List of Ph.D. Courses

Research Methods Courses (5 courses/15 hours)

The research methods set consists of five courses (15 hours) that discuss the process of research and key methodological issues encountered in management research, and the statistical and analytical tools necessary to conduct this research. The set of required courses includes the following three course (9 hours):

*MGT 9050 Research Methods* 3(3, 0) Research methods supporting scholarly research and publication in management. Topics include theory building, hypothesis specification and testing, experimental design, measurement, sampling, research ethics and related issues. Restricted to doctoral students. Preq: MGT 8540 or equivalent.

*PSCYCH 8100 Research Design and Quantitative Methods I* 3(3, 0) Overview of applied data analysis in industrial and other work-related settings. Analysis techniques focus on the General Linear Model to ANOVA and regression. Preq: Six credits of statistics, research methods or equivalent.

*PSYCH 8110 Research Design and Quantitative Methods II* 3(3, 0) Research methodologies; experimental, quasi-experimental and non-experimental designs emphasizing applied psychological research; scientific method; basic versus applied research; technical writing; grant writing and ethics/Preq: PSYCH 8100/

In addition to two of the following three courses:

*PSYCH 8130 Research Design and Quantitative Methods III* 3(3, 0) Advanced course in applications of multivariate data analysis in industrial and other work-related settings. Topics include the major advanced and multivariate data analytical tools needed for research in applied psychology. Preq: PYCH 8100 or consent of instructor.

*PSYCH 8730 Structural Equation Modeling in Applied Psychology* 3(3, 0) Fundamentals of the statistical techniques involved in structural equation modeling (SEM) in applied psychology. SEM is a regression-based technique that incorporates elements of path analysis, confirmatory factor analysis and structural models. Preq: PSYCH 8100 or consent of instructor.

*SOC 8030 Survey Designs for Applied Social Research* 4(3, 2) Survey research design principles, procedures and techniques used in applied sociology; instrumentation; data collection, management and interpretation. Offered fall semester only. Preq: SOC (R S) 303 or equivalent.

Foundation Courses (2 courses/6 hours)

SCOM Track:

- *IE 8030 Engineering Optimization and Applications* 3(3, 0) Introduction to optimization through the study of problems related to the planning, design and control of production/manufacturing systems; classical nonlinear optimization and algorithmic procedures, primal and dual problems with post-optimality analysis, Markov chains. Preq: Graduate standing and consent of instructor/
- *IE 8040 Manufacturing Systems Planning and Design* 3(3, 0) Concepts and principles associated with the design of manufacturing systems with a focus on modeling and integration methodologies; group technology, process planning, manufacturing modeling and design for manufacturing. Preq: Graduate standing and consent of instructor.
IS Track:

- **MGT (MBA) 8610 Information Systems** 3(3, 0) See MBA 8610. MBA (MGT) 8610 Information systems and technologies; their impacts both within and across organizational settings.
- **MGT 8690 Project Management** 3(3, 0) In-depth study, through case studies, readings and hands-on experience, of processes and techniques to initiate, plan, execute, control and close-out information technology projects. Topics include project integration, scope, time, cost, quality, human resource, communications, risk and procurement management. Preq: Consent of instructor.

**Advanced Courses** (3 courses/9 hours)

A minimum of three advanced course (9 hours), or doctoral seminars. The seminar course offerings are taken consistent with the student’s research and teaching interests.

**MGT 9040 Seminar on Current Management Topics** 3(3, 0) (Theory of Operations Management I: Global Operations and Technology Strategy) Topics from current management literature emphasizing research from scholarly journals. Topics vary in keeping with developments in the literature. Maybe repeated with different faculty for a maximum of six credits. Preq: MGT 8030 or consent of instructor.

**MGT 9070 Seminar in the Design of Operations Systems** 3(3, 0) (Lean Production) Current management issues and developments in the evaluation, selection, design and installation of systems for manufacturing and service operations; empirical research dealing with the building blocks of operations such as process technology scanning, selection and installation; operations systems location and layout; and management systems selection and installation. Preq: MGT 8120, consent of instructor.

