. 3 hrs. lecture; 2 hrs. lab. Fundamentals of planning and scheduling techniques, including computer applications, used in the construction industry to manage construction projects.

2000 Construction Safety (3) Construction safety relating to accident causation; contractual obligations; project management and coordination.

2110 Construction Scheduling (3) Prereq.: CM 2121. 2 hrs. lecture; 2 hrs. lab. Principles of construction surveying, fundamental measuring procedures, error analysis, leveling, traverse measurement, planimetric curves, vertical curves, and earthwork calculations.

2131 Commercial Construction Estimating (3) Prereq.: CM 2112 or both. 3 hrs. lecture; 2 hrs. lab. Fundamentals of estimating including quantity surveys, pricing analysis, and bid package preparation for commercial construction.

2131 Industrial Construction Estimating (3) Prereq.: CM 2131 and 3121. 2 hrs. lecture; 2 hrs. lab. Principles of estimating including quantity surveys, pricing analysis, and bid package preparation for industrial construction.

3141 Highway Construction (3) Prereq.: CM 3100. Basic fundamentals of highway construction including: earthmoving, drainage, road paving, bridge, and retaining walls; interpretation of plans and specifications; materials, methods, equipment, and estimating.

3303 Mechanical and Electrical Systems (3) Prereq.: CM 2121 and PHYS 2002. Mechanical and electrical systems in residential and commercial buildings; electrical code and design considerations; safety and quality control, and installation procedures.

4300 Construction Materials (3) Prereq.: CM 2121. Fundamentals involved in design, evaluation, testing, and construction of asphalt, concrete, aggregates, steel, timber, and composites; mechanic properties of soils, compaction, and fibre stability; construction of shallow and deep foundations, and retaining walls.

3305 Structural Technology I (3) Prereq.: MATH 1350 and 2110. 4 hrs. lecture; 3 hrs. lab. Structural mechanics for construction management majors focusing on determination of the nature, magnitude, and equilibrium requirements for structures and the internal load effects (stress and deformation) of these forces on the structural components.

3505 Structural Technology II (3) Prereq.: CM 3505. Structural design of ordinary timber, steel, and reinforced concrete bridges and buildings in accordance with appropriate design code specifications; emphasis on load and construction management.
service structural resistance to vertical and lateral load effects.

14200 Construction Administration (3) Prereq.: CM 2141, 312 and credit in CM 3000. Principles and theory of ownership, organization, contracts, insurance, bonding, and labor relations pertaining to the construction industry.

14201 Construction Law (3) Prereq.: CM 4200. The law of business organization, contracts, liens, and the responsibilities associated with the construction industry; emphasis on claims avoidance.

14202 Construction Business and Finance (3) Prereq.: CM 4200. Open to Construction Management majors only. A comprehensive study of construction management as it relates to a business environment. Topics include current construction trends, financial and management of construction projects.

14206 Special Topics in Construction Management May be taken for a max. of 6 sem. hrs. when topics vary. Advanced topics, current issues, or recent developments in the construction industry.

14207 Independent Study (3) Prereq.: consent of a faculty member. May be taken for a max. of 6 sem. hrs. of credit when topics vary. Open to students enrolled in the undergraduate construction management program.

CREDITS

CURRICULUM AND INSTRUCTION + EDCI

Admission to courses at the 3000-level and above is restricted to students enrolled in a teacher education certification program/concentration. General education courses are marked with stars (★).

1000 Introduction to the Study of Education (3) Field experience in multicultural settings in secondary schools.

2024 2400 Education and Diverse Populations (3) Prereq.: admission to 1-6 teacher education certification program. 2 hrs. lecture; 2 hrs. lab/field experience in multicultural, multi-level settings. Differences among elementary students (grades 1-6) associated with their developmental levels, cultural and ethnic backgrounds, and gender.

2400 Education and Diverse Populations (3) Prereq.: admission to 1-6 teacher education certification program. 2 hrs. lecture; 2 hrs. lab/field experience in multicultural, multi-level settings. Differences among elementary students (grades 1-6) associated with their developmental levels, cultural and ethnic backgrounds, and gender.

2400 Education and Diverse Populations (3) Prereq.: admission to 1-6 teacher education certification program. 2 hrs. lecture; 2 hrs. lab/field experience in multicultural, multi-level settings. Differences among elementary students (grades 1-6) associated with their developmental levels, cultural and ethnic backgrounds, and gender.

2405 Principles and Practices in K-12 Programs (4) Prereq.: EDCI 1000 and enrollment in a program leading to teacher certification in grades K-12. 3 hrs. lecture; 2 hrs. lab/field experience in multicultural settings. Credit will not be given for both this course and MUED 1000.

2406 Critical analysis and evaluation of past and present concepts and techniques of art education; development of a functional art program for elementary schools in Louisiana; art materials, techniques, and activities for children in grades 3-5.

