

The Wesley J. Howe School of Technology Management - V

UNDERGRADUATE COURSES

BT 101 Introduction to Business Planning and Field Study

(3-0-3)

During this first-year course, students gain a fundamental understanding of how businesses are organized, key functions within a company and how companies operate, using a Business Plan model as the teaching tool. Students start their exposure to a group of companies to assist them in determining what company, product or service they will choose for their Business Plan.

BT 102 Diagnosing Internal Capabilities of a Company

(3-0-3)

During this first-year course, students develop skills in conducting an in-depth internal analysis of a company, to include the type of questions and information needed for a situational diagnosis of a company's product or service, R&D efforts, operations, organization and management, and financial capabilities. Students continue their in-depth analysis of three selected companies, using the research and analysis learned in this course and BT 101. Prerequisite: BT 101.

BT 113 Marketing

(3-0-3)

The purpose of this course is to provide the conceptual frameworks and decision-making tools required for success in both technology-based and non-technology-based markets: the student learns to define and select specific customer segments; to monitor the business environment for both opportunities and threats, with particular attention to the ever-changing technological and global context, and to develop marketing strategies for serving each targeted customer segment profitably. Although this course introduces the student to the basic theory and analytical methods characterizing modern marketing practice, there is an emphasis on both the marketing of technology products/services as well as the impact of technology on the general practice of marketing. Students are required to present both a detailed marketing plan and several rigorous case analyses.

BT 115 Financial Accounting

(4-0-4)

This course deals with the methods and principles of financial accounting. It focuses on the recording and measurement of the business activities and the preparation of financial reports. The emphasis is on summarizing activities for persons external to the business. Topics include: financial statements, principles of accrual accounting, the measurement and reporting of detailed balance sheet items and the analysis of financial reports.

**BT 121 IT and Applications: Introduction to eTechnology
(3-0-3)**

The recent developments in Information Technology (IT) and e-business have brought dramatic changes in the way companies operate, compete and conduct business. During this course, students are introduced to the organizational structure of e-business and are provided with a solid theoretical foundation for understanding applications from a managerial orientation. The focus is on how new technology is conducted and managed, in addition to its opportunities, limitations, issues and risks. The goals for the course are to encourage students to develop skills in two areas: IT fundamentals and business applications. Specific topics include: architecture of IT, e-business and the Internet, future trends in IT and understanding business applications as they relate to IT. This course requires in-class use of a laptop computer in the current Stevens configuration with Stevens wireless and TCP/IP access.

**BT 131 Technogenesis: Introduction to Innovation and Creativity
(3-0-3)**

This course introduces students to innovation and creativity. Included are techniques to stimulate creativity in groups and individuals. The course utilizes individual and team projects to develop an intrinsic understanding of the environment, humans' interactions with it and innovations to improve that interaction. Students report the results of their innovation efforts through written and oral presentations. This course is open only to Business and Technology majors.

**BT 201 Diagnosing and Measuring Customer Satisfaction
(3-0-3)**

During this second-year course, students learn how to perform an external customer analysis on a company they have selected. Students will present their findings at the end of the semester, summarizing their customer satisfaction analysis. Students gain an understanding and appreciation of the issues that must be addressed to initiate a Customer Satisfaction Measurement (CSM) program, the issues involved in the development and implementation of CSM and, finally, managerial considerations involved in CSM. Topics include: customer satisfaction, "Customer Value Model" and collecting and analyzing demographic and psychographic data. Prerequisites: BT 101, BT 102.

**BT 202 Diagnosing the External Environment
(3-0-3)**

Students continue to build upon the market research and situational analysis techniques from prior courses by evaluating the external factors that can significantly impact a company's performance. Topics include: identifying key market-related forces and their impact on the company's marketing strategy; the impact of technological and socioeconomic developments; analyzing and understanding the impact of economic development on a company's financial strategy; and understanding the impact of legislative and regulatory actions. Students complete an externally-focused analysis of a company's operations and use the results of the analysis to identify threats and opportunities related to that company's performance. Prerequisites: BT 101, BT 102 and BT 201.

**BT 214 Market Research
(3-0-3)**

This course exposes students to the entire marketing research process, from the

problem formulation stage (at the very beginning) to the research findings report (at the very end). This objective is achieved in two ways: in the classroom and in the field, where students are required to work closely with an actual business client on a marketing research project concerning an actual product or service. (The instructor assists the students in securing a business client.) During the course, the topics covered include the marketing research process and problem formulation, research design, primary data collection, data collection forms, attitude measurement, sampling procedures, sample size, collecting the data, data analysis, interpretation of results and the final research report. The course builds heavily on the statistical foundation laid down during BT 221 Statistics. A statistical package (SPSS) is used during the analysis stage of the research process. Prerequisites: BT 113, BT 221.

**BT 215 Cost Accounting
(3-0-3)**

This course deals with the methods and principles of managerial accounting. It is concerned with the use of accounting data by individuals within a business in order to enhance managerial decision-making and control. Topics covered include cost estimation and management, cost accounting systems, cost allocation, decision analysis, budgets, variances and responsibility accounting. Prerequisite: BT 115.

**BT 221 Statistics
(3-0-3)**

This course provides students with an understanding of the use of statistical methods as applied to business problems, in general, and to marketing research applications in particular. Topics include: descriptive statistics; probability theory, discrete and continuous probability distributions; sampling theory and sampling distributions; interval estimation; hypothesis testing; statistical inference about means, proportions and variances; tests of goodness-of-fit and independence; analysis of variance and experimental design; simple and multiple regression; correlation analysis. This course has been developed with particular attention to the specific statistical foundation required by students enrolling in BT 214 Marketing Research the next term. A statistical package (SPSS) is used throughout the term.

**BT 223 Applied Models & Simulation
(3-0-3)**

This course covers contemporary decision support models of simulation and forecasting for business activity. Students learn how to identify and conceptualize stochastic problems, choose the appropriate methods, collect and process the data (data mining) and create stochastic simulations. Analytical methodologies are based on statistical simulation, operations research optimization and statistical forecasting. Computer simulations are performed on PCs equipped with a user-friendly graphical interface with multimedia reports generation for visualization. Students conduct business game simulations for group decision support. EM 345 may be taken as an alternative. This course requires in-class use of a laptop computer in the current Stevens configuration with Stevens wireless and TCP/IP access. Prerequisites: Ma 117 and BT 121.

**BT 224 Science and Technology: Electricity, Magnetism and Optics
(3-0-3)**

This is the second in the four-course science and technology sequence for the business and technology program students. It is designed to provide students with an overview of modern science and technologies, as well as scientific and

engineering methodologies. This course focuses on electricity and magnetism including electromagnetic waves and optical phenomena and technologies. Prerequisites: Ma 117, PEP 111.

**BT 301 Goal Setting and Sales and Revenue Plan Development
(3-0-3)**

Students learn how to set preliminary goals, objectives and strategies. They begin to develop the specific aspects of their business plan including an actual sales/revenue plan. Topics covered also include preparing an R&D plan and the use of historical information to prepare sales, revenues and marketing expense estimates. Students work independently and in class; individually and in teams. Prerequisites: BT 101, BT 102, BT 201 and BT 202.

**BT 302 Preparing the Planning Document
(3-0-3)**

This course covers the basic managerial components of planning, organizing, influencing and controlling with selected study and discussion of important and sometimes controversial topics including global management, social and ethical responsibility, human resources, change, leadership and communication. By term-end, students are expected to complete the 'Managerial' portion of their Business Plan. Prerequisites: BT 101, BT 102, BT 201, BT 202 and BT 301.

**BT 321 Corporate Finance
(3-0-3)**

This course covers capital budgeting, capital structure, dividend policy, mergers and acquisitions and aspects of international finance. The impact of and techniques for web-based finance are also covered. Prerequisites: BT 115, Ma 117, BT 221 and EM 350.

**BT 334 Science and Technology: Introduction to Chemistry and Materials
(3-0-3)**

The course is the third in a four-course sequence, for the business and technology program students, designed to provide students with an overview of modern sciences and technologies as well as scientific and engineering methodologies. This course presents an introduction to chemistry, functional and structural materials and modern physics. Prerequisites: BT 224.

**BT 352 Managing Innovation and Technology
(2-0-2)**

This course will introduce the student to the basic principles of managing technology and innovation in the corporate environment and the critical role technology plays as a strategic resource to achieve an organization's business objectives. Topics will include the evolution of technology and the technology lifecycle, understanding technological innovation in industry and organizational contexts, intellectual property and the new product/service development process. Prerequisite: BT 224. Corequisite: BT 334.

**BT 401 Implementation, Controlling and Capital Acquisition
(3-0-3)**

Students learn how to use their business plan, deal with problems encountered, update and get funding. They are exposed to the issues of law, ethics and negotiation as applied to business implementation. Students are required to make

their first full-plan presentation to peers and faculty. Topics include type of capital and alternative sources, venture capital and building the organizational infrastructure for plan support. Prerequisites: BT 101, BT 102, BT 201, BT 202, BT 301 and BT 302.

BT 402 Plan Perfection and Presentation

(3-0-3)

Students see the culmination of their efforts in this final semester. They make their presentation; it is evaluated by industry and venture leaders. Prerequisites: BT 101, BT 102, BT 201, BT 202, BT 301, BT 302 and BT 401.

BT 403 Marketing Strategy and Decision Making

(3-0-3)

This elective course provides students the opportunity to draw together and build upon the marketing and business knowledge acquired in prior courses. Students are challenged to apply and extend this knowledge in a variety of marketing opportunities, forecasting, test market interpretation, product management, pricing decisions, development of the marketing communication mix and sales force management. Cases are extensively used. Prerequisites: BT 113, BT 214.

BT 411/412 Business Consulting in Engineering I and II

(0-6-2)

Students are required to join senior engineering project teams and contribute to the project in terms of helping the group develop a business plan for its design product.

BT 413 Business Law, Ethics and Negotiations

(3-0-3)

This course covers the fundamentals of contract law, aspects of environmental regulations, lobbying, ethics and the law and negotiating techniques. Specific discussion includes the legal and ethical aspects of the new web-based economies and businesses internationally.

BT 414 eTechnology Infrastructure*

(3-0-3)

This course introduces students to the managerial analysis and application of network and software applications necessary to develop, maintain and enhance a business presence in the electronic marketplace. This course builds upon previous courses in Information Technology, including network and software applications from a management and implementation perspective, and introduces advanced concepts in these areas. This course requires in-class use of a laptop computer in the current Stevens configuration with Stevens wireless and TCP/IP access. Prerequisites: CS 115, BT 121 and EM 350.

