

Education for Working Professionals

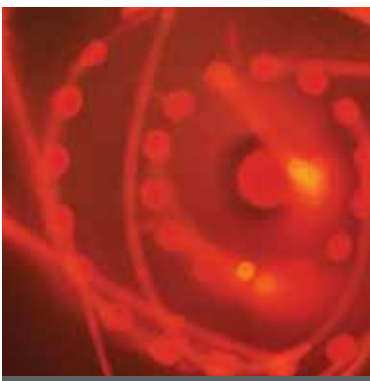
2009-2011

## Distance Learning Program Information

[www.rpi.edu/ewp/distance](http://www.rpi.edu/ewp/distance)



**Rensselaer**



# WWEI

## RENSSELAER IN BRIEF

Founded in 1824 “for the purpose of instructing persons ... in the application of science to the common purposes of life,” Rensselaer people have performed the research, developed the technologies, produced the innovations, and formed the enterprises that defined and accomplished the technological agendas of the 19th and 20th centuries, and are continuing to do so in the 21st century. Rensselaer is the nation’s oldest technological university, educating the leaders of tomorrow for technologically based careers. The Institute is especially well-known for its success in the transfer of technology from the laboratory to the marketplace so that new discoveries and inventions benefit human life, protect the environment, and strengthen economic development.

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## About Education for Working Professionals

Education for Working Professionals (EWP) is one of Rensselaer's four core enterprises and encompasses a range of programs designed specifically for current and future workforce leaders with a range of high-end, customized degree, certificate, and professional development programs. Program content flows from the heart of Rensselaer's research strengths and unique academic programs. Rensselaer supports this vision by forging strategic partnerships with businesses, governments, universities, and innovative professionals who impact society and technology around the nation and the world.

The mission of EWP is to educate business and technical leaders with the knowledge, analytical skills, creativity, and inspiration to think strategically, lead change, and create breakthrough solutions that meet the technological and business challenges of the global environment now and in the future. With dramatic increases in the rate of change, working professionals expect and demand an academic environment that fits the evolving needs of their fast-paced world, and Rensselaer responds to this need through the EWP enterprise.



## An Interactive Learning Environment

### PROGRAMS THAT FIT YOUR GOALS. CLASSES

#### Troy Campus

Working professionals are invited to enroll in degree and certificate programs on Rensselaer's Troy, N.Y. campus while remaining fully employed. Programs delivered in evening and weekend formats are available from all five of Rensselaer's schools. Available offerings include: Aeronautical Engineering; Applied Science; Business Administration; Civil Engineering; Computer and Systems Engineering; Electrical Engineering; Environmental Engineering; Human-Computer Interaction; Industrial and Management Engineering; Information Technology; Management; Materials Science and Engineering; Mechanical Engineering; and Nuclear Engineering.

Troy's campus facilities include a 218,000-square-foot Center for Biotechnology and Interdisciplinary Studies which ranks among the world's most advanced research facilities focused on the application of engineering and the physical and information sciences to the life sciences; studio classrooms that allow students at wired workstations to utilize Web-based technologies, full-motion video, and computer simulation, among other technologies; and a new Experimental Media and Performing Arts Center that supports the intersection of art, media, technology, and research. Rensselaer's 275-acre campus is alive with the spirit of exploration, collaboration, and discovery. Built into a hillside, it overlooks the historic city of Troy, N.Y. and the Hudson River. While there's no substitute for a personal visit to campus, the Rensselaer Virtual Tour is the next best thing. Check it out at: <http://www.rpi.edu/tour>.





THAT FIT YOUR SCHEDULE. EXPERIENCES TO CHANGE YOUR LIFE.

### Hartford Campus

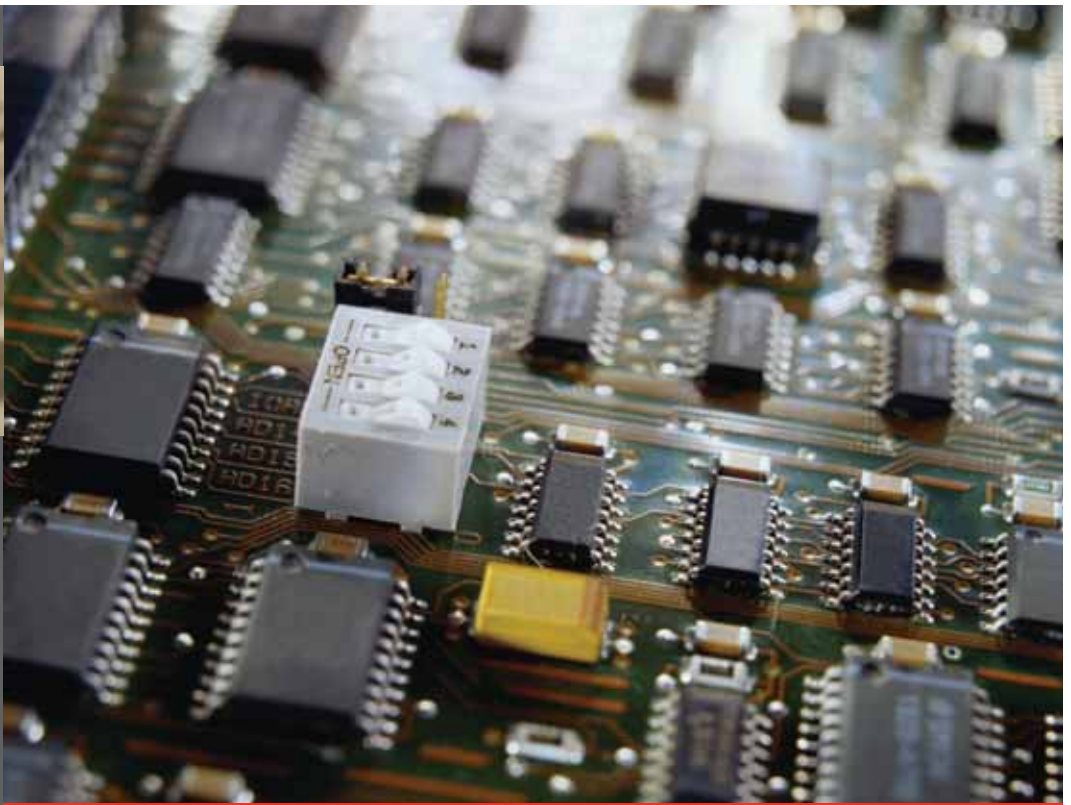
Rensselaer's Hartford campus provides a challenging educational environment and a dynamic learning experience for students who need to balance their professional, academic, and personal lives. More than 1,200 students attend classes at Rensselaer's Hartford campus and southeastern Connecticut regional site.

