

Rensselaer Polytechnic Institute

Master of Science Information Technology



ITWS @ Rensselaer

-- Version --
June 2016

Overview

Rensselaer's Master of Science in Information Technology balances the study of management strategies and technology leadership with advanced course work in an IT concentration. Students complete a suite of Core and Capstone courses, and also select three to five additional courses to complete their Concentrations. Both a professional and research track are offered for the M.S. in IT degree.

Twelve concentrations are currently available at Rensselaer's Troy Campus: Cognitive Computing, Data Science and Analytics, Information Dominance, Web Science, Networking, Management Information Systems, Software Design and Engineering, Financial Engineering, Database and Intelligent Systems, Information Security, Information Systems Engineering and Human-Computer Interaction.

Curriculum

Students admitted to the M.S. in IT develop an approved plan of study that includes the following:

- Ten courses in IT (A minimum of thirty credits)
- A minimum of six courses (eighteen or more credits) at the 6000 graduate level
- Five Core courses in Information Technology (IT Core). For the research track, replace ITWS-6300 Business Issues for Engineers and Scientists core course with one of the two semester courses ITWS-6980 Master's Project or ITWS-6990 Master's Thesis.
- A minimum of three courses (nine credit hours or more) in a Concentration
- One elective approved by the advisor to add further breadth or depth to the degree
- One of: ITWS-6800 Information Technology Master's Capstone course (Professional Track), ITWS-6980 Master's Project (Research Track) or ITWS-6990 Master's Thesis (Research Track)

The Core and Concentration courses are designed to accommodate a wide range of backgrounds. If students have previously completed a basic required Core course, they then complete the next level required course to add depth in that Core area. For example, if an equivalent course to Database Systems was completed in a prior degree, the Core requirement could be satisfied by taking Enterprise Database Systems or Database Mining. Our goal is to bring students to the next level of IT expertise.

Concentrations are chosen from twelve possibilities. Students who plan to complete the program in **Two-Semesters** select one concentration and complete most of their Core courses in the Fall followed by the Concentration and Capstone courses in the Spring for a total of ten courses. Students who elect the **Three-Semester** option are able to complete two Concentrations over three terms for a total of twelve courses. The Three-Semester students will also generally complete a significant salaried co-op/ internship assignment over the summer (or the summer/fall) terms.

The Financial Engineering Concentration is completed by taking core courses in Database Design, Software Design and Engineering, HCI and Data Analytics plus five Concentration Courses and the Capstone Course. An upper level course in Finance is a prerequisite.

The M.S. in IT Capstone course integrates the knowledge and professional practice of IT Core and Concentration courses. Topics in database systems, networking, data analytics, software design and engineering, management of technology, human computer interaction, and ethics are applied within a framework of global e-business strategy. The course utilizes an Information Technology Team Project with a real organization to practice the major concepts of the IT Degree. Team members select, develop, and present a significant technology implementation project, incorporating strategy, systems development and business planning.

Rensselaer currently offers numerous Ph.D. degrees with significant IT related research including the Multidisciplinary Science degree with a research track in Information Technology. There is no separate Ph.D. degree in Information Technology.

Transfer credit is not expected to fulfill Core or Concentration requirements. Students can waive an IT core area requirement and substitute an approved elective only if they have already taken the equivalent of all listed core courses. Students may request transfer credit for the elective, subject to advisor approval. Additionally, no more than half of all credits used towards the M.S. in IT degree may be taken from courses offered by the Lally School of Management and Technology. These courses are coded MGMT.

The IT master's is also available as part of the Advanced Professional Studies blended learning program, based in Troy, NY, Hartford and Groton, Connecticut. Students enrolling in the APS program should consult the following web site for concentrations, course offerings and degree requirements: <http://www.rpi.edu/dept/aps/>.

Core Courses

To acquire a breadth of IT experience, master's degree students take the five Core courses listed below. If students have previously completed a Core course at Rensselaer or elsewhere, they fulfill the Core requirement by taking an advanced course in that area.

