Supply Chain and Analytics

Courses

SCMA 2300 Business Statistics: 3 semester hours
Prerequisites: INFSYS 1800 and a minimum campus GPA of 2.0. This course covers statistical methods and techniques for business applications. Topics include, but are not limited to, hypothesis testing, regression analysis, time series, and forecasting. Students will learn to identify and define business related hypotheses, build hypothesis testing and predictive models, and perform analysis and interpret results. It lays the foundation for students to be successful in more advanced analytical-oriented courses.

SCMA 2301 Introduction to Supply Chain Management: 3 semester hours
Prerequisites: A minimum campus GPA of 2.0. This course provides an understanding of fundamental concepts of supply chain management. All functional areas of supply chain management are introduced, including procurement, production and operations management, transportation and logistics, inventory and warehousing, demand planning, and network design. Topics also cover supply chain metrics, strategy, risk management, and integration with other business functions.

SCMA 3320 Operations Management: 3 semester hours
Prerequisites: SCMA 2301 or MATH 1320 and a 2.0 campus GPA . This course covers supply chain management with special focus on understanding manufacturing and service operations. Emphasis is on the application of quantitative methods to the solution of strategic, tactical and operational problems. Topics include demand planning, capacity, new product design and launch, process selection, facility layout, production planning, scheduling, inventory, process control, waiting lines, lean production, etc.

SCMA 3321 Procurement: 3 semester hours
Prerequisites: SCMA 2301 and a 2.0 campus GPA. This course covers procurement processes and supplier management, with emphasis on managing a supplier base for both products and services. Topics include the strategic role of procurement in supply chains, sourcing options, identification and evaluation of requirements, the role of product design, make-versus-buy decisions, and supplier selection and evaluation.

SCMA 3331 Data Visualization for Business Applications: 3 semester hours
Prerequisites: BUS AD 1107 or SCMA 2300. This course introduces students to the principles of effective data visualization, and how to visualize Key Performance Indicators across the strategic, tactical, and operational levels of business processes including supply chains, marketing, finance, among others. Visualization tools including Microsoft Excel, Tableau and ArcGIS are introduced. Topics covered include fundamental theory on display of quantitative information, the use of maps to analyze business data, and how to organize figures to tell a story.

SCMA 3345 Predictive Analytics and Data Mining: 3 semester hours
Prerequisites: SCMA 2300 and a minimum campus GPA of 2.0. This course focuses on predictive analytics in business settings. Topics may include applications of multivariate analyses to problems in marketing, finance, transportation and logistics. The course covers use of decision trees, regression and logistic regression to explain phenomena and predict future outcomes. Students acquire experience in the use of modern tools for data mining.

SCMA 3370 Introduction to Transportation: 3 semester hours
Prerequisites: A minimum campus GPA of 2.0. This course provides an overview of the transportation sector, including history, providers, users, government regulation, and the central role of transportation in supply chain management. The course covers the importance of domestic and global transportation, the operational aspects of the various transportation modes (rail, water, motor, air, and pipeline), the role of transportation intermediaries, the demand and supply of transportation, and the managerial aspects of transport in both the commercial and urban environment.

SCMA 3371 Traffic and Transportation Management: 3 semester hours
Prerequisites: SCMA 3370 and a minimum campus GPA of 2.0. This course focuses on transportation management as a function of a firm's logistics and supply chain strategy. The course covers the management of the various transportation modes (rail, motor, air, water, and pipeline), strategic use of transportation intermediaries such as 3PL's, and linkages between transportation and warehousing. This course is designed to provide a basic understanding of the issues and work performed by transportation managers, including costing and pricing, transportation procurement, transportation technology, and cross border trade management.

SCMA 3376 Transportation Security and Risk: 3 semester hours
Prerequisites: SCMA 3370 and a minimum campus GPA of 2.0. This course emphasizes risk and security issues related to transportation systems and supply chains, including highway, aviation, pipeline, waterway, transit, and rail networks, as well as port facilities. This course also provides an overview of transportation safety issues including passenger and employee safety, and hazardous materials. It addresses transportation and supply chain risk management and continuity strategies to prepare for, and respond to, disruptions as from terrorism events or natural disasters.

SCMA 3390 Internship in Supply Chain and Analytics: 1-3 semester hours
Prerequisites: Minimum campus GPA of 2.0, consent of supervising instructor and department chair. Students are employed in the field where they apply the knowledge and skills learned in the classroom. Professional development and obtaining specialized work experience are the primary goals. A departmental faculty member will monitor the student's program with the student providing a formal written report at the end of the project. Students cannot receive credit towards the emphasis for both SCMA 3390 and SCMA 4389. Repeatable for a maximum of 9 credit hours.

