INFORMATION SCIENCE AND TECHNOLOGY

Information science and technology offers a bachelor's degree focused on today's cutting-edge information technology. Students in information science and technology study the latest technology in areas including business analytics & data science, networking, database management systems, telecommunications, enterprise resource planning, human-computer interaction, e-commerce, and integrated business systems. Professionals in this field administer, maintain, and support computer systems and networks.

Today's business environments have a critical need for professionals who have an understanding of information technologies based on a broad knowledge of management practices, economics, psychology, and the humanities. These individuals are needed to implement technology to support business processes, managerial decision-making, and organizational communication.

As an information science and technology major, you will take courses that are rigorous and oriented toward building the foundation necessary for lifetime learning. Studying at Missouri S&T, you will benefit from the world-class computer environment and your association with excellent students from around the country and the world. Students in the program are strongly encouraged to do summer internships or co-ops with companies before they graduate. There are many rich opportunities and students benefit greatly in terms of their education and the edge they have seeking full-time employment once they graduate.

**Bachelor of Science**

**Information Science and Technology**

In Information Science and Technology, the Bachelor of Science degree consists of 120 credit hours. All undergraduate students in Business and Management Systems are required to complete a General Education Requirements Core, including courses in Humanities, Social Sciences, Mathematics, Science, and Communication Skills.

A common departmental core of courses in Management and Information Technology helps provide students with skills to succeed in a fast-changing and globalized environment. Information Science and Technology (IST) Core courses and IST Electives provide students with comprehensive knowledge of information technology utilization in businesses. These courses include business analytics & data science, database management, systems analysis, introduction to data science and management, computing internals, networks and communications, and electronic and mobile commerce. The electives for this degree consist of advanced coursework in the areas introduced by the required courses.

A minimum grade of "C" is required in the IST Core, IST Electives, Management, and Information Technology courses. Students have 9 credit hours for free electives.

**Freshman Year**

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**Sophomore Year**

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<td>ERP 2110</td>
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**Junior Year**

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**Senior Year**

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<td>POL SCI 1200</td>
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**Total Credits: 120**

A grade of "C" or better is required in the following courses for graduation: BUS 1110, BUS 1210, BUS 1810, BUS 5980, ECON 1100, ECON 1200, ERP 2110, FINANCE 2150, MKT 3110, IS&T 1561, IS&T 1562, IS&T 1750, IS&T 3131, IS&T 3333, IS&T 3343, IS&T 3420, IS&T 3423, IS&T 4641, IS&T 4654, and all IS&T Electives.

1. Writing intensive course
2. Any course in the following areas: biology, chemistry, geology, geological engineering, physics.
3. Any course in the following areas not used for other degree requirements: art, economics, English, foreign language, history, literature, music, philosophy, political science, psychology, sociology, theater.
4. A grade of "C" or better is required in IS&T elective courses for graduation. Electives may be any IS&T or ERP designated course at the 3000-level or above or COMP SCI 4700 or COMP SCI 5601.
5. MATH 1120 may be substituted for MATH 1140.

**Minors**

You must see the department advisor and complete a minor application before beginning your minor. Requirements change over time. You will be held to the requirements in force at the time you apply for the minor. Postponing your application for the minor may result in you having to...
take additional courses to complete the minor. At least six (6) hours of the minor course work must be taken in residence at Missouri S&T.

**Minor in Artificial Intelligence and Machine Learning in Business**

The Minor requires 15 credit hours, as follows:

- BUS 5730 Machine Learning and Artificial Intelligence for Business 3
- IS&T 5535 Machine Learning Algorithms and Applications 3
- IS&T 3420 Introduction to Data Science and Management 3
- and two courses from the following list:
  - STAT 3111 Statistical Tools For Decision Making 3
  - IS&T 3333 Data Networks and Information Security 3
  - IS&T 3343 Systems Analysis 3
  - IS&T 4450 Introduction to Information Visualization 3
  - IS&T 5420 Business Analytics and Data Science 3
  - IS&T 5520 Data Science and Machine Learning with Python 3
- ERP 5410 Use of Business Intelligence 3

**Minor in Business**

The minor in business and management systems requires the following 15 hours of coursework:

- FINANCE 2150 Corporate Finance I 3
- ECON 1100 Principles Of Microeconomics 3
  or ECON 1200 Principles Of Macroeconomics 3
- BUS 1110 Introduction to Management and Entrepreneurship 3
- BUS 1210 Financial Accounting 3
- MKT 3110 Marketing 3

**Minor in Business Analytics and Data Science**

The minor in business analytics and data science requires the following 15 hours of coursework:

- IS&T 1750 Introduction to Management Information Systems 3
- IS&T 3423 Database Management 3
- IS&T 3420 Introduction to Data Science and Management 3
- and two courses from the following list:
  - IS&T 4450 Introduction to Information Visualization 3
  - IS&T 5420 Business Analytics and Data Science 3
  - IS&T 5520 Data Science and Machine Learning with Python 3

**Minor in Business Applications and Software Development**

The Minor requires 15 credit hours, as follows:

**Required Courses:**

- IS&T 3420 Introduction to Data Science and Management 3
- IS&T 5520 Data Science and Machine Learning with Python 3

**And three courses from the following list:**

- IS&T 1552 Implementing Information Systems: Data Perspective 3
  or IS&T 1562 Java and Data Structures 3
- IS&T 3131 Computing Internals and Operating Systems 3
- IS&T 3423 Database Management 3
- IS&T 3443 Database Applications in Business 3
- ERP 5240 Enterprise Application Development and Software Security 3

**Minor in Cybersecurity Management and Information Assurance**

This minor requires the following 15 hours of coursework:

The following three courses are required:

- BUS 5910 Privacy and Information Security Law 3
- IS&T 4780 Human and Organizational Factors in Cybersecurity 3
- IS&T 3333 Data Networks and Information Security 3

Two of the following three courses must also be taken:

- ERP 5240 Enterprise Application Development and Software Security 3
- IS&T 4335 Fundamentals of Mobile Technology for Business 3
- IS&T 4641 Digital Commerce and the Internet of Things 3

**Minor in Digital Supply Chain Management**

The minor in digital supply chain management requires the following 15 hours of coursework:

- BUS 5360 Business Operations 3
  or MECH ENG 3653 Manufacturing 3
- ERP 5310 Supply Chain Management Systems in an ERP Environment 3
- ERP 4010 Customer Relationship Management in ERP Environment 3
  or MECH ENG 5760/ Probabilistic Engineering Design 3
  AERO ENG 5760

Two courses from the following list:* 6

- ERP 5410 Use of Business Intelligence 3
- ERP 5110 Enterprise Resource Planning Systems Design and Implementation 3
- MECH ENG 5708 Rapid Product Design And Optimization 3
- MECH ENG 5656 Design For Manufacture 3
- MECH ENG 5757/ ENG MGT 5515 Integrated Product And Process Design 3
- MECH ENG 5763 Computer Aided Design: Theory and Practice 3

* Non business and information technology students must select ERP 5110 as one of the two electives.

**Minor in Electronic and Social Commerce**

The minor in electronic and social commerce requires the following 15 hours of coursework:

- IS&T 4641 Digital Commerce and the Internet of Things 3

Four courses from the following list: 12

- IS&T 4335 Fundamentals of Mobile Technology for Business 3
- IS&T 5251 Technological Innovation Management and Leadership 3
- IS&T 5652 Advanced Web Development 3
- IS&T 5168 Law and Ethics in E-Commerce 3
- IS&T 5885 Human-Computer Interaction 3
- IS&T 5886 Prototyping Human-Computer Interactions 3
- MKT 5310 Digital Marketing and Promotions 3
- MKT 4580 Marketing Strategy 3

**Minor in Enterprise Resource Planning (ERP)**

The minor in ERP requires the following 15 hours of coursework:

- BUS 1210 Financial Accounting 3
- ERP 2110 Introduction to Enterprise Resource Planning 3
- ERP 5110 Enterprise Resource Planning Systems Design and Implementation 3

Six credit hours of electives from any other ERP-designated courses at the 4000-level or above 6

Total Credits 15
**Minor in Entrepreneurship**
The minor in entrepreneurship requires the following 15 hours of coursework:

- BUS 1110 Introduction to Management and Entrepreneurship 3
- BUS 5980 Business Models for Entrepreneurship and Innovation 3
- MKT 5310 Digital Marketing and Promotions 3
- Two courses from the following list: 6
  - BUS 4150 Customer Focus and Satisfaction
  - BUS 5580 Strategic Management
  - IS&T 4641 Digital Commerce and the Internet of Things
  - IS&T 4654 Web and Digital Media Development
  - IS&T 4335 Fundamentals of Mobile Technology for Business
  - IS&T 5251 Technological Innovation Management and Leadership
  - IS&T 6654 Advanced Web and Digital Media Development
  - IS&T 5886 Prototyping Human-Computer Interactions
  - ENG MGT 5511 Technical Entrepreneurship
  - ENG MGT 5411 Engineering Design Optimization

