Graduate Program Course Descriptions

**IST 650 Information Systems Technology in Context**
This course introduces the human and environmental issues that impact the design, development, and use of secure information systems. Organizational, social, legal, and ethical topics include secure software project management, secure systems analysis and design, interface design and knowledge management, privacy issues, and the current legal landscape of information security and privacy. The course is organized around a series of case studies that illustrate and raise questions about these topics.

**IST 660-Introduction to Cybersecurity and Information Assurance**
This course is designed to provide an introduction to cyber security and information assurance. It covers the fundamental concepts necessary to understand the threats to security as well as various defenses against those threats. The course includes an understanding of existing threats, planning for security, technology used to defend a computer system and implementing security measures and technology.

**IST 661- Security Policy and Risk Assessment (Prereq: IST 660)**
This course addresses ethical, legal, risk management and policies and issues within which information systems and technology lifecycle professionals shall practice and to study how they impact privacy, fair information practices and content control. In addition, this course offers an overview of the various risk analysis and assessment techniques.

**IST 665-Secure Networking (Prereq: IST 660)**
This course is designed to equip students with applications and practice of cryptography in securing wired/wireless networks and Internet. Following techniques would be studied: classical systems, symmetric block ciphers, linear and differential cryptanalysis, public-key cryptography, cryptographic protocols, hash functions, authentication, key management, key exchange, signature schemes and how it can be applied to secure network infrastructure, firewalls, digital right management, and related topics.

**IST 666 Secure Software Development (Prereq: IST 660)**
This course covers development of security requirements and the design, development and implementation of secure mobile and web applications. Principles of secure design and coding will be covered in depth. Vulnerabilities and countermeasures for computer systems, mobile and web applications are explored. This course also covers Secure Development Lifecycle (SDL) needed to understand and apply best practices for development and on-going support to secure software.

**IST 667 Intelligence and Security Analysis (Prereq: IST 660)**
This course offers an advanced overview of the various structured analytical techniques used in the intelligence and security professions for conducting in-depth analysis and assessment. Emphasis will be placed on application of various models and computer-based applications for analysis.
CSCI 534 - Digital Forensics and E-Discovery (Prereq: IST 660)
This course offers study of techniques, tools, and processes used to discover digital evidence. Topics include collection, preservation, presentation, and preparation of computer based evidence for the purposes of criminal law enforcement or civil litigation.

IST 670-Data Management and Analytics
This course deals with the application of the data management process for analytics including analysis, design, data acquisition, cleaning, transformation, quality, structure, and security of the databases. Evaluation of how these data relate and aggregate in analytic databases, data marts, data warehouses, and how they are used by analytical tools will be explored through case studies and projects.

IST 671-Data Mining and Knowledge Discovery (Prereq: IST 670)
This course covers the techniques to assess input data, quality of output as well as the principles and methodologies involved in the data mining. The course is designed to ensure the students have the ability to apply, analyze and evaluate different machine learning schemes and data mining algorithms. In addition, the construction of data-driven discovery and modeling of hidden patterns in large real-world data and text would be covered in this course.

IST 675-Semantic Web Technologies (Prereq: IST 670)
This course provides an introduction to transition from traditional web to semantic web technologies. Topics covered include the representation of structured web documents in XML, describing web resources in RDF, Ontology Engineering, Web Ontology Language, logic/inference and applications of Semantic Web Technologies.

IST 676-Data Fusion (Prereq: IST 670)
This course covers the introduction to the concepts, techniques, and issues surrounding the fusion of information from multiple sensors and sources of data. Topics include distributed data collection, linking of the data from a variety of platforms, ETL (Extraction, Transformation, and Loading) procedures, and data warehousing technologies, data fusion techniques, information access and delivery.

IST 677-Data Visualization (Prereq: IST 670)
The course covers the visual representations that can help in the analysis and understanding of complex data, design effective visualizations, and to create interactive visualizations using modern web-based frameworks. This course explores the data visualization tools and concepts to represent the data and insights visually.

IST 678 Business Intelligence and Analytics (3) Course provides an introduction to Business Intelligence, including analytics, processes, methodologies, infrastructure and current practices used to transform business data into useful information and support business decision-making. Students will learn to extract and manipulate data from these systems and assess statistical analysis along with reporting options such as management, dashboards, and balanced scorecards. F, S, SU.

CSCI 575 - Decision Support Systems (Prereq: IST 670)
This course offers a study of decision support systems. Topics include computerized decision support and business intelligence systems, modeling and methodologies. Course will cover data and web mining concepts, knowledge management technologies, collaboration techniques, and intelligent systems. Course includes a research-based focus to explore current advances in the field.
IST 659-Sp. Topics in Information Systems Technology – Security Patterns (Prereq: Completion of Core Courses)
This course examines the field of security design patterns. Students will survey a set of security patterns, study implementation options for selected patterns, and contribute additional pattern documentation to improve the effectiveness and usability of selected patterns for the general community. Project work in this course would include the implementation of security patterns to a real world problem.

IST 669-Sp. Topics in Information Security – Secure Cloud Computing (Prereq: Completion of Core Courses)
This course explores the fundamentals of cloud computing and addresses the cloud security related risks, issues and challenges associated with the cloud by exploring the security architectures, cloud software security and cloud networking security tools and techniques. Project work in this course would include the detailed solutions to the cloud computing related industry problems.

IST 679-Sp. Topics in Data Analytics - Big Data Analytics (Prereq: Completion of Core Courses)
This covers the fundamental concepts of Big Data management and analytics. In addition, this course is designed to equip the students with the analysis, design and development of the applications that deal with very large volumes of data as well as in proposing scalable solutions for them to aid business intelligence and scientific discovery. Project work in this course would include the implementation of solutions to the big data related industry problems.

IST 799- Research Thesis (Prereq: Completion of Core Courses)
After successful completion of the thesis, students will have designed, implemented, and presented, both orally and in writing, an original research project. Specifically, the student will have delineated a research topic; conducted a comprehensive review of the literature; developed appropriate methodology for investigating a topic; collected and analyzed data; interpreted the results; and made recommendations. The course serves as a culminating activity via a manuscript and an oral presentation.