* BT 421 can be substituted for BT 414.

BT 415 Entrepreneurship

(3-0-3)

This course covers differentiated and contrasted aspects of an entrepreneurial organization. In addition, students are exposed to the latest e-business tools used to expand a business and facilitate entrepreneurial start-up firms. Included are differences in funding techniques, hiring and practice and leveraging of supplier resources.

BT 421 Systems Analysis and Design (Elective)
(3-0-3)

This course focuses on the analysis and development of systems to meet the increasing need for information within organizations. It presents and analyzes various topics such as the systems development life-cycle, analysis and design techniques, information systems planning and project identification and selection, requirements collection and structuring, process modeling, data modeling, design of interface and data management, system implementation and operation, system maintenance and change management implications of systems.

BT 423 Intellectual Property and International Business Law (Elective)
(3-0-3)

This course takes an in-depth look at intellectual property rights, with a focus on key management issues and how one secures, manages, and enforces these rights. There is a major focus on the international and Internet aspects of intellectual property, but also on other areas of concern to business and technology managers, such as unique contexts in which intellectual property issues arise, events normally viewed under other areas of law but which impact intellectual property, and how to protect the firm and its intellectual property rights. The student will examine the current state of the law in these areas as well as gain insight into the possible future direction of the law, helping the student become better prepared for today's and tomorrow's work and business environment.

BT 425 Investment Management (Elective)
(3-0-3)

An introduction to the investment management process emphasizing measuring and managing investment risk and return. Topics will include investment objectives and constraints, modern portfolio theory, CAPM, efficient markets, stock and bond valuation models, performance evaluation, futures and options.

BT 450 Global Management Seminar (Elective)
(3-0-3)

This seminar will examine the processes of globalization for multi-national companies and why they seek markets in other countries. US and foreign countries' cultural, labor and management issues will be compared. How management practices transfer across cultures will also be examined. Includes visits to overseas companies as part of a field study experience.

Mgt 111 Social Psychology and Organizational Behavior
(3-0-3)

Using an applied and experiential format, this course exposes students to theory, methods and research in organizational behavior and social psychology. Topics relating to individual differences and group dynamics in organizational settings are stressed. Learning occurs through discussion, group activities and the completion of assessment instruments. Emphasis is on helping students understand and improve their skills in key areas including decision-making, leadership, negotiation and conflict resolution.

Mgt 243 Macroeconomics
(3-0-3)

The forces which govern the overall performance of the national economy are covered. Areas discussed include: supply and demand analysis, national income

theory, monetary systems, alternative approaches to economic policy, current macroeconomic problems and international economies.

**Mgt 244 Microeconomics
(3-0-3)**

The behavior of and interactions between individual participants in the economic system are covered. In addition to providing a theoretical basis for the analysis of these economic questions, the course also develops applications of these theories to a number of current problems. Topics include: the nature of economic decisions, the theory of market processes, models of imperfect competition, public policy towards competition and the allocation of factors of production.

**Mgt 401 MIS/DBMS/Networks*
(3-0-3)**

A technical and managerial perspective that considers the management of Information Technology (IT). Topics include hardware, software, data/information, networks, applications, organization considerations and frameworks for managing. Students assess applications, analyze case studies and explore important aspects of a company's IT environment. This course requires in-class use of a laptop computer in the current Stevens configuration with Stevens wireless and TCP/IP access.

*BT 421 can be substituted for Mgt 401.

GRADUATE COURSES

All Graduate courses are 3 credits except where noted.

Management Courses

Mgt 503 Microeconomics

This is a concentrated course in basic economics with particular emphasis on price theory; it is a prerequisite for candidates for the master's degree. Topics include: the nature of economic decisions, the theory of market processes, models of imperfect competition, public policy towards competition, the allocation of factors of production and current economic problems. No credit for departmental majors.

Mgt 600 Managerial Accounting

This course will develop accounting analysis useful for managerial decision-making purposes. Topics will include an introduction to elements of financial accounting, cost-profit-volume analysis, manufacturing costs and elements of cost accounting, special decision analysis, budgeting, variances and controllability and responsibility accounting. Prerequisite: Mgt 503 recommended.

Mgt 607 Managerial Economics

This course examines the use of economic information and analysis in making business decisions. Topics include modeling concepts, demand analysis and forecasting, production and cost analysis, pricing, capital budgeting and uncertainty. Prerequisites: Mgt 503, Mgt 600 or their equivalents; Statistics and introductory calculus recommended.

Mgt 608 Macroeconomic Analysis

The objective of this course is to develop competency in the analysis of

macroeconomic phenomena as they shape the state of the American economy. Topics include: recent macroeconomic history, the monetary system, models of macroeconomic markets, unemployment, inflation, international trade and finance, macroeconomic policies and the use of macroeconomic data in management decision-making. Prerequisite: Mgt 503 or equivalent.

Mgt 609 Introduction to Project Management

This course deals with the basic problems of managing a project, defined as a temporary organization built for the purpose of achieving a specific objective. Both operational and conceptual issues will be considered. Operational issues include definition, planning, implementation, control and evaluation of the project. Conceptual issues include project management vs. hierarchical management, matrix organization, project authority, motivation and morale. Cases will be used to illustrate problems in project management and how to resolve them.

Mgt 610 Strategic Perspectives on Project Management

This course provides a theoretical perspective on project management for a better understanding of project implementation in modern organizations. The course is based on the premise that success in project leadership depends on a proper managerial style and attitude, and not on specific tools for planning and controlling. The course focuses on developing the manager's conceptual thinking and on building "the project manager's mind." The course helps managers see the entire project landscape and the long-term issues that are critical to project success. It will also address the organizational aspects of initiating and running the program. Prerequisite: Mgt 609.

Mgt 611 Project Planning and Monitoring

Formalized procedures, tools and techniques used in conceptual and detailed planning of the project. Development of work breakdown structure as the foundation for project cost and project duration. Application of project data in monitoring the project progress and in formulating remedial actions in response to unexpected occurrences. Prerequisite: Mgt 609.

Mgt 612 The Human Side of Project Leadership

Project success depends, to a great extent, on the human side. Success in motivating project workers, organizing and leading project teams, communication and sharing information and conflict resolution, are just a few areas that are critical for project success. However, being primarily technical people, many project managers tend to neglect these "soft" issues, assuming they are less important or that they should be addressed by direct functional managers. The purpose of this course is to increase project managers' awareness of the critical issues of managing people and to present some of the theories and practices of leading project workers and teams.

Mgt 613 Project Management Office

A comprehensive, all-inclusive description of the Project Management Office (PMO), highlighting features most appropriate and relevant to specific project situations. Motivations for adopting a PMO, such as project performance, project manager competency or the organizational desire to excel. Short-term and long-term functions are identified and discussed. Project evaluation models and PMO implementation guidelines are presented and discussed in detail. Co- or Prerequisites: Mgt 609 and Mgt 611.

Mgt 614 Advanced Project Management

This course deals with advanced problems in project management that were not addressed in previous courses. It also expands on several previously mentioned topics. The course addresses the critical points in project management for the experienced project manager and looks at projects in their broad sense, as seen by top management and from an organizational global perspective. Prerequisite: Mgt 609. In addition, Mgt 610 is preferred as a prerequisite but may be taken at the same time.

Mgt 618 Engineering Economics and Management Policy

This course covers the discipline of engineering economics and how this discipline influences management policy and decision-making. The major emphasis is on the selection process for capital investments, both tangible and intangible, and how this process is structured and constrained by the time value of money, the source of funds, market demand and competitive position. The first part of the course covers the basics of the engineering economics on which the selection process rests. The remaining parts cover the selection process itself, beginning with deterministic analyses based on single-valued estimates, continuing on, where significant, to risk analyses based on multivalued estimates, and concluding with multiattribute analyses in which both the monetary and non-monetary factors involved in investment decisions are combined into single figures of merit. In passing through the process, capital budgeting, cost estimation, probability analysis, uncertainty analysis and Monte Carlo simulation are introduced and applied. Case studies are used where appropriate. Prerequisite: Mgt 600.

Mgt 620 Statistical Models

The major portion of the course covers an introduction to the probabilistic and statistical concepts and models used in day-to-day business decision-making. Topics include data analysis, correlational techniques, regression, statistical inference and forecasting.

Mgt 621 Management Models

This course covers mathematical and computer-based models which assist managers in decision-making, including resource allocation, transportation, inventory management, congestion phenomena, service processes and shortest routes and maximum flow of goods. Emphasis is on model formulation from real-world situations, development of alternative solutions using computer models and post-optimality analysis.

Mgt 623 Financial Management

Financial manager's functions, liquidity vs. profitability; financial planning; capital budgeting; management of long-term funds, money and capital markets, debt and equity; management of assets, cash and accounts receivable, inventory and fixed assets. Prerequisites: Mgt 600, Mgt 607.

Mgt 625 Investments and Capital Markets

This is an introductory course in capital markets with an emphasis on the management of investments. Topics include: discounting, net present value, risk, the capital asset pricing model, diversification, the term structure of interest rates, financial markets, the efficient markets hypothesis, technical and fundamental analysis, options pricing and portfolio management. Prerequisite: Mgt 600.

Mgt 626 Cost Analysis and Control

This course presents advanced techniques and analysis designed to permit managers to estimate and use cost information in decision-making. Topics include: historical overview of the management accounting process, statistical cost estimation, cost allocation and uses of cost information in evaluating decisions about pricing, quality, manufacturing processes (such as, JIT, CIM), investments in new technologies and investment centers. Prerequisites: Mgt 503 or equivalent, Mgt 600.

Mgt 630 Global Business and Markets

Provides a broad, multidisciplinary understanding of global business. The theoretical context for engaging in international trade is established, with attention to the current economic and political environment. Then the business-level rationale and techniques for initiating trade, as well as the functional area decisions that must be made, are discussed. Topics include: comparative advantage, culture, protectionism, financial flows, entry strategies, marketing, managing payments, material and manufacturing. Prerequisites: Mgt 503 or equivalent.

Mgt 632 Power, Politics and Policy

This course will focus on the relationship and impact that international relations, international business and foreign policy have on world trade, commerce, and finance. The course will provide the student with a better understanding of how the complexity of international differences affects political, economic and cultural behaviors. Among the topics for discussion: the content and scope of international politics, the international struggle for power, the role and impact of non-governmental organizations, foreign policy as a tool for promoting international commerce, the role of international law and world public opinion, the rise of regionalism, the political economy of international trade. NOTE: Undergraduates (even with a master's study plan) are not permitted to take this course.