2408 Education and Diverse Populations (3) Prereq.: admission to 1-6 teacher education certification program. 2 hrs. lecture; 2 hrs. lab/field experience in multicultural, multi-level settings. Differences among elementary students (grades 1-6) associated with their developmental levels, cultural and ethnic backgrounds, and gender.

2500 Knowledge in Mathematics and Science (3) Prereq.: BASC 2100 (or concurrent enrollment). Introduction to multiple disciplinary perspectives on knowing and learning. Topics may include: mathematical and scientific pedagogy. Includes field experiences in area schools.

2700 Characteristics of Learners with Exceptionalities (3) Prereq.: EDCI 2400 and concurrent enrollment. Required for all multicultural, multi-level settings. Structures of the discipline of mathematics applied to teaching reading; general review of reading processes, strategies, techniques and materials.

3000 Children's Literature (3) Survey of children's literature across time, genres, and media; focus on wide reading in children's literature and an appreciation of the value of literature in the classroom.

3001 Student Development and Diversity (3) Prereq.: credit or registration in EDCI 2001 and concurrent enrollment in one of the following: BIOL 3001, CHEM 3001, ENGL 3501, FREN 3401, HIST 3001, MATH 3001, PHYS 3001, SPAN 3001. 2 hrs. lecture; 3 hrs. lab/field experience in multicultural settings. Differences among secondary students in all levels, cultural, and ethnic backgrounds, genders, learning abilities, and special needs.

3002 Classroom Management (3) Prereq.: EDCI 3001 and concurrent enrollment in one of the following: BIOL 3002, CHEM 3002, ENGL 3502, FREN 4002, MATH 3002, PHYS 3002, SPAN 3002. Prereq.: credit or registration in EDCI 2400 and concurrent enrollment in multicultural settings. Learning processes of middle school and high school students in the social learning environment of the classroom, work organization, technology, motivation, social interactions, integration of technology, and classroom management.

3112 Reading Instruction in the Elementary School (6) Prereq.: EDCI 2025; concurrent registration in EDCI 3111 for elementary grades majors. 3 hrs. lecture; 6 hrs. field experience in multicultural settings. Current instructional materials and methods in teaching reading at the elementary school level; understandings and skills in a laboratory situation in the present reading techniques, their history, the current issues.

3113 Materials and Methods in Teaching Communicative Skills in the Elementary School (2) Prereq.: EDCI 2025; concurrent registration in EDCI 3112 for elementary grades majors. Instructional materials and methods in teaching language arts communicative skills at the elementary school level; understanding and skills in a laboratory situation in the public school.

3124 Curriculum Discipline: Mathematics Theory and Practice (6) Prereq.: Professional Practice Block I, 12 sem. hrs. of mathematics, including MATH 1201 and 1202; 11 sem. hrs. of natural science; and concurrent enrollment in EDCI 2001 and 2040. 2 hrs. lecture; 2 hrs. lab/field experience in multicultural, multi-level settings. Structures of the discipline of mathematics applied to teaching mathematics in grades K-5. Interdisciplinary perspectives on knowing and learning, general pedagogical strategies, techniques, and materials are coordinated with basic principles of learning.

3125 Curriculum Discipline: Science (3) Prereq.: Professional Practice Block I, 11 sem. hrs. of natural science, 12 sem. hrs. mathematics, and concurrent enrollment in EDCI 3124 and MATH 2205. 2 hrs. lecture; 2 hrs. lab/field experience in multicultural, multi-level settings. Structures of science disciplines applied to teaching science in grades 1-6; standards-based pedagogical strategies, techniques, and materials coordinated with basic principles of learning.

3126 Curriculum Disciplines: Mathematics (3) Prereq.: EDCI 2405 or 2040; 6 sem. hrs. of credit in mathematics courses, and concurrent enrollment in EDCI 3125 and 3127. 2 hrs. lecture; 2 hrs. lab/field experience in multicultural, multi-level settings. Structures of mathematical disciplines for teaching mathematics in grades K-5; strategies, techniques, and materials coordinated with basic rationales and principles of learning.

3127 Curriculum Disciplines: Social Studies (3) Prereq.: EDCI 2400 and concurrent enrollment in EDCI 3125 and 3127; 2 hrs. lecture; 2 hrs. lab/field experience in multicultural, multi-level settings. Structures of the social sciences disciplines for teaching social studies in grades K-5; standards-based pedagogical strategies, techniques, and materials coordinated with basic rationales and principles of learning.

3135 Teaching Reading in the Junior High School (3) Prereq.: EDCI 2400 or 2405 or equivalent. Approaches to teaching reading to junior high school students; teaching by integrated reading approaches and materials.

3136 Reading in the Content Areas (3) Content area reading problems and solutions; individual and group reading programs; and concurrent enrollment in HUEC 3055, 3482, and 3483. Integrated, comprehensive curriculum content for children in grades 6-12; language arts, mathematics, social studies, science, and the arts.