Name　　　　　　**:** Dixon Prem Daniel R

Research Advisor　**:** Dr. Sundarraj R P

Research Area　　**:** Information Systems

SYLLABUS OF COURSES SELECTED FOR COMPREHENSIVE EXAMINATION

1. **MS6031: Data Analysis for Research**
   - Introduction to statistics and descriptive statistics – scatter plot, box plot, contingency table, histogram, measures of central tendency, measures of dispersion
   - Probability distribution – Uniform Distribution, Bernoulli Distribution, Binomial Distribution, Poisson Distribution, Geometric Distribution, Exponential Distribution, Negative Binomial Distribution, Normal Distribution and Binomial approximation
   - Central Limit Theorem
   - Inferential statistics – Confidence Interval, Population and Sample
   - Hypotheses testing – single sample z test, single sample t test, chi squared test of variance, proportion z test, two sample z test, two sample t test, paired t test, two sample proportion z test, chi squared test of independence
   - Type 1 and type 2 errors
   - Multi sample tests – ANOVA and Regression

2. **MS 7080: Research Methodology in Business and Management**
   - What is Research? – What is knowledge? - Theory, knowledge and research
   - Types of Research – Descriptive and Casual research – Conceptual and Experimental Research
   - The Scientific Approach – Philosophy and the roots of science; what is science? – Scientific knowledge and the scientific method
   - The Interpretive Approach – the emergence of alternative methods of knowing; interpretative research traditions; implications of interpretive research
   - Theory and Hypotheses – What is a theory? Theory building vs. Theory testing, conceptualization and hypothesis testing
   - Research Design – Purpose of research design – the experimental approach – Cross-sectional designs; Longitudinal designs; case study designs and action research
   - Qualitative and Quantitative research in Management: Social constructionism, Ethnography, Case study research, Narrative studies, Grounded theory, Surveys and Experiments

3. **MS 5260: Management Information Systems**

- Introduction, Information systems and their classification, IT architecture and infrastructure, IT, business and strategy
- Data management: data bases, data warehouses and beyond, Enterprise information systems for operational efficiency and automation, Introduction to e-commerce, e-business and beyond
- Business case for IT, make or buy, measuring benefits, Information technology acceptance, IT services management, frameworks, IT security
- Competing on IT, DSS, & Business intelligence systems

4. **MS6840: Data Warehousing and Data Mining**
- Vocabulary of business analytics, business value of analytics, BI architecture, adoption,
- Fundamentals of data management, data quality, RDBMS, SQL, data warehousing, OLAP, big data and analytics,
- Data mining process, statistical learning, over view of data mining techniques, regression analysis, Classification, techniques, classifier performance, scoring models, classification using decision trees; implementation in R: problem of targeted mailing,
- Cluster analysis, clustering techniques, implementation in R: clustering for segmentation and profiling,
- Machine learning, artificial neural networks for time series modeling, implementation in R: financial time series modeling using ANN,
- Mining the web: Text mining, process, key concepts, sentiment scoring, text mining using R- the case of a movie discussion forum, summary

5. **MS5810: Decision Support Systems**

- DSS Configurations, What Is a DSS?, Characteristics and Capabilities of DSS, Components of DSS, The Data Management Subsystem, The Model Management Subsystem,
- The User Interface (Dialog) Subsystem, The Knowledge-Based Management Subsystem, The User, DSS Hardware, DSS Classifications
- MSS Modeling, Static and Dynamic, Models Certainty, Uncertainty, and Risk, Influence Diagrams, MSS Modeling with Spreadsheets, Decision Analysis of a Few Alternatives (Decision Tables and Decision Trees),
- Presentation of Papers
    i. Keeney, Ralph L., Howard Raiffa, and John S. Hammond. "Hidden Traps in Decision Making." Harvard Business Review (1998).
    ii. Mayer, Future trends in Model Management Systems, *Decision Support Systems*, Vol. 22,, pp. 325-335, 1998

iii. Power and Sharda, "Model driven decision support systems: concepts, research directions," Decision Support Systems, Vol. 43, pp. 1044-1061, (2007)

iv. Kwan, Fong and Wong, "An e-customer behavior model with online analytical mining for internet marketing planning," Decision Support Systems, Vol. 41, pp. 189-204, (2005)

v. Lee et al. "Visualization and analysis of clickstream data of online stores for understanding web merchandising," Data Mining and Knowledge Discovery, Vol. 5, pp. 59-84, (2001).