Mgt 641 Marketing Management

The study of marketing principles from the conceptual, analytical and managerial points of view. Topics include: strategic planning, market segmentation, product life-cycle, new product development, advertising and selling, pricing, distribution, governmental and other environmental influences as these factors relate to markets and the business structure. Prerequisite: Mgt 600.

Mgt 646 Human Resource Processes: Techniques and Applications

Job analysis is the fundamental building block for virtually all human resources practices. This course first introduces students to the theory, practices and techniques for analyzing and describing the nature of work and individual jobs in organizations. It then focuses on how this information is applied to develop other human resources systems such as selection, job design, training and compensation. A particular emphasis is placed upon the development and implementation of performance appraisal systems. Research and practices regarding various approaches to performance appraisal are discussed, as are the implications of performance appraisal for motivation, development and organizational effectiveness.

Mgt 647 Legal and Social Environment of Human Resources

This course reviews the key laws and legal principles impacting human resources practices and employer and employee relationships. Through a review of actual cases, federal and state laws impacting civil rights and equal opportunity, wages and hours, privacy, safety and health, employee benefits and insurance, worker's

compensation and labor relations and arbitration are covered. The constitutional, social and economic implications of human resources law are also discussed. This is a dynamic field of study with changes occurring literally on a weekly basis. Students will be expected to participate actively in classroom discussions and role-play exercises.

Mgt 650 International Business Management

This course provides students with an exposure to management in the international economic environment: global industries and regional markets, multinational corporations and international economic organizations. From decision-making, to negotiation and communication, the behavioral aspect of management is more complex and varied in a cross-cultural context. Managerial processes, such as planning, structuring and implementing offer special challenges when extended beyond home country borders. What constitutes effective leadership and what motivates workers are key questions in the international context. Students explore these topics in light of cultural difference through cases, discussion, reading and exercises.

Mgt 654 Organizational Change and Development

This course introduces students to the social science techniques and change interventions used to improve organizational effectiveness and enhance the personal development of individuals. Special emphasis is given to the application of systems theory for diagnosing and planning change efforts at the organizational, group and individual levels. Relationships between organization development and broader issues such as strategic planning and environmental contingencies are also stressed. The efficacy of organization development initiatives is also critically considered, as are the challenges posed in trying to simultaneously improve an organization's performance while also helping it to be more responsive to the interests and needs of its members. Prerequisite: Mgt 680 or permission of instructor.

Mgt 656 Total Quality Management

Principles and techniques of total quality management (TQM) with emphasis on their application to technical organizations. Topics include management philosophy, concepts and critique of quality "Gurus," TQM model and strategy; TQM tools and techniques; Dept. of Defense 5000.51-G TQM guides; review and critique of the Deming and Baldrige Awards; concurrent engineering; quality function, deployment and design for cost. Students will form teams to analyze a case study involving TQM concepts and techniques.

Mgt 657 Operations Management

Covers the general area of management of operations, both manufacturing and non-manufacturing. The focus of the course is on productivity and total quality management. Topics include quality control and quality management, systems of inventory control, work and materials scheduling and process management. Cross-listed with ME 560.

Mgt 658 New Business Ventures

The principal issues involved in new business formation and development will be presented in this overview course. This will include both the initiation of new ventures within existing firms and the entrepreneurial startup situation. Particular topics addressed include: business opportunity identification, the startup process, management team development, business plans, valuation, raising capital,

budgeting, deal structures, intellectual property, management of growth, compensation, securities law and public offerings, tax considerations, issues of business maturity and business failure. Prerequisites: Mgt 600, Mgt 607, Mgt 623 and Mgt 690 or permission of the instructor.

Mgt 661 Marketing Online

Developing products requires an understanding of content development, knowledge of industry trends and the ability to develop deals that bring your product to market. This course examines consumer demand, consumer behavior, industry projections, delivery platforms, distribution channels, market research and the product development process (from concept to consumer support). Both general marketing practices and those particular to the online environment are addressed. Students are required to work in teams and create a marketing plan. There are no prerequisites. Cross-listed with MIS 661.

Mgt 662 Legal Issues for the IT Professional

The course is a study of every major area of law that has an impact on the IT professional. The focus is on issues pertaining to electronic commerce and other technology-intensive business practices. The course discusses basic commercial law, jurisdictional issues and the contracting environment for online activity, including UCITA, intellectual property law, domain names, the protection of databases, privacy and publicity rights and government regulation, including content-based restrictions, criminal law and the prospective taxation of e-commerce. The goal of the course is to provide basic background in these issues for non-lawyers, and to promote sensitivity to the technological and business scenarios in which legal issues arise, enabling better management of their technological resources and commercial opportunities. Cross-listed with MIS 662.

Mgt 663 Entrepreneurship

In this course students will evaluate and create their own prospective business strategies. They will develop an understanding of entrepreneurship and innovation in starting and growing a business venture. Students will be given an opportunity to actually start their own business or create a business in their company by learning how to take advantage of the new order of business opportunities of the information age. This course's main objective is to show students how to identify these opportunities, be able to formulate and evaluate both qualitatively and quantitatively whether the opportunity is worth pursuing, and, of course, how it may be pursued. Actual case studies and experiences will be intertwined with the course content. There are no prerequisites. Cross-listed with MIS 663.

Mgt 671 Technology and Innovation Management

This course introduces the student to topics in the management of technology and examines the critical role of technology as a strategic resource to enable management to achieve organizational objectives. Topics include entrepreneurship, developing and managing new ventures, managing innovation, the technology life-cycle and technology forecasting, management of research and development (R&D) personnel and projects, evaluation of R&D projects and integrating technology strategy with the organization's overall business strategy. Prerequisite: Mgt 690 or permission of instructor.

Mgt 672 Technology Licensing and Finance

This course examines the valuation, patenting and licensing of early-stage

technology as a means to exploit innovation. By understanding technology to be a negotiable asset for the firm, we take a fundamentally different approach than venture capital models, which focus on the enterprise, rather than the commercialization of technology itself. Accordingly, we study the economics and theory of intellectual property; valuation of intangible assets; IP agreements and protection regimes; negotiations and trading techniques; licensing and litigation strategies. Prerequisites: Mgt 623 Financial Management or the combination of Mgt 600 Managerial Accounting and Mgt 607 Managerial Economics.

Mgt 675 New Product and Service Innovation

This course provides students with the most current theories of innovation when organizations create new tangible products and intangible services. From team and organizational processes, to the evolving portfolio, the innovating enterprise competes on the basis of change. By building upon material covered in Technology Innovation Management (Mgt 671), this course will deepen students' knowledge of the innovation process in the enterprise and will pay special attention to service industries. The course will be taught with lectures and real-world cases. Upon completion, students will have enhanced their knowledge of the innovative enterprise and increased their practical skills for careers in technology management. Prerequisite: Mgt 671 Technology and Innovation Management.

Mgt 673 Global Innovation Management

This course is focused on the globalization paradigm and its effects on the management of innovation. It is an interdisciplinary course, which analyzes the different managerial areas of strategy, organization, technology and market as integrated with the innovation process in a global context. The underlying theories and models are explored to understand how the innovation process is affected by local, national and global influences; what cultural and organizational drivers are at work; and how to manage commercialization of new products on a life-cycle basis, in a diverse and ever-changing global market. Case studies will be used to support the theoretical constructs and reinforce learning. Prerequisite: Mgt 671.

Mgt 677 Emerging Technologies

This course discusses emerging technologies, how they evolve, how to identify them and the effect of international, political, social, economic and cultural factors on them. Topics covered in the course include accuracy of past technology forecasts, how to improve them, international perspectives on emerging technologies, future customer trends and forecasting methodologies such as monitoring, expert opinion, trend analysis and scenario construction. Emerging technologies will be examined through student company examples, invited speakers and videos.

Mgt 679 Management Information Systems

Management's need for information has greatly increased in importance and complexity. This course introduces students to the use of computerized information systems to satisfy strategic business needs. Subjects include types of information systems, use of the computer to leverage information in support of key decision-making responsibilities, computer technology from a manager's viewpoint, prioritization of information system needs and systems development methodology. The student will analyze an organization's information needs and prepare an information systems plan.

Mgt 680 Organizational Behavior and Theory

Organization scientists generally think of organizations as being comprised of three levels of analysis: the individual, the group or department, and the organization itself. Using a systems perspective, this course focuses on the group and interpersonal factors accompanying an organization's operation. Topics covered include understanding organizations as structured systems, individual differences and performance, group dynamics and performance, learning, motivation, leadership and principles of communication particularly as they relate to decision-making and conflict management.

Mgt 681 Managing Pharmaceutical Research and Development

This course provides an overview of the drug and biologics development process from discovery through regulatory approval. Special attention is given to the roles, functions and importance of the various disciplines involved in the R&D process, their interactions with each other and the strategic management of these functions. Attention will also be given to key technologies used throughout the R&D process. The economics of pharmaceutical R&D as well as trends in licensing, outsourcing and partnerships will be covered. The student will gain an understanding of R&D strategy and the relationship between R&D and sales, marketing and manufacturing. Prerequisite Mgt 671 Technology and Innovation Management

Mgt 682 Pharmaceutical Sales, Marketing and the Supply Chain

This course focuses on the organizational, management and technology issues related to the sales and marketing function of the pharmaceutical industry as one of its principal boundary-spanning functions. This course will use extensive research and current literature on pharmaceutical sales and marketing business approaches and technologies that drive or support sales and marketing plans as well as information and knowledge management considerations that drive competitive distinctiveness. This course will also explore the real and potential information and knowledge linkages between the sales and marketing function and the discovery, product development and supply chain functions of the pharmaceutical industry. This course also focuses on the issues surrounding supply chain design, planning and execution for the pharmaceutical and biotech industries from drug discovery to delivery.

