INFORMATION SCIENCE AND TECHNOLOGY

Information science and technology (IS&T) offers an M.S. degree program. Information technology has transformed every aspect of our economy and society. Rapid spread of technology has generated the need for highly trained professionals to implement and maintain information systems. The M.S. in information science and technology is designed to educate students in the design, development, and successful application of information systems in organizations.

Also offered are a number of graduate certificates: business analytics and data science, business intelligence, digital media, digital supply chain management, electronic and social commerce, enterprise resource planning, human-computer interaction and user experience, mobile business and technology, information systems project management. These graduate certificates are intended for students who wish to specialize and for working professionals who want to stay ahead of rapidly changing technology. Each graduate certificate program consists of a four-course sequence from existing graduate-level courses. Certificate credits earned by students admitted to the M.S. program will count toward their master’s degree. Students admitted just to the certificate program will have non-matriculated status. However, if they complete the four-course sequence with a grade of “B” or better in each of the courses taken, they will be admitted to the M.S. program if they so choose. In addition, successful completion of the graduate certificate offered in the business program, with grades of “B” or better in each of the courses will also enable admission to the IS&T M.S. program. Admitted students must still meet the admissions requirements relative to undergraduate coursework prerequisites.

The faculty is active in studying the design and application of the web and has external support for research. Research experiences are integrated into the classroom experience. Specially equipped research laboratories are available to support studies in human-computer interaction and experiments with computer networks, as are general purpose computing laboratories that are available to all students. A large number of computing languages and special-purpose software tools are available on various platforms. While instruction and research are on the leading edge of information systems, the department endeavors to keep class sizes small to facilitate student and faculty interactions.

Financial Assistance

Financial assistance is available to graduate students in the form of assistantships and fellowships. Research opportunities for advanced students exist. For application forms, contact the department.

Additional Information

Contact us at 573-341-7216, bit@mst.edu or visit http://bit.mst.edu.

Admission Requirements

In addition to the requirements set by the office of admissions and the office of graduate studies, specific requirements for admission to the M.S. in information science and technology (thesis or non-thesis) are as follows:

- Successful completion of an undergraduate degree from a recognized college or university with a GPA (grade point average or international equivalent) of 3.0/4.0 or better.
- Submission of scores from the Graduate Record Exam (GRE) or the Graduate Management Admissions Test (GMAT).
- TOEFL or IELTS scores must be submitted if English is not the candidate’s natural language.
- Undergraduate coursework in Calculus; Statistics; Programming Languages with Data Structures; Information Systems; Relational Database Management Systems; and Computer Architecture must be shown.

***Please note that meeting the above requirements does not guarantee admission into the M.S. in information science and technology, but, rather, is used by the admissions committee in the decision-making process***

Degree Requirements

M.S. with thesis: The M.S. degree with thesis requires the completion of 24 hours of graduate course work (5000-level or above), 6 hours of research, and the successful completion and defense of a research thesis.

M.S. without thesis: The M.S. degree without thesis requires the completion of 30 hours of graduate course work (5000-level and above). Courses below the 5000-level will not count toward the M.S. degree, even if they are taken to fulfill prerequisites.

The following core courses are required of all M.S. students in information science and technology. These courses are designated to ensure that all IS&T masters students study the four information systems perspectives of networks and web design, human perception, application implementation, and organizational systems.

IS&T 5251 Technological Innovation Management and Leadership
IS&T 5885 Human-Computer Interaction
IS&T 6261 Advanced Information Systems Project Management
IS&T 6336 Foundations of Internet Computing

The department of business and information technology offers a variety of graduate certificates. Each certificate program consists of four courses and is open to persons holding a bachelor’s, master’s or Ph.D. degree in areas such as business, social sciences, technology, engineering, or related disciplines who have the required pre-requisites for the courses in the program. A student must maintain an average cumulative grade point of 3.0 or better on a 4.0 scale in the certificate courses in order to receive the graduate certificate.

Students may apply to be admitted only to a graduate certificate program. If admitted, the student will have non-degree graduate status but will earn graduate credit for the courses completed. If a student completes the four graduate certificate courses with a grade of B or better in each of the courses taken, the student may be admitted to the master of business administration or to the master of science in information science and technology if the student so chooses. A student must, however, follow the normal application process and meet the undergraduate coursework prerequisites. The graduate certificate credits will count toward the student’s MBA or M.S. degree.