Required Core Courses

IT Core Area	Course Number	Course Title	Term(s) Offered
Database Systems	CSCI-4380	Database Systems	Spring
Data Analytics	ITWS-6350	Data Science	Fall
Software Design and Engineering	CSCI-4440	Software Design and Documentation	Fall/Spring
	ITWS-6700	Software Development	Spring
Management of Technology*	ITWS-6300	Business Issues for Engineers and Scientists (Professional Track Only)	Fall/Spring
Human Computer Interaction	COMM-6420	Foundations of HCI Usability	Fall

* For the research track, replace ITWS-6300 Business Issues for Engineers and Scientists with one of the two semester courses ITWS-6980 Master's Project or ITWS-6990 Master's Thesis.

Advanced Core options for students who have previously completed a Core Course

IT Core Area	Course Number	Course Title	Term(s) Offered
Database Systems	CSCI-6390	Database Mining	Fall
	ITWS-6350	Data Science	Fall
Data Analytics	CSCI-6390	Database Mining	Fall
	ITWS-6400	X-Informatics	Spring
	ITWX-6600	Data Analytics	Spring
Software Design and Engineering	CSCI-6500	Distributed Computing Over the Internet	Spring
	ITWS-6400	X-Informatics	Spring
Management of Technology	MGMT-6080	Networks, Innovation and Value Creation	Fall
	MGMT-6140	Information Systems for Management	Spring
Human Computer Interaction	COMM-6620	Information Architecture	Spring
	COMM-6760	User-Experience Design	Fall
	COMM-6880	Interactive Data Visualization	Summer

One of:

Master's Capstone	ITWS-6800	Information Technology Master's Capstone (Professional Track Only)	Fall/Spring
Master's Project	ITWS-6980	Master's Project (Research Track)	Fall/Spring
Master's Thesis	ITWS-6990	Master's Thesis (Research Track)	Fall/Spring

Concentrations

The IT faculty designed the IT Concentrations to provide an in-depth, leading-edge experience in the application of information technology. Students often select areas that complement their prior backgrounds (e.g., students with strong backgrounds in computer science may select MIS or Information Systems Engineering). Alternately, some students select a concentration area related to their prior backgrounds and then expand on that background through higher-level coursework.

NOTES:

- Courses taken to complete a Core requirement do not count towards the Concentration.
- Students must have the prerequisites knowledge for each course as described in the university catalog: <http://www.rpi.edu/academics/catalog/index.html>

Concentration	Course Number	Course Name	Term(s) Offered
COGNITIVE COMPUTING	<p>Different people take 'cognitive computing' to mean different things. Roughly, we can split these different meanings in two groups. The first group uses 'cognitive computing' to denote computational methods that attempt to mimic the way the human mind processes information: stand-alone technologies that have cognitive capacities in and of themselves. An example would be a deep learning neural network that performs image recognition. The second group uses the term to denote computational tools that 'fit' and 'enhance' the human mind: human-centered technologies that are cognitively ergonomic and cognitively enabling: technologies that take into account the scope and limits of human cognition but that allow the human user to augment their cognitive capacities. An example would be Watson as a paramedic. Of course, these two different meanings are not exclusive. In fact, in order for a system to augment the cognitive powers of a human user, the system is likely to require some intelligence in and of itself. Our program of Cognitive Computing is along the lines of the second meaning of the term: it is a program that studies how human cognition can be extended through the use of intelligent technology. As such, the program draws largely from the cognitive sciences, information sciences, and communication sciences.</p> <p>Select three of the following courses:</p>		
	COGS-4620	Cognitive Engineering	Fall
	COGS-496X	Affective Computing	Fall
	COGS-496X	The Linguistics of Computational Linguistics	Fall
	COGS-6210	Cognitive Modeling I	Spring
	COGS-6240	Logic and Artificial Intelligence	Spring
	COGS-696X	Computational Linguistics	Fall
	CSCI-4150	Introduction to AI	Fall
	CSCI-6100	Machine Learning	Fall
	CSCI-6130	Natural Language Processing	Fall
	CSCI-6270	Computational Vision	Fall
	CSCI-6390	Database Mining	Fall
	CSCI-696X	Cognitive Computing	Fall
	CSCI-696X	Computational Social Choice	Spring
	ITWS-6400	X-informatics	Spring
	ISYE-4260	Human Performance Modeling and Support	Spring
	ISYE-4810	Computational Intelligence	Spring
	PSYC-4370	Cognitive Psychology	Fall