Mgt 683 Introduction to Pharmaceutical Manufacturing

Pharmaceutical manufacturing is vital to the success of the technical operations of a pharmaceutical company. This course is approached from the need to balance company economic considerations with the regulatory compliance requirements of safety, effectiveness, identity, strength, quality and purity of the products manufactured for distribution and sale by the company. Quality assurance and regulatory issues in pharmaceutical manufacturing. Overview of chemical and biotech process technology and equipment, dosage forms and finishing systems, facility engineering and health, safety and environment concepts. Regulatory and legal overview. Cross-listed with PME 530

Mgt 684 Regulation and Compliance in the Pharmaceutical Industry

This course explores the US and international regulatory environments that govern the pharmaceutical and biotechnology industries with particular focus on the US Food and Drug Administration, the European Agency for the Evaluation of Medical Products and the Japanese Ministry of Health, Labor and Welfare. The essential components of Good Laboratory Practices, Good Clinical Practices and Good Manufacturing Practices

regulations will be covered. Students will develop an understanding of the formulation and execution of regulatory strategy and key ethical issues in medical research. Where appropriate, case studies will be used to illustrate the challenges and issues associated with compliance as well as the consequences of non-compliance. Ethical issues and the potential consequences of ethical lapses will also be explored.

Mgt 685 Employee Compensation

This course examines reward systems in organizations broadly defined to incorporate salary, benefits and incentive pay programs. Topics covered will include: legislative issues affecting pay; job evaluation; wage and salary administration; merit pay and other incentives; types of benefit programs; management and administration of compensation and benefits; and issues related to equity and comparable worth.

Mgt 690 Organization Theory and Design

Organization scientists generally think of organizations as being comprised of three levels of analysis: the individual, the group or department, and the organization itself. This course focuses on the problems and challenges managers face in dealing with the organization as a whole and the interrelationships between organization groups. Specific issues and problems which are covered include: the relationship of the organization with the external environment; the influence of the organization's strategies, size and production technology on the organization's design; and strategies for managing organizational processes such as conflict, culture and change.

Mgt 691 Management Policy Dynamics

The students will be divided into small groups and supplied with a simulated history of a firm. It will be the responsibility of each group to structure itself to be able to make decisions about the goals of its company and to make operational decisions aimed at implementing these goals. A computer model simulates the performance of the firm that would result from these decisions. Both quantitative analysis and group decision-making are emphasized. It is recommended that this course be taken in the last term. Prerequisites: Mgt 680, Mgt 690 and Mgt 600 and/or 623, or permission of the instructor.

Mgt 700 Econometrics

An introduction to the science of designing statistical models of economic processes. Students will be required to build and estimate a number of models during the term. Topics include: regression theory, statistical difficulties in regression analysis, advanced topics in single-equation regression, models of qualitative choice (such as, probit, logit) and simultaneous equation estimation. Prerequisites: Mgt 503 or equivalent, Mgt 620 or permission of the instructor.

Mgt 710 Risk Management: Methods and Applications

Theoretical and practical aspects of risk assessment and management will be covered. Major topics include: importance of innovation and technological changes in current competitive environment, risk and uncertainty, decision trees, binomial methods and derivation of Black-Scholes option pricing formula, extension of option methodology to non-financial (real) options, VAR (value at risk), a framework for risk assessment and several real-world case studies. The course is designed for all students of the School of Technology Management. Prerequisites: TM 605 or CS 505, Ma 500 or TM 500 and Mgt 671 (formerly Mgt 702) or advisor permission.

Mgt 718 Multivariate Analysis

Experimental design, statistical estimation and hypothesis testing from multivariate distributions. Topics covered will include regression models, multivariate analysis of variance, canonical correlations, classification procedures and factor analysis. Computer applications of these techniques will be examined. Prerequisite: Mgt 620 (formerly Mgt 796).

Mgt 719 Research Methods

Research philosophy, ethics and methodology will be discussed. Each student will, under the guidance of the instructor, formulate a problem, search the literature and develop a research design. In addition, the student will examine and criticize research reports with special emphasis on the statement of the problem, the sampling and measuring techniques that are used and the analyses and interpretation of the data. Emphasis is on applying research methodology to real-world organizational problems. Prerequisite: Mgt 620 (formerly Mgt 796).

Mgt 725 Strategic Management

An interdisciplinary course which examines the elements of, and the framework for, developing and implementing organizational strategy and policy in competitive environments. The course analyzes management problems both from a technical-economic perspective and from a behavioral perspective. Topics treated include: assessment of organizational strengths and weaknesses, threats and opportunities; sources of competitive advantage; organizational structure and strategic planning; leadership, organizational development and total quality management. The case method of instruction is used extensively in this course. Prerequisites: Mgt 600, Mgt 607, Mgt 690 or their equivalents.

Mgt 730 Design and Analysis of Experiments

This course starts with the design and analysis of one factor analysis of variance. Methods of testing specific questions using planned comparisons are stressed. Models with two or more factors are considered with detailed instruction on the analysis of interactions. Repeated-measures designs are also covered, as well as designs with random as well as fixed factors. Prerequisite: Mgt 620.

Mgt 733 Applied Regression Analysis

A substantial portion of the models developed to describe phenomena in both the physical and social sciences utilizes regression analysis from simple linear regression to multiple regression; nonlinear coefficient estimators are derived, their properties discussed and numerous examples are used to demonstrate various aspects of interpretation. Tests of significance are also covered for most of the techniques presented. Prerequisite: Mgt 620.

Mgt 744 Analytic Methods of Forecasting

Emphasis is on the practical aspects of the Box-Jenkins methodology for fitting and forecasting linear stochastic models of industrial time series; model identification, model estimation, model diagnostic checking and model forecasting of seasonal and nonseasonal series; contrasts with exponential smoothing; laboratory analysis of selected time series. Prerequisite: Mgt 620.

Mgt 794 Decision Analysis for Corporate Networks

This course is designed to integrate the student's knowledge of accounting, engineering economics and multi-attribute decision-making techniques for evaluating

and selecting complex systems, such as telecommunications networks for corporate communications. A review of accounting, financial and engineering economic concepts will be followed by the study of utility analysis and simple and multi-attribute decision analysis. Case studies involving telecommunications facilities will be used and issues of equipment acquisition, financing, accounting, cost estimation and system performance will be discussed. Prerequisites: Mgt 600, Mgt 618.

Mgt 800 Special Problems in Management*

With permission of the instructor. Limit of six credits for the degree of Master of Science.

Mgt 801 Special Problems in Management*

With permission of the instructor. Limit of six credits for the degree of Doctor of Philosophy.

Mgt 802 Project Management Examination*

This will test the project management knowledge of students who have completed approved training programs in project management. Upon successful completion, (graded pass/fail) students will be awarded 12 credits toward the Master of Science in management with a Project Management concentration. The credits cannot be used toward the Project Management Graduate Certificate of Special Study and are not transferable to other institutions.

Mgt 803 Project Management Examination

This will test the project management knowledge of students from AT&T, Lucent Technologies and Verizon who have completed company-sponsored project management courses. Upon successful completion, (graded pass/fail) students will be awarded three credits towards a Master of Science degree. The examination is normally given twice each year.

Mgt 900 Thesis in Management*

For the degree of Master of Science. Six to 12 credits with departmental approval.

Doctoral Seminars

Mgt 704-705 Research Seminar: Information Management and Organizational Structure and Design I, II

Primarily for doctoral candidates. Will concentrate on the features that information and computer-based communication systems need to support the goals and responsibilities of various components of the organization, as well as the effect that the introduction and use of information and computer-based communications systems have on the organization's performance. Will include measures of effectiveness, organization characteristics, job enrichment and distribution of responsibility for information systems and computer-supported group work. Prerequisite: permission of the instructor.

Mgt 716, Mgt 726, Mgt 736 Seminars: Advanced Topics in Information Management, Technology Management and Telecommunications Management

Specialized topics at the leading edges of research and theory in information management/technology management will be intensively explored. Each research seminar will focus on a different set of topics.

Mgt 778 Principles of Information Management I

This course is open only to doctoral students in information management with the permission of the instructor. Students should normally have completed all M.S.-level core courses before they enroll. This course will cover vital topics in information management that will help the student prepare to perform original research in some significant aspect of information management. The course will stress both the technical and organizational aspects of the information resource and, in particular, how these aspects interrelate. Students will be expected to do a wide range of readings, participate in seminar presentations given by Stevens and outside professional speakers, as well as prepare and present their own research projects.

Mgt 779 Principles of Information Management II

This course is open only to doctoral students in information management with the permission of the instructor. It is generally recommended for students who have completed Mgt 778 Principles of Information Management I. Students should normally have completed all M.S.-level core courses before they enroll. The course will stress both the technical and organizational aspects of the information resource and, in particular, how these aspects interrelate. Students will be expected to do a wide range of readings, participate in seminar presentations given by Stevens and outside professional speakers, as well as prepare and present their own research projects.

Mgt 790 Innovation Management and Technogenesis

This course will survey current research and theory in seven different areas related to the management of innovation. These areas include: creativity, the front-end of innovation, innovation management, leadership and teamwork, project management, the economics of innovation, and CSCW and groupware: brainstorming and creativity. Students will read leading-edge papers in each area and lead discussions with a faculty member who is expert in each area facilitating the discussion. Each student will write a research proposal on one of the topics covered in the course.

Mgt 960 Research in Management*

Original research leading to a doctoral dissertation. Hours and credits to be arranged.

TG 501 Entrepreneurship for Business and Engineers and Scientists

This course exposes students to entrepreneurship in the broader sense and will relate to venturing in both large and small business organizations. It will address the crucial aspect of Technogenesis - nurturing new technologies from concept to realization.

*By request

EMT Courses in the Master of Technology Management Program for Experienced Professionals (EMTM)

EMT 624 Financial Analysis for Technical Organizations

This course presents concepts regarding the collection, processing and reporting of financial information in a technology-based business. Managerial accounting and cost accounting, and their uses and limitations will be discussed. Use of financial statements, budgets and cost estimates in management decision-making will be

emphasized. The impact of the risk and uncertainty associated with financial decisions will be illustrated via case studies.

EMT 607 Managerial Economics

This course examines the use of economic information and analysis in making business decisions. The goal of the course is to provide an understanding of the economic principles that enable managers to direct scarce resources most efficiently. A secondary goal is to provide students with a familiarity with the economic environment in which business operates. Prerequisite: EMT 624.

EMT 623 Financial Management

Financial manager's functions, liquidity vs. profitability; financial planning; capital budgeting; management of long-term funds, money and capital markets, debt and equity; management of assets, cash and accounts receivable, inventory and fixed assets. Prerequisite: EMT 624.