**MGT 9160 Directed Readings in Management** 1-3(1-3, 0) (Theory of Operations Management II: Service Science – Service Operations Strategy and Design) Directed reading and research in the student’s area of interest. Maybe repeated for a maximum of three credits. Preq: Consent of instructor.

**MGT 9250 Seminar on Information Systems Foundations** 3(3, 0) Foundations of Information systems research including classical framework literature. Research philosophies, key methodologies and relevant theoretical underpinnings are discussed and debated.

**MGT 9270 Seminar in Organizational Impacts of Information Systems** 3(3, 0) Current theoretical and empirical research related to the organizational impacts of information systems. Research focuses on strategic and structural impacts of information technologies within and across organizations.

**MGT 9040 Seminar in Advanced Organizational Behavior** 3(3, 0) Foundation knowledge in Organizational Behavior, including classic and contemporary theories, ongoing controversies, and important empirical studies. Theory and research concerned with micro-organizational processes, and analytical skills necessary to critically evaluate and integrate work in this area. This source is offered in the summer.

*Doctoral Dissertation Research* (18 hours)

**MGT 9910 Doctoral Dissertation Research** 1-12

**Elective Courses**
SCOM Track: ECON 8040 and at least one other econometrics course must be completed prior to sitting for comprehensive exams. Students are encouraged to audit at least two additional courses, which can be completed after comprehensive exams but prior to graduation.

ECON (AP EC) 8040 Applied Mathematical Economics 3(3, 0) See AP EC 8040. AP EC (ECON) 8040 Applied Mathematical economics 3(3, 0) Discusses mathematical tools needed in economic analysis; matrix algebra, differentiation, unconstrained and constrained optimization, integration and linear programming.

ECON (AP EC) 8060 Econometrics I 3(3, 0) See AP EC (ECON) 8060 econometrics I 3(3, 0) Application of econometric techniques and stochastic models to economic problems. Considers distribution theory, simple and multiple regression modeling, hypothesis testing and other issues in regression analysis.

Some students are alternatively taking:

ECON 6050 Introduction to Econometrics 4(3, 3) Introduction to the methods of quantitative analysis of economic data Reviews basic statistical methods and probability distribution. Topics include data management using professional statistical software applications; multiple regression analysis; hypothesis testing under conditions of multicollinearity, heteroscedasticity; and serial correlation. Preq: ECON 2110 and 2120; MTHSC 1080 or 2070; EX ST 3010 or MTHSC 3010 or 3090.

ECON 8070 Econometrics II 3(3, 0) Economic models expressed as systems of equations; problems of identification, parameter estimation, measurement errors and statistical inference; techniques of simulation, forecasting, model validation and interpretation. Offered fall semester only.

Some students are alternatively taking:

ECON 6060 Advanced Econometrics 3(3, 0) Reviews statistical inference using regression (OLS) analysis and mode specification Topics include multicollinearity; heteroscedasticity and serial correlation; two-stage least squares and instrumental variables models; simultaneous equations models; limited dependent variable model using maximum likelihood estimation and time-series analysis; and presentation of results in technical writing; Preq: ECON 4050 or consent of instructor.

ECON (AP EC) 8080 Econometrics III 3(3, 0) Continuation of ECON 8070. Covers current economic models and estimation procedures. Offered spring semester only. Preq: ECON 8070.

ECON 9000 Selected Topics in Economics 3(3, 0) (Econometrics I: Mathematical Statistics for Econometrics) or (Advanced Econometrics)

Current topics in economic theory and empirical research. May be repeated for credit, but only if different topics are covered.

SCOM Track

ECON 6040 Game Theory 3(3, 0) Introduction to the formal analysis of strategic interaction among rational, self-interested rivals. Basic theoretical aspects of games are discussed and applied to such as bargaining, voting, auctions and oligopoly. Preq: ECON 3140 and MTHSC 1060, or ECON 4300, or consent instructors.
ECON (AP EC) 8010 Microeconomic Theory 3(3, 0) Microeconomic theory and its use to analyze and predict the behavioral of industries, firms and consumers under various market conditions. Offered fall semester only.

ECON (AP EC) 8020 Advanced Economic Concepts and Applications 3(3, 0) Rigorous development of price theory under alternative product and resource market structure. Preq: Consent of instructor.

