

**Descriptions — Management  
of  
Courses**

**835. Nonlinear Optimization Models**  
Winter. 4(4-0) Students may not receive credit for both MGT 835 and SYS 828, 834.

Nonlinear optimization—examples and applications. Kuhn-Tucker Theory. Saddle point optimality conditions. Algorithms for problems with constraints. Unconstrained optimization: introduction to search methods.

**836. Applied Stochastic Processes for Business**  
Spring. 4(4-0) 835.

The structure and analysis of stochastic models common to business and economics. Topics may include the Poisson process, renewal-reward processes, discrete Markov processes, with examples from queuing, reliability, maintenance and inventory.

**860. Corporation Management and Society**  
Spring. 4(4-0) 806.

Analysis of the emerging character of administrative structure of the large corporation. Administrative autocracy, corporate government, stockholder and director relationships. Examination of ethics of decision-making, strategic values and priorities basic to resource allocation decisions.

**880. Organization and Control in the Political Economy: Institutions and Theory**

Winter. 4(4-0) Interdepartmental with and administered by the Economics Department. Organization and technique in choice and implementation of economic, especially planning and programming, functions of political authority.

**881. Organization and Control in the Political Economy: Selected Problems**

Spring. 4(4-0) Approval of instructor. Interdepartmental with and administered by the Department of Economics.

Analysis of role and tasks, appropriate techniques and organizational structures of political agencies in planning and management of complex programs.

**890. Special Problems**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**906. Behavioral Research: Organization**

Winter. 3 credits. MTA 905.

Concepts and methods of behavioral science research that are applicable to the study of organization as a strategic device in the development of tangible and intangible values and in the control of elements of business enterprise.

**907. Behavioral Research: Business Executive**

Spring. 3(4-0)

Concepts and methods of behavioral science research in the study of the agents of enterprise decision-making and action. Attention is focused on the way in which decisions are made in business organizations and the multiple influences operating on the executive. Modes of adjustment to the decision environment are examined.

**908. Seminar in Organization Theory**  
Winter. 4(4-0) 806; doctoral candidates; master's candidates with approval of department.

Directed reading and research on issues in contemporary organization theory.

**911. Seminar in Personnel Research**  
Spring. 4(4-0) 810; doctoral candidates; master's candidates with approval of department.

Directed reading and research on issues in contemporary personnel administration theory and practice.

**937. Systems Simulation**

Fall. 4(4-0) 836, STT 423, MTH 228. Interdepartmental with the Statistics and Probability Department.

The concept of a model, model building, characteristics of simulation models. Techniques of computer simulation. Simulation models in research and management planning/control. Validation and experimental design. Special purpose languages.

**948. Mathematical Programming For Business**

Spring. 4(4-0) 836, MTH 334, 426, STT 863. Interdepartmental with the Statistics and Probability Department.

Large mathematical programs with special structure. Duality and decomposition in mathematical programming. Basic theory of dynamic programming; multistage decision processes and the principle of optimality. Risk, uncertainty, and introduction to stochastic and adaptive control processes.

**949. Advanced Applied Stochastic Processes**

Winter. 4(4-0) 836, 937. Interdepartmental with the Statistics and Probability Department.

Selected topics from the following areas: Semi-Markov, Markov-renewal and regenerative process models; Markov and semi-Markov decision processes; decision theory, applications from production, inventory, reliability, queuing, and gaming theory.

**999. Research**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**MARKETING AND  
TRANSPORTATION  
ADMINISTRATION MTA**

**College of Business**

**292. Selected Topics**

Fall, Winter, Spring. 3(3-0) or 4(4-0) May re-enroll for a maximum of 8 credits when a different topic is taken.

Selected subject matter of current interest in marketing: social, institutional, and managerial, etc., topics. Subject varies by terms.

**300. Marketing Management in Business and Society I**

Fall, Winter, Spring, Summer. 4(4-0) EC 200.

Firm and consumer roles in the exchange system for goods and services. Competitive analysis of market structures and marketing management. Fitting product-service offerings to various customer group needs.