EMT 628 Financial Analysis Ramp

This ramp course is designed to provide students with an understanding of the basic tools and procedures of accounting in order to assure a common level of understanding for the class. The course consists of a web-based, self-administered tutorial with quizzes and problems, a three-hour lecture and Q&A class prior to the first class meeting of EMT 624, and a post-test. The class and tutorial can be waived if a student has sufficient background in accounting. The posttest is mandatory. (1.0 credit)

EMT 629 Marketing Ramp

This ramp course is designed to introduce students to the Capstone simulation as it relates to marketing. Covered topics will include the fundamentals of the Marketing Mix including pricing, advertising, distribution and product-related issues. A final exam will determine competency. Students with graduate education in marketing may just take the exam. (1.0 credit)

EMT 642 Marketing Management in Technical Organizations

This course focuses on the methodology involved in developing and writing an effective marketing plan. It covers how to obtain the information that is needed and how to write a rigorous marketing plan for a product or service. The course details the steps needed to perform a market opportunity analysis (MOA) and explores how to develop market-based strategies and tactics to capitalize on the identified opportunities.

EMT 677 Emerging Technologies

This course discusses emerging technologies, how they evolve, how to identify them and the effect of international, political, social, economic and cultural factors on them. Topics covered in the course include accuracy of past technology forecasts, how to improve them, international perspective on emerging technologies, future customer trends and forecasting methodologies such as monitoring, expert opinion, trend analysis and scenario construction. Emerging technologies will be examined through student company examples, invited speakers and videos. Cross-listed as Mgt 677.

EMT 714 Technology Strategy

This course discusses the technology strategy process and develops skills, methodologies and critical thinking in order to achieve technological competitive

advantage. Subjects covered include technology life-cycles, type and characteristics of RD&E project portfolio selection, and an overview of successful development strategies. Case studies will be used to build competence and confidence in the concepts.

EMT 715 Strategic Business Management

This course focuses on the major elements of the strategic management model including mission, external and global environment, company profile, strategic analysis and choice, long and short term objectives; action plans/tactics, policies, restructuring, reengineering, strategic control and continuous process improvement (CPI). Student teams analyze and formulate strategies for companies they select. This course includes concepts and management principles that will be expanded in EMT 714 Technology Strategy, EMT 755 Process Management in High-Tech Organizations and EMT 677 Emerging Technologies.

EMT 740 Managing Multifunctional Teams

This course focuses on understanding the interplay of group, inter-group and organizational factors on the performance of multifunctional teams in technology-based organizations. The course integrates theory and research on multifunctional teams with the skills necessary for effectively managing them. Topics covered include managing decision-making and conflict in multifunctional teams, managing the team's boundary and inter-group relations, organizational designs that support working cross-functionally and measuring and rewarding team performance. Cases are used to illustrate the problems of working cross-functionally. Individuals are given feedback on their team management skills.

EMT 741 Innovation Management Process

This course focuses on how to take a product or service from concept to market quickly and successfully. It covers the conventional stage-gate process and explores when it works and when it does not, and offers alternative innovation strategies that are appropriate for different innovation environments including breakthrough new products and services. The main emphasis of this course is on developing and commercializing technically-sophisticated products and services.

EMT 743 Integrated Practicum

Students participate throughout the program in business simulations to demonstrate a working knowledge of the principles presented in individual courses. The practicum also includes activities designed to enhance team and leadership skills which are assessed throughout the course. (4.0 credits)

EMT 751 Project Management and Leadership

This course provides a theoretical and practical perspective on modern project management and leadership in technology-based organizations and forms the conceptual basis to develop "a project leader mindset." The course will focus on strategic project success, as well as project cultures, project organization and project processes as they are employed in different project types and for different levels of project uncertainty, complexity and pace. The leadership part of the course is based on the premise that people are the real engine behind project results, and they must be led and motivated in a very unique way. Different leadership styles will be discussed, together with motivation and career issues in different project and organizational settings.

EMT 752 Corporate Venturing

This course focuses on corporate venturing and entrepreneurship. Business and financial issues associated with starting and buying an entrepreneurial, high-technology business are addressed. Subjects covered include a discussion of previous corporate ventures, critical success factors and an international perspective on corporate venturing. Lessons learned from new technology start-ups will be discussed along with an evaluation of the decision processes used by venture capitalists. The final project is the development of a venture plan for the student's company. Over half of the business plans receive funding. Startup funding on previous projects has ranged from \$50,000 to \$1,000,000,000.

EMT 755 Process Management in High-tech Organizations

The basic concepts and principles of how process management applies to technical and business functions will be covered. Total Quality Management (TQM) and Concurrent Engineering will be explored in detail. The Baldrige and Deming Awards will be compared to illustrate the various process management concepts. Selected TQM topics will be discussed to illustrate the concepts of TQM, CPI and CCE.

EMT 758 Oral and Written Communication Competency

Students are exposed to several skills to help them present and write more effectively. Specific topics include components of effective writing, ten steps for effective presentations, using advanced computer technologies in oral presentations and portraying the correct image. Students are subsequently graded on several team and individual oral presentations and written reports throughout the EMTM program, which are designed to determine the level of competency in both oral and written communications. Each student will have an oral/written report card. (2.0 credits)

EMT 798 Integration and Application of Technology Management +

This is the capstone course for the program. It is designed to integrate the knowledge developed in the other courses via a business simulation in which teams of students compete in running their companies in a complex simulated environment. The course includes lectures and workshops that demonstrate theory and techniques of cross-functional decision-making in the management of technology. Individuals and teams will be observed and assessment feedback will be given. (5.0 credits)

EMT 800 Special Problems for the Master of Technology Management for Experienced Professionals (EMTM)

1 to 6 credits. Limit of 6 credits for the degree of Master of Technology Management (EMTM).

EMT 800B Managerial Decision Making

Executives make decisions every day in the face of uncertainty. The objective of this course is to help students understand how decisions are made, why they are often less than optimal and how decision-making can be improved. This course will contrast how managers *do* make decisions with how they *should* make decisions, by thinking about how "rational" decision makers *should* act, by conducting in-class exercises and examining empirical evidence of how individuals *do* act (often erroneously) in managerial situations. The course will include statistical tools for decision-making as well as treatment of the psychological factors involved in making decisions.

EMT 800C Technology Commercialization

This course comprises the topics of technology assessment, valuation, transfer, and strategic alliances. Despite the prodigious output of American invention, much early stage technology remains poorly selected, protected, managed and financed. Firms waste billions of dollars on the wrong technological bets. Students will learn methods for sourcing, screening and selecting promising technologies for commercial exploitation. The second half of this course studies ways firms can leverage external R&D through license agreements, strategic alliances and acquisitions. Outsourcing technology makes a firm more nimble and gives it more options to act. Regardless of the student's current job function, technology managers need to understand their options to assess, license and acquire technology.

MIS Courses

MIS 500 Practicum Oral and Written Communication Competency

Students will be graded on several team and individual oral presentations and written reports which demonstrate their competency in both oral and written communications. Each student will have an oral/written report card. (0.6 credits)

MIS 501 Information Management

A technical and managerial perspective that considers the management of an Information Technology (IT) organization for students with little or no academic or professional IT experience. Topics include: hardware, software, data/information, networks, applications, organization considerations and frameworks for managing them. Students assess applications, analyze case studies and explore an important aspect of their company's information technology environment. This non-credit, web-based course is in place to prepare MSIS students that do not have IT experience. It (or equivalent experience) is a prerequisite for any MSIS course.

MIS 502 Introduction to Accounting, Microeconomics, Statistics and Finance

This non-credit, self-paced, web-based course is provided as a prerequisite to the required finance course for MSIS students. It introduces students to four important business disciplines: accounting, Microeconomics, Statistics and Financial statements. It is intended for students without the respective background from either previous course work or work experience.

MIS 620 (formerly Mgt 772) Analysis and Development of Information Systems

This course presents and analyzes various approaches to information analysis and development of organizational information systems within a system development life-cycle (SDLC), e.g. the waterfall, concentric and prototyping approaches. Topics include strategic planning for SDLC, front-end and back-end phases of SDLC, project management, CASE methodologies and balancing user, organizational and technical considerations. Prerequisites: Mgt 501, Mgt 698, Mgt 679 (formerly Mgt 771), or equivalent.

MIS 630 (formerly Mgt 773) Data and Knowledge Management

This course deals with strategic frameworks for, and uses of, data, information, and knowledge within business and organizational contexts. Major course topics include data quality, data and information modeling, data warehouses, strategic information systems planning, information continuum and knowledge work. Prerequisites: Mgt 501, Mgt 698, Mgt 679 (formerly Mgt 771), or equivalent.

MIS 640 (formerly Mgt 776) Managing Information Networks

This course introduces the technical as well as managerial aspects of distributed information systems. The emphasis is on synthesizing the underlying technologies (networks, databases and applications) with management approaches (planning, staffing and organizing). Topics include: opportunities and challenges of distributed information systems, review of network technologies (LANs, WANs, MANs, high speed networks), network architectures, client/server computing, distributed databases, distributed applications, open systems standards and the management of distributed information systems. Case studies are introduced to illustrate different challenges and approaches to solutions.

MIS 645 (formerly Mgt 644) CyberSecurity Principles for Managers

This comprehensive course will cover the key security concepts for managers. In the first phase, security fundamentals will be covered with emphasis on levels of security (network, system software, middleware, applications, business processes), authentication, authorization, access and integrity. In the second phase, the key security technologies such as cryptographic algorithms (symmetric and asymmetric encryption), PKI, digital certificates and corporate security will be discussed. The last phase of this course will discuss the management issues of security policies and security administration and describe how various security technologies and approaches can be applied to cybersecurity. Topics will include an overview of Internet security, web security, web application security, wireless and mobile web security and other emerging cyber information issues. Students will conduct a security audit of web sites and web-based corporate applications. Prerequisites: Students should have had exposure to network architecture, data architecture and application architecture prior to taking this course by completing the following: Mgt 772, Mgt 773, and Mgt 776 or their equivalents.

MIS 646 (formerly Mgt 645) Enterprise Architectures for Information Security

This course focuses on the analysis and management of information security architectures. Information security architectures consist of organizational, process, and technology (e.g., data, applications, network, systems) domains. The integration and effective management of such architectures is essential to effectively responding to technical risk dynamics. The course will focus on evaluating the architectural domains and their integration. The course will rely on management research on information security, risk, IT strategic planning, and distributed computing. The student will learn the relationships between business requirements, technical requirements and technical risk, and make appropriate choices for risk mitigation. The course will provide insights on the continuous management of the information security function in organizations. Prerequisites: Students should have had exposure to network architecture, data architecture, and application architecture prior to taking this course by completing MIS 620 (formerly Mgt 772), MIS 630 (formerly Mgt 773), MIS 640 (formerly Mgt 776) or their equivalents. In addition, they will have completed MIS 645 (formerly Mgt 644) "CyberSecurity Principles."