Graduate certificates are listed below:

Business Analytics and Data Science

Data analytics facilitates realization of objectives by identifying trends, creating predictive models for forecasting, and optimizing business
processes for enhanced performance. Three main categories of analytics are:

- **Descriptive** - the use of data to find out what happened in the past.
- **Predictive** - the use of data to find out what could happen in the future.
- **Prescriptive** - the use of data to prescribe the best course of action for the future.

Big data is an emerging phenomenon. Computing systems today are generating 15 petabytes of new information every day—eight times more than the combined information in all the libraries in the U.S.; about 80% of the data generated every day is textual and unstructured data.

This graduate certificate is one of three graduate certificates offered by cooperating departments at Missouri S&T to fulfill the needs in the area described as "big data." The other two graduate certificates are:

- **Big Data and Security**
- **Big Data Management and Analytics**

A student admitted to this graduate certificate must complete four courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>IS&amp;T 5420</td>
<td>Business Analytics and Data Science</td>
</tr>
<tr>
<td>IS&amp;T 6450</td>
<td>Information Visualization</td>
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One course from the following:

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>IS&amp;T 5001</td>
<td>Special Topics (Data Methodologies Using Python)</td>
</tr>
<tr>
<td>ERP 5410</td>
<td>Use of Business Intelligence</td>
</tr>
<tr>
<td>COMP SCI 5204</td>
<td>Regression Analysis</td>
</tr>
<tr>
<td>COMP SCI 5402</td>
<td>Data Mining &amp; Machine Learning</td>
</tr>
<tr>
<td>COMP SCI 6304</td>
<td>Cloud Computing and Big Data Management</td>
</tr>
<tr>
<td>COMP ENG 6330</td>
<td>Clustering Algorithms</td>
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<tr>
<td>STAT 5814</td>
<td>Applied Time Series Analysis</td>
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<tbody>
<tr>
<td>IS&amp;T 6443</td>
<td>Information Retrieval and Analysis</td>
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<tr>
<td>IS&amp;T 6444</td>
<td>Essentials of Data Warehouses</td>
</tr>
<tr>
<td>IS&amp;T 6445</td>
<td>Database Marketing</td>
</tr>
<tr>
<td>IS&amp;T 6448</td>
<td>Building the Data Warehouse</td>
</tr>
<tr>
<td>IS&amp;T 6887</td>
<td>Research Methods in Business and IS&amp;T</td>
</tr>
<tr>
<td>ERP 5210</td>
<td>Performance Dashboard, Scorecard and Data Visualization</td>
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<tr>
<td>ERP 6610</td>
<td>Advanced Customer Relationship Management in ERP Environment</td>
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<tr>
<td>ERP 6220</td>
<td>Data Modeling &amp; Visualization Prototyping for Enterprise Decision Dashboards</td>
</tr>
<tr>
<td>BUS 6425</td>
<td>Supply Chain and Project Management</td>
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**Business Intelligence**

Interest in business intelligence has been a recent strong theme among employers. Medium and large-sized businesses are especially interested. In order to make appropriate decisions, upper-level administration of an organization needs to draw data together from different systems in order to get a unified picture of the status and performance of an organization and present it in helpful ways. Examples include the development of organizational scorecards, dashboards, and other tools that provide a picture of how an organization is performing. People capable of creating and maintaining such information are needed.

This graduate certificate focuses on the technologies that allow an organization to make effective business decisions based on operational data pulled together from many different sources inside and organization. The target audience consists of any individual who would need to understand the technologies and their capabilities.

A student admitted to this graduate certificate must complete four courses:

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<tbody>
<tr>
<td>ERP 5410</td>
<td>Use of Business Intelligence</td>
</tr>
<tr>
<td>IS&amp;T 6444/</td>
<td>Essentials of Data Warehouses</td>
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<tr>
<td>ERP 6444</td>
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Two courses from the following list:

<table>
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ERP 5110</td>
<td>Enterprise Resource Planning Systems Design and Implementation</td>
</tr>
<tr>
<td>ERP 5210</td>
<td>Performance Dashboard, Scorecard and Data Visualization</td>
</tr>
<tr>
<td>ERP 6610</td>
<td>Advanced Customer Relationship Management in ERP Environment</td>
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<td>IS&amp;T 6445</td>
<td>Database Marketing</td>
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**Digital Media**

Digital media is growing as consumers change the way they access information. In pursuing this certificate, students will acquire the skills and knowledge to create, design and analyze digital media. The focus will be on the media itself, the social/digital network that connects these media, the interfaces that connect these media with users, and the application of these skills in business and other creative contexts. Thus this certificate program will address the pressing demand and opportunities for graduates with advanced knowledge and skills in areas such as networked communication and marketing, web-based media creation and design, and methods for designing and building effective human-media interfaces.