Concentration	Course Number	Course Name	Term(s) Offered
DATA SCIENCE AND ANALYTICS	Data and Information analytics extends analysis (descriptive and predictive models to obtain knowledge from data) by using insight from analyses to recommend action or to guide and communicate decision-making. Thus, analytics is not so much concerned with individual analyses or analysis steps, but with an entire methodology. Key topics include: advanced statistical computing theory, multivariate analysis, and application of computer science courses such as data mining and machine learning and change detection by uncovering unexpected patterns in data.		
	Select two or three of the following courses:		
	ITWS-6350	Data Science	Fall
	ITWS-6400	X-Informatics	Spring
	ITWS-6600	Data Analytics	Spring
	ISYE-6180/ISYE-696X	Knowledge Discovery with Data Mining/ Big Data Analytics	Spring
	If only two of the above were chosen, select one more of the following courses:		
	ARTS-496X	Creative Data Design	Spring
	COMM-6880	Interactive Data Visualization	Summer
	CSCI-4020	Computer Algorithms	Spring
	CSCI-4150	Introduction to AI	Fall
	CSCI-4220	Network Programming	Spring
	CSCI-4320/ CSCI-6360	Parallel Programming/ Parallel Computing	Spring
	CSCI-6100	Machine Learning	Fall
	CSCI-6270	Computational Vision	Fall
	CSCI-6130	Natural Language Processing	Fall
	CSCI-6390	Database Mining	Fall
	CSCI-696X	Foundations of Data Science	Spring
	CSCI-696X	Interactive Visualization	Spring
	ISYE-4220	Optimization Algorithms and Applications	Fall
	ISYE-4670	Mathematical Statistics	Spring
	ISYE-4810	Computational Intelligence	Spring
	ITWS-696X	Data and Society	Spring
	ITWS-696X	Big Data Policies	Fall
	ITWS-696X	Data Analysis Research Lab	Fall
	MGMT-6100	Statistics and Operations Management	Fall
	MGMT-696X	Technology Fundamentals for Business Analytics	Fall
	MGMT-696X	Applied Analytics and Predictive Modeling	Spring

Concentration	Course Number	Course Name	Term(s) Offered
INFORMATION DOMINANCE	<p>The Information Dominance concentration prepares students for careers designing, building, and managing secure information systems and networks. The concentration includes advanced study in encryption and network security, formal models and policies for access control in databases and application systems, secure coding techniques, and other related information assurance topics. The combination of coursework provides comprehensive coverage of issues and solutions for utilizing high assurance systems for tactical decision-making. It prepares students for careers ranging from secure information systems analyst, to information security engineer, to field information manager and chief information officer. It is also appropriate for all IT professionals who want to enhance their knowledge of how to use pervasive information in situational awareness, operations scenarios, and decision-making.</p>		
	Select two or three of the following courses:		
	CSCI-4220	Network Programming	Spring
	CSCI-6230	Cryptography and Network Security I	Fall
	ECSE-4670	Computer Communication Networks	Fall
	ISYE-4310	Ethics of Modeling for Industrial Systems Engineering	Fall
	ISYE-6180/ISYE-696X	Knowledge Discovery with Data Mining/Big Data Analytics	Spring
	ITWS-4370	Information System Security	Spring
	ITWS-6600	Data Analytics	Spring
	If only two of the above were chosen, select one more of the following courses:		
	CSCI-6390	Database Mining	Fall
	CSCI-6240	Cryptography and Network Security II	Spring
	CSCI-696X	Security Topics Course	Fall
	CSCI-696X	Cloud Computing Seminar	Fall
	ITWS-696X	Big Data Policies	Fall
	ISYE-6500	Information and Decision Technologies for Industrial and Service Systems	Fall/Spring