Rensselaer Hartford offers graduate programs in Management, Computer and Systems Engineering, Computer Science, Electrical Engineering, Engineering Science, Information Technology, and Mechanical Engineering. Specialized programs include Dual Master's Degrees, the Weekend MBA, the Elite Master's Program, and the International Scholars Program, as well as several graduate certificates in Computer and Information Sciences and Engineering. Courses are delivered by faculty with significant industry experience, solid academic credentials and scholarship, and exceptional teaching skills whose expertise is grounded in sound research and best practices from a global perspective. Each course is designed to meet the needs of working professionals seeking to advance their careers and enhance their organizations' successes. Rensselaer graduates are entrepreneurial and personify the Institute's slogan, "Why not change the world?"

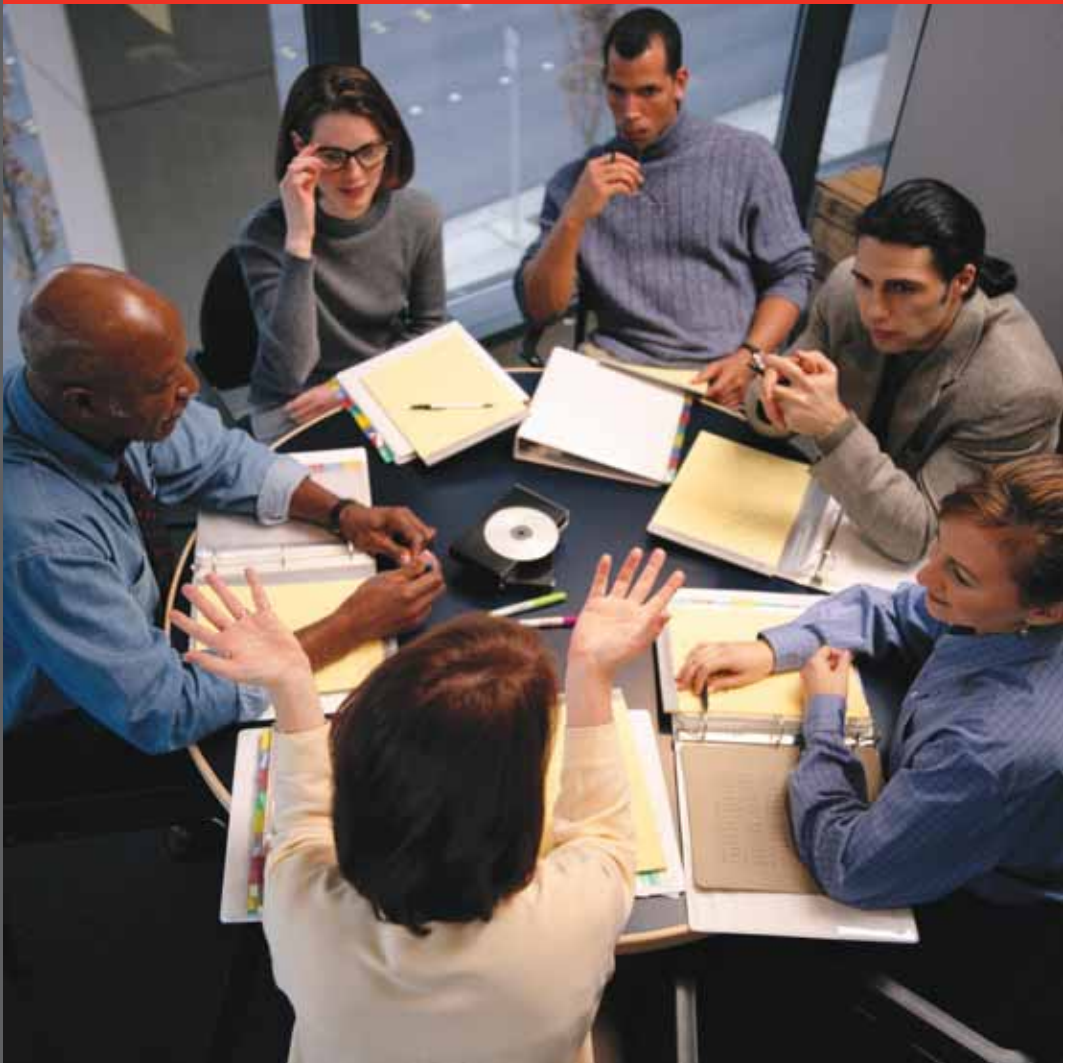
### Distance Learning

For over two decades, Rensselaer has pioneered the application of state-of-the-art technologies to deliver high-quality, interactive learning experiences in distributed environments. A leader in graduate-level, distributed education programs for working professionals, Rensselaer provides online course delivery combined with face-to-face interaction with faculty to enhance the online learning experience. Individuals from leading corporations and government agencies worldwide participate in distance courses that originate from Rensselaer's Troy, Hartford, and southeast-ern Connecticut site campuses and are supported by course Web sites and other technologies that provide communication and collaboration tools to facilitate interaction between students and faculty and among students. Rensselaer is known for excellence in content, delivery, and services, and has received considerable national recognition and numerous awards. Degree and certificate programs in Engineering, Human-Computer Interaction, Information Technology, and Management, have been available via distance.