ECON (AP EC) 9010 Price Theory 3(3, 0) Neoclassical paradigm of market price and quantity; rigorous consideration of consumer behavior, the theory of the firm and market equilibrium, production and resource demands and the supply of resources. Preq: ECON (AP EC) 8010 or equivalent.

EX ST 8020 Statistical Methods II 3(3, 0) Extended coverage of several methods introduced in EX ST 8010: multiple regression model building and diagnostics, experiment design and analysis, and non-parametric methods; mixed models and repeated measures analyses’ categorical data analysis; multivariate methods and sampling designs; appropriate use of statistical software. Preq: EX ST 8010 * Recommended for Summer Sessions

IE 8070 Discrete Systems Simulation 3(3, 0) Constructing computer models to represent existing real-world systems or hypothetical future systems; experimenting with these models to explain system behavior, improve system performance, or design new systems with desirable performances. Preq: MTHSC 3020 and IE 8090 or consent of instructor.

IE 8600 Dynamic Programming 3(3, 0) Theory and methodology of dynamic programming: Bellman’s principle of optimality; Mitten’s sufficiency conditions; recursive optimization of serial and nonserial multistage systems; optimization of discrete and continuous systems through decomposition; special aspects of problem formulation. Preq: IE 8030

PSYCH 8710 Psychological Tests and Measurement 3(3, 0) Advanced survey of psychological test development, evaluation and utilization in organizational and research settings; professional guidelines for the practice of testing in industrial/organizational psychology and legal guidelines for using tests in industry. Preq: Consent of instructor.

PSCYCH 8990 Selected Topics 3(3, 0) (Meta-Analysis) Selected current and classic topics not covered in other courses. Maybe be repeated for credit

Graduate level supply chain management (MBA or IE), linear programming (MTHSC), cognitive psychology (PSYCH), or others as recommended by advisor.

IS Track

CP SC 6620 Database Management Systems 3(3, 0) Introduction to database/data communication concepts as related to the design of online information systems. Problems and solutions involving structuring, creating, maintaining and accessing multiple-user database are presented and solutions developed. Comparison of several commercially available teleprocessing monitor and database management systems is made. Preq: CP SC 3600.

CP SC 8650 Data Mining 3(3, 0) Study of principles of data mining: concepts and techniques of data analysis including regression, clustering, classification, association, prediction, etc.; efficient data mining algorithms; data mining applications in various areas including market analysis and management, WWW mining, bioinformatics, etc. Course projects for designing nad using data mining algorithms in the applications are required. Preq: Knowledge of statistics and database systems or consent of instructor.
**ECON (AP EC) 8240 Organization of Industry** 3(3, 0) The structure of markets and firms; forces that determine the size of firms and the boundaries of markets; the behavior of firms, both singly and in concert, to exploit market positions.

**PSYCH 835 Advanced Human Factors Psychology** 3(3, 0) Foundation from which to study interactions between human beings and systems in order to maximize safety, performance and user satisfaction. Integration and application of basic research and theory in sensation, perception, cognition and motor control. Preq: Consent of instructor.

**PSYCH 8620 Organizational Psychology** 3(3, 0) Investigation of forms of organizational structure and basic theories of organizations. Includes research and theories on human behavior in organizations including motivation, leadership and job satisfaction. Discusses relationships between theories and research on human behavior and organization development and change. Preq: A course in industrial/organizational psychology or equivalent.

**PSYCH 8710 Psychological Tests and Measurement** 3(3, 0) Advanced survey of psychological test development, evaluation and utilization in organizational and research settings; professional guidelines for the practice of testing in industrial/organizational psychology and legal guidelines for using tests in industry. Preq: Consent of instructor.

**PSYCH 8990 Selected Topics** 3(3, 0) (Meta-Analysis) Selected current and classic topics not covered in other courses. Maybe repeated for credit.

Graduate level computer science (CP SC), management (MBA or MGT) or others as recommended by advisor.

**SOC 8050 Evaluation Research** 3(3, 0) Research methods and techniques of computer-assisted data management and analyses used in evaluating policies, operation, organization and effectiveness of social programs in the private and public sectors; microcomputer software packages available for these purpose. Offered spring semester only. Preq: SOC 8030.