**301. Marketing Management in Business and Society II**

Fall, Winter, Spring, Summer. 4(4-0) 300.

Development of distribution, communication and pricing policies. Integration of product, distribution, communication and price policies into a marketing plan. Emphasis on financial aspects of marketing and impact on society.

**311. Personal Selling**

Fall, Winter, Spring, Summer. 3(3-0)

Theories, principles, methods and techniques of personal selling with application to different buyer-seller situations. Development of interpersonal communication skill. Career opportunities in selling.

**313. Sales Management**

Fall, Winter, Spring, Summer. 4(4-0) 300.

Organization and administration of the firm's personal selling. Topics include: recruitment, selection, training, compensation, evaluation, development, and motivation of salesmen; market assessment, territory alignment, and quotas; segmental analysis and budgeting.

**316. Fundamentals of Statistical Inference**

Fall, Winter, Spring, Summer. 4(5-0)

STT 315. Primarily for students in the College of Business. Interdepartmental with and administered by the Statistics and Probability Department.

Description of sample data, applications of probability theory, sampling, estimation, tests of hypotheses.

**317. Quantitative Business Research Methods**

Fall, Winter, Spring, Summer. 4(3-2)

316. Interdepartmental with the Statistics and Probability Department.

Application of statistical techniques to business decision-making. Topics covered include applications of linear regression and correlation, analysis of variance, selected non-parametric tests, time series, and index numbers.

**320. Consumer and Buyer Behavior**

(420.) Fall, Spring, Summer. 4(4-0) 300.

Consumer buyer behavioral characteristics, theories and research methods for marketing and strategies and problem solving. Emphasis on predicting and understanding purchase behavior for best firm/buyer needs match.

**335. Food Processing and Distribution Management**

Winter. 3(3-0) 300 or FSM 200.

Interdepartmental with Food Systems Economics and Management.

Analysis of problems faced in the food processing and distribution system. Includes functional interrelationships, consumer orientation and future development.

**341. Transportation Plans and Policies**

Fall, Spring, Summer. 4(4-0) Juniors.

Policy formulation in logistics, transportation and distribution (LTD) systems. Examination of historical forces and trends, major contemporary demand and supply influences, development of a functional framework, survey of major emerging policies.

**351. Retail Management**

Fall, Winter, Spring, Summer. 4(4-0) 300, AFA 201 or concurrently.

Management methods, locational analysis, store organization, personnel planning, merchandising, buying and pricing techniques and customer service policies for retail firms. Survey of retailing and its role in distribution.

**400H. Honors Work**

Fall, Winter, Spring. 1 to 15 credits. Approval of department.

Investigates models, concepts and research findings of particular significance to effective decision-making in administration of marketing and transportation systems.

**409. Field Studies in Business**  
Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 8 credits. Majors and approval of department. Planned program of independent research or observation, study, and work in selected business firms. Designed to supplement classroom study in such a way as to make maximum contribution to student's total educational experience.

**414. Marketing Research**  
Fall, Winter, Spring, Summer. 5(5-0) 300, 316.  
Research process as an aid to decision-making in marketing managements. Specific attention to the planning of research and gathering analysis and interpretation of data.

**415. International Market Systems**  
Fall, Winter. 4(4-0) Juniors.  
Development of criteria for evaluating foreign markets. Design of international organization and marketing systems. Study of major methods, modes, and strategies of international trade and operations. Applications through reports and case decisions.

**418. Marketing Development and Policies**  
Fall, Winter, Spring. 4(4-0) 301, 414 and at least 3 additional credits of MTA electives.  
Study and integration of major tasks and decisions involved in developing and marketing products. Comprehensive discussion of cases involving different decisions for a variety of products.

**439. Advanced Food Processing and Distribution Management**  
Fall. 3(3-0) 335. Interdepartmental with Food Systems Economics and Management. Managerial principles and techniques applied to food processing and distribution. Emphasizes adjustment to changing social, economic and internal company environment. Student interaction with industry, labor and government representatives. Field trips, special projects.