A student admitted to this graduate certificate must complete four courses:

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<tr>
<td>IS&amp;T 6654</td>
<td>Advanced Web and Digital Media Development</td>
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Two courses from the following list:

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<tr>
<td>IS&amp;T 5885</td>
<td>Human-Computer Interaction</td>
</tr>
<tr>
<td>IS&amp;T 6680</td>
<td>Advanced Web and New Media Studies</td>
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<tr>
<td>MKT 5310</td>
<td>Digital Marketing and Promotions</td>
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</tbody>
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<tr>
<td>IS&amp;T 6562</td>
<td>Advanced Web Development</td>
</tr>
<tr>
<td>IS&amp;T 5886</td>
<td>Prototyping Human-Computer Interactions</td>
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</table>

**Digital Supply Chain Management**

Success in today’s marketplace requires that organizations deliver products and services that provide easily identified value for their customers. This certificate draws on strengths within two departments to integrate source (strategic procurement and supply management), production (manufacturing and service operations), and delivery processes (demand fulfillment), with a focus on the use of information technologies as the critical enabler of supply chain efficiencies and responsiveness.

The certificate is designed to give students the tools and ideas that help shape and define the various components of value creation. Students can gain knowledge and skills in the full spectrum of supply chain activities: supplier relationships, purchasing management, operations and inventory management, logistics and transportation, quality management, and information technology.
A student admitted to this graduate certificate must complete four courses:

- ERP 5110 Enterprise Resource Planning Systems Design and Implementation
- ERP 5310 Supply Chain Management Systems in an ERP Environment

One course from the following list:
- MECH ENG 5708 Rapid Product Design And Optimization
- BUS 6425 Supply Chain and Project Management

One course from the following list:
- ERP 5410 Use of Business Intelligence
- ERP 6120 Enterprise Resource Planning: Systems Config and Integration
- ERP 6610 Advanced Customer Relationship Management in ERP Environment
- MECH ENG 5656 Design For Manufacture
- MECH ENG 5757 Integrated Product And Process Design
- MECH ENG 5760/ Probabilistic Engineering Design
- AERO ENG 5760
- MECH ENG 5763 Principles And Practice Of Computer Aided Design

Electronic and Social Commerce

Social commerce is just one sub-set of e-commerce, however it is growing rapidly. The department of business and information technology (BIT) has leveraged its’ strengths in both business and technology for this program, which is designed to create successful students by developing skills in technological business practices that will provide opportunities for succeeding in today’s fast paced world. To that end, the program focuses on the following competencies:

- Management concepts applied to IT
- Management concepts applied to support of electronic commerce
- Use of business processes in IT integration
- Competitive advantage through IT
- Electronic commerce through collaborative shopping

A student admitted to this graduate certificate must complete four courses:

- IS&T 6641 Advanced Electronic and Mobile Commerce

One course of the following:
- IS&T 5251 Technological Innovation Management and Leadership
- BUS 6723 Artificial Intelligence, Robotics, and Information Systems Management

Two courses from the following list:
- IS&T 5168/ PHILOS 4368 Law and Ethics in E-Commerce
- IS&T 5652 Advanced Web Development
- IS&T 5885 Human-Computer Interaction
- IS&T 5886 Prototyping Human-Computer Interactions
- IS&T 6335 Mobile Technology for Business
- IS&T 6445 Database Marketing
- IS&T 6680 Advanced Web and New Media Studies
- MKT 5310 Digital Marketing and Promotions
- MKT 6580 Advanced Marketing Strategy

Enterprise Resource Planning (ERP)

Corporations worldwide have focused on improving business processes for the past two decades. In fact, while most Fortune 500 companies have already adopted enterprise resource planning (ERP) systems, now many midsize companies are also planning ERP implementations. With a commitment to keep pace with these changes in business processes and technology, the University of Missouri system joined SAP’s™ University Alliance and Microsoft’s™ University Alliance programs in order to continue and expand classroom capabilities for integrating ERP software into the curriculum.