Concentration	Course Number	Course Name	Term(s) Offered
WEB SCIENCE	<p>The study of Web Science gives students insights into understanding what the web is and how to engineer its future and ensure its social benefit. The new Web Science concentration contains courses focused on one of the most powerful research, social and commercial technologies of our time.</p>		
	<p>The leader of the concentration is Dr. James Hendler, an internationally renowned figure in Web research and one of the pioneers of the Semantic Web. Along with colleagues Dr. Peter Fox and Dr. Deborah McGuinness, Dr. Hendler is working on research to advance scientific discovery and innovation by enabling rapid and easy collaboration between scientists, educators, students, policy makers, and even “citizen scientists” around the world wide web. They have created an innovative set of courses that focus on new trends in eScience and new technologies for the World Wide Web.</p>		
	<p>IT professionals who complete this concentration can apply their knowledge to careers in web-based businesses, web-based startup companies, or to playing the role of innovators in their organizations’ use of the web.</p>		
	<p>Select two or three of the following courses:</p>		
	ITWS-6400	X-Informatics	Spring
	COMM-4580	Advertising and Culture	Fall
	COMM-4470	Information Design	Fall
	COMM-4690	Interface Design: Hypermedia Theory and Application	Spring
	COMM-6510	Communication Theory	Fall
	COMM-6760	User-Experience Design	Fall
	COMM-6880	Interactive Data Visualization	Summer
	COMM-696X	Mobile AR	Fall
	CSCI-4220	Network Programming	Spring
	CSCI-696X	Interactive Visualization	Spring
	CSCI-696X	Semantic Web Topics Course	Fall
	CSCI-696X	Cloud Computing Seminar	Spring
	CSCI-696X	Distributed Systems and Algorithms	Fall
	MGMT-6720	Internet Marketing	Spring
	<p>Optional Data Course, select only one:</p>		
	ARTS-496X	Creative Data Design	Spring
	CSCI-6100	Machine Learning	Fall
	ITWS-6350	Data Science	Fall
	ITWS-696X	Data Analytics	Spring
ISYE-6180/ISYE-696X	Knowledge Discovery with Data Mining/ Big Data Analytics	Spring	

DATABASE AND INTELLIGENT SYSTEMS	<p>The Database and Intelligent Systems concentration prepares students for careers in database design, database administration, database application development, or database systems implementation. Database design focuses on modeling some aspect of a physical or conceptual world that must be captured in a database as part of a larger application system. Database administration (DBA) focuses on installation, operation, and maintenance of a database system and its applications on a day-by-day basis for an organization or company. Database application development focuses on building complex application systems, including web-based applications that use a database at their core. Database systems implementation focuses on creating the underlying database system itself and is most likely done with a career in a database vendor company.</p>		
	Select three of the following courses:		
	CSCI-4150	Introduction to AI	Fall
	CSCI-6100	Machine Learning	Fall
	CSCI-6390	Database Mining	Fall
	CSCI-696X	Cloud Computing Seminar	Spring
	CSCI-696X	Distributed Systems and Algorithms	Fall
	ISYE-4810	Computational Intelligence	Spring
	ISYE-6180/ISYE-696X	Knowledge Discovery with Data Mining/ Big Data Analytics	Spring
	ITWS-6350	Data Science	Fall
ITWS-6600	Data Analytics	Spring	

INFORMATION SECURITY	<p>The Information Security concentration prepares students for careers designing, building, and managing secure computer systems and networks. The concentration includes advanced study in encryption and network security, formal models and policies for access control in databases and application systems, secure coding techniques, and other related information assurance topics. The combination of coursework provides comprehensive coverage of issues and solutions for building and operating high assurance systems. It prepares students for careers ranging from secure systems analyst, to security engineer, to security manager and chief security officer. It is also appropriate for other IT professionals who want to enhance their knowledge of information assurance.</p>		
	Select two or three of the following courses:		
	CSCI-4210	Operating Systems	Fall/Spring
	CSCI-6230	Cryptography and Network Security I	Fall
	ITWS-4370	Information System Security	Spring
	CSCI-696X	Security Topics Course	Fall
	If only two of the above were chosen, select one more of the following courses:		
	CSCI-6390	Database Mining	Fall
	CSCI-6240	Cryptography and Network Security II	Spring
	ISYE-4310	Ethics of Modeling for Industrial Systems Engineering	Fall
	ISYE-6180/ISYE-696X	Knowledge Discovery with Data Mining/ Big Data Analytics	Spring
	MATH-4020	Introduction to Number Theory	Spring

