807. *Administrative Policy*

Fall, Winter, Spring, Summer. 4(4-0) 806; EC 860; AFA 840; MTA 802.

Application of administrative theory and observational and analytic techniques to actual business situations through the use of cases. Analysis, decisions, formulation of plans for action. Cases viewed from standpoint of general management.

808. *Seminar in Management, Organization, and Administration*

Fall, Winter, Spring, Summer. 4(4-0) May re-enroll for a maximum of 12 credits.

Philosophy, practice, research, and current problems in management, organization, and administration. Historical and current literature, lectures, discussion, individual research, cases and plant visits are methods of study used in various terms.

HISTORY OF MANAGEMENT THOUGHT. *Fall.*

Development of management concepts as evidenced in the writings of major contributors. Environment factors and relation of early ideas to current thought.

CONTEMPORARY ISSUES IN ADMINISTRATION. *Spring.*

Recent and current developments in the administration of business enterprises. Examination of theory and practice.

ORGANIZATION THEORY. *Winter, Summer.*

Critical and comparative consideration of organization theory with special reference to industrial organizations. Problems of organization structure and administrative practice in the management of business concerns are analyzed in the light of objectives, environment, and current theories.

810. *Personnel Management*

Fall, Winter, Summer. 4(4-0) 806.

Principles and methods of recruiting, selecting, training, evaluating, motivating, and rewarding personnel. Fringe benefits, retirement, absenteeism, and other employee benefit problems.

811. *Advanced Problems in Personnel Management*

Spring, Summer. 4(4-0) May re-enroll for a maximum of 8 credits. 810.

Advanced studies in selected administrative and technical policies and practices in employee relations, with individual and group project work and research.

812. *Manpower Measurement and Management*

(804.) Spring of even-numbered years. 4(4-0) 801 or approval of department.

Emphasis on utilization of manpower as a factor of production. Manpower is viewed as a productive resource to be measured, programmed and controlled in routine and non-routine work.

815. *Linear Programming in Management*

Fall, Spring. 4(4-0) MTA 802.

Theory, formulation and application of the general linear, transportation and integer programming models.

816. *Simulation of Production Systems*

Winter, Summer. 4(4-0) MTA 802.

Use of digital computer for management decisions. Development of skills in computer programming and use of simulation models to study behavior and design of systems.

818. *Supervisory and Executive Development*

Fall, Spring, Summer. 4(4-0) 806 or 808.

Theory and research of developmental stages of executive careers. Special emphasis on: impact of organization on executive potentiality; forces influencing development of executive skills and abilities; studies of antecedents of executive role performance; role of training programs.

820. *Quality and Reliability*

Fall of odd-numbered years. 4(4-0) MTA 802.

Specification of reliability and quality criteria; methods of evaluation and control; particular emphasis on cost minimization models.

821. *Production Control*

Winter. 4(4-0) 801.

Planning and control of production operations. Inventory management, production and work force smoothing, job shop scheduling and project scheduling.

822. *Manufacturing Strategy and Policy*

Spring. 4(4-0) Approval of department.

Major production operations and policy decisions in the total business strategy of the firm. Viewpoint of top administrator responsible for production.

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.

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 credits. 906.

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.

910. *Topics in Operations Research*

Spring. 4(4-0) 815.

Advanced mathematical and computational theory and methods in operations research. Emphasis on the formulation of problems and interpretation of results.

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.

999. *Research*

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

MARKETING AND TRANSPORTATION ADMINISTRATION MTA

College of Business

300. *Consumption and Marketing Organization*

Fall, Winter, Spring, Summer. 4(2-2) EC 200.

Adjustment of the firm to its market environment with emphasis on competitive strategy. Assessment of market forces and opportunities with reference to social, political, economic and technological forces affecting distribution methods and institutions. Structural organization of marketing system-functions involved in effective market performance. Small group problems involving analysis of costs and efficiency.

301. *Management of Marketing Effort*

Fall, Winter, Spring. 4(2-2) 300.

Market management in relation to total enterprise. Problems, analytical tools and approaches to decisions concerning allocation of funds to various means of market cultivation. Development of promotional strategy, price policy and management of field selling effort. Particular attention to role of marketing research, forecasting, budgets, organization arrangements and control techniques. Use of cases in small groups.

311. *Principles of Selling*

Fall, Winter, Spring, Summer. 3(2-1)

Nature of personal selling and its requirements. Functional relationships of selling in marketing mix. Buyer motivations and selling theories, with application to various buyer-seller situations.