ERP systems can be used to reinforce many of the concepts covered in the business discipline. ERP systems incorporate state-of-the-art technology, providing a comprehensive teaching tool for business and for information systems. Universities that have successfully incorporated an ERP system into their curricula find unprecedented student demand for those subjects.

ERP can be viewed as a combination of business management practice and technology, where information technology integrates with a company’s core business processes to enable the achievement of specific business objectives. This certificate prepares students for positions as both technical and business consultants in the ERP field.

A student admitted to this graduate certificate must complete four courses:

- ERP 5110 Enterprise Resource Planning Systems Design and Implementation
- ERP 6120 Enterprise Resource Planning: Systems Config and Integration
- Two additional ERP courses at the 5000 level or above, such as:
  - ERP 5240 Enterprise Application Development and Software Security
  - ERP 5210 Performance Dashboard, Scorecard and Data Visualization
  - ERP 5310 Supply Chain Management Systems in an ERP Environment
  - ERP 5410 Use of Business Intelligence
  - ERP 5510 ERP System Administration
  - ERP 6220 Data Modeling & Visualization Prototyping for Enterprise Decision Dashboards
  - ERP 6444/ IS&T 6444 Essentials of Data Warehouses
- ERP 6610 Advanced Customer Relationship Management in ERP Environment

Human-Computer Interaction and User Experience

There is a growing demand within industry for workers with expertise in human-computer interaction (HCI), who generally hold titles such as interface designer; usability researcher analyst; usability engineer; user experience specialist; or information architect. HCI specialists bridge the gap in organizations between groups who build the technologies and groups who use the technologies. The qualifications for these positions generally fall into the following categories:

- Knowledge of human-computer interaction principles
- Skills in collecting user requirements
- Skills in developing prototypes, both low fidelity (e.g., paper) and high fidelity (e.g., html mock-up)
- Skills in evaluation of the impact of technologies on humans

A student admitted to this graduate certificate must complete four courses:

- IS&T 5885 Human-Computer Interaction
- IS&T 5886 Prototyping Human-Computer Interactions
- IS&T 5887 Human-Computer Interaction Evaluation

One course from the following:
- IS&T 6680 Advanced Web and New Media Studies
Information System Project Management

Managing the development of large software systems is significantly different from managing construction or research projects. However, some of the tools developed for traditional project management continue to have value and can be adapted to development of software.

This certificate aims to equip students with a set of tools that will allow them to achieve Project Management Institute (PMI) standards in the project management area to successfully manage resources, and to analyze, evaluate and improve complex projects.

A student admitted to this graduate certificate must complete four courses:

- IS&T 6261 Advanced Information Systems Project Management
- ENG MGT 5320 Project Management
- ENG MGT 6222 Case Studies in Project Management
- ENG MGT 6223 Global Project Management

Mobile Business and Technology

Interest in the use of mobile technology among organizations has seen a strong, upward trend over the past few years. The proliferation of smart phone and tablet devices has presented organizations with new challenges creating and developing a coherent strategy associated with this new innovation. In order to create this strategy, organizations will need an understanding of the mobile industry in general and specific technologies supporting the trend. People capable of creating and maintaining mobile technology strategies are needed.

This certificate is designed to cover the mobile industry as well as the technologies, devices, operating systems, user interface design, and tools of mobile applications. The focus will be on the mobile industry and technologies that allow an organization to make decisions in this dynamic domain.

A student admitted to this graduate certificate must complete four courses:

- IS&T 6335 Mobile Technology for Business
- ERP 5240 Enterprise Application Development and Software Security
- Two courses from the following list:
  - ERP 5210 Performance Dashboard, Scorecard and Data Visualization
  - ERP 5310 Supply Chain Management Systems in an ERP Environment
  - ERP 6610 Advanced Customer Relationship Management in ERP Environment
  - IS&T 5652 Advanced Web Development
  - IS&T 5886 Prototyping Human-Computer Interactions

Carla Pauline Bates, Assistant Teaching Professor
MASTER Missouri S&T
Learning styles, learning technologies.