INFORMATION SYSTEMS ENGINEERING	<p>The Information Systems Engineering (ISE) concentration prepares students to succeed in the Information Systems (IS) profession as a technically competent systems analyst, software designer, and application developer. The IS profession is generally made up of business analysts, systems designers, and programmers; where business analysts identify requirements with end users, systems designers construct the information architecture (networks, databases, and applications) required, and programmers develop the software implementation. Graduates of this ISE concentration will claim the middle domain, systems designer, while being perfectly capable of moving into either of the other two domains. The graduates could go anywhere information systems are used, meaning essentially any modern organizations in any sector of the economy. The ISE curriculum combines competencies in databases and software engineering with technical analysis and design tools to give graduates a unique blending of knowledge.</p>		
	Select three of the following courses:		
	CSCI-6390	Database Mining	Fall
	CSCI-696X	Computational Finance	Fall
	ECSE-6860	Evaluation Methods for Decision Making	Fall
	ISYE-4310	Ethics of Modeling for ISYE	Fall
	ISYE-4530	Information Systems	Fall
	ISYE-6180/ISYE-696X	Knowledge Discovery with Data Mining/ Big Data Analytics	Spring
	ISYE-6610	Systems Modeling in Decision Sciences	Fall
	ISYE-6620	Discrete-Event Simulation	Fall
	ISYE-6870	Introduction to Neural Networks	Spring
	ISYE-696X	Data Analytics Research Lab	Fall
	ITWS-6600	Data Analytics	Spring
	MGMT-6140	Information Systems for Management	Spring
	MGMT-6170	Advanced Systems Analysis and Design	Spring/Fall
MGMT-696X	Advanced Data Resource Management	Fall	

NETWORKING

The Computer Networking concentration prepares students for careers in network design and planning, network monitoring and management, network application development, or network deployment and customization. Network design and planning focuses on projecting the organization or company needs onto the structure and configuration of its network, including capacity, security and applications. Network monitoring and management focuses on installation, operation, and maintenance of a network, including identifying and responding to the failures and attacks, on a day-by-day basis for an organization or company. Network application development focuses on building complex distributed software systems that depend heavily in their execution on networking. Network deployment and customization focuses on creating the network for a company or organization, including customization of the general network features. Typical careers will place graduates at network vendor companies, Internet service or application providers (ISP or ASP) or at the IT departments of any organization or enterprise.

Select three of the following courses:

CSCI-4220	Network Programming	Spring
CSCI-4320/ CSCI-6360	Parallel Programming/ Parallel Computing	Spring
CSCI-6500	Distributed Computing over the Internet	Spring
CSCI-6230	Cryptography and Network Security I	Fall
CSCI-6250	Frontiers of Network Science	Fall
CSCI-696X	Distributed Systems and Algorithms	Fall
ECSE-4670	Computer Communication Networks	Fall
ECSE-6600	Internet Protocols	Spring
ECSE-6660	Broadband and Optical Networking	Spring

**SOFTWARE
DESIGN AND
ENGINEERING**

The Software Design concentration prepares students for careers in design and development of software applications and infrastructure. For software applications design and development, students obtain necessary skills and perspective for supervising and participating in all phases of software projects: architecture, high-level design, detailed design, documentation, implementation, testing, systems integration, and system maintenance. These same phases are also important in developing software infrastructure, including software component libraries and other foundations for productive applications development. Additional issues for software infrastructure include systematic classification of software library components, design of interfaces for interoperability, and assuring reliability and high performance even as existing components are redesigned for broader applicability. Areas in which there is high demand for software applications designers include, among many others, simulation software, distributed systems, embedded systems, web technologies and protocols, and graphical user interfaces. Companies and organizations developing such applications are also increasingly recognizing the role of specialists in software infrastructure.

