

**6900-6910. Special Problems.** 1–3 hours each. 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 Programs 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 Programs 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. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Graduate Programs Office prior to registration. May be repeated for credit.

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## Management Science

see Information Technology and Decision Sciences

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## Manufacturing Engineering Technology

see *Undergraduate Catalog*

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## Marketing and Logistics

### ***Logistics and Supply Chain Management, LSCM***

**5300. Strategic Supply Chain Management.** 3 hours. The distribution and logistics imperative is to achieve cost-containment while delivering customer satisfaction. Course examines how channel integration fosters the coordination, systemization needed to maximize efficiency and produces the greatest net value for the customer. Students explore how resource allocation and channel relationship decisions impact inventory, transportation, warehousing, purchasing and packaging systems. Prerequisite(s): MKTG 5150 or consent of department.

**5560. Strategic Logistics Management.** 3 hours. Analysis of internal and environmental factors affecting logistical systems and operations. Includes the integration of transportation, inventory, facility location, informational flow, materials handling and packaging activities into a system for managing a physical flow of inbound and outbound products and materials in a global environment. The total-cost and total-system approaches are developed in relationship to planning and managing the logistical function within the organization. Prerequisite(s): MKTG 5150 or consent of department.

**5860. Advanced Supply Chain Management Problems.** 3 hours. Decision-making tools and skills as they apply to logistics and supply chain management. Course stresses

developing skills to analyze technical problems and their interrelationships within a company. Prerequisite(s): LSCM 5300 and 5560.

**5910. Special Problems.** 1–3 hours. Course provides a unique opportunity for the student to learn by doing with a real business or institution, solving real problems. While each project provides very specific and unique learning opportunities within the logistics area, the primary areas of knowledge and skill development for each are business analysis and decision making; consultative business relationships; project management; communication, written and oral; and teamwork. A maximum of 3 total hours of LSCM 5910 may be applied toward the MBA degree.

### **Marketing, MKTG**

**5000. Marketing Concepts.** 1.5 hours. A functional analysis of marketing and its importance in the economy as well as in business management. Develops an understanding of the increased complexity of the modern marketing system, why it is essential and how it performs. Embraces business activities involved in moving goods from production to consumption. This course meets the deficiency requirement in marketing for MBA candidates.

**5150. Marketing Management.** 3 hours. Application of concepts, tools and procedures employed by practicing marketing managers. Specific attention is given to product development and management, promotion development and management, channel selection and management, physical distribution management, and price setting and management. Students acquire skills in the essentials of case analysis and written as well as oral presentation of their analysis. Oral presentations may be made using electronic media. Groups may be required for case work. Prerequisite(s): MKTG 3650 or 5000.

**5200. Customer Behavior.** 3 hours. In a marketplace increasingly characterized by enduring buyer-seller relationships, marketers must be acutely aware of the individual and organizational characteristics that foster brand loyalty and equity. The identification of changing trends in customer behavior as applied to domestic and global markets, consumer markets, business-to-business markets, institutional markets, not-for-profit markets and governmental markets is critical for competitive success in today's dynamic markets and environments. The student will be introduced to models of buying behavior in consumer, business-to-business and not-for-profit marketing exchanges.

**5250. Information for Strategic Marketing Decisions.** 3 hours. Overview of methods for conducting market research. Research methodology topics covered include why and when to do marketing research; data types, sources and collection methods; sampling; and data analysis techniques. Use of the Internet as a major resource for conducting market research. Prerequisite(s): MKTG 5150 and DSCI 5010; DSCI 5180 is recommended; or consent of department.

**5260. Applied Multivariate Methods for Marketing Decision Making.** 3 hours. Develop a better understanding of the relevance of multivariate techniques such as multiple regression, discriminant, factor, cluster, logistics regression, conjoint analysis, etc. to marketing problems. Using a "hands-on, applications, managerial orientation," the course emphasizes appropriate statistical and presentation software and packages that enhance correct application, interpretation and presentation of each technique. Prerequisite(s): MKTG 5250 and DSCI 5180 or consent of department.

**5400. Product Planning and Brand Management.** 3 hours. Focus on issues related to product/brand management, an important marketing function. Topics covered include integration of the function within the organization; portfolio management, environmental scanning, identification and creation of value (not just a product) to offer to consumers; budgeting, planning and control issues. Within these broad groupings, some of the specific areas discussed are research, data management and analyses for planning and decision making, decisions in the areas of product/service offering, pricing, promotions management (advertising, sales promotion, personal selling and publicity), distribution (all aspects), ethics, and global implications among others. Prerequisite(s): MKTG 5150.