*NOTE: Effective for the Fall 2009 semester, Rensselaer is phasing out the delivery of degree and certificate programs via distance.*



Our high-end, customized degree, certificate, and professional development programs ensure that EWP graduates have an education that empowers them to become architects of their own futures.



## Professional Development

### PROFESSIONAL DEVELOPMENT PROGRAMS

Lifelong learning is essential to continued professional growth. Professional development programs, seminar topics and Academic Short Courses are generally made available to working professionals during the summer and academic year and can be customized, based on need, to allow the working professional an opportunity to learn from experts who will share their knowledge and the latest research being conducted at Rensselaer. Programs and courses can be personalized and offered in a short, intensive format, to minimize the time away from work. Most workshops are designed to address the professional development needs of employees who are looking to learn new skills and stay competitive in their field.

### CUSTOM PROGRAM OPPORTUNITIES

Rensselaer is offering seminar topics and academic short courses from all five schools; Architecture, Engineering, Humanities Arts and Social Sciences, Management, and Science. Customized programs can be developed and delivered upon request, based on faculty availability.

### PROFESSIONAL STAFF DEVELOPMENT -CONSULTATION AND TRAINING PROGRAM

Professional staff development is also available through Rensselaer's premier Archer Center for Student Leadership Development. Consultation sessions are conducted to assess professional development needs and create a customized program designed to meet each organization's needs. Staff development sessions develop employee skills and maximize overall organizational effectiveness.

### EXECUTIVE AND PROFESSIONAL DEVELOPMENT PROGRAMS

These programs teach developing managers as well as seasoned executives how to improve their leadership styles and to be better leaders and team builders. Rensselaer is the only network associate of the internationally renowned Center for Creative Leadership (CCL)<sup>®</sup> in the northeastern United States. Foundations of Leadership (FOL)<sup>®</sup> is a three-day leadership development workshop designed to assist the development of emerging leaders and managers by increasing their personal awareness, interpersonal effectiveness, and managerial abilities. Leadership Development Program (LDP)<sup>®</sup> is an intense, five-day program designed to improve the effectiveness of upper-middle to senior-level managers by helping them to recognize their strengths and weaknesses as leaders.

## Regional Programs

### REGIONAL SITE IN SOUTHEASTERN CONNECTICUT

Rensselaer operates a regional site in southeastern Connecticut. Faculty from Rensselaer's Hartford campus travel to the southeastern Connecticut site to teach courses. Students at Rensselaer's southeastern Connecticut site participate in cohort-based learning programs to complete their degrees.

### NAVY NUCLEAR PROGRAM

Rensselaer operates a regional site in Malta, N.Y. for graduates of the Navy Nuclear Power Training School who are stationed at the Kesselring site in West Milton, N.Y. Navy personnel enter the program with one year's worth of undergraduate coursework and Rensselaer provides the remaining coursework for students to complete a B.S. in Nuclear Engineering within two to three years. Rensselaer courses are primarily taught on-site in Malta by faculty from the Troy campus. In addition, on-site courses are supplemented by one or two online courses each semester.

Most distributed delivery courses are taught in real-time by Rensselaer faculty members before a live class of graduate students at Rensselaer's Troy or Hartford campus. Courses delivered to distance students combine live class sessions on one of Rensselaer's campuses or at corporate sites with a blend of synchronous and asynchronous technologies. Specific technologies are selected to provide engaging learning experiences and maximum opportunities for interaction between students and faculty and among students.

## Campus Cohort Students

- Campus cohort students are students who are not employed at one of Rensselaer's corporate partner sites.
- Courses delivered via distance to campus cohort students combine campus class meetings with online learning activities.
- Most of the coursework is conducted online and campus class meetings are designed to ensure the opportunity for face-to-face interaction with other students and with faculty.
- Campus cohort students are expected to come to campus to participate in 2-4 class sessions for each course in which they are enrolled.
- All campus cohort students are expected to attend the first class meeting on campus where they will meet faculty and classmates, who they will interact with throughout the semester.
- The faculty will designate for each course the remaining sessions in which they expect distance students to be on campus and the dates will vary based on the design of the course and the way in which the faculty choose to conduct class meetings.
- Courses may originate on the Troy or Hartford campus. To participate in campus class meetings, students would go to the campus at which the course originates.
- Students are also expected to actively participate in both synchronous and asynchronous online activities and must have access to appropriate computing resources with which to do this.
- Most courses meet once a week in the evening for 3-hour class meetings, but there are some courses that meet twice a week during the day for 1- to 2-hour class meetings.

## Corporate Partner Sites

- Courses are delivered via distance to students at corporate partner sites.
- Students are also expected to actively participate in both synchronous and asynchronous online activities and must have access to appropriate computing resources with which to do this.
- Faculty site visits are scheduled at the beginning of the semester in coordination with site administrators.
- Rensselaer faculty make visits each semester to those sites with sufficient enrollments to allow for face-to-face interaction.