**445. Management of Logistics Transportation and Distribution Systems**  
Fall, Winter, Spring. 4(4-0) Juniors.  
Micro analysis of private and public enterprise movement systems. Component parts of the movement system, analytical tools used in system planning, implementation and control.

**448. Passenger Transportation Systems**  
Winter. 4(4-0) 300 or HRI 375. Interdepartmental with the School of Hotel, Restaurant and Institutional Management. Composition and objectives of principal passenger travel markets. Analysis of carrier service, pricing and promotional practices and problems, competitive and cooperative relations. Review of major proposals for change and expansion of service systems.

**452. Retail Policies and Problems**  
Spring. 4(4-0) 351.  
Analysis of retail problems with examination of selected current major problem areas. Critical review of budgetary and other controls, standards and techniques used to achieve management objectives.

**IDC. Canadian-American Studies**  
For course description, see Interdisciplinary Courses.

**802. Research Analysis for Marketing Decisions**  
Fall, Spring. 4(4-0)  
Use of research techniques as an aid in marketing decision making. Research process involving research problem definition, hypothesis formulation, data collection, interpretation and presentation. Class projects may be used.

**804. Marketing Concepts and Processes**  
Fall, Winter. 4(4-0)  
The business is considered relative to its external environment. Institutions comprising the marketing system, the principal environmental opportunities and constraints facing the marketing manager, and the major marketing informational, control and coordination devices available to the firm will be studied.

**805. Marketing: Models, Theories and Strategies**  
Fall, Winter, Spring, Summer. 4(4-0) 804.  
Analysis of marketing functions, programming marketing effort, and control and coordination are considered within the context of industrial and consumer demand. Strategic and decision-making aspects of marketing are stressed.

**807. Foundations of Industry**  
Fall, Summer. 3(3-0)  
Functional appraisal of materials foundation of business enterprise, emphasizing allocation, support capacity and essential characteristics of present and future industrial resources as they affect business decisions, opportunities and responsibilities.

**808. Emerging Issues in the Business Environment**  
Winter, Summer. 4(4-0) May re-enroll for a maximum of 12 credits if course content changes. Thirty credits of MBA core program, or approval of department.  
Selected significant current organization, social, political, economic and cultural issues are examined in relation to business policy and decision making. Discussions, readings and research reports. Topics selected may vary from term to term.

**809. Planning Logistics, Transportation, and Distribution Systems**  
Fall, Winter, Summer. 4(4-0)  
Planning and control of the enterprise logistics system and physical distribution operations. Systems approach will emphasize plans appropriate to objectives of the enterprise—private, public, or carrier.

**810. National Transportation Policy and Plans**  
Fall, Winter, Summer. 4(4-0)  
An operational model and theoretical perspective of national policies that are apt to shape the future of the transportation system. Interaction of government, carrier, and user logistics and distribution strategies.

**811. Seminar in Marketing**  
Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 15 credits.

**812. Problems in Logistics, Transportation, and Distribution Systems**  
Spring, Summer. 4(4-0) 810.  
Design, application, and measurement of the cost and service performance of a specific enterprise's logistics system. Includes examination of applicable research concepts, planning models, and control techniques.

**823. Seminar in Retailing**  
Winter. 4(4-0)  
Critical analysis of available generalizations concerning the economic, social, and commercial role of retailing. Special attention to concepts of retail competition and productivity. Emphasis on research in improving retail efficiency.

**824. Marketing Channel Management**  
Winter. 4(4-0) 805.  
Seminar in selected organizational, social, political, economic and cultural issues related to management in marketing channels.

**831. Advanced Food Processing and Distribution Management**  
Fall, Spring. 4(4-0) May re-enroll for a maximum of 8 credits. Approval of department. Interdepartmental with the Department of Agricultural Economics.  
Food industry adjustment to changing social, economic and internal company environment. Managerial principles and techniques applied to food processing and distribution. Student interaction with industry, labor and government representatives.

**841. Management of Logistics, Transportation, and Distribution Systems**  
Spring. 4(4-0) 810.  
A case course on management problems encountered in logistics, transportation, and distribution systems. Merits considered for alternative solutions and implementation strategies in the decision making process.