**5450. New Product Development.** 3 hours. Focus on issues related to new product development. Includes topics such as new product development process, identification and creation of value (not just a product) to offer consumers; budgeting, planning and control issues. Within these broad groupings, some of the specific areas discussed are research, data management and analyses for planning and decision making in areas of new product/service offering, pricing, promotions management (advertising, sales promotion, personal selling and publicity), distribution (all aspects), ethics and global implications among others. Prerequisite(s): MKTG 5150.

**5550. Decision Making in Global Markets.** 3 hours. The first half of the 21st century will be characterized by significant shifts in the manufacturing, distribution and consumption of products and services. As transitional and emerging economies mature, foreign entry, local marketing and global management become compelling issues in the design and implementation of marketing strategies. Emphasis on the rapidly changing nature of global markets and implications for the desirability and potential profitability of these markets. Significant sources of threats and opportunities, along with those internal resources of a firm necessary for coping with these opportunities and threats will form the core material of the course. Particular emphasis will be given to the market entry and expansion strategies available to multi-national and global marketers. Prerequisite(s): MKTG 5150.

**5600. Emerging Issues in Strategic Marketing.** 3 hours. Investigation, analysis and discussion of selected emerging problems, methods, concepts relevant to strategic marketing decision-making in dynamic markets and environments. Examines a wide variety of marketing topics. Prerequisite(s): MKTG 5150 or consent of department.

**5620. Marketing in a Digital Age.** 3 hours. Designed for graduate level students, course addresses issues related to high technology marketing in the contemporary business environment. Guide to integrating electronic resources in the marketing process. Includes the following broad topic areas: electronic commerce and traditional marketing, electronics marketing resources, implementing the e-commerce strategy, and special topics. Prerequisite(s): MKTG 5150.

**5650. Salesforce Management.** 3 hours. Survey of aspects of integrating the salesforce with product development, manufacturing, order processing, account maintenance, and analyzing marketing decisions. Consists of four modules: evaluating the salesforce, integrating marketing (brand and product management) with field sales and customer

service, analyzing marketing opportunities from a salesforce perspective, and salesforce analysis. Prerequisite(s): MKTG 5150.

**5670. Strategic Retail Management.** 3 hours. Exploration of the principles and methods of managing chain and independent retail stores. Requires the student to complete a project that includes all aspects of starting both brick and click retail operations. Prerequisite(s): MKTG 5150.

**5750. Services Marketing.** 3 hours. Students are assumed to enter this course with basic knowledge of marketing terminology and concepts. Focus is on integration and application of these services marketing contests, with particular focus on analysis and formulation of marketing strategy for service marketing organizations. Prerequisite(s): MKTG 5150.

**5760. New Service Development.** 3 hours. Examination of some of the important issues in the development of new services and development of the concepts, methods, and procedures by which marketing managers in the services industry can improve the quality of their decision-making with respect to the successful introduction of new offerings. Prerequisite(s): MKTG 5150.

**5800. Internship in Marketing or Logistics.** 3 hours. Supervised work experience in a position related to the student's career objective that meets the department's internship requirements. Prerequisite(s): 12 hours of graduate-level marketing courses. Student must meet employer's requirements and have consent of the department's MBA adviser and the internship director.

**5850. Effective Marketing Planning in Dynamic Environments.** 3 hours. Development of a strategic marketing plan for a specific product or service utilizing techniques and information from earlier courses in the program. Implementation, control and evaluation plans are developed. Course also addresses the practical aspects of appraisal, prediction and monitoring of external market factors that will impact organizational performance. A major theme of the course is how marketing decisions contribute to developing and maintaining competitive advantage in dynamic markets. Prerequisite(s): must be taken in the final term/semester of the student's program.

**5875. Marketing Rights and Responsibilities.** 3 hours. Critical assessment of the ethical and social management implications in the deployment of marketing strategy and tactics. Specific attention is afforded to the rights and responsibilities of marketers, consumers and society. Topics include the application of ethical theories to marketing problems, the societal outcomes of marketing policies and the reconciliation of international marketing norms, standards and rules of conduct. Exploration of real-world marketing decision-scenarios to provide a platform of highly interactive dialogue on issues dealing with ethics, organizational compliance, societal marketing and social responsibility. Prerequisite(s): MKTG 5150 or consent of department.

**5900. Directed Study.** 3 hours. Topic chosen by the student and developed through meetings and activities under the direction of the instructor; activities include required, regular participation in a specified 4000-level class. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Graduate Programs Office prior to registration.