## New Corporate Partners

Employees of new corporate partners participate either as corporate partner sites or as campus cohort students based on the number of enrollments per site in a program.

## Delivery Technologies

Based on the format and structure of each course, specific technologies are selected for the delivery of each course to distributed sites and students. The technologies used for each course are listed on the Web site prior to the start of each semester. The possible technologies are described below:

### Online Conferencing (OLC-IC, OLC-OC)

In-class (IC) and out-of-class (OC) course activities, that require synchronous, or live, interaction utilize Rensselaer's online conferencing tool, which enables online communication and collaboration over the Internet. The online conferencing tool supports Web-based audioconferencing, synchronized content presentation and Web-browsing, text chat, and application-sharing.

### Internet Videostreaming, Live or Delayed (VSL, VSD)

Lecture or content is captured on video, digitized, delivered, and viewed via the Internet. Videostreams may consist of entire class lectures or shorter video clips of specific content. Live videostreams are available for synchronous viewing at the time the class is being conducted and may also offer real-time interaction with the instructor and classroom. Delayed videostreams are viewed on-demand or asynchronously at the student's convenience.

NOTE: Students and sites should ensure that local computer systems meet the minimum technical requirements. For a detailed list of requirements, please click on the "Technical Requirements and Support" section of our Web site.

Internet protection services such as firewalls, designed to protect corporate information and systems, may sometimes prevent students from successfully viewing streamed content. Corporate network administrators are often able to make minor adjustments in the firewall scheme that allow streaming to be done. However, some security policies do not permit the necessary modifications to the firewall. Students at these facilities may be directed to use a computer that is not connected to the Internet through their corporate network in order to participate in videostreamed courses. Questions should be directed to Rensselaer's Help Desk at [consult@rpi.edu](mailto:consult@rpi.edu) or by calling (518) 276-7777.

## Rensselaer's Learning Management System (RPILMS)

Rensselaer's Learning Management System (RPILMS) is an integrated set of tools for developing and delivering interactive courses or course components over the Web. It allows for the distribution of static content (e.g., syllabi, schedules, announcements, and lecture notes), and also provides access to interactive tools (e.g., discussions, whiteboard, live chat, and online assessments). RPILMS allows an instructor to easily organize and distribute course materials and grades to students both locally and remotely in a secure environment. In addition, it facilitates communication between the instructor and the students, as well as student-to-student interactions. To access and configure your computer to use RPILMS, print course materials, and participate in course discussions, please refer to the system site at <http://rpilms.rpi.edu>.

## Services at Participating Corporate Sites

Meeting the ongoing educational needs of working professionals requires an active collaboration between industry and higher education. The success of this relationship is a joint responsibility between Rensselaer, corporate students, and their employers. Participating employers must be committed to creating a setting that recognizes and supports the need for continued growth among the company's technical professionals. Rensselaer is committed to integrating its education and services into this setting.

Corporate partners meet this challenge in a number of important ways.

- In addition to supporting employees through tuition assistance and ensuring that the Rensselaer courses are received and distributed at local sites, companies identify site administrators who act as liaisons to provide critical coordination with Rensselaer.
- They coordinate application and registration procedures, develop site-specific schedules where necessary, review course syllabi, monitor and proctor examinations, and facilitate the distribution and receipt of course materials that are not available via the Internet.
- Assignments and course materials that are mailed to the sites should be distributed according to local procedures, and upon completion returned to Rensselaer using an overnight express delivery service or using the professor's preferred method of delivery. It is required that sites keep a copy of all course materials they submit to us each semester. This enables the site administrator to monitor course activities closely.

## Services for Students

Rensselaer has a full range of support services for students participating in distance courses and pursuing degree or certificate programs via distance. Most program and course information and many of the forms, policies, and procedures that distance students need can be found on our Web site. In addition, a Student Services Administrator (SSA) is designated to be the primary contact at Rensselaer for all distance students. The SSA is proactive in helping students with both the application and registration processes as well as with all other academic and logistical issues. The SSA also serves as the primary contact for students on any issues related to their enrollment at Rensselaer and participation in Rensselaer courses. The SSA works closely with campus student services and technical staff to ensure that the highest level of services is provided to distance students.

## Academic Advising

Students may interact with the faculty during telephone office hours, via electronic mail, online discussion, or chat groups.

Academic advising is an essential element of the Rensselaer graduate experience. Students communicate regularly with the staff and faculty advisers to discuss questions concerning curricular requirements, transfer credit, individual academic needs, and course content. An important aspect of the academic advising process is the submission of a required Plan of Study, which establishes the specific courses each student will take to fulfill the degree requirements. Students should submit a Plan of Study once they are admitted to a degree program. The submission of an official Plan of Study is required within the first year of being admitted to a degree program.

## Course Materials

Instructional materials are sent to sites or individual students in hardcopy or electronic format. Many are also available on the course Web site. These materials include: Course Syllabi, Course Schedules, Class Notes/Handouts, Assignments, and Examinations.

To order textbooks and other course material, the site administrator or student should contact the Rensselaer Bookstore. Textbook/cases can be shipped to a student's home or office address. Billing can be applied to the company or the student's credit card. Ordering information is listed on the Web at <http://bookstore.rpi.edu>.

### Computing

Some graduate courses and curricula are computing intensive; therefore, students and site administrators should be aware of course computing requirements prior to registration. Rensselaer will, in specific instances, license and make specialized software available to students. Educational discounts will be provided to sites using this service. In some cases, access to campus computing facilities at Rensselaer is required.

