

7995 Independent Readings in Biological Sciences (1-3) Prereq.: consent of instructor. May be taken for a max. of 9 sem. hrs. of credit. Directed individual readings under the guidance of a graduate faculty member.

8000 Thesis Research (1-12 per sem.) "S"/"U" grading.

8903 Microbiology for Teachers (4) Su 2 hrs. lecture; 4 hrs. lab. Relation of microorganisms to everyday living; how knowledge of these forms is used in effective teaching of high school science and home economics.

BUSINESS ADMINISTRATION

• BADM

1000 Introduction to the Study of Business (1) F

Enrollment in this course is limited to students admitted to the E. J. Ourso College of Business. Introduction to the E. J. Ourso College of Business policies and resources including academic advising, majors, career alternatives, college technology, and student organizations.

1001 Introduction to Business (3) May not be taken by students in the E. J. Ourso College of Business. Operation of the business firm; function of the businessman; nature of economic system and private enterprise.

3000 Family Business Management (3) Prereq.: ACCT 2001, 2101; ECON 2000, 2010; ISDS 1100; MKT 3401. Family business culture; entrepreneurial influences; key issues and conflicts; career planning; counseling and consulting; professional support relationships; survival skills as a son or daughter in a family business.

4000 Innovation and Creativity (3) Prereq.: ACCT 2001, 2101; ECON 2000, 2010; ISDS 1100; MKT 3401. Role of creativity and innovation in product, service, or idea generation that may eventually lead to business formation and commercialization; barriers to creativity and innovation; alternative problem-solving approaches.

4010 Special Topics in Entrepreneurship (3) May be taken for a max. of 6 sem. hrs. of credit when topics vary. In-depth coverage of special topics.

4020 Internship in Entrepreneurship (3) Prereq.: approval of department; May be repeated for a max. of 6 sem. hrs. when topics vary. Gaining first-hand knowledge of the business start-up process; practical hands-on experience in business-plan formation.

4030 Independent Study in Entrepreneurship (3) Prereq.: approval of department May be repeated for a max. of 6 sem. hrs. credit when topics vary. Detailed study of a specific aspect of entrepreneurship.

7000 Internship in Business Administration (3) Prereq.: prior approval of M.B.A. director. Open only to full-time M.B.A. students. May be taken once for credit. 10 hrs. of learning experience (fall/spring); 20 hrs. (summer). General supervision by a faculty member; direct supervision by a business professional. Pass-fail grading based on a written evaluation by the professional supervisor, a written report by the student, and the faculty member's evaluation.

7010 The Practice of Business (1) F,S Open only to students in the M.B.A. program. Taken each semester of the M.B.A. program. Course must be successfully completed four times prior to graduation. Exposure to the practice of business; a series of visits to area businesses, in conjunction with classroom experiences, to learn how managers and operations specialists in various industries cultivate, shape, and exploit their companies' resources to meet current and future market needs.

7020 Managerial Statistics (3) Open only to students in the M.B.A. program. An introduction to statistical thinking and overview of statistical methods used to analyze and interpret data, draw inferences, and make decisions; topics include descriptive statistics, probability, sampling and sampling distributions, estimation, confidence intervals, hypothesis testing, linear regression, forecasting, and control charting; emphasis on how to use spreadsheets to analyze data and how to interpret the results.

7030 Understanding Financial Information (3) Composition of financial statements; information processing and reporting for the purpose of understanding accounting information; legal and ethical obligations of the accounting profession.

7040 Managerial Economics (3) Practical applications of microeconomic theory; demand forecasting techniques, cost estimation, and analysis of market structures.

7050 Information Systems (3) Prereq.: ISDS 1100 or equivalent. Open only to students in the M.B.A. program. Contemporary topics in information systems; a survey of

information system analysis and design; introduction to business data communication, database management systems, and knowledge based systems; enterprise-wide systems and information systems control.

7060 Elements of Cost Management (3) Prereq.: BADM 7030. Open only to students in the M.B.A. program.

Understanding and applying cost management practices used in business today; development of costing and budgeting systems used for cost management; applications of analysis used in management decision making and control; cost-profit-volume analysis; analysis of variances between budgeted and actual cost; methods of evaluating responsibility centers based upon profitability measures.

7070 Understanding Behavior in Organizations (3) F

Open only to students in the M.B.A. program. Broad understanding of factors influencing the behavior of individuals in organizations; topics include the individual and contextual determinants of behavior and the tools managers use to influence and direct employee behavior; emphasis on managerial applications of behavioral science theories.