MIS 647 Information Security and the Law

This course examines every major aspect of the relationship between information security and the law, at a level suitable for information security specialists and senior managers who supervise information security operations. In the first phase, the course explores substantive legal principles relating to information security, with regard to both private and government interests. The second phase of the course

explores information security operations as the repository of information that may be at issue in legal proceedings. Finally, the course concludes with a discussion of the balancing process required to promote information security in a system of ordered liberties, that is, with due respect for civil rights.

MIS 650 IT Outsourcing Governance

The purpose of this course is to describe the important governance considerations necessary to manage IT outsourcing. The material in this course will be valuable to students/companies who are undertaking IT outsourcing activities and to students/companies who serve as the outsourcing vendors. Topics will include strategic decision making, feasibility considerations, day-to-day management functions (such as, managing Service Level Management using dashboards effectively, measuring and assessing value, project prioritization, resource allocation) and the "sunset" decision to close out an outsourcing agreement and reintegrate the functions and processes within the firm. Students can combine the knowledge and skills gained in this course with the more specialized knowledge in the other three IT outsourcing courses to create a valuable skill set for today's marketplace for all organizations: foreign and domestic, corporate, non-profit and government. Prerequisites: Mgt 680, MIS 750, Mgt 623.

MIS 651 Legal Issues in IT Outsourcing

The purpose of this course is to acquaint students with the specialized legal aspects of IT outsourcing needed to manage contract negotiation and for ongoing relationship management and measurement, regulation, off-shoring and termination of IT outsourcing. Successful completion of the course allows the student to achieve a useful level of specialized management knowledge.

MIS 652 Relationship Management and IT Outsourcing

This course will cover the many variations and complex manifestations of Relationship Management (RM) in the 21st century corporation in the context of IT outsourcing. Students will be exposed to both theoretical models and practical case studies to more fully develop a set of knowledge and skills to help them with RM related issues. Students will learn how to place outsourcing relationships within the general context of RM and identify the unique aspect of Outsourcing relative to other areas of RM. The issue of offshore outsourcing RM will also be discussed in this context.

MIS 654 Privacy in a Networked World

Increasing use of computers and networks in business, government, recreation and almost all aspects of daily life has led to a proliferation of online sensitive data, i.e., data that, if used improperly, can harm the data subjects. As a result, concern about the ownership, control, privacy and accuracy of these data has become a top priority. This course focuses on both the technical challenges of handling sensitive data and the policy and legal issues facing data subjects, data owners and data users. This course is suitable for advanced undergraduate computer science majors, graduate students in computer science and students in technology management or other majors with some computer science background. Course readings draw on a variety of sources, including both technical materials and the popular press. The course includes a privacy-related project. Cross-listed with CS 578.

MIS 661 Marketing Online

Developing products requires an understanding of content development, knowledge

of industry trends and the ability to develop deals that bring your product to market. This course examines consumer demand, consumer behavior, industry projections, delivery platforms, distribution channels, market research and the product development process (from concept to consumer support). Both general marketing practices and those particular to the online environment are addressed. Students are required to work in teams and create a marketing plan. There are no prerequisites. Cross-listed with Mgt 661.

MIS 662 Legal Issues for the IT Professional

The course is a study of every major area of law that has an impact on the IT professional. The focus is on issues pertaining to electronic commerce and other technology-intensive business practices. The course discusses basic commercial law, jurisdictional issues and the contracting environment for online activity, including UCITA, intellectual property law, domain names, the protection of databases, privacy and publicity rights and government regulation, including content-based restrictions, criminal law and the prospective taxation of e-commerce. The goal of the course is to provide basic background in these issues for non-lawyers, and to promote sensitivity to the technological and business scenarios in which legal issues arise, enabling better management of their technological resources and commercial opportunities. Prerequisite: Mgt 679 (formerly Mgt 771). Cross-listed with Mgt 662.

MIS 663 Entrepreneurship in IT

In this course students will evaluate and create their own prospective business strategies. They will develop an understanding of entrepreneurship and innovation in starting and growing a business venture. Students will be given an opportunity to actually start their own business or create a business in their company by learning how to take advantage of the new order of business opportunities of the information age. This course's main objective is to show students how to identify these opportunities, be able to formulate and evaluate both qualitatively and quantitatively whether the opportunity is worth pursuing, and, of course, how it may be pursued. Actual case studies and experiences will be intertwined with the course content. There are no prerequisites. Cross-listed with Mgt 663.

MIS 665 Cybersecurity Forensics

Security forensics involves the identification, preservation and analysis of evidence of security attacks to identify the attackers and document their activity with sufficient reliability to justify appropriate technological, business, and legal responses. This topic has technological and legal components, both of which are covered in this course. The technical aspect addresses analysis of intruder types and the intrusion process, review of logs and profiles and their types, identifying attack signatures and fingerprints, exploring the applications of data mining techniques, study of various traceback methods and the preservation of the information and evidence acquired through the use of forensic tools and techniques. The legal aspect addresses the impacts of forensics on the legislative, judicial and regulatory proceedings that collectively articulate and promote public policy goals, determine civil and criminal liability and define and assess regulatory compliance. The course draws on pertinent concepts of law and legal procedure, at a level accessible by non-lawyers, to explore the broader significance of forensics in the private and public sectors. Prerequisite: CS 573 or MIS 645. Cross-listed with CS 665 and TM 665.

MIS 671 (formerly Mgt 721) Pharmaceutical Industry Trends and Issues

The course will provide an overall look at IT in the pharmaceutical industry, its structure and trends and issues which have driven it, are affecting it now, and are likely to change it in the future. This course will focus on the business forces shaping the pharmaceutical industry. In addition, this course will use management research on the integration of IT with the business. The student will learn how to evaluate important business trends and how IT can be used to support business success. Topics include a pharmaceutical industry overview, regulatory compliance, new drug development, manufacturing and logistics, product marketing, the role of IT in the pharmaceutical industry, company strategies, e-pharma and 21st century pharmaceutical-market future trends.

MIS 672 (formerly Mgt 722) Pharmaceutical Industry New Drug Development

This course is designed to provide the student with an in-depth understanding of the pharmaceutical research & development process and the role of Information Technology (IT) in this process, with the goal of helping the student to be an effective provider of information system development and operations in this arena. The various phases of the process will be described in detail including key regulatory imperatives and the role of project management. The current contributions of IT to each phase will be reviewed; the global perspectives on international harmonization and worldwide submissions will be discussed; the economics of IT in drug R&D will be highlighted; illustrative case studies will be presented; and a view of the future of IT in R&D will be put forth. Topics include organizational models in R&D and IT, a comprehensive view of the main components of the R&D process, current contributions of IT to each of the main components of the R&D process, the global perspective and the economics of IT in drug development.

MIS 673 (formerly Mgt 724) Pharmaceutical Industry Supply Chain

This course focuses on the issues surrounding supply chain design, planning and execution for the pharmaceutical and biotech industries from drug discovery to delivery. This course will use research on information systems, optimization, e-business and decision-support technologies and lessons learned from their effective use in global supply chain management for manufacturing and distribution in the process industries. The student will learn how to evaluate global supply chain issues from the perspectives of various stakeholders in relationship to overall organization and societal goals. They will further understand the different mechanisms for collaboration and create a process for establishing and maintaining an effective global SCM solution architecture. Topics include good manufacturing practice and regulations, advanced planning and scheduling, global competition, mergers and acquisitions, innovation, new tools and partnerships, effective global supply chain management and qualifying for a global supply chain manager position.

MIS 674 (formerly Mgt 723) Pharmaceutical Industry Marketing and Sales

This course focuses on the organizational, management and technology issues and considerations related to the sales and marketing function of the pharmaceutical industry as one of its principal boundary-spanning functions. This course will use extensive research and current literature on pharmaceutical sales and marketing business approaches and Information Technologies that drive or support sales and marketing plans as well as information and knowledge management considerations that drive competitive distinctiveness. This course will also explore the real and potential information and knowledge linkages between the sales and marketing

function and the discovery, product development and supply chain functions of the pharmaceutical industry. Topics include linkage of the R&D/marketing and sales cost spiral, the industry focus on enhancing marketing and sales effectiveness, the relationship between information delivery mechanisms and physician prescribing habits, information technology's growth in marketing and sales, pharmaceutical sales and marketing and its relationship to the information value chain, the impact of new trends in discovery on sales and marketing approaches and the growing role of the healthcare consumer.

MIS 681 (formerly Mgt 761) Financial Service Industry Trends and Issues

This course concentrates on IT trends and issues in the financial services industry. Due to the diversity of this industry (banking, brokerage and insurance), along with the assortment of customer characteristics (i.e. retail vs. institutional), we will modularize the lectures by industry and customer partitions. This segregation will provide for a better understanding of this ever-changing industry. Upon successful completion of this course, students will have a solid understanding of the industry, market dynamics and how their roles in technology have an immense impact in the industry. This course will cover the structure and functioning of financial services, from the perspective of banking, insurance, capital markets and brokerage. Topics include industry consolidation and globalization, investment banking, fixed-income markets, the equity markets, the regulatory environment and financial analysis approaches. Trends in IT and its effect on each of these areas will be discussed.

MIS 682 (formerly Mgt 762) Capital Markets

This course is designed to familiarize the student with the current workings of the capital markets. This course describes fundamental analytical techniques and state-of-the-art financial instruments. It begins with the time value of money and progresses to bond mathematics, portfolio management and derivatives. The role of information technology is emphasized in both the development and delivery of financial instruments. Students will learn to structure IT applications to meet the needs of a trader or broker. Topics include the time value of money, bond math, the yield curve, analytical tools, trading and investment strategies, money market instruments and repurchase agreements, corporate bonds, macroeconomic dynamics, derivatives, securitization, equities and the role of IT in capital markets.

MIS 683 (formerly Mgt 763) Financial Services Industry Back Office

This course is designed to provide the student with an in-depth understanding of the back-office trade process and the role of information technology (IT) in this process, with the goal of helping the student to be an effective provider of information system development and operations in this arena. The various phases of the trade process will be described, including key regulatory requirements. The current contributions of IT to the process will be reviewed, including straight-through processing, T+1 and foreign exchange trades. Topics include the structure and vocabulary of a trade and trade processing, the street-side view of a process flow, global processing, regulatory and compliance, back-office best practices, improving efficiencies and real-time processing.