Select two or three of the following courses:

CSCI-4020	Computer Algorithms	Spring
CSCI-4210	Operating Systems	Fall/Spring
CSCI-4220	Network Programming	Spring
CSCI-4320/ CSCI-6360	Parallel Programming/ Parallel Computing	Spring
CSCI-4430	Programming Languages	Fall/Spring
CSCI-4440	Software Design and Documentation	Fall/Spring
CSCI-6140	Computer Operating Systems	Fall
CSCI-696X	Cloud Computing Seminar	Spring
CSCI-696X	Distributed Systems and Algorithms	Fall
CSCI-696X	Semantic Web Topics Course	Fall
CSCI-696X	Interactive Visualization	Spring
ISYE-4220	Optimization Algorithms and Applications	Fall
ITWS-6400	X-Informatics	Spring
ITWS-6700	Software Development	Spring
MGMT-6170	Advanced Systems Analysis and Design	Spring/Fall

If only two of the above were chosen, select one more of the following courses:

COMM-4690	Interface Design: Hypermedia Theory and Application	Spring
COMM-6560	Visual Design: Theory and Application	Fall
COMM-6770	User Experience Design	Spring
COMM-6810	Studio Design in HCI	Spring
COMM-6880	Interactive Data Visualization	Summer

**MANAGEMENT
INFORMATION
SYSTEMS**

The Management Information Systems concentration is designed for professionals seeking executive positions with responsibilities for achieving competitive advantage through the effective development and integration of information technology into organizations. The emergence of Internet and the World Wide Web has ushered in a new paradigm for organizing in which information technology and IT management capabilities could determine winners and losers in electronic markets. The net result is a growing need for managers in all functional areas to be conversant with strategies and tactics for managing the use of information technology. This concentration is designed to fulfill this need and expose students to IT management concepts and theories. The courses use an interdisciplinary approach, are project and case based and provide a solid grounding in systems analysis and design, IT project management, enterprise information architecture planning and design, evaluation of IT value, identification and assessment of opportunities for IT-enabled business transformation and information systems management. MIS graduates can find managerial positions in the information systems departments in organizations and in consulting.

Select three of the following courses

Note: A maximum of five management courses (prefix: MGMT) may be taken towards the IT degree.

CSCI-6390	Database Mining	Fall
MGMT-4130	Enterprise IT Integration	Spring
MGMT-4150	IT Project Management	Spring
MGMT-6060	Business Implications of Emerging Technologies	Fall/Spring
MGMT-6080	Networks, Innovation and Value Creation	Fall
MGMT-6140	Information Systems for Management	Spring
MGMT-6170	Advanced Systems Analysis and Design	Spring/Fall
MGMT-6720	Internet Marketing	Spring
MGMT-6810	Management of Technical Projects	Fall
COMM-6880	Interactive Data Visualization	Summer
MGMT-696X	Advanced Data Resource Management	Fall
MGMT-696X	Technology Fundamentals for Business Analytics	Fall