7080 Macroeconomic Analysis & Issues (3) Open only to students in the M.B.A. program. Examining forces determining the magnitude of such variables as the aggregate volume of an economy's output, the volume of resource employment, the size of national income, and the general price level; international variables of trade and financial flows; international trade agreements and other foreign variables that affect exchange rates, domestic income, output, prices, and employment.

7090 Financial Management (3) Prereq.: BADM 7030. Credit will not be given for this course and FIN 7717.

Investment and financing decisions within the firm; role of capital markets; usefulness and limitations of financial data; cash flow projections; working capital management.

7100 Marketing Administration (3) Marketing decision making and planning, including marketing research, product development and management, distribution, demand estimation, market structure analysis, pricing, promotion, advertising, and direct marketing.

7120 Operations Management (3) Prereq.: BADM 7020.

Open only to students in the M.B.A. program. Major problems and decision processes of operations management; operations strategy; process and capacity planning; facilities planning; aggregate planning; materials planning; quality planning.

7140 Legal Environment of Business (3) Open only to students in the M.B.A. program. The structure of the legal environment of business; sources of law affecting business; constitutional issues in the legal environment of business; contracts and sales; torts; products liability; corporations; securities; bankruptcy; antitrust; discrimination; labor relations; environmental law; criminal law; its impact negotiation strategies; associated ethical and international issues.

7160 Negotiation, Persuasion, and Influence (1.5) F

Experiential-based course designed to provide managers with the basic concepts and techniques necessary for effective negotiation and conflict resolution in a variety of business contexts.

7170 Understanding International Management Challenges (3) F Open only to students in the M.B.A. program.

Theories and management of international operations; development of environmental, operational, strategic, and decision making perspectives.

7190 Managing Sources of Competitive Advantage (3) S

Contemporary approaches to developing and sustaining a competitive advantage in global competition; topics include: competition for competence, strategy and technology, managing home and host government relations, cooperative strategy, strategic alliances, organizational innovation, and managing global strategic change.

7210 Understanding Ethical Issues in Business (1.5) S

Designed to help future managers confront and successfully manage ethical issues and their economic, legal, political, social, and cultural aspects.

7270 Seminar in New Developments in Business Administration (3)

7420 Financing New Ventures I (1.5) Insight into financing new ventures and investing in companies in early stages; sourcing, qualifying, and analyzing deals; negotiating, structuring, and pricing; creating value; realizing value through various kinds of exit from the business.

7421 Financing New Ventures II (1.5) Prereq.: BADM

7420. Focus on cases and projects taken from actual financing situations; structuring of venture capital; the process of making investments in emerging companies.

7430 Family Business Management (1.5) Key issues and conflicts facing individuals and families involved in business relationships; family business culture; entrepreneurial influences; career planning; professional support relationship; survival skills as a son or daughter in a family business.

7432 Innovation and Creativity (1.5) Role of creativity and innovation in product, service, or idea generation that may eventually lead to business formation and commercialization; barriers to creativity and innovation; alternative problem-solving approaches.

7440 Franchise Development (1.5) Important factors in starting and managing a new franchise; characteristics of franchiser and franchisee; evaluation of franchising opportunities; legal concerns of franchising; development of appropriate strategies.

7441 Franchise Planning (1.5) Prereq.: BADM 7440.

Development of franchising business plan to include marketing, management, financial projections, and operations manual outline.

7460 Special Topics in Entrepreneurship (1.5) May be repeated for a max. of 6 sem. hrs. credit when topics vary. In-depth coverage in special topics such as women-owned business, home-based business, exporting for small business, and team-building for start-ups.

7470 Internship in Entrepreneurship (1.5) May be repeated for a max. of 6 sem. hrs. of credit when topics vary. Understanding actual entrepreneurial situations; creating an integrated, cross-functional strategy; implementing and managing projects.

7480 Independent Study in Entrepreneurship (1.5)

Prereq.: departmental approval. May be repeated for a max. of 6 sem. hrs. credit when topics vary. Detailed study of a specific aspect of entrepreneurship.

7900 Human Factors in Business and Industry: Current

Problems (3) May be taken for a max. of 6 hrs. of credit when topics vary. Human factors related to business problems.

8000 Thesis Research (1-12 per sem.) "S"/"U" grading.

8900 Pre-dissertation Research (1-9) May be repeated for credit.

9000 Dissertation Research (1-12 per sem.) "S"/"U" grading.

BUSINESS COMMUNICATION

• BCOM

5200 Executive Communication (3) Developing and applying communication strategies; analysis of business situations and development of appropriate strategies; written, oral, and interpersonal applications; impact of technologically mediated communication.