**Total Credits** 15

**Minor in Finance**
The minor in finance requires the following 15 hours of coursework:

- ECON 1100 Principles Of Microeconomics 3
  or ECON 1200 Principles Of Macroeconomics 3
- FINANCE 2150 Corporate Finance I 3
- and three courses from the following: 9
  - BUS 5230 Financial Statement Analysis
  - FINANCE 5160 Corporate Finance II
  - FINANCE 5260 Investments I
  - FINANCE 5310 Financial Technology and Analytics

**Total Credits** 15

**Minor in Financial Technology**
The minor in financial technology requires the following 15 credit hours, as follows:

- Required Courses: 9
  - FINANCE 2150 Corporate Finance I
  - FINANCE 5310 Financial Technology and Analytics
  - IS&T 3420 Introduction to Data Science and Management

- And one course from the following list: 3
  - FINANCE 5160 Corporate Finance II
  - FINANCE 5260 Investments I
  - BUS 5230 Financial Statement Analysis

- And one course from the following list: 3
  - IS&T 5520 Data Science and Machine Learning with Python
  - IS&T 4641 Digital Commerce and the Internet of Things
  - IS&T 4780 Human and Organizational Factors in Cybersecurity
  - ERP 5410 Use of Business Intelligence
  - ERP 5210 Performance Dashboard, Scorecard and Data Visualization

**Minor in Human-Computer Interaction and User Experience**
The minor in human-computer interaction and user experience requires the following 15 hours of coursework:

- PSYCH 1101 General Psychology 3
- IS&T 4654 Web and Digital Media Development 3
- IS&T 5885 Human-Computer Interaction 3
- And two of the following 6
  - IS&T 4680 Introduction to Web and New Media Studies
  - IS&T 5886 Prototyping Human-Computer Interactions
  - IS&T 5887 Human-Computer Interaction Evaluation

**Minor in Information Science and Technology**
The minor in information science and technology requires the following 15 hours of coursework:

- IS&T 1750 Introduction to Management Information Systems
- IS&T 1551 Implementing Information Systems: User Perspective or IS&T 1561 Algorithms and Programming with Java
- IS&T 1552 Implementing Information Systems: Data Perspective or IS&T 1562 Java and Data Structures
- ERP 2110 Introduction to Enterprise Resource Planning
- One other IS&T or ERP course at the 2000 level or above.

**Minor in Management**
The minor in management requires the following 15 hours of coursework:

- BUS 1110 Introduction to Management and Entrepreneurship 3
- Four courses from the following list: 12
  - BUS 2910 Business Law
  - BUS 3115 Introduction to Teambuilding and Leadership
  - BUS 4111 Business Negotiations
  - BUS 4150 Customer Focus and Satisfaction
  - BUS 5360 Business Operations
  - BUS 5470 Human Resource Management
  - BUS 5580 Strategic Management
  - IS&T 4261 Information Systems Project Management
  - ENG MGT 3320 Introduction to Project Management

**Minor in Marketing**
The minor in marketing requires the following 15 hours of coursework:

- ECON 1100 Principles Of Microeconomics 3
  or ECON 1200 Principles Of Macroeconomics 3
- MKT 3110 Marketing 3
- Three courses from the following list: 9
  - MKT 3210 Consumer Behavior
  - MKT 5310 Digital Marketing and Promotions
  - MKT 4150 Customer Focus and Satisfaction
  - MKT 4580 Marketing Strategy
  - ERP 4610 Customer Relationship Management in ERP Environment
  - Other marketing electives approved by the department (MKT 3000 and above)

**Minor in Mobile Business and Technology**
The minor in mobile business and technology requires the following 15 hours of coursework:

- IS&T 4641 Digital Commerce and the Internet of Things 3
- IS&T 4335 Fundamentals of Mobile Technology for Business 3
- ERP 5240 Enterprise Application Development and Software Security 3
- Two courses from the following list: 6
  - IS&T 3333 Data Networks and Information Security
  - IS&T 5560 Advanced Web Development
  - IS&T 5886 Prototyping Human-Computer Interactions
  - ERP 4610 Customer Relationship Management in ERP Environment
  - ERP 5310 Supply Chain Management Systems in an ERP Environment
  - ERP 5210 Performance Dashboard, Scorecard and Data Visualization
IS&T 1001 Special Topics (IND 0.0-6.0)
This is designed to give the department an opportunity to test a new course. Variable title.

IS&T 1551 Implementing Information Systems: User Perspective (LEC 3.0)
Introduction to object-oriented programming in the context of developing and implementing the various components of an information system with particular attention given to system interface such as window and web forms. Class will include numerous projects covering foundational programming.