### Internet Access/E-mail Accounts

Access to e-mail and the World Wide Web is required, either at work or at home, for all students enrolled in distance courses. The Web is used for many course communications and printing of class notes. Since various types of important course information may be sent in attachment files, you will need a service provider capable of accepting these documents. Free e-mail accounts (i.e., through Hotmail, Yahoo, etc.) may not accept these attachments and should not be used. All correspondences and communications from Rensselaer faculty and staff will therefore be sent to students' Rensselaer email addresses. To ensure receipt of all important scholastic and course information, Rensselaer students must make their Rensselaer e-mail account their primary account or utilize the forwarding option to forward their Rensselaer email to a preferred email address. Please note that once a Rensselaer employee is admitted they will receive a student e-mail account in addition to their employee account. To obtain information on how to access and maintain a Rensselaer e-mail account, please contact Rensselaer's Help Desk at [consult@rpi.edu](mailto:consult@rpi.edu) or call (518) 276-7777.

### Rensselaer Computing System (RCS) Accounts

Among the services available to students is the Rensselaer Computing System (RCS). The Rensselaer Computing System provides students with computing access to a host of campus computing services such as RPILMS (Rensselaer's Learning Management System), Rensselaer's library databases, RCS remote access servers via telnet and ftp, and applications on RCS.

Access to all of Rensselaer's computing services requires an RCS userid and an RCS password. For information on how to obtain your RCS userid and password please contact Rensselaer's Help Desk at [consult@rpi.edu](mailto:consult@rpi.edu) or call (518) 276-7777.

### Library Services

The Rensselaer Research Libraries strive to offer services to distance students that are comparable to those available to campus users. Because many of the Rensselaer library databases and electronic publication vendors will only allow connections from a Rensselaer computer address (i.e., they are IP-restricted), Rensselaer users must be authenticated through and use their RCS computing account (see how to obtain an RCS account above).

## Registration

This overview is designed to provide you with information on the courses available each semester and to assist you in course selection and registration. Prior to each term, registration information is e-mailed directly to all active matriculated students, which will provide detailed instructions regarding how to register for your course(s). All matriculated students register online using Rensselaer's Student Information System (SIS), <http://sis.rpi.edu>. Non-matriculated students must register via fax or mail. If you have any questions regarding the registration process, please contact the Student Services Administrator (SSA) at (518) 276-2347.

## Registration Verification

Students can verify their registration online by checking Rensselaer's Student Information System (SIS). We also provide each corporate site with a list of registered students before classes start. Prior to the start of the semester a Course Information memo will be e-mailed to students for each course in which they are registered. This e-mail includes valuable information about the course that should be reviewed to ensure students are prepared for the semester.

## Student Information System (SIS) Access

Online access to the Student Information System ([sis.rpi.edu](http://sis.rpi.edu)) allows admitted students to register for classes, check registration status, review grades, and change personal contact information on the Web. Instructions are available online at <http://sis.rpi.edu>.

## Course Selection

Before you select your courses, please review the course description pages on the Education for Working Professionals Web site for content, prerequisites, and any other special requirements. Refer to the "Who Should Enroll" section of each course description to find out how the course fits into your Plan of Study. If you have questions regarding the best course choice for your program, please call your Rensselaer SSA.

### DEGREE PROGRAM CODES

These codes are used in the "Who Should Enroll" section of each course description page:

<b>CSCI</b>	M.S. in Computer Science
<b>CSYS</b>	M.Eng. in Computer and Systems Engineering
<b>ELEC</b>	M.Eng. in Electrical Engineering with a Concentration in Microelectronics
<b>EPOW</b>	M.S. and M.Eng. in Electric Power Engineering
<b>HCIN</b>	M.S. in Human-Computer Interaction
<b>ITEC</b>	M.S. in Information Technology
<b>MBA</b>	Master of Business Administration
<b>MGMT-MS</b>	M.S. in Management
<b>MGTE</b>	M.Eng. in Industrial and Management Engineering
<b>TCOM</b>	M.S. in Technical Communication

Students are responsible for submitting a formal Plan of Study to the Student Services Administrator (SSA) for department approval within the first year after admission to a degree program. If you have any questions regarding course selection, please contact the SSA. For updated degree and curricular information, visit the Web site at <http://www.rpi.edu/ewp>.

## Course Schedules

A course schedule will be provided within the syllabus on the course Web site for your specific course(s) during the first week of classes. The schedule/syllabus will also provide the corresponding dates for courses with a delayed schedule (if applicable, not all courses follow a delayed schedule). Please be sure to view the syllabus for additional course information. Due dates are also available online through Rensselaer's Learning Management System.

# Graduate School Policies

## Transfer Credit Approval Policy

Credit for graduate work completed at other accredited institutions may be offered in partial fulfillment of the requirements for a degree at Rensselaer when the work is appropriate to the student's program. As a rule, this work will have been earned prior to admission at Rensselaer. The maximum age of acceptable transfer credit is five years. Students already enrolled at Rensselaer who wish to take courses elsewhere must obtain the prior approval of his or her adviser and the Dean of the Graduate School. Matriculated students may transfer in a maximum of six transfer credits toward a Rensselaer master's degree. A grade of "B-" or better is required for transfer. A course must be pre-approved by a faculty member and the academic adviser, as well as the Graduate School, in order to be used on the student's Plan of Study.