BUSINESS LAW • BLAW

3200 Introduction to Law (3) Not open to students in the E. J. Ourso College of Business. Credit will not be given for

both this course and BLAW 3201 and 4203. Fundamentals of the American legal system; basic principles of the law of contracts, commercial paper, agency, partnerships, corporations, torts, and crimes; case materials used to demonstrate legal analysis and reasoning.

3201 Business Law (3) Credit will not be given for this course and BLAW 3200, FIN 3200, or 3201. Development of Anglo-American common law, the American constitutional system, and the Louisiana civil law system; law of contracts, torts, and agency; business aspects of criminal law; ethical facets of the legal environment; case materials used to demonstrate problem analysis.

3202 Commercial Transactions (3) Prereq.: BLAW 3201. Credit will not be given for this course and BLAW 3200, or 4203 or FIN 3200, or 3202, or 3203. Louisiana law and Federal legislation in the following areas: employment law, workers' compensation, business entities, intellectual property, agency, insurance, sales, donations, leases, security devices, bankruptcy, and commercial paper.

3230 Sports Law (3) Credit will not be given for both this course and FIN 3230. Business and legal sports aspects, particularly professional and collegiate level; antitrust laws; labor law and collective bargaining; contract law and player agents; professional franchise location; college athletics and the NCAA; equal opportunities and Title IX; licensing and trademark rights; tort issues.

4203 Commercial Transactions for Accountants (3) Prereq.: BLAW 3201. Credit will not be given for this course and BLAW 3200, 3202, FIN 3202, 3203. Specifically for accounting majors. Legal concepts underlying sale of goods;

commercial paper; security interests, securities regulation, accountants' malpractice, negotiable instruments, and bankruptcy; application of the Uniform Commercial Code and preparation for the CPA examination.

CHEMICAL ENGINEERING • CHE

2160 Computer Technology for Chemical Engineering Systems (1) F,S Prereq.: MATH 1550. Introduction to operating systems, programming techniques, and software packages used in the solution of chemical engineering problems.

2171 Chemical Engineering Fundamentals: Material and Energy Balances (3) F,S Prereq.: MATH 1550 and CHEM 1202. Emphasis on basic principles and concepts used to make chemical engineering calculations; techniques used in these calculations applied to typical industrial problems.

2176 Mathematical Modeling of Chemical Engineering Systems (3) F,S Prereq.: MATH 2090, CHE 2160, and 2171. Basic concepts and techniques in analysis of engineering processes; mathematical description of physical systems and application of modern computers to solution of resulting equations.

3100 Chemical Equilibrium and Kinetics of Environmental Processes (3) F Prereq.: CHE 3172 or ME 3333 or equivalent. Not open to chemical engineering majors. Credit will not be given for both this course and CHE 4190.

Introductory chemical thermodynamic concepts extended to heterogeneous equilibrium, dilute solutions, surfaces and colloids of significance in environmental engineering processes; chemical reaction kinetics concepts applied to the environment; applications to waste treatment process design, property estimations for elucidating the fate and transport of chemicals in the environment.

3101 Transport Sciences: Momentum Transfer (3) F Prereq.: CHE 2171, MATH 2090, and credit or registration in CE 2450. Fundamentals of momentum transfer; applications to the fluid problems of engineering.

3102 Transport Sciences: Heat and Mass Transfer (4) S Prereq.: CHE 3101 or CE 2200, and MATH 2065 or 2090. Fundamentals of heat and mass transfer; similarities of heat, mass, and momentum transfer and their interrelation; engineering applications.

3104 Engineering Measurements Laboratory (3) F,S Prereq.: CHE 2176 and credit or registration in CHE 3102. 2 hrs. lecture; 3 hrs. lab. Laboratory work to accompany CHE 3101 and 3102.

3171 Process Economics and Optimization (3) F Prereq.: CHE 2176 and credit or registration in CHE 3102 and 3173. Application of optimization principles to the economic design of chemical engineering unit operations.

3172 Chemical Engineering Thermodynamics (3) F Prereq.: CHE 2171 and credit or registration in CHEM 3491. Basic concepts and chemical engineering applications of thermodynamics; emphasis on flow processes and real gas thermodynamics.

3173 Heterogeneous Equilibrium (3) S Prereq.: CHE 3172. Theory of vapor-liquid, liquid-liquid, and solid-liquid equilibrium, including the effects of chemical reactions; application of thermodynamic theory to the correlation of equilibrium data and the prediction of equilibrium compositions.

3249, 3250 Engineering Practice (1-3, 1-3) Su only Prereq.: consent of instructor. Pass-fail grading. A minimum of 6 weeks of full-time employment by an industry participating in the summer program. Same as ENGR 3049, 3050. Selected engineering problems in an industrial environment.