IS&T 1552 Implementing Information Systems: Data Perspective (LEC 3.0)
Continuation of object-oriented programming in the context of developing and implementing the various components of an information system with particular attention given to database incorporation. Class will include numerous projects covering intermediate topics. Prerequisite: A grade of "C" or better in IS&T 1551.

IS&T 1561 Algorithms and Programming with Java (LEC 3.0)
Introduction to programming using Java. Topics include basic programming concepts such as variable data, decision-making, and repetitive code. Also algorithm design and analysis, event-driven design with classes and methods. Numerous programs and group exercises.

IS&T 1561H Algorithms and Prog Java-Honors (LEC 3.0)

IS&T 1562 Java and Data Structures (LEC 3.0)
Provides an intermediate knowledge of programming using Java. Important concepts of Object Oriented programming will be covered. A significant part of the course will be devoted to data structures and how to handle them. Numerous programs will be assigned. Prerequisites: IS&T 1561.

IS&T 1750 Introduction to Management Information Systems (LEC 3.0)
This course familiarizes the students with the fundamental concepts and principles of management information systems. Topics covered include the strategic role of IT, decision support systems, database and datawarehouse, enterprise applications, mobile applications, and social and ethical issues related to information systems.

IS&T 2000 Special Problems (IND 0.0-6.0)
Problems or readings on specific subjects or projects in the department. Consent of instructor required.

IS&T 2001 Special Topics (IND 0.0-6.0)
This is designed to give the department an opportunity to test a new course. Variable title.
IS&T 2002 Cooperative Training in Information Science & Technology (IND 0.0-6.0)
On-the-job experience gained through cooperative education with industry with credit arranged through departmental co-op advisor. Grade received depends on quality of reports submitted and work supervisors’s evaluation. Prerequisite: Completed 30 hours toward degree.

IS&T 3000 Special Problems (IND 0.0-6.0)
Problems or readings on specific subjects or projects in the department. Consent of instructor required.

IS&T 3001 Special Topics (LEC 0.0-6.0)
This course is designed to give the department an opportunity to test a new course. Variable title.

IS&T 3131 Computing Internals and Operating Systems (LEC 3.0)
Design-oriented introduction to computer components and operation. Standard codes; number systems; base conversions; computer arithmetic; boolean algebra; operating system components including memory management, device management, and I/O management; and related issues are covered. Prerequisite: A grade of "C" or better in IS&T 1551 or IS&T 1561 or Comp Sci 1570.

IS&T 3221 Network Performance Design And Management (LEC 3.0)
This course provides analytical capabilities needed to effectively design, deploy, and manage computer networks and protocols. Prerequisites: IS&T 3333.

IS&T 3333 Data Networks and Information Security (LEC 3.0)
The course provides an overview of current and evolving networking and information security principles. Concepts include network standards and protocols; operation and management; switching and routing; area networks; wireless network infrastructure; security frameworks, policies, and management. Prerequisites: At least Sophomore standing.

IS&T 3343 Systems Analysis (LEC 3.0)
Introduction to the processes by which business information systems are analyzed, designed, and introduced into the business environment. Topics include investigation of existing systems, requirements analysis, logical and physical design, database design, forms design, and report analysis. Prerequisite: IS&T 3423.

IS&T 3420 Introduction to Data Science and Management (LEC 3.0)
Introduces students to increasing business success through analysis of large-scale data collections. Topics include: import/export of data, summary statistics, cross-tabulation, data transformations (sub setting, merging, sorting and aggregation), modeling methods, and visualization. Significant programming in R is expected. Prerequisites: IS&T 1562 or IS&T 1552 or Comp Sci 1575.

IS&T 3423 Database Management (LEC 3.0)
The course introduces the concepts of database management systems. Issues in database architecture, design, administration, and implementation are covered. Prerequisites: IS&T 1750; A grade of "C" or better in IS&T 1551 or IS&T 1561 or Comp Sci 1570.

IS&T 3443 Database Applications in Business (LEC 3.0)
Design, development and implementation of application software typical to the modern business environment utilizing popular commercial database management systems such as Oracle and Access. Focus given to business case modeling, requirement analysis, database design, and implementation challenges. Project oriented. Prerequisite: IS&T 3343.

IS&T 3553 Modular Software Systems in Java (LEC 3.0)
Introduction to Software Life Cycle and characteristics of large modular software systems. Exploration of software support for such systems, using Java, including use of GUI interfaces, advanced I/O and String handling, Interfaces, Threads, and other modularity features. Program project included. Prerequisites: IS&T 3131 and either IS&T 1562 or IS&T 1552.