Randy Lawrence Canis, Adjunct Professor
JD University of Missouri-Columbia
Privacy and information security law, patent law, intellectual property for computer scientist, legal environment for engineers.

Langtao Chen, Assistant Professor
PHD Georgia State University

Yu Hsien Chiu, Associate Teaching Professor
MASTER University of Wisconsin-Milwaukee
Enterprise resource planning, accounting information systems.

Craig C Claybaugh, Associate Professor
PHD University of Wisconsin-Milwaukee
Enterprise resource planning, information technology vendor-client relationships, online trust, social networking.

Cassandra Carlene Elrod, Associate Professor
PHD University of Missouri-Rolla
Marketing in higher education, operations management, supply chain management, continuous improvement, project management, quality, and lean enterprise.

Li-Li Eng, Associate Professor
PHD University of Michigan Ann Arbor
Financial and managerial accounting, international accounting.

Hanging Fang, Assistant Professor
PHD Mississippi State University

Barry B Flachsbart, Professor
PHD Stanford University
Large databases, manufacturing information systems, information systems project management, team building and leadership.

Nobuyuki Fukawa, Associate Professor
PHD Louisiana State University
Consumer behavior, marketing research, marketing strategy.

Richard H Hall, Professor
PHD Texas Christian University
Human-computer interaction with a focus on learning technologies.

Michael Gene Hilgers, Professor
PHD Brown University
Modeling and simulation, learning technologies, and human-computer interaction.

Bih-Ru Lea, Associate Professor
PHD Clemson University
Enterprise resource planning, performance dashboards, accounting information systems, data visualization, business process integration, and supply chain management.

Chris J Merz, Adjunct Instructor
PHD University of California-Irvine
Utilization of statistics and databases in marketing activities

Fiona Fui-Hoon Nah, Professor
PHD University of British Columbia
Management information systems, E-commerce, mobile commerce, human-computer interaction.

Nicholas Oswald, Adjunct Instructor
MASTER University of Wisconsin Science & Technology
Human-computer interaction, implementing information systems, management information system, system analysis and design.

Keng Leng Siau, Professor
PHD University of British Columbia
Design science, virtual world and 3D web electronic, mobile, and ubiquitous business, business intelligence/analytics.
Nathan W Twyman, Assistant Professor
PHD University of Arizona
Deception detection, human-computer interaction, human risk assessment, auditing, security, and forensic systems.

Wen-Bin Yu, Associate Professor
PHD University of Louisville
Business intelligence, text mining, data mining, demand forecasting, simulation, and agent bases systems.

Hongxian Zhang, Assistant Professor
PHD University of Texas at San Antonio
Corporate finance, investments, public pension funds.

IS&T 5000 Special Problems (IND 0.0-6.0)
Problems or readings on specific subjects or projects in the department. Consent of instructor required.

IS&T 5001 Special Topics (LEC 0.0-6.0)
This is designed to give the department an opportunity to test a new course. Variable title.

IS&T 5040 Oral Examination (IND 0.0)
After completion of all other program requirements, oral examinations for off-campus M.S./Ph.D. students may be processed during intersession. Off-campus M.S. students must be enrolled in oral examination and must have paid an oral examination fee at the time of the defense/comprehensive examination (oral/ written). All other students must enroll for credit commensurate with uses made of facilities and/or faculties. In no case shall this be for less than three (3) semester hours for resident students.

IS&T 5099 Research (IND 0.0-15)
Investigations of an advanced nature leading to the preparation of a thesis or dissertation. Consent of instructor required.

IS&T 5131 Foundations of Computer Architecture (LEC 3.0)
Design-oriented foundations of computer components and operation. Standard codes; number systems; base conversions; computer arithmetic; boolean algebra; operating system components including memory management, device management; plus related computer architecture topics. Research paper required. Prerequisites: IS&T 1552 and graduate standing.

IS&T 5168 Law and Ethics in E-Commerce (LEC 3.0)
Provides the ethical framework to analyze the ethical, legal, and social issues that arise for citizens and computer professionals regarding the computerization of society. Topics include: free speech, privacy, intellectual property, product liability, and professional responsibility. (Co-listed with Philos 4368).