**851. Market Behavior and Competitive Strategy**  
Fall, Winter, Summer. 5(5-0) 805.  
Industrial and consumer market structure and behavior and their impact upon the firm's competitive operations and actions.

**853. Market Programming**  
Winter, Spring, Summer. 4(4-0) 802 or concurrently, 805; AFA 840.  
Planning processes leading to programming the various elements of market cultivation. Major emphasis is given to the development of a total marketing strategy for the firm. Case analysis.

**854. Problem-Solving Processes in Marketing**  
Fall, Spring. 4(4-0) 853.  
The problem-solving process is approached through the investigation and solution of current marketing problems by research teams.

**855. Market Cost-Revenue Analysis**  
Winter. 4(4-0) One course in accounting and one in marketing. Interdepartmental with the Accounting and Financial Administration Department.  
Analytical tools for use in planning and controlling marketing activities. Emphasis on the determination of factors causing marketing cost differences and the assignment of costs to those factors. Application of tools to determination of expenditure-revenue patterns and market potentials.

**860. International Business**  
Winter, Summer. 4(4-0)  
The economic environment within which the international firm operates is presented. Special emphasis on relating trade and payments theory, regional analysis, and economic development to strategy formulation of the firm. Marketing, financial, and organizational factors are considered.

**862. International Marketing**  
Spring. 4(4-0) 805.

Models for headquarters planning and control of international marketing operations are developed. Social, cultural, institutional, and economic variables are considered in studying marketing operations in foreign environments.

**863. Problems in International Business**

Fall. 4(4-0) 860 or 862 or approval of department.

Examination of strategies and organization for international business. In-depth consideration of headquarters and overseas personnel, marketing, financial, and legal issues.

**890. Special Problems**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**905. Analysis of Business Enterprise Systems**

Fall. 3 credits. 805; MGT 806.

Research concepts and scientific methods for the study of business enterprise systems. The design of research, formulation of hypotheses, concepts of measurements and use of quantitative methods in the study of business systems.

**909. Theory of Transportation—Distribution Systems**

Fall. 4(4-0)

Examines the functions of transportation-distribution systems. Develops the relevant elements of networks, systems, and economic theory with empirical design. Applications to the design evaluation, and control of representative macro and micro systems.

**910A. Advanced Research in Marketing I**

Winter. 4(4-0) Second-year doctoral students in marketing.

Advanced concepts and quantitative methods in the scientific investigation of market phenomena and the tools of market cultivation.

**910B. Advanced Research in Marketing II**

Spring. 5(5-0) 910A.

Continuation of 910A.

**911A. History of Market Thought**

Fall. 4(4-0) May re-enroll for a maximum of 15 credits. 851.

Traces the evolution of marketing institutions, techniques, theories and criticisms. The influence of changing environmental and technological factors on marketing practice and thought. Readings in retrospective and original materials, discussion and research paper.

**911B. Seminar in Macro Marketing**

Winter. 4(4-0) May re-enroll for a maximum of 15 credits. 911A.

Examines the relationships between competition, marketing and corporate and economic growth. Emphasis is given to a functional examination of competition and the central role of innovation in the process.

**912. Research Methodology in Transportation-Distribution Systems**

Winter. 4(4-0) 812, 909.

Research methodology in the design and administration of transportation-distribution systems. Emphasis on technique and methodology for conducting system design studies and evaluation of common implementational problems.

**941. Transportation-Distribution Development Policy**

Spring. 4(4-0) 909, 912.

Applications in theory, principles, and processes developed in MTA 909 and MTA 912 to the design of research processes and reports in significant transport and distribution problems.

**957. Seminar in Micro Marketing**

Spring. 4(4-0) 911A.

Examines the current state of theory concerning the planning and implementation of marketing strategies and programs, and tries to identify where future research is needed and/or will be most useful to marketing and business managers.

**999. Research**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**MATHEMATICS MTH**

**College of Natural Science**

One and one-half years of high school algebra and one year of geometry and a satisfactory score on the placement test are prerequisites for all courses in the Mathematics Department which carry credit.