MIS 684 (formerly Mgt 764) Financial Services Industry Marketing and Sales

This course concentrates on effective selling and marketing IT strategies in the financial services industry. Due to the diversity of this industry (banking, brokerage and insurance), along with the multiplicity of customer characteristic (retail vs.

institutional), we will modularize the lectures by industry and customer partitions. This segregation will provide for a better understanding of this ever-changing industry. Upon successful completion of this program, students will identify client constituent's product needs and the ability for financial services companies to deliver this product (service) in a timely, cost-effective fashion. Corporate branding and marketing strategies will be reviewed and challenged by the student. Topics include the "sell-side", the "buy-side", the selling distribution process, e-business selling strategies, marketing strategies and corporate bonding, the role of data warehousing and sales data mining and partnership with the client.

MIS 710 (formerly Mgt 783) Process Innovation and Management

This course focuses on the role of Information Technology (IT) in reengineering and enhancing key business processes. The implications for organizational structures and processes, as the result of increased opportunities to deploy information and streamline business systems, are covered. Cross-listed with NIS 630.

MIS 730 (formerly Mgt 784) Integrating IS Technologies

This course focuses on the issues surrounding the design of an overall Information Technology architecture. The traditional approach in organizations is to segment the problem into four areas - network, hardware, data and applications. Instead, this course concentrates on the interdependencies among these architectures. In addition, this course will utilize management research on organizational integration and coordination. The student will learn how to design in the large, make appropriate choices about architecture in relationship to overall organization goals, understand the different mechanisms for coordination available and create a process for establishing and maintaining an ongoing enterprise architecture. Prerequisites: Mgt 772, Mgt 773 and Mgt 776 or their equivalents. Cross-listed with NIS 633.

MIS 750 (formerly Mgt 781) Management of IT Organizations

The objective of this course is to investigate and understand the organizational infrastructure and governance considerations for Information Technology (IT). It concentrates on developing the students' competency in current/emerging issues in creating and coordinating the key activities necessary to manage the day-to-day IT functions of a company. Topics include: IT's key business processes, IT governance, IT organizational structure, value of IT, role of the CIO, outsourcing, systems integration, managing emerging technologies, change management, and human resource considerations. This course must be taken towards the end of the Information Systems degree program.

MIS 757 (formerly Mgt 757) Practicum - Effective Communication for Managers+

In this workshop lab, students will learn several skills to help them present and write more effectively. Specific topics include components of effective writing, ten steps for effective presentations, using advanced computer technologies in oral presentations and portraying the correct image. (0.7 credits) Cross-listed with EMT 757.

MIS 758 (formerly Mgt 758) Practicum - Oral and Written Communication Competency+

Students will be graded on several team and individual oral presentations and written reports which demonstrate their competency in both oral and written communications. Each student will have an oral/written report card. (0.6 credit) Cross-listed with EMT 758.

MIS 760 (formerly MIS 780) IT Strategy

The objective of this course is to address the important question, "How does one improve the alignment of business and Information Technology strategies?" The course is designed for advanced graduate students. It provides the student with the most current approaches to deriving business and Information Technology strategies, while ensuring harmony among the organizations. Topics include business strategy, business infrastructure, IT strategy, strategic alignment, methods/metrics for building strategies and achieving alignment. This course must be taken after MIS 750.

MIS 800 Special Problems in MIS (M.S.)*

With permission of the instructor. Limit of six credits for the degree of Master of Science. Cross-listed with Mgt 800.

MIS 850 Research in Managing IT Strategic, Tactical and Operational Issues

This course provides the student with the opportunity to research current and emerging seminal trends in the responsibilities of the lead IT executive. It addresses IT topics such as alignment, strategy, governance, value, processes, outsourcing, organization and H/R and managing emerging technologies. Students will be required to seek out and review current seminal research that defines the job of the CIO and the IT organization as it strives to align with the business. In particular, because this course is for doctoral students only, there is an emphasis on investigating these topics, becoming familiar with leading researchers and publications in the area, and presenting the results of individual assessments. Prerequisites: Mgt 704 and exposure to all aspects of information management demonstrated by their previous academic or practical experience, as well as research methods.

MIS 900 Thesis in MIS (M.S.)*

For the degree of Master of Science. Six to 12 credits with departmental approval. Cross-listed with Mgt 900.

Telecommunications Management Courses**TM 500 Calculus for Telecommunications Managers**

The goal of this course is to provide students with the background in calculus necessary for the telecommunications curriculum. Topics covered include review of algebra, plane coordinates and functions, differentiation, series, geometric series and exponential series, the elements of counting, illustrations of the material on discrete distributions, z-transforms, integration of simple functions, integrals over the entire line and basic probability densities. This course may not be taken for credit towards a degree at Stevens.

TM 550 Introduction to Telecommunications Concepts

This course sets the foundation for courses that are to follow covering concepts and major technologies of the telecommunications industry. Telecommunications regulations, end-to-end service and historical events are stressed. This course is open to Telecommunications majors only and is intended for students with a minimal telecommunications background. This course may not be taken for credit towards a degree at Stevens. Variable credits, 0-3.

TM 584 Wireless Systems Security

Wireless systems and their unique vulnerabilities to attack; system security issues in the context of wireless systems, including satellite, terrestrial microwave, military tactical communications, public safety, cellular and wireless LAN networks; security topics: confidentiality/privacy, integrity, availability and control of fraudulent usage of networks. Issues addressed include jamming, interception and means to avoid them. Case studies and student projects are an important component of the course. Cross-listed with EE 584 and NIS 584.

TM 586 Wireless Networking: Architectures, Protocols and Standards

This course addresses the fundamentals of wireless networking, including architectures, protocols and standards. It describes concepts, technology and applications of wireless networking as used in current and next-generation wireless networks. It explains the engineering aspects of network functions and designs. Issues such as mobility management, wireless enterprise networks, GSM, network signaling, WAP, mobile IP and 3G systems are covered. Cross-listed with NIS 586 and EE 586.

TM 601 Principles of Applied Telecommunications Technology

This course covers required technical concepts of applied telecommunications and an overview of the industry as a regulated and competitive environment. The main issues of telecommunications systems and network transmission, signaling and switching are covered. Attention is given to the following topics: analog and digital communications; telephony; data communications; signal types; modulation; multiplexing; network design concepts; and relevant standards. These topics are presented with attention to the functional interrelationship of the various sectors of the industry, business and government regulatory bodies, all of which are affected by this technology.

TM 605 Probability for Telecommunications Managers

This course provides a background in probability and stochastic processes necessary for the analysis of telecommunications systems. Topics include: axioms of probability, combinatorial methods, discrete and continuous random variables, expectation, Poisson processes, birth-death processes and Markov processes. (Also counts for credit for the NIS program). Cross-listed with NIS 605.

TM 610 Business Information Networks

Concentrated study of data and computer communications, information network architectures and standards. Topics include: IP networking, information characteristics and requirements for voice, video, image and data; protocol definitions and performance analyses for distributed networks; network topologies; local area networks (LAN) functional characteristics, performance and analysis studies for Ethernet and token ring as primary technologies; internetworking; metropolitan area networks (MAN) including FDDI, DQDB; and wide area networking (WAN) technologies including frame relay and asynchronous transfer mode (ATM). Prerequisites: TM 601, TM 605.

TM 611 Emerging Technologies

This course covers a wide range of emerging state-of-the-art transmission and switching technologies, evolving communication protocols and their applications. This course is a super-loaded look at the key technologies that are about to enter the mainstream. The course studies technologies that impact both the service provider

industry as well as the corporate enterprise IT environment. Topics included in this course are: VoIP protocols (H.323, SIP, SGCP, MGCP, IPDC, etc.) and soft switches; Multiprotocol Label Switching (MPLS) and their applications such as VPN and Traffic Engineering; Wavelength Division Multiplexing (WDM) and optical switching; Gigabit/10 Gigabit Ethernet and Storage Area Networks (SAN); Wireless LANs (IEEE 802.11a/b/g, 802.15, 802.16, etc.); management and performance modeling tools. Prerequisites: TM 601, TM 610.

TM 612 Regulation and Policy in the Telecommunications Industry

Historical perspective of telecommunications as a regulated industry, effects of regulation on industry growth in pre- and post-divestiture environments; special case of divestiture of AT&T; government regulatory agencies and processes; management issues related to business between regulated and non-regulated corporations; tariff structures, rules and rate making in the regulated environment. Issues of privatization and deregulation in international telecommunications and their effects on global companies are also studied.

TM 613 Knowledge Discovery and Data Mining for Telecommunications Managers

This course covers topics in intelligent extraction of data and information from data stores and data warehouses. The course complements several theoretical techniques such as neural networks, data-driven decision, rule-based systems, machine learning and decision trees with case studies from several telecommunications companies such as Bell Atlantic, US West, etc. Prerequisite: TM 605.

TM 614 Principles of Traffic Engineering and Performance Analysis

Introduction to the principles of traffic engineering and performance analysis which play a crucial role in the design, provisioning, measurement, management and control of modern telecommunications systems. Topics include models for traffic arrival and service processes, superposition and decomposition, traffic burstiness, grade of service (GOS), quality of service (QOS) issues, efficiency, trunk reservation priority, peakedness, interactive systems, throughput/delay tradeoffs, bottleneck analysis, overload performance and control and buffer management principles. Open, closed and mixed queuing network flow control models are studied as well as throughput and delay analysis for controlled and random access LAN. Prerequisites: TM 601, TM 605.

TM 615 Wireless Communications and Mobile Computing

This course provides a broad overview of the important field of wireless and personal communications. Topics to be examined include the mobile wireless standards of AMPS, North American TDMA (IS-138), GSM and CDMA (IS-95). Security and privacy, network management and interworking in wireless systems (IS-41) will also be examined. An overview of RF propagation factors and selected cellular design approaches is presented. Wireless data are introduced by examining cellular digital packet data. Selected goals and challenges of the field of mobile computing are examined along with the resulting network architectures and applications. Prerequisites: TM 601, TM 610.

TM 616 Global Wireless Industry

This course is focused on the global wireless industry and mobile wireless systems. The course will analyze the various complexities facing management when deploying or operating a wireless mobility system. The four main areas of the management of

mobile wireless systems that will be covered in the course are the global wireless mobility market, regulatory requirements, management challenges, and decision methods. The course will utilize a combination of traditional instructor-led material in addition to homework assignments that will be geared toward reinforcing the lecture material. A team-based class project will also be assigned. Specific topics covered include the global wireless industry (service providers, handset and infrastructure vendors and standards and trade organizations), international regulation, wireless operators' organization and metrics and the initial planning, deployment decisions, forecasting and budget considerations in wireless system deployment.