<p style="text-align: center;">FINANCIAL ENGINEERING*</p> <p>* prerequisite – knowledge in finance is required</p>	<p>The Financial Engineering concentration prepares students for careers in the financial industry, with opportunities in financial analysis, management, and consulting and also in banking, investments, and insurance. The combination of advanced study in IT and Financial Engineering uniquely qualifies graduates to assist firms seeking IT solutions to financial systems. The FE concentration is offered jointly with the Lally School of Management and Technology. Students are introduced to the mathematical approach to risk analysis, portfolio selection, investment planning and derivative instruments, among other financial topics. Focus will be on modeling, optimization, statistical and other computational techniques.</p>		
	MATH-4740	Intro. To Financial Mathematics and Engineering (required)	Fall
	MGMT-7760	Risk Management (required)	Fall
	With Advisor approval, choose three additional courses:		
	CSCI-696X	Computational Finance	Fall
	ECON-4120	Quantitative Analysis	Fall
	ECON-6570	Advanced Econometrics	Spring
	ISYE-6100	Time Series Analysis	Spring
	MATH 4800	Numerical Computing	Fall/Spring
	MATH-4820	Introduction to Numerical Methods for Differential Equations	Spring
	MATH-6740	Financial Mathematics and Simulation	Spring
	MATP-4620	Mathematical Statistics	Spring
	MATP-4700	Mathematical Models of Operations Research	Fall
	MATP-4820	Computational Optimization	Spring
	MATP-6640	Linear Programming	Spring
	MGMT-6020	Financial Management I	Fall
	MGMT-6210	Managerial Accounting	Spring
	MGMT-6240	Financial Trading and Investing	Spring
	MGMT-6370	Options, Futures and Derivatives Markets	Spring
	MGMT-6400	Financial Econometric Modeling	Spring
	MGMT-6410	Investments I	Spring
	MGMT-6430	Advanced Financial Statement Analysis	Fall/Spring
	MGMT-6510	Financial Computation	Fall
	MGMT-6520	Financial Modeling	Fall
	MGMT-696X	Fixed Income	Spring

**HUMAN-
COMPUTER
INTERACTION**

The Human-Computer Interaction concentration prepares IT professionals for careers in information technology design and development. The focus is on the ways technical skills in IT can be applied in a user-centered rather than a strictly technology-centered or developer-centered way.

In the HCI Concentration, students are given the opportunity to:

- practice the research and design skills necessary to produce effective, usable human interfaces for IT systems
- deepen their understanding of cognitive and social theories underlying effective human interface design, and
- acquire the ability to make strategic decisions based on user data which will enhance the processes and products associated with IT design

Students with an HCI concentration may go on to careers in fields such as User-Centered Design, Human Factors and Usability Engineering, and Quality Assurance, contributing to a wide variety of hardware and software product areas.

Select three of the following courses:

ARTS-4968	Creative Data Design	Spring
COMM-4470	Information Design	Fall
COMM-4690	Interface Design	Spring
COMM-6530	Media Communications Research	Spring
COMM-6810	Studio Design in HCI	Spring
COMM-6770	User Experience Design	Spring
COMM-6880	Interactive Data Visualization	Summer
COMM-696X	Mobile AR	Fall
CSCI-696X	Interactive Visualization	Spring
ISYE-4260	Human Performance Modeling and Support	Spring

Admissions Requirements

Applicants are expected to have prior academic records that indicate their ability to excel in advanced coursework. Prospective students should also have completed the equivalent to the following three Rensselaer courses prior to enrollment:

- CSCI-1100 Computer Science I (Fundamentals of Computer Science) – Number systems; basic computer architecture; stepwise refinement of algorithms; functions and parameter passing; basic programming concepts through two-dimensional arrays and pointer basics using C++.
- CSCI-1200 Data Structures – Pointers; classes; operator overloading; deep vs. shallow copy constructors; inheritance; file I/O; templates in C++, introductory algorithm analysis and data structures.
- CSCI-2300 Introduction to Algorithms – Topics including mathematical induction and its application to algorithm design; linear structures; trees and balanced trees; heaps and priority queues; graphs and graph algorithms; backtracking, divide-and-conquer and greedy algorithms.

The GRE (Graduate Record Examination) and a resume are required of all applicants.



“When I compare the opportunities I had before and after the IT program, it has been a complete turnaround. I got more interviews and I saw a lot of respect from the recruiters”.

-Deepika Singh
B.A. Architecture, M.S. Information Technology
Concentration in Software Design

“Oracle employs some of the most talented developers and technical staff in the world. Being in that sort of environment, you must have a firm grasp of technical aspects as your team is constantly immersed in all kinds of situations. Both my overall experience and focused studies in particular courses at RPI prepared me for this environment.”

-Scott Jablonski
B.S. Psychology, M.S. Information Technology
Concentration in Information Systems Engineering



For Additional Information:

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