**5910. Marketing Practicum and Restricted Consulting Assignment.** 3 hours. Course provides a unique opportunity for the student to learn-by-doing with a real business or institution, solving real problems. While each project provides very specific and unique learning opportunities within the marketing area, the primary areas of knowledge and skill development for each are business analysis and decision making; consultative business relationships; project management; communication, written and oral; and teamwork. Prerequisite(s): MKTG 5150, MKTG 5250 and consent of instructor.

**6010. Seminar in Marketing Thought.** 3 hours. Understanding of the history of marketing, theoretical definitions of marketing, and controversies in marketing thought. Investigation, analysis, and discussion of significant issues in the field of marketing.

**6020. Seminar in Advanced Consumer Behavior.** 3 hours. Interdisciplinary course examining empirical and theoretical studies of the factors that influence the acquisition, consumption and disposition of goods, services and ideas. Analysis of the psychological, sociological, anthropological, demographic and regulatory forces that impact consumers. Examination of research methodologies employed to conduct empirical studies of consumer behavior.

**6030. Seminar in Marketing Strategy.** 3 hours. Review of research in marketing strategy. Seminar topics include theories of competition and marketing strategy including antecedents, outcomes, mediators and moderators between strategy and performance; multimarket competition, first/late mover advantage, transaction cost analysis, marketing channels, and the contributions to the strategy dialogue.

**6600. Seminar in Marketing Issues.** 3 hours. Investigation, analysis and discussion of significant issues in marketing. May be repeated for credit.

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## Master's Engineering Technology

see Engineering Technology

## Materials Science and Engineering

### Materials Science and Engineering, MTSE

**5000. Thermodynamics of Materials.** 3 hours. The zeroth law of thermodynamics, work, energy and the first law of thermodynamics; the second law of thermodynamics, thermodynamic potentials, the third law of thermodynamics, thermodynamic identities and their uses, phase equilibria in one-component systems, behavior and reactions of gases. Solutions, binary and multicomponent systems: phase equilibria, materials separation and purification. Electrochemistry. Thermodynamics of modern materials including liquid crystals.

**5010. Bonding, Structure and Crystallography.** 3 hours. Interatomic bonding; amorphous and crystalline structures in metals, ceramics and polymers; point and line defects in crystals; structure determination by X-ray diffraction; basic symmetry operations, point and space groups in crystal systems. Prerequisite(s): MFET 3450.

**5100. Fundamental Concepts of Materials Science.** 3 hours. Crystal structures including defects and structures of non-crystalline materials. Phase diagrams, intermolecular forces. Organic raw materials, metals and alloys, ceramics, electronic materials, liquid crystals, polymers, natural and synthetic composites, smart materials, hybrids. Mechanical, thermophysical, electrical, magnetic and surface properties including tribology, corrosion and degradation. Testing of materials. Prerequisite(s): consent of department.

**5200. Advanced Concepts of Metallurgical Science.** 3 hours. Chemical and physical properties of metals and alloys. Emphasis on the relationship of structure and thermodynamics to behavior. Topics include crystal structure, thermodynamics, phase diagrams, phase transformations, oxidation, mechanical, electrical and magnetic properties. Prerequisite(s): PHYS 4110, CHEM 3510 or consent of department.

**5210. Corrosion and Oxidation of Materials.** 3 hours. Electrochemical corrosion mechanisms, corrosion prevention and high temperature corrosion. Oxidation mechanisms of metals and alloys, internal oxidation, oxidation resistant alloys and other methods of oxidation protection. Prerequisite(s): MTSE 5200 or consent of department.

**5300. Science and Technology of Modern Ceramics.** 3 hours. Emphasis on structure-property relationships: chemical bonding, crystal structures, crystal chemistry, electrical properties, thermal behavior, defect chemistry. Processing topics: powder preparation, sol-gel synthesis, densification, toughening mechanisms. Materials topics: glasses, dielectrics, superconductors, aerogels. Prerequisite(s): MTSE 5100, 5200 or consent of department.

**5310. Sol-Gel Processing.** 3 hours. Elements of sol-gel synthesis and processing, including colloids, sols, alkoxide chemistry, hydrolysis and condensation reactions, gelation mechanisms, novel synthesis methods, sol-gel thin films, thin film processing and characterization of sol-gel products. Prerequisite(s): MTSE 5300 or consent of department.

**5400. Advanced Polymer Physics and Chemistry.** 3 hours. Chemical structures, polymerization, molar masses, chain conformations. Rubber elasticity, polymer solutions, glassy state and aging. Mechanical properties, fracture mechanics and viscoelasticity. Dielectric properties. Polymer liquid crystals. Semi-crystalline polymers, polymer melts, rheology and processing. Thermal analysis, microscopy, diffractometry and spectroscopy of polymers. Computer simulations of polymer-based materials.