880. **Organization and Control in the Political Economy: Institutions and Theory**
Winter of even-numbered years. 4(4-0) Interdepartmental with and administered by the Department of Economics.
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**
Winter of odd-numbered years. 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**
Fall. 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) MGT 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) MGT 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) MGT 836, STT 423, MTH 228. Interdepartmental with the Department of Statistics and Probability.
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) MGT 836, MTH 334, MTH 426, STT 863. Interdepartmental with the Department of Statistics and Probability.
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) MGT 836, MGT 937. Interdepartmental with the Department of Statistics and Probability.
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. **Doctoral Dissertation 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 reenroll 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, AFA 201 or AFA 330.
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) Juniors, MTA 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) MTA 300.
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) MTA 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. **Fundmentals 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 Department of Statistics and Probability.
Description of sample data, applications of probability theory, sampling, estimation, tests of hypotheses.

317. **Quantitative Business Research Methods**
Fall, Winter, Spring, Summer. 4(5-0) STT 315. Interdepartmental with the Department of Statistics and Probability.
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) MTA 300.
Consumer buyer behavior 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) MTA 300 or FSM 200. Interdepartmental with Food Systems Economics and Management.
Anlysis 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) MTA 300.
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) MTA 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 reenroll 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) MTA 301, MTA 317.

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) MTA 300.

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, Summer. 4(4-0) MTA 301, MTA 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) MTA 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) MTA 300.

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) MTA 300 or HRI 375.

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) MTA 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.

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) MTA 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 of industrial resources as they effect business decisions, opportunities and responsibilities.

808. Emerging Issues in the Business Environment

Winter, Summer. 4(4-0) May reenroll 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. 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. 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 reenroll for a maximum of 15 credits.

812. Problems in Logistics, Transportation, and Distribution Systems

Winter, Spring. 4(4-0) MTA 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

Spring. 4(4-0) MTA 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 reenroll 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, Summer. 4(4-0) MTA 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. 4(4-0) MTA 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) MTA 805.

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) MTA 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 on marketing. Interdepartmental with the Department of Accounting and Financial Administration.

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) MTA 805.

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

863.   Problems in International
Business
Fall. 4(4-0) MTA 860 or MTA 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. MTA 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) MTA 910A.

Continuation of MTA 910A.

911A.   History of Market Thought
Fall. 4(4-0) May reenroll for a maximum of 15 credits. MTA 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 reenroll for a maximum of 15 credits. MTA 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) MTA 812, MTA 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) MTA 909, MTA 912.

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

957.   Seminar in Micro Marketing
Spring. 4(4-0) MTA 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.   Doctoral Dissertation 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 Department of Mathematics which carry credit.

0813.   Elements of Algebra
Fall, Winter, Spring, Summer. 0(3-0) (3(3-0) See page A-2 item 3.) Current enrollment in MTH 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.

0823.   Intermediate Algebra
Fall, Winter, Spring, Summer. 0(2-0) (2(2-0) See page A-2 item 3.) Current enrollment in MTH 104, one year of high school algebra, satisfactory score on placement exam.

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) 1-1/2 high school units in algebra and satsfactory score on placement test, or MTH 082; 1 high school unit in geometry. Not open to students who have had trigonometry in high school or credit in MTH 109.

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

1033.   Elements of Algebra
Fall, Winter, Spring, Summer. 2(2-0) Current enrollment in MTH 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.

1043.   Intermediate Algebra
Fall, Winter, Spring, Summer. 3(3-0) Current enrollment in MTH 082, one year of high school algebra, satisfactory score on placement exam.

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

108.   College Algebra and
Trigonometry I
Fall, Winter, Spring. 5(5-0) 1-1/2 high school units in algebra and satisfactory score on placement test, or MTH 082; 1 high school unit in geometry. Not open to students with credit in MTH 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) 1-1/2 high school units in algebra and superior score on placement test, or MTH 108; 1 high school unit in geometry. Not open to students with credit in MTH 102 or MTH 111.

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

110.   Finite Mathematics with
Applications
Fall, Winter, Spring. 5(5-0) MTH 108 or MTH 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) 1-1/2 years of high school algebra, 1 year of high school geometry, satisfactory score in algebra placement examination, trigonometry or MTH 102 or concurrently. Not open to students with credit in MTH 108 or MTH 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) MTH 109 or MTH 111.

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