The Transfer Credit Approval form is available at [http://www.rpi.edu/dept/srfs/transfer\\_credit\\_approval.pdf](http://www.rpi.edu/dept/srfs/transfer_credit_approval.pdf). Print out and complete the form and submit to your Rensselaer point of contact for processing.

## Plan of Study

The submission of an official Plan of Study is required within the first year of being admitted to a degree program. A Plan of Study form is available online. Students must submit a revised plan of study if any changes are made after approval.

## Residence and Time Limit

A student earning a master's degree is required to complete a minimum of 24 credit hours at Rensselaer for each Master of Science or Master of Engineering degree sought.

Students engaged in working professional programs (part-time students) must complete all work for the master's degrees requiring 30 credits within three calendar years of the original admission date. Those working professionals pursuing master's degrees requiring 60 credits must complete the requirements within five years, beginning with the date of the original admissions letter. Extensions may only be granted if the student is in good academic standing and has an acceptable Plan of Study. Working professionals must petition the Dean of the Graduate School for an extension.

# Financial Information

Tuition and any other miscellaneous charges will be billed one month before the start of the semester. Payment is due within 30 days. When a student is sponsored by an employer, official documentation must be on file in the Bursar's office, prior to the drop deadline.

All tuition and fees are due no less than 30 days after the invoice. Listed below are the rates for tuition and fees for the 2009-2010 academic year\*:

## Tuition

- **Tuition Rate — \$1,325 per credit hour**  
To pay your bill online, please go to [finance.rpi.edu](http://finance.rpi.edu).

## Fees

- **Late Payment Fee — \$50**  
(this fee is assessed on delinquent accounts)
- **Course Materials**  
The amounts for the items not available through the textbook vendor—business cases, course notes, and software—will be listed on the Web site.

## Payments should be made to:

Rensselaer Polytechnic Institute  
Attn: 3rd Party Billing Specialist  
PO Box 2500  
Troy, NY 12181

## Inquiries on the EWP student and sponsor invoices should be made to:

3rd Party Billing Specialist  
(518) 276-6654 or (518) 276-6610

\*Fall 2009, Spring 2010, Summer 2010

\*\*Waived for Rensselaer alumni

**NOTE: Tuition and Fees for the 2010-2011 academic year will be posted on the EWP website prior to the start of the Fall 2010 semester**

## MASTER OF ENGINEERING IN

### Computer and Systems Engineering

Computer and Systems Engineering is the fastest-growing branch of engineering. Rensselaer's Electrical, Computer and Systems Engineering Department offers several courses specifically geared toward working professionals that provide a concentration in networking and software engineering. Students may also take courses in management, manufacturing, or computer science to satisfy a breadth requirement. The Master of Engineering degree in Computer and Systems Engineering provides the tools needed for the success of professional engineers.

#### ADMISSION REQUIREMENTS

- Bachelor of Science degree in computer engineering, electrical engineering, or computer science from an accredited undergraduate institution
- Undergraduate coursework or work experience in programming, computer organization, computer architecture, discrete mathematics, data structures, probability, and signals and systems
- Undergraduate GPA of 3.2 or higher
- Grades of "B" or better in courses completed since bachelor's degree
- GRE required
- TOEFL score of 570 or above (required for international students)
- Completed application form
- Official transcripts for all undergraduate and graduate work
- Statement of background and goals as it applies to the program
- Two letters of recommendation
- Resume

#### GRADUATION REQUIREMENTS

- Matriculated status
- Approved Plan of Study and worksheet
- At least 18 credits must be at the 6000 level
- At least 21 credits must be from Electrical, Computer, and Systems Engineering (up to 6 of these credits can be from related technical areas with the approval of the faculty adviser, e.g., Computer Science, Electric Power Engineering, Materials Engineering, Physics, etc.)
- Minimum 3.0 GPA; minimum of 30 credits

#### PLAN OF STUDY

(minimum of 30 credit hours, must also conform to the graduation requirements listed above)

##### I. Concentration Courses (9-10 credits)

Select at least three courses

ECSE-4670	Computer Communication Networks
ECSE-4750	Computer Graphics
ECSE-6600	Internet Protocols
ECSE-6660	Broadband and Optical Networking
ECSE-6770	Software Engineering I
ECSE-6780	Software Engineering II

##### II. Two Course Sequence to Provide Breadth (6-7 credits)

Must come from courses outside of, and not directly related to, Electrical, Computer, and Systems Engineering and must be approved in advance by the faculty adviser.

Examples include, but are not limited to:

DSES-6110	Introduction to Applied Statistics
DSES-6230	Quality Control and Reliability
MGMT-6450	Manufacturing Systems Management
MANE-6800	Manufacturing Systems Integration

##### III. Electives (15-16 credits)

At least two must come from Electrical, Computer, and Systems Engineering (ECSE) to meet the required 15 credits in ECSE.

Select five courses, possible options include:

CISH-6120	Distributed Database Systems
CISH-6220	Lans, Mans, and Internetworking
CISH-6510	Web Application Design and Development
CSCI-4220	Network Programming
CSCI-4380	Database Systems
CSCI-6140	Computer Operating Systems
ECSE-4670	Computer Communication Networks
ECSE-4750	Computer Graphics
ECSE-6600	Internet Protocols
ECSE-6660	Broadband and Optical Networking
ECSE-6770	Software Engineering I
ECSE-6780	Software Engineering II

NOTE: Students interested in applying for a research-oriented M.S. degree should notify their Rensselaer point of contact for details on admission, curriculum, and graduation requirements.

