MS/Customer Analytics Courses

**Summer Foundations Courses (0.5 Credits)**

**MEC 5200: Fundamentals of Statistics and SPSS Programming**

**R Programming Workshop (2 day)**

**Fall Semester (15 Credits)**

**MEC 537: Data Analysis, Forecasting and Risk Analysis**

This course presents a modern and contemporary coverage of several econometric models that are used for the analysis and forecasting of business data. The basic building blocks for the analysis are regression time series models. Broad coverage of non-seasonal and seasonal ARIMA models is included. The important family of ARCH-GARCH models, used to represent changing volatility, are also covered in detail. These models are widely used in option pricing and in other financial applications. The course includes some extensions of these models to multivariable problems. Students are exposed to numerous real data sets in class and in assignments. All the models are analyzed with a popular econometrics software package that is employed in business. A group project is required. 3 Credits

**CSE 514A: Data Mining**

Many scientific computing problems are, by nature, statistical. Such problems appear in many domains, such as text analysis, data mining on the web, etc. Another source of the statistical nature of such problems is the lack of sufficient information of the problem domains as well as the specific problems at hand. What is available for a typical application is usually a set of data from observation. The main objective of this course is to gain experience of dealing with statistical data analysis problems by studying various statistical methods that can be used to make sense out of data, by reading and reviewing literature as well as by working on a specific problem in a selected application domain. 3 Credits

**Pol Sci 363: Quantitative Political Methodology**

This is an introduction to research methodology and quantitative analysis for social scientists. Students are introduced to the logic of social scientific inquiry, and to the basic statistical tools used to study politics. Students learn and apply the following to answer substantive questions: measurement, descriptive analysis, correlation, graphical analysis, hypothesis testing, confidence intervals, analysis of variance and regression analysis. Major components of the course include learning how to collect, manage and analyze data using computer software, and how to effectively communicate to others results from statistical analyses. Students work
collaboratively on research projects in which they pose their own questions, design a study, collect and analyze the data, and present their findings in a research paper. 3 Credits

**OMM 5705: Quantitative Decision Making**

Many managerial decisions, regardless of their functional orientation, are increasingly based on analysis using quantitative models from the discipline of management science. Management science tools, techniques and concepts (e.g., data, models, and software programs) have dramatically changed the way business operates in manufacturing, service operations, marketing, finance, and other areas. This course is designed to introduce students to fundamental quantitative techniques of using data to make informed management decisions. In particular, we will focus on various ways of modeling decision problems in order to enhance decision-making skills. These objectives are facilitated through the three key management science modeling approaches taught in this course: (i) optimization tools and constrained resource allocation; (ii) decision analysis; and (iii) simulation for the analysis of uncertainty and risk. The implementation of quantitative analysis tools has been facilitated considerably by the development of spreadsheet-based software packages, and so we will make liberal use of Excel and its optimization and data analysis add-ins. 1.5 Credits.

**MKT 571A: Marketing Research**

This introductory marketing research course examines the role of marketing research in the formulation and solution of marketing problems. In this course, students develop and apply basic skills in conducting and evaluating marketing research design. The first part of the course will focus on data collection from consumers using techniques such as focus groups, surveys, experiments etc. The second part will focus on basic analysis of the collected data using techniques such as t-tests, chi-square, and linear regression. Students will apply and implement these techniques using standard statistical software. 1.5 Credits.

**MKT 571B: Advanced Marketing Research**

This course is a follow-up to MKT 5714 and is designed to develop advanced techniques in marketing research and analysis. In this course, students will advance their skills in conducting marketing research and analyzing data using sophisticated multivariate techniques such as conjoint analysis, multidimensional scaling, cluster analysis, etc. These analyses will give students the tools to conduct a variety of advanced marketing analyses, such as segmentation and perceptual mapping. The course will teach students how to implement these techniques using standard statistical software. 1.5 Credits.

**MKT 577: Marketing Strategy**

Marketing strategic decisions requires long-term planning and are often costly to change once implemented. They often involve more than one marketing mix variable (price, advertising, and other promotions) that have to be consistent with a firm’s core competencies, with the objective of establishing sustainable competitive advantages. Good strategic planning involves careful analysis of customers and competitors in the industry, identifying a feasible set of options and then deciding on a course of action. With recent developments in information technology, firms have collected valuable market data, either by themselves or from third-party data providers. The biggest question for most firms, however, is how to use these data to help make strategic
decisions. The objective of this course is to develop a comprehensive framework to help understand the strategic situations of firms and the trade-off’s involved in decision-making. It will also provide students’ knowledge of using analytical skills to solve business problems. We will explore the importance of Customer Relationship Management (CRM) and how to use customer analysis to make marketing decisions. Other topics including competitor analysis, segmentation-targeting-positioning (STP), price competition, product strategy, entry strategy, etc. will be covered. This is currently a core course in Olin’s PMBA program. If the starting class of the PMBA program draws 20 students or more, we will consider offering an additional section of this course to comfortably meet demand. 3 credits.