IS&T 5251 Technological Innovation Management and Leadership (LEC 3.0)
The course focuses on the knowledge and skills necessary for the development and implementation of effective strategies for the management of technology-based organizations. This involves: developing a general management perspective on technology and innovation, examining the problems of new product development, identifying distinctive technological competencies, licensing and marketing technologies, assessing the organizational and industrial context of technology. Prerequisite: Senior or Graduate Standing.

IS&T 5400 Special Problems (IND 0.0-15)
Problems or readings on specific subjects or projects in the department. Consent of instructor required.

IS&T 5401 Oral Examination (IND 0.0-15)
After completion of all other program requirements, oral examinations for off-campus M.S./Ph.D. students may be processed during intersession. Off-campus M.S. students must be enrolled in oral examination and must have paid an oral examination fee at the time of the defense/comprehensive examination (oral/ written). All other students must enroll for credit commensurate with uses made of facilities and/or faculties. In no case shall this be for less than three (3) semester hours for resident students.

IS&T 5420 Business Analytics and Data Science (LEC 3.0)
Analysis of large business data sets via statistical summaries, cross-tabulation, correlation, and variance matrices. Techniques in model selection, prediction, and validation utilizing general linear and logistic regression, Bayesian methods, clustering, and visualization. Extensive programming in R is expected. Prerequisites: Calculus, Statistics, and Programming knowledge.

IS&T 5423 Foundations of Data Management (LEC 3.0)
Foundational concepts of database management systems. Issues in database architecture, design, administration, and implementation. Extensive use of SQL with Oracle to create and manage databases. Significant project dealing with triggers or stored procedures. Prerequisites: IS&T 1750, IS&T 1552, and graduate standing.

IS&T 5520 Data Methodologies in Python (LEC 3.0)
Python methodologies for manipulating, processing, cleaning, grouping, slicing, reshaping and summarizing information in data-intensive applications; managing files, scraping web pages, mining social media; describing, modeling, analyzing, and visualizing data. Tools include pandas, NumPy, SciPy, and Matplotlib libraries. Prerequisites: One of Stat 3111, Stat 3113, Stat 3115, Stat 3117 and either IS&T 5552 or Comp Sci 1510; for Graduate Students: Graduate Standing and Knowledge of Calculus, Statistics, and Programming.

IS&T 5562 Advanced Web Development (LEC 3.0)
Advanced Web development techniques to provide dynamic interaction; methods for extracting and delivering dynamic information to/from Web servers - a hands-on approach. Emphasis on interaction with servers; mobile software development; processing of graphics and web video. Project work is required. Prerequisites: IS&T 1551 and IS&T 4654.

IS&T 5885 Human-Computer Interaction (LEC 3.0)
Introduction to the field of Human-Computer Interaction (HCI). Students examine issues and challenges related to the interaction between people and technology. The class explores the social and cognitive characteristics of people who use information systems. Students learn techniques for understanding user needs, interface prototyping & interface evaluation.

IS&T 5886 Prototyping Human-Computer Interactions (LEC 3.0)
This course explores novel HCI and UX technologies as well as methods and tools for creating system prototypes, including best practices and guidelines for optimal user experiences. Example concepts include mobile applications, behavioral monitoring, gamification, natural user interfaces, haptics, and computers as social actors. Prerequisite: Preceded or accompanied by IS&T 5885.

IS&T 5887 Human-Computer Interaction Evaluation (LEC 1.5 and LAB 1.5)
This course covers research and analysis methods and tools for evaluation of the impact of information technology systems on humans and organizations. The focus will be on practical evaluation with the goal of providing recommendations for improving system functionality and usability. Prerequisite: Preceded or followed by IS&T 5887.

IS&T 6000 Special Problems (IND 0.0-6.0)
Problems or readings on specific subjects or projects in the department. Consent of instructor required.

IS&T 6001 Special Topics (LEC 0.0-6.0)
This is designed to give the department an opportunity to test a new course. Variable title.
IS&T 6050 Continuous Registration (LEC 1.0)
Doctoral candidates who have completed all requirements for the degree except the dissertation, and are away from the campus must continue to enroll for at least one hour of credit each registration period until the degree is completed. Failure to do so may invalidate the candidacy. Billing will be automatic as will registration upon payment.

IS&T 6099 Research (IND 0.0-15)
Investigations of an advanced nature leading to the preparation of a thesis or dissertation. Consent of instructor required.