SCMA 3398 Seminar in Supply Chain and Analytics: 1-3 semester hours
Prerequisites: To be determined each time the course is offered and to include a minimum 2.0 campus GPA. This course is a selected special topic in the fields of supply chain management and analytics. May be repeated for credit with different topics.

SCMA 3399 Independent Study in Supply Chain and Analytics: 1-3 semester hours
Prerequisites: Minimum campus GPA of 2.0 and approval by the supervising professor and the department chair. Special individual study in supply chain and analytics under the supervision of a full-time faculty member of the department.

SCMA 4325 Environmental Sustainability in Business Operations: 3 semester hours
Same as BUS AD 4325. Prerequisites: SCMA 2301 or permission of instructor. This course studies the environmental impacts of business operations, and it focuses especially on the principles and methods of 'lean and green' operations, i.e., ways in which organizations can reduce their costs and increase profits, while reducing their environmental impacts. Specific topics include energy efficiency, resource reduction, waste reduction, design for the environment, externalities and internal pricing mechanisms, environmental technologies, life-cycle assessment, recycling, re-use, and re-manufacturing, as well as national and global environmental issues.

SCMA 4330 Business Logistics: 3 semester hours
Prerequisites: SCMA 2301 and a minimum campus GPA of 2.0. This course examines the design, analysis, and operation of business logistics systems. Topics include supply chain trade-offs and decision-making, transportation planning, facility location and network design, inventory management, warehouse operations, sustainable logistics, and the role of technology. Through learning these topics, students also develop analytical and problem-solving skills such as data cleaning and processing, Excel-based modeling, heuristics, linear optimization, and mixed-integer programming.

SCMA 4331 Applied Supply Chain Modeling: 3 semester hours
Prerequisites: SCMA 2300 and SCMA 2301 and a 2.0 minimum campus GPA. This course introduces applied models and technology for supply chain management through hands-on experience using state-of-the-art software and tools for the design and operation of supply chains. The course covers the economic tradeoffs involved in such decisions, data requirements, operating parameters, application of software packages and performance management and analytics.

SCMA 4334 Supply Chain and Business Integration: 3 semester hours
Prerequisite(s): SCMA 2301 with a minimum 2.0 campus GPA. This course covers the principles and practices of supply chain integration, emphasizing how internal alignment among all business functions in an organization (e.g., sales, marketing, finance, logistics, purchasing, manufacturing, etc.) and external integration with key customers and suppliers drive superior business performance. Students will also get hands-on experience in real life business case simulation games to enhance their learning experience.

SCMA 4347 Introduction to Project Management: 3 semester hours
Same as ENT 4147. Prerequisites: SCMA 2301 and a minimum campus GPA of 2.0. This course introduces the concepts and practices of Project Management with a focus on supply chain and analytics related projects. It covers conventional aspects of project management, such as the project evaluation, planning, roles, responsibilities, scheduling, and tracking. In addition, this class introduces agile project management as applicable to projects where there is not the specificity of goals or solutions to be applicable to traditional project management.

SCMA 4350 Prescriptive Analytics and Optimization: 3 semester hours
Same as ACCTNG 4450. Prerequisites: MATH 1105 and a minimum campus GPA of 2.0. This course covers the construction and application of prescriptive analytical models for optimizing business decisions in a wide range of areas such as manufacturing, service, supply chains, logistics and finance. Topics include performance metrics, linear programming, integer programming, network optimization, simulation, and implementation using Excel.

SCMA 4381 Global Supply Chain Management: 3 semester hours
Same as INTL BUS 4381. Prerequisites: SCMA 2301 and a minimum campus GPA of 2.0. This course covers business logistics and supply chain strategies involving shipments across national boundaries. Topics may include the effects of international agreements and regional trading blocks on supply chain strategies, the design of global logistics networks, managerial processes and systems for international production and distribution, and risk management for international logistics.

SCMA 4389 Supply Chain Management Practicum: 3 semester hours
Prerequisites: SCMA 3320. This course engages students with local organizations to provide practical experience in critical thinking, analysis, and communication in a supply chain context. This allows students to integrate, synthesize and apply supply chain management knowledge and skills in a real business/organization through projects jointly supervised by a faculty member and a supervisor from the organization. Students cannot receive credit towards the emphasis for both SCMA 3390 and SCMA 4389.