3271, 3272 Senior Projects (1-2, 1-2) Prereq.: consent of department. Pass-fail grading. Experimental and theoretical investigations including library research.

4151 Unit Operations Design (4) F Prereq.: CHE 3102, 3171, and 3173. 3 hrs. lecture; 3 hrs. lab. Unit operations analyzed as applications of chemical engineering fundamentals and transport sciences; use of these principles in design calculations.

4162 Unit Operations Laboratory (3) F,S Prereq.: CHE 3104 and credit or registration in CHE 4151. 1 hr. lecture; 6 hrs. lab. Obtaining and interpreting data needed to solve typical problems in design or operation of chemical engineering equipment.

4172 Process Design (4) S Prereq.: CHE 4151 and 4190. 3 hrs. lecture; 3 hrs. lab. Chemical plant design from initial concept through preliminary estimate; flow diagrams, equipment cost estimation, economic analysis, safety, and environmental issues; computer-aided process design.

4190 Chemical Reaction Engineering (3) F Prereq.: CHE 3102 and 3173; or equivalent. Basic principles of reactor design; selection of best design alternatives; achievement of optimum reactor operation.

4198 Process Dynamics (3) S Prereq.: CHE 3171 and credit or registration in CHE 4151. Principles and practices of process dynamics and automatic control; mathematical modeling of process dynamics, feedback control, and feed forward control.

4204 Technology of Petroleum Refining (3) F Prereq.: Credit or registration in CHE 4151. Catalytic and thermal processes used in petroleum refining; application of scientific and engineering principles in processes such as catalytic cracking, reforming, coking, alkylation, isomerization, and hydroprocessing; emphasis on applied catalysis and its impact on engineering design.

4205 Technology of Petrochemical Industry (3) Prereq.: CHE 4151. Processes used in the manufacture of petroleum-based chemicals; application of scientific and engineering principles involved in the production of hydrogen, alcohols, olefins, aromatics, aldehydes, ketones, acids, rubber, and other polymers; emphasis on catalysis by transition-metal complexes.

4210 Industrial Catalysis (3) Prereq.: credit or registration in CHE 4190. Principles of the industrial utilization of heterogeneous catalysis; topics include absorption phenomena, methodology in catalyst preparation, characterization and evaluation of catalysts, diffusion and reaction in porous catalysts, and a survey of major industrial processes.

4221, 4222 Senior Research (1,2) Prereq.: CHE 3102, 3104, and 3173, gpa of at least 2.8 (in CHE) and consent of instructor. CHE 4221 is prerequisite for 4222. Project chosen in consultation with instructor. Formal proposal and final presentation required. Not open to graduate students. Comprehensive research or development project of a theoretical or experimental nature, involving a team effort over two semesters (fall and spring period).

4253 Introduction to Industrial Pollution Control (3) Prereq.: CHE 3102 or equivalent introductory course in transport science. Quantitative application of chemical engineering principles to removal of objectionable components from effluents, with emphasis on industrial processing effluents; currently available techniques for controlling air and water pollution and solid wastes; concept of pollution control through basic process alterations developed by specific examples.

4260 Biochemical Engineering (3) Prereq.: credit or registration in CHE 4190 or equivalent. Application of chemical engineering fundamentals to microbiological and biochemical systems; problems peculiar to industrial operations involving microbial processes; growth conditions and requirements, metabolisms, product separations, enzyme catalysis, sterilization, and aseptic operations.

4263 Environmental Chemodynamics (3) Prereq.: CHE 3102 or equivalent introductory course in transport science. Environmental chemodynamics: interphase equilibrium, reactions, transport processes and related models for anthropogenic substances across natural interfaces (air-water-sediment-soil) and associated boundary regions.

4270 Processing of Advanced Materials (3) Prereq.: CHE 3102 or equivalent transport course. Treatment of coupled chemical reaction and mass, energy, and momentum transport in the manufacturing and processing of semiconductors and advanced ceramic materials; engineering models for chemical and physical vapor deposition methods and condensed phase processes.

4275 Electrochemical Engineering (3) Prereq.: CHE 3102 or equivalent introductory course in transport science. Principles of electrochemistry applied to engineering problems; potential distribution theory, kinetics, mass transport, and thermodynamic principles; quantification of controlling factors in microfabrication, corrosion, battery design, and electrochemical synthesis.

4285 Principles of High Polymers (3) Prereq.: CHE 3172 and CHEM 3491. Solution and solid-state properties of high polymers; microstructure of polymer chains and effect on macromolecular physical properties of the final plastics.

