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.  

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, queueing, 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). Junior, MTA 900.  
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.

**303. Materials and Logistics Management**  
(MGT 300). Fall, Winter, Spring. 4(4-0). Juniors in the College of Business.  
Selected candidates; master's candidates with approval of the Department of Management.  

**304. Operations Planning and Control**  
(MGT 301). Winter, Spring. 4(4-0). MGT 303 or approval of department. Interdepartmental with and administered by the Department of Management.  
Managing the production system. Product development, process selection, facilities location and layout; staffing; materials, cost and quality control.

**305. Purchasing Management**  
Fall, Winter, Spring. 4(4-0). MGT 303 or approval of department. Interdepartmental with and administered by the Department of Management.  

**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. 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. Fundamentals of Statistical Inference**  
Fall, Winter, Spring. Summer. 4(5-0).  
STT 115 Primary 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**  
(Fall, Winter, Spring. 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.  
Analysis of problems faced in the food processing and distribution system. Includes functional interrelationships, consumer orientation and future development.

**341. Transportation Distribution Systems**  
Fall, Winter, Summer. 4(4-0). MGT 303 or approval of department. Interdepartmental with the Department of Management.  
Application of economic and business principles to transportation and distribution systems. Functional analysis of all major transport modes. Identification of major issues, analysis of alternatives and discussion of probable future outcomes.

**342. Traffic Management**  
Winter, Spring, Summer. 4(4-0). MGT 303 or approval of department. Interdepartmental with the Department of Management.  
Basic practices related to purchasing and operating transportation services for private and public enterprises.

**351. Retail Management**  
Fall, Winter, Spring. 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.

**403. Research and Negotiation for Purchasing Materials and Management**  
Winter. 4(4-0). MGT 303 or approval of department. Interdepartmental with and administered by the Department of Management.  
Applied research and planning focusing on the purchasing and materials management functions in organizations. Preparation for and conducting purchase negotiations. Field research studies. Administration of the research and planning effort.
405. **Operations Management**  
*Topics*  
Spring, 4(4-0) MGT 303 or approval of department. Interdepartmental with and administered by the Department of Management. Consideration of current and controversial questions in operations management. Emphasis on component used in planning, implementing and controlling operations. Analysis of experience in planning research and gathering analysis and interpretation of data.

406. **Retail Policies and Problems**  
Spring, 4(4-0) MTA 35. Analysis of retail problems with examination of selected case with major problem areas. Critical review of budgetary and other controls, standards and techniques used to achieve management objectives.  

407. **Materials and Logistics**  
*Policy*  
Winter, Spring, 4(4-0) MGT 303 plus 12 credits in MLM Program. Interdepartmental with the Department of Management. Analysis of comprehensive cases incorporating topics covered in the entire materials and logistics management program.

409. **Field Studies in Business**  
Fall, Winter, Spring, Summer. Variable credits. 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.

410. **Marketing Research**  
Fall, Winter, Spring, Summer. 5(5-0)  
MGT 301, MTA 317  
Research process as an aid to decision making in marketing management. Specific attention to the planning of research and gathering analysis and interpretation of data.

411. **International Marketing**  
Fall, Winter, Spring, Summer. 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.

412. **Marketing Development and Policies**  
Fall, Winter, Spring, Summer. 4(4-0) MTA 314 and at least 3 additional credits in MTA electives. Study and integration of major tasks and decisions involving developing and marketing products. Comprehensive discussion of cases involving different decisions for a variety of products.

413. **Advanced Food Processing and Distribution Management**  
Fall, Winter, Spring, Summer. 4(4-0) 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 international environment. Student participation in industry, labor and government representatives. Field trips, special projects.

414. **Physical Distribution Management**  
Fall, Winter, Spring, 4(4-0) MGT 303 or approval of department. Interdepartmental with the Department of Management. Micro analysis of private and public physical distribution systems. Emphasis on component parts of the movement system; analytical tools used in planning, implementing and controlling the system.