IS&T 4000 Special Problems (IND 0.0-6.0)
Problems or readings on specific subjects or projects in the department. Consent of instructor required.

IS&T 4001 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 4099 Undergraduate Research (IND 0.0-6.0)
Designed for the undergraduate student who wishes to engage in research. Not for graduate credit. Not more than six credit hours allowed for graduation credit. Subject and credit to be arranged with the instructor.

IS&T 4257 Network Economy (LEC 3.0)
Emerging Network/Internet economy, using traditional economic tools. Topics: production and reproduction cost of information, information as an "experience good," versions of products, switching cost, lock-in effects, market adoption dynamics, first-mover advantage, intellectual property rights. Prerequisite: Econ 1100 or Econ 1200. (Co-listed with Econ 4130).

IS&T 4261 Information Systems Project Management (LEC 3.0)
The course overviews general project management principles and then focuses on information system application development. Topics include requirements analysis, project scheduling, risk management, quality assurance, testing, and team coordination. Prerequisites: A grade of "C" or better in IS&T 1551 or IS&T 1561 or Comp Sci 1570.

IS&T 4335 Fundamentals of Mobile Technology for Business (LEC 3.0)
A broad overview of mobile technology use in business environments. Topics include the mobile industry; mobile network and wireless standards; mobile devices; mobile web design and app development; social and user experience issues; mobile marketing and commerce. Prerequisites: Junior standing or above.

IS&T 4444 Introduction to 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. Prerequisites: IS&T 3423.
IS&T 4450 Introduction to Information Visualization (LEC 3.0)
Topics include: the visualization development framework, traditional presentations of data, human perception and aesthetics, colorspace theory, visualization algorithms and software, modern visualizations of large data sets. Application of R packages will be emphasized throughout. Prerequisites: Statistics, Calculus, and Programming Knowledge.

IS&T 4450H Introduction to Information Visualization-Honors (LEC 3.0)

IS&T 4641 Digital Commerce and the Internet of Things (LEC 3.0)
Introduction to fundamental concepts of management and application to IT and support of commerce. Examines the use of IT in business processes and everyday interactions such as IoT. Explores management issues of integrating IT into processes to run businesses better. Prerequisites: IS&T 1750 and at least Sophomore standing.

IS&T 4642 E-Commerce Architecture (LEC 3.0)
Course will cover the issues associated with computer architecture, as it relates specifically to e-commerce applications. Topics will include e-commerce systems and processes, specialized software, and databases. Prerequisite: IS&T 3333.

IS&T 4654 Web and Digital Media Development (LEC 3.0)
This course covers techniques and tools for design and development of web-based media, including text, graphics, animation, audio, and video.

IS&T 4680 Introduction to 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. Prerequisite: Junior or Senior standing.

IS&T 4780 Human and Organizational Factors in Cybersecurity (LEC 3.0)
In-depth examination of human and organizational factors in cybersecurity and information assurance. Study of how to protect information integrity, availability, and confidentiality, as well as tools, methods, principles, and analytics for fraud prevention, insider threat detection, and forensic investigations. Assumes prior exposure to cybersecurity or IA.

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 on-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: Graduate Standing, strong programming knowledge.

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 5420 Business Analytics and Data Science (LEC 3.0)
Analysis of large business data sets via statistical summaries, crosstabulation, 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: Strong programming knowledge required.

IS&T 5520 Data Science and Machine Learning with Python (LEC 3.0)
Examines data science methodologies for scraping, manipulating, transforming, cleaning, visualizing, summarizing, and modeling large-scale data as well as supervised and unsupervised machine learning algorithms applied in various business analytics and data science scenarios. Python libraries such as Pandas, NumPy, Matplotlib, and Scikit-learn are utilized. Prerequisites: One of Stat 3111, Stat 3113, Stat 3115, or Stat 3117; one of IS&T 1552, IS&T 1562, Comp Sci 1575; for Graduate Students: knowledge of calculus, statistics, and programming.
IS&T 5535 Machine Learning Algorithms and Applications (LEC 3.0)
Introduces techniques of modern machine learning methods with applications in marketing, finance, and other business disciplines. Topics include regression, classification, resampling methods, model selection, regularization, decision trees, support vector machines, principal component analysis, and clustering. R programming is required. Prerequisites: One of Stat 3111, Stat 3113, Stat 3115, Stat 3117; one of IS&T 1552, IS&T 1562, Comp Sci 1575; or Graduate Standing with knowledge of calculus, statistics, and programming.

IS&T 5652 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 4654; one of IS&T 1551, IS&T 1561.

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 3.0)
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 accompanied by IS&T 5885.