Spring Semester (15 Credits)

MKT 555A: Data Analysis for Brand Management

Today’s brand managers typically have access to large quantities of data. For example, managers of consumer packaged goods brands typically have access to supermarket scanner data that cover thousands of daily transactions in hundreds of product categories at the store. Careful analyses of such data lead to an improved understanding of the marketplace and, in turn, improve the quality of marketing decisions. This course will cover statistical models and techniques that can be effectively used by brand managers on large marketing datasets. While the focus will be on fast-moving packaged goods categories (coffee, laundry detergents, carbonated beverages, etc.), the course will also deal with durable goods (automobiles), entertainment products (movies), etc. Microsoft Excel will be used for analysis. 1.5 Credits.

MKT 555: Analytics-Driven Brand Management

This course will cover decision support tools that can be effectively used by brand managers to improve the quality of their marketing decisions, such as pricing, advertising, promotions, etc. These decision-support tools typically rely on market-based estimates of demand and competitive conditions, which are often obtained by analyzing historical transactions data (which is the focus of MKT 555A: Data Analysis for Brand Management) and sometimes using consumer surveys (which is the focus of MKT 571A: Marketing Research I). The focus of this course will be on the optimization of marketing resources and budgets given such a quantitative understanding of the marketplace. While the focus will be on fast-moving packaged goods categories (coffee, laundry detergents, carbonated beverages, etc.), the course will also deal with durable goods (automobiles), entertainment products (movies), etc. Microsoft Excel will be used for analysis. 1.5 Credits.

MKT 558: Pricing Strategies

This course is designed to equip you with some essential concepts and techniques needed to make profitable decisions about one of the most important marketing variables—price. This course is structured around four fundamental factors that firms need to consider in their pricing decisions: costs, customers, competitors, and climate (legal environment). Through case
studies, in-class discussions, and course project/presentations, this course will provide you with a conceptual framework, grounded in modern economics and consumer psychology, for analyzing a complex marketing environment and designing proactive pricing strategies that are most profitable for a business. 1.5 Credits.

**MKT 558B: Pricing Decision Making & Implementation**

The focus of this course is on pricing tactics and strategies that are proven to be profitable for firms. Through case studies, lectures, a pricing simulation game, and presentations, this course will help students gain insights into successful pricing strategies in various industries and to develop skills that are necessary to make the most important business decision—pricing—in their organizations. Topics of discussion include pricing innovative products, pricing and market making on the internet, pricing of digital products, and dynamic and competitive pricing. 1.5 Credits

**MKT 500Q: Intensive Industry Project**

Students will work in teams on an analytics-driven client project, applying the tools that they learned in their Fall course work to the client’s data-driven business problem under faculty and client supervision. Each student is expected to spend about 150 hours on the project. Grades are based on the quality of the final deliverables, i.e., written report and oral presentation. 3.0 credits.

**MKT 571C: Database Marketing**

Firms in many industries typically collect large quantities of customer transactions data. It is important for firms to analyze these datasets in order to identify, target, and engage with their customers. Managers can use the results of these analyses to answer strategic questions such as the following: How should we segment our customers? What is the value of maintaining the relationship with a customer? Which customers should we target for new product or promotional offers? Which prospective customers should we try to acquire? This course will familiarize students with some customer-level data sources and their potential use for strategic decision-making, especially with regard to customer relationship management (CRM). It will describe a set of analytical and statistical tools that are necessary to make sense out of such data. Students will work with special-purpose statistical software for this purpose. 1.5 Credits.

**B53 MGT 620 Empirical Methods in Business**

The objectives of this course are to train students in different business disciplines to understand: how to use data to address research questions, how to build econometric models that can be applied to data, and how to estimate the econometric models using some statistical packages. This course emphasizes empirical data handling and estimation issues. Prerequisites: students are expected to have basic statistical knowledge such as random variables and distributions, tests of statistical hypothesis, basic linear regression, and maximum likelihood estimation. 3 credits.
**MKT 500S Predictive Analytics for Business Decision Making**

Predictive Analytics deals with the employment of formal learning from business experience, using business data, to predict the future behavior of customers or other critical organizational elements in order to drive better business decisions. This course emphasizes data situations that students are likely to face in marketing, finance, manufacturing and consulting jobs. Students will analyze real-world business datasets using various advanced analytic techniques such as logistic regression, decision trees, neural networks, stochastic gradient boosting, MARSplines, Ensembles, Clustering, Associations etc. The focus of the course lies in the conversion of raw and messy business data into robust actionable predictions for decision-making. 3 credits.