880. Organization and Control in the Political Economy: Institutions and Theory
Winter of even-numbered years. 4(4-0)
Intermediate with and administered by the Department of Economics.
Organization and technique in choice and implementation of economic, (especially planning, programming) functions of political authority.

906. Behavioral Research: Organization
Fall. 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. Seminar in Organizational Behavior
Fall. 4(4-0) MGT 806.
Directed reading on the behavior of individuals within business organizations. Theory and research in motivation, leadership, and group dynamics are covered.

911. Seminar in Personnel Research
Spring, 4(4-0) MGT 810; doctoral candidates, master's candidates with approval of department. Directed research and research on issues in contemporary personnel administration theory and practice.

945. Mathematical Programming for Business
Spring of even-numbered years. 4(4-0)
MGT 885. Intermediate with the Department of Statistics and Probability.
Large mathematical programs with special structure. Duality and decomposition. Dynamic programming; multistage decision processes and the principle of optimality. Integer programming.

949. Advanced Applied Stochastic Processes
Spring of odd-numbered years. 4(4-0) MGT 886. Intermediate 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 gambling theory.

999. Doctoral Dissertation Research
Fall, Winter, Spring. Summer. Variable credit. Approval of department.
801. **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.

802. **Transportation Policy and Plans**  
Fall, Winter, Spring, Summer. 4(4-0) MGA 800.  
Future of the transportation system. Interaction distribution strategies. An operational model and theoretical distribution with the Department of Planning.

803. **Causes of Marketing Failure**  
Fall, Winter, Spring, Summer. 3(3-0) MGT 805; 4(4-0) MGT 806.  
Selected significant current organization, social, political, economic and cultural issues are examined in relation to marketing failures and decision making. Discussion, readings and research reports. Topics selected may vary from term to term.

804. **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.

805. **Materials Forecasting**  
(MGT 802) Fall, Spring, 4(4-0) MGT 800 plus 30 credits of MBA core program, or approval of department.  
Analysis of supply and demand trends. Analytical forecasts of national and international materials and purchasing market. Influence of national and international materials on policies, strategies and behavior.

806. **Transportation Policy and Plans**  
Fall, Winter, Spring, Summer. 4(4-0) MGT 800.  
Future of the transportation system. Interaction distribution strategies. An operational model and theoretical distribution with the Department of Planning.

807. **Transportation Distribution Strategies**  
Fall, Winter, Spring, Summer. 4(4-0) MGT 800.  
Transportation and physical distribution system. Emphasis on detailed examination of component parts of the movement storage system.

808. **Emerging Issues in the Business Environment**  
Winter, Summer. 4(4-0) May enroll for a maximum of 12 credits of 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. Discussion, readings and research reports. Topics selected may vary from term to term.

809. **Transportation Distribution Strategies**  
Fall, Winter, Spring, Summer. 4(4-0) MGT 800.  
Transportation and physical distribution system. Emphasis on detailed examination of component parts of the movement storage system.

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

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

812. **Systems Design Modeling**  
Spring, 4(4-0) MGT 800.  
Systems design with the Department of Management.  
Research procedure and planning models for design of the firm's logistical system. Emphasis on situational analysis, research methodology, data analysis, analytical techniques and implementation.

813. **Materials and Logistics Management Policy**  
Spring, Summer. 4(4-0) MGT 800 plus 30 credits of MBA Program, or approval of department.  
Case course that integrates the materials and logistics management. Emphasis on problems of determining, applying course materials and preparation of plans that improve total system performance.

814. **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.

815. **Problem-Solving Processes in Marketing**  
Fall, Spring, 4(4-0) MTA 852.  
The problem-solving process is approached through the investigation and solution of current marketing problems by research teams.
911A. History of Market Thought
Fall, 4(4-0) May reenroll for a maximum of 15 credits. MTH 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. MTH 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) MTH 912, MTH 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) MTH 909, MTH 912.
Application of theory, principles and processes developed in MTH 909 and MTH 912 to the design of research processes and reports in significant transport and distribution problems.

957. Seminar in Micro Marketing
Spring. 4(4-0) MTH 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.

MATHMATICS 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.

0823. Intermediate Algebra
Fall, Winter, Spring, Summer. 0(2-0) [2(2-0) See page A-1 item 3.] Current enrollment in MTH 1043, 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. Approved through Spring 1982.

1063. Elements of Algebra
Fall, Winter, Spring, Summer. 2(2-0) Current enrollment in MTH 8013.
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.

1043. Intermediate Algebra
Fall, Winter, Summer. 3(3-0) Current enrollment in MTH 8023, 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. Approved through Spring 1982.

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 0823; 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 satisfactory 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. 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. 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, transcendental functions, vector analysis, solid geometry, partial differentiation, multiple integrals, infinite series, power series.

113. Calculus and Analytic Geometry II
Fall, Winter, Spring. 5(5-0) MTH 112.
A continuation of MTH 112.

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

190. Freshman Mathematics Seminar
Fall, Winter. 3(3-0) Freshmen Mathematics majors; prior or concurrent calculus enrollment.
Intended to introduce mathematics majors to the type of mathematical reasoning and subject matter they can expect to encounter in advanced mathematics courses. Specific content will vary.

201. Mathematical Foundations for Elementary School Teachers
Fall, Winter, Spring. 4(4-0) 1-1/2 high school units in algebra and satisfactory score on placement test, or MTH 0823-1043; 1 high school unit in geometry. Open only to elementary education majors.
Fundamental concepts and processes of mathematics for prospective elementary school teachers.

202. Foundations of Algebra
Fall, Winter, Spring. 4(4-0) MTH 201; elementary education majors.
Fundamental concepts of algebra for elementary school teachers.

203. Foundations of Geometry
Spring. 4(4-0) MTH 201; elementary education majors.
Fundamental concepts of geometry for prospective elementary school teachers.

214. Calculus and Analytic Geometry III
Fall, Winter, Spring. 5(5-0) MTH 113.
Continuation of MTH 113.

215. Calculus and Analytic Geometry IV
Fall, Winter, Spring. 4(4-0) MTH 214.
Continuation of MTH 214.