TM 617 Next Generation Wireless Systems

This course provides a broad perspective on the services, applications, requirements, architecture, standards and impact of emerging wireless networks. The new wireless services and applications, which are driving the development and deployment of new wireless networks, are defined and differentiated. The tradeoffs between customer requirements and network performance are analyzed. The fundamentals of next generation network interfaces and resource management and the impact of multiple international standards are explored. The architecture and operational scenarios of the two major third generation standards (UMTS and cdma2000) are examined and differentiated. UMTS and cdma2000 are compared from multiple perspectives including network evolution, services and applications, global markets, and financial perspectives. Specific topics examined include services, applications, and QoS in next generation wireless networks along with the architecture and operational scenarios of global standards (UMTS and cdma2000) in next generation wireless networks. Prerequisite: TM 615.

TM 618 Performance of Emerging Mobile Wireless Networks

This course develops a fundamental understanding of the performance, management and life-cycle analysis of emerging mobile wireless networks. The major components of a mobile wireless network; the Radio Access Network (RAN) and the core Back-Bone Network (BBN), are described in terms of their major functional elements. The impact of these functional elements upon the ability of the system to achieve established performance metrics is examined. This course will also examine the trade-offs in system performance and management that each of the elements has on system complexity, planning and ability to meet the required performance objectives. Life-cycle analysis and in particular, the migration of mobile wireless systems to third generation networks is discussed with emphasis on the impact of migration on system architecture and cost. The topics of system performance, management and life-cycle analysis are crucial to wireless managers and professionals in the planning and migration of mobile wireless networks. The course includes a team project where the students will apply the knowledge covered by the course to a practical case study. Prerequisites: TM 605, TM 610, TM 615.

TM 619 E-Commerce Technologies

The course provides an understanding of electronic commerce and related architectures, protocols and technologies. It describes the e-commerce concept, objectives and market drivers, as well as requirements and underpinning techniques and technologies, including the Internet, WWW, multimedia, intelligent agents, client-server relations and data mining. Security in e-commerce is addressed, including types of security attacks, security mechanisms, Virtual Private Networks (VPNs), firewalls, intranets and extranets. Implementation issues in e-commerce, including the design and management of its infrastructure and applications (ERP,

CRM, SCM), are discussed. M-commerce is addressed; electronic payment systems with their associated protocols are described, and various B2C and B2B applications are presented. Also, policy and regulatory issues in e-commerce are discussed. Cross-listed with CS 619, CpE 619 and NIS 619. Prerequisite: CS 666, CpE 678, TM 610 or Mgt 776.

TM 621 Telecommunications Switching and Signaling

This course covers the technologies of switching systems for circuit, packet and broadband-switched networks. The focus of this course is switching systems instead of transmission systems. Topics include: telephony switching, switching fabric architectures and analysis of their complexity, optical and photonic switching, Asynchronous Transfer Mode (ATM) for broadband networks. The various layers of ATM are investigated with switching fabric and architecture alternatives. Included in this course is the study of high-speed packet networks based on Label Switching (MPLS) and their applications (VPN, Traffic Engineering). Other related topics include IP telephony and its standards such as H.323, SIP, SGCP. This course also covers circuit-switched network signaling used in user-to-network and network-to-network call control. Major topics include Common Channel Signaling System 7 (CCS7), Signaling Transfer Point (STP), ISDN User Part (ISUP), Transaction Capabilities Part (TCAP) and routing techniques. The course will cover Inter-working of SS7 and IP Session Initiated Protocol (SIP), H.323 signaling protocol series. Included in the course are discussions on existing products in the industry such as Lucent Technologies' 5ESS, Ericsson's AXE10, Juniper's M160, Tellium's Aurora System.

TM 624 Network Management

This course presents technical management issues of network control and operations. This subject is approached with the introduction of organization issues and requirements for network systems groups within corporations, and then principally concentrates on the current technical issues of network management standards such as SNMP and SNMPv2. The course requires students to engage in the detailed study of the evolving standards of Management Information Bases (MIB) in the industry and the messaging protocols required to implement Network Management Systems (NMS). Semester projects include the group development of computer-based simulated network management systems to apply the knowledge gained in the course and detailed competitive analysis of current systems implemented in industry. Topics include network management concepts, administrative and operational management, performance management, fault management, configuration management, security management and accounting management, remote network management (RMON). Prerequisites: TM 601, TM 605, TM 610.

TM 665 CyberSecurity Forensics

Security forensics involves the identification, preservation and analysis of evidence of attacks in order to identify the attackers and document their activity with sufficient reliability to justify appropriate technological, business and legal responses. Forensic activity takes place in a complex, ever-changing legal and social context, which must be understood to fully appreciate the power and value of that activity. This course covers both technological and legal components of the topic. The technical aspect addresses analysis of intruder types and the intrusion process, review of logs and profiles and their types, identification of attack signatures and fingerprints, application of data mining techniques, study of various traceback methods and the

preservation of the information and evidence acquired through the use of forensic tools and techniques. The legal aspect addresses the impact of forensics on the legislative, judicial, and regulatory proceedings that collectively articulate and promote public policy goals, determine civil and criminal liability and define and assess regulatory compliance. It also discusses the point that the effective and appropriate use of forensics requires that such investigations be conducted under law, with particular regard to civil rights, rights of privacy, property and contract rights. The course draws on pertinent concepts of law and legal procedure, at a level accessible by non-lawyers, to explore the broader significance of forensics in the private and public sectors. Prerequisite: CS 573 or MIS 645. Cross-listed with MIS 665 and TM 665.

TM 670 Decision Analysis for Corporate Network Systems

This course surveys sector implementation of corporate telecommunication networks and the business issues involved in their selection. Issues of equipment acquisition, financing and accounting will be studied in depth. Additionally, the equipment/system selection process will use the techniques of probabilistic outcomes, simulation, sensitivity analysis and multi-attribute analysis to better define the risks and opportunities of these investments. Also studied are telecommunications systems' effects on the balance sheet of the corporation as financial assets or liabilities: strategic assets, active revenue-producing tools or passive service provision in the corporation's realization of a business plan. Prerequisites: TM 601, TM 610, Mgt 600 and Mgt 618.

TM 694 E-Business Security and Information Assurance

Information assurance and security are recognized as very important areas in electronic business transactions and financial systems, from the managers', users' and providers' viewpoints. This course addresses the security of e-business and cyber environments from an end-to-end perspective, including data center security and access security. The information security phases of inspection, protection, detection, reaction and reflection are emphasized. Topics also include: application, server and database security, virtual local area networks (VLANs), secure access techniques and secure electronic payment systems. The course also reviews financial Electronic Data Interchange (EDI) and smart card security in banking applications. The course includes a project and some lab experiments related to SSL, SET, EDI, server and application security. Cross-listed with CS 694. Prerequisite: CS 666 or TM 610 or equivalent.

TM 765 Selected Topics in Telecommunications Management

A participating seminar on topics of current interest and importance in the field of applied telecommunications technology and networking.

TM 770 Economics of Networks: Pricing, Auctions and Trading

Network industries play a crucial role in modern life and the economy would be very much diminished without communications and information networks. This course analyzes the economics of networks and communications services. Theoretical and practical aspects of the subject will be covered based on three pillars: technologies, pricing, and special topics (auctions, trading bandwidth, regulation). Communications technologies are reviewed, traditional as well as new, such as the Internet, ATM, wireless. The course then provides in-depth analysis of the economics of monopoly, oligopoly and perfectly competitive markets, as applied to the telecom markets. Pricing alternatives are formalized using simple mathematical models. Students learn

how network control and performance of networks tie with the economic analysis of consumer behavior. Special topics related to game theory, risk management of telecom operations, trading of bandwidth as well as auctions of bandwidth and spectrum are covered towards the end of the course. It is an essential reference for students who are focusing on the performance, analysis and design of networks, regulation and policy in telecommunications, economics of information goods and risk management. The course targets advanced master's students and Ph.D. students across all Schools (Management, Engineering, Sciences), who are interested in the economic aspects of communication networks. Prerequisites: Calculus and Networks at a university level, e.g. TM 500 and TM 601, or equivalent. The course is technically demanding and is intended for students who have a quantitative background and knowledge of communications networks.

TM 800 Special Problems in Telecommunications Management*

An investigation of a current research topic under the direction of a faculty member. A written report is required which should have the substance of a publishable article. Earned credits range from one to five credits to be applied to the M.S. in Telecommunications Management degree.

TM 801 Special Problems in Telecommunications Management*

With permission of the instructor. Limit of six credits for the degree of Doctor of Philosophy.

TM 900 Thesis in Telecommunications Management*

For the degree of Master of Science. Six to 12 credits with departmental approval.

*By request

+ Open only to students in the Master of Technology Management program.

Science Education Courses Offered online at www.WebCampus.Stevens.edu

Mgt 627 Mathematical Tools for Data Analysis

This course will endeavor to equip the student with tools to visually analyze data and to elicit questions suggested by the data. Modern technology provides tools for graphical display and simulation heretofore unavailable. This course of study introduces the student to such technological innovations and will include such topics as stemleaf plots, histograms, hanging rootograms, hanging chi-grams, box plots, contingency tables and related chi-square tests, typical values, measures of spread, regression models, Q-Q plots and nonparametric tests such as the sign test, the Wilcoxon signed rank test, Mann-Whitney tests and Kendall's tau. The emphasis will be on exploratory data analysis in contrast to confirmatory analyses, and will utilize real data extracted from the web and elsewhere. Offered online only.

Mgt 651 Internet Applications for Use in Science Education

This course is designed to enable students at course end to navigate the web effectively, to explore Ask-an-Expert Sites, to develop and assess collaborative projects and to utilize subject guides and search engines. Students will be taught how to introduce website materials into traditional courses, how to locate resources for social sciences or language arts, how to create a web site and how to use FTP. Students will make final presentations. Students will acquire the range of requisite skills to enable and foster the seamless introduction of Internet materials into

science or mathematics courses. Emphasis will be on the acquisition of real-time data from the Internet. Offered online only.

Mgt 785 Introduction to the Development of Computer-Based Instructional Systems

This course includes the study of the various types of computer-based instructional (CBI) approaches: tutorials, drills, simulations, instructional games and tests; the process of producing such materials: preparation, design, storyboarding, programming and evaluation. It offers instruction in the use of authoring systems with which CBT materials may be readily produced. Assignments include the critique of an existing CBI program and the creation of a short tutorial. Offered online only.