415. **Materials and Logistics**  
*Policy*  
Winter, Spring, 4(4-0) MGT 303 plus 12 credits in MLM Program. Interdepartmental with the Department of Management. Analysis of comprehensive cases incorporating topics covered in the entire materials and logistics management program.

416. **Managerial Concepts and Processes**  
Fall, Winter, Spring, Summer. 4(4-0) MTA 304. 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.

417. **Marketing Concepts and Processes**  
Fall, Winter, Spring, Summer. 4(4-0) MTA 304. 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.

418. **Marketing: Models, Theories and Strategies**  
Fall, Winter, Spring, Summer. 4(4-0) MTA 304. 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.

419. **Emerging Issues in the Business Environment**  
Winter, Summer, 4(4-0) or approval of department. Interdepartmental with and administered by the Department of Management. Analysis of retail problems with examination of selected case with major problem areas. Critical review of budgetary and other controls, standards and techniques used to achieve management objectives.  

420. **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.

421. **Purchasing Administration**  
Winter, Spring, 4(4-0) MGT 800 Interdepartmental with and administered by the Department of Management. Purchasing objectives, responsibilities, policies and organization. Source selection, evaluation and development of vendors. Purchase planning and evaluation.

422. **Production and Inventory Management**  
Winter, Spring, 4(4-0) MGT 800 Interdepartmental with and administered by the Department of Management. Analysis of decision-making aspects of marketing are stressed.

423. **Distribution Management**  
Winter, Spring, 4(4-0) MGT 800 Interdepartmental with and administered by the Department of Management. Analysis of decision-making aspects of marketing are stressed.

424. **Interdepartmental with the Department of Management**  
*Interdepartmental with the Department of Management*  
Analysis of comprehensive cases incorporating topics covered in the entire materials and logistics management program.

425. **Emerging Issues in the Business Environment**  
Winter, Summer, 4(4-0) or approval of department. Interdepartmental with and administered by the Department of Management. Analysis of retail problems with examination of selected case with major problem areas. Critical review of budgetary and other controls, standards and techniques used to achieve management objectives.  

426. **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.

427. **Purchasing Administration**  
Winter, Spring, 4(4-0) MGT 800 Interdepartmental with and administered by the Department of Management. Purchasing objectives, responsibilities, policies and organization. Source selection, evaluation and development of vendors. Purchase planning and evaluation.

428. **Production and Inventory Management**  
Winter, Spring, 4(4-0) MGT 800 Interdepartmental with and administered by the Department of Management. Analysis of decision-making aspects of marketing are stressed.

429. **Interdepartmental with the Department of Management**  
*Interdepartmental with the Department of Management*  
Analysis of comprehensive cases incorporating topics covered in the entire materials and logistics management program.
834. 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. Food Marketing Management
Fall, Spring 4(4-0) May reenroll for a maximum of 8 credits. 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. Materials and Logistics Management Policy
Spring, Summer 4(4-0) MGT 805 plus 30 credits in the MBA Program. Interdepartmental with the Department of Management. Case course that integrates the materials and logistics management program. Emphasis on problem recognition, applying course materials and preparation of plans that improve total system performance.

831. 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.

843. 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, Summer 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, Spring 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 economic 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 credits. 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 measurement, and 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 4(4-0) MTA 910A. Continuation of MTA 910A.

911A. History of Market Thought
Fall 4(4-0) May reenroll for a maximum of 15 credits. MTA 853. 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) MTA 853. 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 809. 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 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) 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 credits. Approval of department.

MATHEMATICS

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 (1-3-0) 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. Approved through Spring 1982.

0823. Intermediate Algebra

102. Trigonometry
Winter, Spring. 3(3-0) 1-1/2 high school units in algebra and satisfactory score on placement test, or MTH 102; 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, circular 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 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. Approved through Spring 1982.