4296 Development of Mathematical Models (3) Prereq.: CHE 2176 and 3102; or equivalent. Mathematical descriptions of systems encountered in chemical engineering developed from basic principles; lumped parameter systems, distributed parameter systems, formulation of ordinary and partial differential equations, continuous and discrete analogs, and matrix formulations; models developed for systems ranging from simple elements to plant-scale.

4410 Special Topics in Chemical Engineering Design (3) May be taken for a max. of 6 sem. hrs. when topics vary. One or more phases of current chemical engineering design.

4420 Special Topics in Chemical Engineering Science (3) May be taken for a max. of 6 sem. hrs. when topics vary. One or more phases of current chemical engineering science.

7110 Mathematical Methods in Chemical Engineering (3) F Review of physicochemical problem formulation; analytical and approximate techniques for the solution of linear and nonlinear differential equation models in chemical engineering systems.

7120 Chemical Engineering Thermodynamics (3) F Thermodynamic properties, first and second laws of thermodynamics, entropy, Maxwell relations, and relationship of thermodynamic properties to intermolecular forces; physical equilibrium with emphasis on partial free energy, fugacity, Raoult's law, K-values, equations of state, and activity coefficients; chemical equilibrium and free energies; fundamentals of statistical mechanics.

7130 Fundamentals of Transport Phenomena (3) S Foundations of heat, mass, and momentum transfer in continua; laminar flow; boundary layer theory; turbulence; buoyancy-induced flow; heat and mass transfer by diffusion, convection, and turbulence.

7140 Chemical Reactor Design Methods (3) S Basic principles of chemical kinetics, fluid flow, heat transfer, and mass transfer used in design of chemical reactors; chemical equilibria, chemical kinetics, design of isothermal reactors, effects of nonideal flow, nonisothermal reactors, and solid-gas catalytic reactions.

7314 Optimization (3) Techniques of optimization including analytical methods, linear and nonlinear programming, geometric and dynamic programming, and variational methods with application to systems of interest to chemical engineers.

7352 Distillation and Other Separation Processes (3) Mathematical models, phase equilibria, and calculation procedures related to design and behavior of distillation columns, absorbers, extractor-settlers, etc.; emphasis on computer techniques.

7512 Advanced Chemical Engineering Analysis (3) Prereq.: CHE 7110 or equivalent. May be taken for a max. of 6 hrs. of credit with consent of department. Topics in chemical engineering analysis, such as perturbation methods, matched asymptotic expansions, vector and tensor calculus, and numerical techniques.

7522 Advanced Chemical Engineering Thermodynamics (3) Prereq.: CHE 7120 or equivalent. May be taken for a max. of 6 hrs. of credit with consent of department. Thermodynamics of chemical engineering processes, such as nonequilibrium thermodynamic properties.

7532 Advanced Chemical Engineering Fluid Mechanics (3) Prereq.: CHE 7130 or equivalent. May be taken for a max. of 6 hrs. of credit with consent of department. Chemical engineering flow processes, such as turbulence, boundary layer theory, hydrodynamic stability, compressible flow, multiphase flow, chemically reacting flows, and nonNewtonian and viscoelastic fluids.

7534 Advanced Chemical Engineering Heat Transfer (3) Prereq.: CHE 7130 or equivalent. May be taken for a max. of 6 hrs. of credit with consent of department. Chemical process heat transfer; phase change and moving boundary problems; heat transfer mechanisms, natural and forced convection, radiation, and combined heat and mass transfer.

7536 Advanced Chemical Engineering Mass Transfer (3) Prereq.: CHE 7130 or equivalent. May be taken for a max. of 6 hrs. of credit with consent of department. Transport of mass in chemical engineering processes, such as diffusional operations, models for mass transfer in multicomponent, multiphase, stationary, flowing, and reacting systems.

7542 Catalysis (3) Prereq.: CHE 7140 or equivalent. Heterogeneous catalysis; adsorption phenomena, physical methods, solid state spectroscopies, and reaction mechanisms as applicable to fundamental and industrially significant processes.

7544 Chemical Kinetics and Reaction Mechanisms (3) Prereq.: CHE 7140 or equivalent. Gas-phase reactions and modern approach to deduction of reaction mechanism; collision, transition state, RRK, and RRKM theories, bond energy correlations, kinetics of complex reaction systems, fast reactions, computer modeling, and sensitivity analysis.

7572 Advanced Automatic Process Control (3) Prereq.: CHE 4198 or equivalent. Recent developments in control theory applied to control schemes in industrial processes; techniques of state space analysis, nonlinear stability criteria, multivariable control, and system identification.