IS&T 6261 Advanced Information Systems Project Management (LEC 3.0)
Project management principles, first from a general perspective, and then focused specifically on information system application development are explored. Topics include requirements analysis, project scheduling, risk management, quality assurance, testing, and team coordination. Report writing and research literature searches are required. Prerequisites: IS&T MS Entrance requirements, with strong programming knowledge.

IS&T 6335 Mobile Technology for Business (LEC 3.0)
Overview of mobile technology use in business environments. Topics include: mobile industry; mobile network and wireless standards; mobile devices; mobile web design and app development; social and user experience issues; mobile marketing and commerce. Project required. Prerequisites: IS&T 3333 or equivalent.

IS&T 6336 Foundations of Internet Computing (LEC 3.0)
The foundations of Internet Computing include computer networks and Web sites. Networks are covered thoroughly and research directions for networking and information security are discussed. Web site design and research findings about site usability considerations are examined. Prerequisite: IS&T MS entrance requirements, including solid programming knowledge.

IS&T 6443 Information Retrieval and Analysis (LEC 3.0)
Covers the applications and theoretical foundations of organizing and analyzing information of textual resources. Topics include information storage and retrieval systems, web search engines, text mining, collaborative filtering, recommender systems. Students will also learn the techniques with the use of interactive tools such as SAS. Prerequisite: ERP 5410 or statistics knowledge.

IS&T 6444 Essentials of Data Warehouses (LEC 3.0)
This course presents the topic of data warehouses and the value to the organization. It takes the student from the database platform to structuring a data warehouse environment. Focus is placed on simplicity and addressing the user community needs. Prerequisite: IS&T 3423 or equivalent relational database experience. (Co-listed with ERP 6444).

IS&T 6445 Database Marketing (LEC 3.0)
Intro to methods and concepts used in database marketing: 1) predictive modeling techniques (e.g., regression, decision trees, cluster analysis) and 2) standard processes for mapping business objectives to data mining goals to produce a deployable marketing model. Metrics like lifetime value of a customer and ROI will be covered. Several application areas covered. Prerequisite: Statistics understanding, programming understanding, familiarity with spreadsheets.

IS&T 6448 Building the Data Warehouse (LEC 3.0)
Data modeling and processes needed to populate a data warehouse; tradeoffs among several models and tools; technical issues that are faced, such as security, schemas, Web access, other reporting techniques. Prerequisite: IS&T 6444.

IS&T 6450 Information Visualization (LEC 3.0)
Topics/activities include: the visualization development framework, traditional presentations of data, human perception and aesthetics, colorspace theory, visualization algorithms and software, case studies of modern topology, research into visualization algorithms and implementations in R. Students will produce significant programs and visualizations. Prerequisites: Statistics, Calculus, and Programming Knowledge.

IS&T 6641 Advanced Electronic and Mobile Commerce (LEC 3.0)
Fundamental concepts of management and application to IT and support of commerce. Examines the use of IT in business processes and the management issues of integrating IT into organization processes to gain a competitive advantage. Includes a major end-of-semester project. Prerequisites: Knowledge of management information systems.

IS&T 6654 Advanced Web and Digital Media Development (LEC 3.0)
This course covers advanced techniques and tools for the design and development of web-based media, including text, graphics, animation, audio, and video. This course is an advanced version of Web and Digital Media Development, with additional assignments.

IS&T 6680 Advanced Web and New Media Studies (LEC 3.0)
The course covers web culture, including topics such as social media; citizen journalism, crowd intelligence, privacy, and copyright. This course is an advanced version of Intro to Web Studies, with additional assignments.

IS&T 6780 Adv Human and Organizational Factors in Cybersecurity (LEC 3.0)
In-depth examination of human and organizational factors in cybersecurity and information assurance. Examines current challenges to protecting the integrity, availability, and confidentiality of information, as well as tools, methods, principles, and analytics for fraud prevention, insider threat detection, and forensic investigations. Project Required. Prerequisite: None, but recommended: IS&T 3333 or IS&T 6363 or Comp Sci 3600 or another introductory cybersecurity or information assurance course.

IS&T 6887 Research Methods in Business and IS&T (LEC 3.0)
This course covers quantitative and qualitative research methods for exploring the interaction between people and information technologies. The course covers techniques and tools for carrying out literature reviews, forming research goals, designing research, conducting data analyses; and preparing manuscripts and live presentations. (Co-listed BUS 6887).