## MASTER OF SCIENCE IN

### Computer Science

Rensselaer's Computer Science Department has strong links with industry, and both faculty and students are regularly engaged in contracts sponsored by major corporations. The department has gained an international reputation for the quality of its research and remains in the forefront of computer technology.

Rensselaer brings the high-quality courses and faculty from Computer Science to distance learning students. In addition, the Computer Science program features several courses offered by faculty from Rensselaer's affiliated campus, Rensselaer at Hartford. The Hartford campus has been serving the needs of working professionals for over 40 years, and offers many courses that are designed to satisfy the educational needs of industry.

The M.S. in Computer Science consists of 30 credit hours.

#### ADMISSION REQUIREMENTS

- Bachelor of Science degree in an appropriate area as determined by the Computer Science department from an accredited undergraduate institution
- Undergraduate coursework\* completed in the following areas:
  - assembler language programming or computer architecture
  - computing languages
  - data structures
- Undergraduate GPA of 3.0 or higher
- Grades of "B" or better in courses completed since bachelor's degree
- Strong math background, generally including calculus, linear algebra, and discrete mathematics
- Completed application form
- Official transcripts for all undergraduate and graduate work
- Statement of background and goals as it applies to the program
- GRE required
- TOEFL required for international students
- Two letters of recommendation
- Resume

\*Equivalent knowledge gained from industrial training and/or experience may be substituted. If admission request is based on equivalent knowledge, applicants must provide these details in their statement of background and goals.

#### GRADUATION REQUIREMENTS

- Matriculated status
- Approved Plan of Study
- At least 18 credits must be at the 6000 level
- At least 18 credits must be from Computer Science or Computer and Systems Engineering
- Minimum 3.0 GPA; minimum of 30 credits
- Culminating Experience

#### PLAN OF STUDY (30 credit hours)

##### I. Required Core Courses (7 credits)

CSCI-6050	Computability and Complexity
CSCI-4210	Operating Systems

##### II. Software Course (3-4 credits)

Select one course	
CISH-6010	Object Oriented Program and Design
ECSE-6770	Software Engineering I
CSCI-4220	Network Programming
CSCI-6140	Computer Operating Systems

##### III. Hardware Course (3-4 credits)

Select one course	
CISH-6220	Lans, Mans, and Internetworking
ECSE-4670	Computer Communication Networks
ECSE-6660	Broadband and Optical Networking
ECSE-6600	Internet Protocols

##### IV. Applications Course (3-4 credits)

Select one course	
CISH-6120	Distributed Database Systems
CISH-6510	Web Application Design and Development
COMM-6420	Foundations of HCI Usability
CISH-4380	Database Systems
ECSE-4750	Computer Graphics

##### V. Research Methods Course (3 credits)

CISH-696X	Research Methods in Computer Science
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##### VI. Culminating Experience (3 credits)

CISH-6970	Computer Science Project
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##### VII. Computer Science and Other Electives (5-8 credits)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

## MASTER OF ENGINEERING IN

### Electrical Engineering with a Concentration in Microelectronics

The rapid and accelerating development of microelectronics technology has led to an expansion of the body of knowledge used by electronics engineers and to an increased sophistication of device models and CAD tools used in microelectronics design and manufacturing. To become and remain competitive, electronics engineers need graduate and continuing education that reflects changes in technology, and yet provides the fundamental core needed to contribute to future generations of technology. Rensselaer has both a department and research center committed to microelectronics technology and design: the Electrical, Computer, and Systems Engineering (ECSE) Department, and the Center for Integrated Electronics (CIE).

The M.Eng. program builds upon a strong base of research and education in microelectronics, including the interdisciplinary Microelectronics Manufacturing Engineering program. While this degree program includes some of the same processing-oriented courses as electives, the emphasis is on semiconductor devices. The program is taught by full-time tenure track Rensselaer faculty, augmented by the expertise of some of the best engineers and scientists working at the forefront of the microelectronics industry. The opportunities offered by both online video instruction and new web-based educational tools make the joint instruction and on-site delivery feasible.

#### ADMISSION REQUIREMENTS

- Bachelor of Science degree in electrical engineering or a closely-related discipline from an accredited undergraduate institution
- Undergraduate GPA of 3.2 or higher
- Grades of "B" or better in courses completed since bachelor's degree
- GRE required
- TOEFL score of 570 or above (required for international students)
- Completed application form
- Official transcripts for all undergraduate and graduate work
- Statement of background and goals as it applies to the program
- Two letters of recommendation
- Resume

#### GRADUATION REQUIREMENTS

- Matriculated status
- Approved Plan of Study and worksheet
- At least 18 credits must be at the 6000 level
- At least 21 credits must be from Electrical, Computer, and Systems Engineering (up to 6 of these credits can be replaced by courses from related technical areas with the approval of the faculty adviser, e.g. Computer Science, Electric Power Engineering, Materials Engineering, Physics, etc.)
- Minimum 3.0 GPA; minimum 30 credits

#### PLAN OF STUDY

(Minimum of 30 credit hours, must also conform to the graduation requirements listed above)

##### I. Core Courses (9 credits)

Select at least three courses

ECSE-4720	Solid State Physics
ECSE-6230	Semiconductor Devices and Models I
ECSE-6260	Semiconductor Power Devices
ECSE-6290	Semiconductor Devices and Models II
ECSE-696X	Modern Power Devices
ECSE 696X	Phys Foundations of Solid-State Devices

##### II. Two-Course Sequence to Provide Breadth (6–7 credits)

Must come from courses outside of, and not directly related to, Electrical, Computer, and Systems Engineering and must be approved in advance by the faculty adviser.