**081. Elements of Algebra**

Fall, Winter, Spring. 0(3-0) [3(3-0)]†  
Current enrollment in 103.

Fractions, decimals, real number properties, algorithms of arithmetic, simple factoring, parentheses, reciprocals, linear equations, integer exponents, applied problems, coordinate systems, graphing, solving equations by graphing.

**082. Intermediate Algebra**

Fall, Winter, Spring. 0(2-0) [2(2-0)]†  
Current enrollment in 104, one year of high school algebra.

Properties of real numbers, polynomials, factoring, rational functions, exponents, roots and radicals, first and second degree equations, linear inequalities, complex numbers, word problems.

**102. Trigonometry**

Winter, Spring. 3(3-0) 1½ high school units in algebra and satisfactory score on placement test, or 082; 1 high school unit in geometry. Not open to students who have had trigonometry in high school or credit in 109.

Trigonometric functions, identities, related angles, radian measure, graphs, sum and difference formulas, simple trigonometric equations, logarithms, solution of plane triangles, inverse functions.

**103. Elements of Algebra**

Fall, Winter, Spring. 2(2-0) Current enrollment in 081.

Fractions, decimals, real number properties, algorithms of arithmetic, simple factoring, parentheses, reciprocals, linear equations, integer exponents, applied problems, coordinate systems, graphing, solving equations by graphing.

**104. Intermediate Algebra**

Fall, Winter, Spring. 3(3-0) Current enrollment in 082, one year of high school algebra.

Properties of real numbers, polynomials, factoring, rational functions, exponents, roots and radicals, first and second degree equations, linear inequalities, complex numbers, word problems.

†See page A-2 item 3.

**108. College Algebra and Trigonometry I**

Fall, Winter, Spring. 5(5-0) 1½ high school units in algebra and satisfactory score on placement test, or 082; 1 high school unit in geometry. Not open to students with credit in 111.

Number systems; variables; functions and relations; mathematical induction; exponents and radicals; elementary theory of equations; binomial theorem; determinants, matrices and systems of equations.

**109. College Algebra and Trigonometry II**

Fall, Winter, Spring. 5(5-0) 1½ high school units in algebra and superior score on placement test, or 108; 1 high school unit in geometry. Not open to students with credit in 102 or 111.

Continuation of 108 plus trigonometry including definition of circular functions, angular measure, fundamental identities.

**110. Finite Mathematics with Applications**

Fall, Winter, Spring. 5(5-0) 108 or 111.

Elementary combinatorial analysis, binomial theorem, vectors and matrices, convex sets and linear programming, graph theory, applications to theory of games.

**111. College Algebra with Trigonometry**

Fall, Winter, Spring, Summer. 5(5-0) 1½ years of high school algebra, 1 year of high school geometry, satisfactory score in algebra placement examination, trigonometry or 102 or concurrently. Not open to students with credit in 108 or 109.

Sets and equations, simultaneous equations and matrices, vectors, inequalities, functions and relations, inverse functions, elementary theory of equations, trigonometric equations and identities, polar coordinates, parametric equations, straight line analytic geometry.

**112. Calculus and Analytic Geometry I**

Fall, Winter, Spring, Summer. 5(5-0) 109 or 111.

The sequence 112, 113, 214, 215, is an integrated course in calculus and analytic geometry, covering derivatives, curve sketching, definite and indefinite integrals, area volume, transcendental functions, vector analysis, solid geometry, partial differentiation, multiple integrals, infinite series, power series.

**113. Calculus and Analytic Geometry II**

Fall, Winter, Spring, Summer. 5(5-0) 112.

A continuation of 112.

**122. Calculus I**

Fall, Winter, Spring. 5(5-0) 109 or 111; not open to engineers, physical science or mathematics majors or to students with credit in 112.

The first of a two-term course in primarily single variable calculus with an introduction to several variables for students who want only one or two terms of calculus.

**123. Calculus II**

Fall, Winter, Spring. 5(5-0) 122, not open to engineers, physical science or mathematics majors or to students with credit in 113.

The second of a two-term course in primarily single variable calculus with an introduction to several variables for students who want only one or two terms of calculus.