313. *Sales Management*

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

Techniques and policies in the administration of the personal sales organization with respect to the marketing strategies involved. Emphasis on the sales management problems of manufacturers.

316. *Fundamentals of Statistical Inference*

Fall, Winter, Spring, Summer. 4(3-2) STT 121. 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) STT 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.

341. Transport Requirements and Programming

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

Transportation and distribution systems are presented as functional entities capable of introducing change into the economic system and capable of reacting to change in other segments of the economy. Subject matter includes regional economic growth, inter-regional trade, macro-location theory, transportation and distribution system alternatives, regional transportation policy.

351. Retail Administration

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

Survey of retailing and its role in distribution. Management policy areas studied include administrative organization, locational decisions, buying, pricing, merchandising, sales promotion, personnel and over-all planning and coordination in retailing firms. Analysis of illustrative cases.

400H. Honors Work

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.

435. Food Merchandising

Fall. 4(4-0) 300, Seniors or approval of department.

Critical examination of the food production-distribution system as a whole; functional relationships performed by various institutions such as manufacturers, brokers, wholesalers, voluntaries, cooperatives, retailers. Analysis of costs, strategies and techniques to facilitate consumer buying.

437. Food Marketing Administration

Spring. 4(4-0) 435 or approval of department.

Policy, organization and personnel structures for food firms, including objectives for corporate structures suitable for large and small firms, merger policies, product line policies, union-management issues, executive development, community and public relations.

439. Special Problems in Food Distribution

Fall, Winter, Spring. 3 credits. May re-enroll for a maximum of 9 credits.

Further study and investigation of current problems within the food industry.

445. Physical Distribution Analysis

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

Analysis of the logistics of distribution systems for firms engaged in marketing and manufacturing. Component parts of each system are studied and analytical tools are presented for selecting those alternatives which will attain the distribution goals of the firm.

447. Passenger Transportation Systems

Spring. 4(4-0)

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

Fall, Spring. 4(4-0) 351.

Analysis of retail problems with intensive examination of selected current major problem areas. Critical review of controls and techniques used to achieve management objectives. Cases, readings and field work.

476. Canadian-American Studies

For course description, see Interdisciplinary Courses.

802. Administrative Research Methods

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

Research process, methods and techniques as a basis for business planning and problem solving. Covered are scientific methodology and problem solving, selected models and model building, selected statistical decision techniques and computer applications.

805. Administration: Theory and Action I

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

Administrative action is considered from the viewpoint of the interaction of the enterprise with its external environment, especially in the market place. Corporate objectives and policies are analyzed in terms of their impact on the adjustment of the business to competitive and regulatory pressures.

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. Frontiers of Business

Winter, Summer. 3(3-0)

Knowledge of administration and research skills will be focused on current and projected developments of important significance to business management. Emphasis on the ways such developments reverberate through a firm or enterprise system.

810. Transportation and Distribution Systems

Fall, Winter. 4(4-0)

Provides a functional knowledge of transportation and distribution systems. Areas covered include: the geography of marketing, the comparative basis for trade, transportation costs and trade restrictions, functional analysis of carriers, sources of flow data, introduction to distribution systems, and the emerging programs of national policy.

811. Seminar in Marketing

Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 15 credits.

812. Analysis of Logistical and Distribution Systems

Winter. 4(4-0)

Specific tools are developed for the individual firm in analyzing spatial arrangements of markets, plant and warehouse location, inventory systems, selection of carrier alternatives and selection of physical movement channels.

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.

831. Seminar in Food Distribution

Fall, Winter, Spring. Variable credit. May re-enroll for a maximum of 12 credits. Approval of Director of Food Marketing Management program. Primarily for Food Marketing Management majors.

Problems and policies related to food marketing management; study of techniques of management and control in this marketing area.

841. Management of Transportation and Distribution Systems

Spring. 4(4-0)

Integrative course drawing heavily on the content of 810 and 812, bringing them to a decisive focus on the logistics of macrodistribution and microdistribution systems. Cases are used to illustrate the principles and develop a relevant context.

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 were developed for use by executives in planning and controlling marketing activities. Emphasis is on the ascertainment of factors causing marketing cost differences and the assignment of costs to those factors. Application of the tools are utilized by the determination of expenditure revenue patterns.

859. International Marketing
Fall. 4(4-0)

Presents an analytic framework for studying the development of marketing systems in the context of overall economic growth. Emphasis given to competitive marketing systems and the structure and operation of regional Common Market arrangements.