SCMA 4398 Advanced Topics in Supply Chain and Analytics: 1-3 semester hours
Prerequisites: SCMA 2301 or permission of the instructor and a minimum 2.0 campus GPA. An intensive study of a specific aspect, problem or technique in the areas of supply chain management, analytics, logistics, or operations management. Different topics may be offered under this course number, so the course (with different topics) can be repeated for credit.

SCMA 5300 Business Analytics: 3 semester hours
Prerequisites: MATH 1030 and spreadsheet modeling or equivalent competency. This course covers all three pillars of analytics (descriptive, predictive and prescriptive) for data-driven business applications at the graduate level. Topics include, but are not limited to, probability, hypothesis testing, regression analysis, time series, linear/integer programming and data mining. Real world examples and case studies in various business domains, including supply chain, finance, marketing and information systems will be introduced. It lays the foundation for students to be successful in more advanced analytical-oriented courses.

SCMA 5310 Supply Chain Strategies: 3 semester hours
Prerequisites: Graduate standing. This course addresses supply chain management and its implications, with a focus on what firms can do to maintain competitiveness in the quickly changing business landscape. Topics may include fundamentals of supply chain management, value chain analyses, supply chain analytics, procurement, production, logistics, inventory management, and marketing business-to-business.

SCMA 5320 Supply Chain and Operations Management: 3 semester hours
Prerequisites: SCMA 5310 (may be taken concurrently). This course addresses decision-making in supply chains, operations and related business functions. Topics include product and process design, facility location and layout, aggregate planning, inventory management, and scheduling, as well as analytical methods of linear programming, decision analysis and queuing.

SCMA 5325 Environmental Analysis and Sustainability in Business Operations: 3 semester hours
Same as BUS AD 5325. Prerequisites: SCMA 5310 or consent of instructor. This course analyzes the environmental impacts of business operations, and it focuses especially on the principles and methods of 'lean and green' operations, i.e., ways in which organizations can reduce their costs and increase profit, while reducing their environmental impacts. Specific topics include energy efficiency, resource reduction, waste reduction, design for the environment, externalities and internal pricing mechanisms, environmental technologies, life-cycle assessment, recycling, re-use, and re-manufacturing, as well as national and global environmental issues.

SCMA 5334 Internship in Logistics and Supply Chain Management: 1-3 semester hours
Prerequisites: Consent of instructor. Students receive practical experience in the area of logistics or supply chain management. The internship is supervised by a professional in the host organization in consultation with a faculty member.

SCMA 5381 Global Supply Chain Management: 3 semester hours
Same as INTL BUS 5381. Prerequisites: SCMA 5310 (may be taken concurrently). This course covers global supply chain management strategy, planning and operations. Topics include issues in global trade, global network design and facility location strategies, international logistics, import-export operations, and global supply chain risk management.

SCMA 5389 Supply Chain Management Practicum: 3 semester hours
Prerequisites: SCMA 5300 or equivalent; SCMA 5310 or equivalent (may be taken concurrently). This course engages students with local organizations to provide practical experience in critical thinking, analysis, and communication in a supply chain context. This allows students to integrate, synthesize and apply supply chain management knowledge and skills in a real business/organization through projects jointly supervised by a faculty member and a supervisor from the organization. Students may not count both SCMA 5398 and an internship toward the SCMA emphasis.

SCMA 5399 Individual Research in Logistics and Operations Management: 1-3 semester hours
Prerequisites: Consent of instructor and graduate director. Special individual research topics in Logistics and Operations Management under the guidance of a specific professor.

SCMA 6321 Strategic Sourcing: 3 semester hours
Prerequisites: SCMA 5310 (may be taken concurrently). This course provides a strategic focus on the acquisition of goods and services and management of suppliers in business-to-business transactions. The course covers the strategic sourcing process, including categorizing the buy, conducting a market analysis, developing a supply strategy, analyzing prices and cost, developing bids, selecting suppliers, negotiating, and managing the supply base.

SCMA 6330 Business Logistics Systems: 3 semester hours
Prerequisites: SCMA 5310 (may be taken concurrently). This course focuses on analysis of business logistics systems and their role in supply chain management. It covers design and operation of logistics systems and their components. Topics include network design, facility location, transportation, vehicle routing, inventory management, customer service, sustainability, and reverse logistics.

SCMA 6331 Supply Chain Modeling: 3 semester hours
Prerequisites: SCMA 5300 and SCMA 5310 (may be taken concurrently) or consent of the instructor. This course introduces model-building techniques for data-driven decision-making in supply chains. It covers math programming (linear and integer programming), network optimization, and constraint programming, with their applications in production planning, MRP, transportation, network design and configuration. It provides hands-on experience by using state-of-the-art optimization tools and commercial software.