860. International Business
Winter, Summer. 4(4-0)

Case examination of United States business overseas organization and operations including administration in foreign settings, overseas personnel, marketing, financial and legal problems in conducting international business.

861. Seminar in International Business
Spring. 3(3-0)

Individual papers concerning international business problems with emphasis on administrative problems under conditions of cross cultural operations.

890. Special Problems
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

905. Administration: Analysis of Business Enterprise Systems
Fall, Summer. 3 credits. 805; MGT 806.

Concepts and methods in the study of the development, functioning, and survival of business enterprise systems. Attention is directed to the elements of enterprise systems, the interaction of the elements, problems of equilibrium and growth, and strategies of business enterprise.

910. Advanced Research in Marketing
Winter. 4(4-0)

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

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

921. Advanced Sampling and Estimation Techniques in Business Administration
Spring. 5(5-0)

Research design, estimation and decision criteria including Bayesian estimators, small sampling, stratified sampling, random and non-random sampling, information theory, powers of tests.

957. Dynamics in Marketing Theory
(857.) Spring, Summer. Variable credit. May re-enroll for a maximum of 6 credits.

Specific subject areas are selected for study where basic theoretical issues are at stake and where marketing thought is currently the most dynamic.

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.

082. Beginning Algebra II
Fall, Winter, Spring. 0(4-0) [4(4-0)]†. One year of high school algebra.

102. Trigonometry
Fall, 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.

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 or 120.

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.

111. College Algebra
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 or 120.

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 I with Analytic Geometry
Fall, Winter, Spring, Summer. 5(5-0) 109 or 111.

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

113. Calculus II with Analytic Geometry
Fall, Winter, Spring, Summer. 5(5-0) 112.

A continuation of 112.

190. Freshman Mathematics Seminar
Winter, Spring. 3(3-0) Freshman; 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. Foundations of Arithmetic
Fall, Winter, Spring, Summer. 4(4-0) Open only to elementary education majors.

Fundamental concepts and structure of arithmetic for prospective elementary school teachers.

†See page A-2 item 3

202. Foundations of Algebra
Fall, Winter, Spring. 4(4-0) 201; elementary education majors.

Fundamental concepts of algebra for elementary school teachers including properties of real numbers, equations, and inequalities, modular arithmetic, complex numbers, polynomials, algebraic structures, functions.

203. Foundations of Geometry
Spring. 4(4-0) 201; elementary education majors.

Fundamental concepts of geometry for prospective elementary school teachers.

214. Calculus III with Vectors
Fall, Winter, Spring, Summer. 5(5-0) 113.

Continuation of 113.

215. Calculus IV with Differential Equations
Fall, Winter, Spring, Summer. 5(5-0) 214.

Continuation of 214.

216. Mathematics of Finance
Winter. 3(3-0) 108 or 111.

Mathematical theory of interest with application to such topics as ordinary, due, and deferred annuities, amortization of debts; depreciation; capitalized cost; purchase price of bonds.

227. Calculus for Social Scientists
Fall. 4(4-0) Graduate standing; 1½ years of high school algebra or high placement score; 1 year of high school geometry. Not open to students who have credit for calculus.

The sequence 227, 228 intended for social science graduate students is mainly calculus. Course 227 includes pre-calculus, differentiation and integration of elementary functions, applications.

228. Calculus for Social Scientists
Winter. 4(4-0) 227.

Mean value theorems, approximate integration, infinite series, Taylor series, partial derivatives, double and triple integration, and applications.

301. Foundations of Mathematics
Fall, Winter, Spring. 3(3-0) Approval of department.

Fundamental ideas underlying elementary mathematics. Basic set theory, relations, functions, mathematical induction, meaning of mathematical proof and the axiomatic method illustrated by examples from algebra, geometry and analysis.

309. Theory of Equations
Fall, Winter, Spring, Summer. 4(4-0) 113 or approval of department.

Desirable for those preparing to teach mathematics in high schools. Mathematical induction, complex numbers, theorems in roots of polynomial equations, cyclotomic equations, ruler and compass constructions, solution of cubic and quartic equations, approximation to roots, theory of determinants, an introduction to matrices and some history of the theory of equations.

315. Concepts of Geometry I
Fall, Winter, Spring. 3(3-0) 215 or 301 or approval of department.

Axiomatic structure of geometries including Euclidean, the classical non-Euclidean and projective geometries. Coordinate systems and geometric transformations.

316. Concepts of Geometry II
Winter, Spring. 3(3-0) 315.

Continuation of 315