SCMA 6345 Business Analytics and Data Mining: 3 semester hours
Same as ACCTNG 5444. Prerequisites: SCMA 5300 and INFSYS 5800. This course concentrates on methods for converting data into business intelligence. It provides knowledge of the principles and techniques for business analytics and data mining. Topics include clustering, pattern recognition, visualization of relationships, predictive modeling, optimization techniques and simulation.

SCMA 6347 Supply Chain Project Management: 3 semester hours
Prerequisites: SCMA 5310. This course addresses the concepts and processes of project management as applicable to supply chain management. Students will study organizational design, project specification, integrated project planning, risk management and project control, and how globalization, environmental and sustainability issues, quality control, and cultural factors drive project management. Students may not receive credit for both SCMA 6347 and INFSYS 6847.

SCMA 6350 Management Science Methods: 3 semester hours
Prerequisites: SCMA 5300 or consent of the instructor. This course provides comprehensive coverage of management science and operations research methodologies. It introduces data-driven optimization approaches to solving business problems, construction of mathematical models, and sensitivity analysis for managerial decision-making. Topics include linear programming, integer programming, network optimization, and simulation.

SCMA 6360 Supply Chain Integration: 3 semester hours
Prerequisites: SCMA 5310 (may be taken concurrently). The course covers the connections between supply chain capabilities and corporate competitiveness, the management of business relationships with customers and suppliers, collaboration and coordination approaches, the role of technology, and the link between supply chain performance and overall financial measures. Students will learn how to leverage the competitiveness of a firm by integrating and coordinating strategies, business relationships and key supply chain processes across the network of suppliers and customers in the supply chain and among the various departments within a firm.

SCMA 6370 Supply Chain Analytics Practicum: 3 semester hours
Prerequisites: SCMA 5300 and SCMA 6350. This course engages students with local organizations to provide practical experience in critical thinking, problem solving, analysis, and communication in supply chains. This allows students to integrate, synthesize and apply supply chain management knowledge and analytical skills in a real business/organization through projects.

SCMA 6395 Seminar in Logistics and Operations Management: 3 semester hours
Prerequisites: SCMA 5310. This course covers topics of current interest in logistics and operations management. Topics may include just-in-time and lean production, quality management, manufacturing and service systems, transportation and logistics, quantitative management tools, etc.

SCMA 7380 Advanced Data Analysis: 3 semester hours
Prerequisites: SCMA 5300 and admittance into the PhD Program, or consent of instructor. This course provides a study of multivariate analytical techniques and their application to the analysis of business systems. Topics may include, but are not limited to, the construction and adaptation of statistical and machine learning models and extrapolative techniques to accommodate factor interactions, nonlinearities, and periodic effects. Methodologies include multiple regression, general linear model, time series analysis, neural networks, and Bayesian methods, among others.

SCMA 7382 Empirical Research Methods: 3 semester hours
Prerequisites: Admittance into the Business Administration PhD Program or consent of instructor. This course focuses on the application of research methods used in collecting and analyzing data from organizations or businesses to build and test supply chain theory. Research methods and their application in supply chain scholarship discussed in this course can include, but are not limited to, surveys, expert panels, field experiments, controlled experiments, structured and semi-structured interviews, archival data analysis, Delphi techniques, case studies, and action research.

SCMA 7383 Advanced Optimization: 3 semester hours
Prerequisites: SCMA 6350 and admittance into the Business Administration PhD Program, or consent of instructor. This doctoral seminar focuses on the theories and methodologies in deterministic optimization. It covers topics including the simplex method and duality theory in linear programming, network optimization, branch-and-bound, branch-and-cut, decomposition methods in integer linear programming, and various heuristics and metaheuristics for solving NP-hard combinatorial optimization problems.

SCMA 7390 Research Seminar in Supply Chain and Analytics: 3 semester hours
Prerequisites: Admittance into the Business Administration PhD Program or consent of instructor. This course covers research approaches, methodologies, and findings in Supply Chain and Analytics. This course may be repeated for credit when the subject matter is different.

SCMA 7393 Special Topics in Supply Chain & Analytics: 3 semester hours
Prerequisites: Admittance into the Business Administration PhD Program or consent of instructor. This course provides an in-depth analysis of special topics in Supply Chain & Analytics research. This course may be repeated for credit when the subject matter is different.