Examples include, but are not limited to:

DSES-6110	Introduction to Applied Statistics
DSES-6230	Quality Control and Reliability
MGMT-6450	Manufacturing Systems Management
MANE-6800	Manufacturing Systems Integration

##### III. Electives (15-16 credits)

Select five courses, possible options include:

EPOW-4080	Semiconductor Power Electronics
ECSE-6270	Optoelectronics
ECSE-6770	Software Engineering I
EPOW-6850	Electric and Magnetic Fields in Electric Power Engineering
MTLE-696X	Advanced Device Processing
MTLE-4290/ ECSE-4290	Electronic Packaging

NOTE: Students interested in applying for a research-oriented M.S. degree should notify their Rensselaer point of contact for details on admission, curriculum, and graduation requirements.

## MASTER OF SCIENCE IN

### Human-Computer Interaction

The integration of computer systems, the Internet, and the World Wide Web into the working world and home life have highlighted the need for professionals who can design human-computer interactions that allow people to work intuitively and with less dependence on long, detailed instructions. Rensselaer's M.S. in Human-Computer Interaction (HCI) combines coursework in human-computer interaction, technical communication, human factors, information design, cognitive science, and computer science to provide the education designers of such systems will need in the future.

The program integrates theory of computer usability and human communication theory with research and practice in designing and evaluating human-computer communication systems. While the program provides HCI implementation skills, the focus is on the study of basic problems in human-technology communication. Our degree emphasizes fundamental principles and evaluation of human-computer interfaces, performance support systems, and system usability, rather than focusing on the hardware or software tools used to implement products.

#### ADMISSION REQUIREMENTS

- Bachelor of Science degree in an applicable area from an accredited undergraduate institution
- Undergraduate GPA of 3.0 or higher
- Grades of "B" or better in courses completed since bachelor's degree
- GRE or completion of HCI certificate from Rensselaer
- Completed application form
- Official transcripts for all undergraduate and graduate work
- Statement of background and goals as it applies to the program
- TOEFL required for international students
- Two letters of recommendation
- Resume

#### GRADUATION REQUIREMENTS

- Matriculated status
- Approved Plan of Study
- At least 15 credits must be at the 6000 level
- Minimum 3.0 GPA

#### PLAN OF STUDY (30 credit hours)

##### I. Core Course Requirements (21 credits)

Students complete the HCI certificate as part of the M.S. program. Studio Design in HCI constitutes the capstone course.

COMM-6420	Foundations of HCI Usability
COMM-6750	Communication Design for the World Wide Web
COMM-6760	Electronic Coaching Systems
COMM-6810	Studio Design in HCI
COMM-696X	Information Architecture
COMM-6480	Theory and Research in Technical Communication and HCI
COMM-6530	Communication Research I

NOTE: Students may substitute COMM-696X Professional Master's Project (Terminal M.S. students only) or COMM-6990 Master's Thesis (Ph.D. track) as their Capstone Requirement instead of COMM-6810 Studio Design in HCI.

##### II. HCI Implementation Course (3 credits)

Select one of the following courses:

COMM-696X	HCI Prototype Production
COMM-696X	HCI Implementation: Flash
COMM-6961	Interactive Narrative

##### III. Advanced HCI Topics Elective (6 credits)

COMM-69XX	Seminar in Human-Computer Interaction Research
COMM-696X	Advanced Topics in HCI

Courses designated as HCI topics courses may be added in the future.

NOTE: Students may apply for a waiver for one of the above requirements and may substitute the following courses offered on the Troy campus:

- Additional courses in Research Methods/Usability Testing such as COMM-6963 Ethnography and Cultural Analysis or PSYC-6570 Advanced Behavioral Statistics
- Additional courses in Human Factors/Cognitive Psychology such as PSYC-6240 Cognitive-Systems Engineering
- Electives in Communication chosen from department offerings. Courses available in Web Design, Interface Design, Characters for Games, and other areas.

## MASTER OF SCIENCE IN Information Technology

Information Technology is the focal point of a revolution in which computer science and computing tools and techniques drive innovation across a wide spectrum of businesses and industries. Rensselaer's interdisciplinary Master of Science program in Information Technology, distinguished by its currency, intensity, and rigor, is educating a cadre of leaders in this revolution. Students gain a theoretical grounding in computing not often acquired "on the job" and a significant body of coursework in a technical IT concentration that will qualify them as IT specialists in that field. Rensselaer's IT graduates are able to "do" as well as "talk about" the application of Information Technology.

Master's students complete one course in each of five Core areas: Networking, Software Design, Database Systems, Management of Technology, and Human-Computer Interaction. In addition to the five Core courses, students will select three additional concentration courses plus the IT Capstone course and one additional elective for a total of ten courses.

### ADMISSION REQUIREMENTS

- Bachelor's degree with competitive academic record from an accredited undergraduate institution
- Completion of a three semester undergraduate sequence of prerequisite courses that is equivalent to Rensselaer's sequence of CSCI-1100 Computer Science I (Fundamentals of Computer Science), CSCI-1200 Computer Science II (Data Structures, Introductory Algorithm Analysis), and CSCI-2300 "Advanced" Data Structures and Algorithm Analysis
- An undergraduate course in Database Systems (If not previously completed, this course can be taken at Rensselaer as an addition to the degree requirements)
- Completed application form
- Official transcripts for all academic study
- Statement of background and goals as it applies to the program
- TOEFL required for international students
- GRE required (A waiver may be granted for if applicants have a master's degree, outstanding academic records, or have completed the Certificate in IT)
- Two letters of recommendation
- Resume

### GRADUATION REQUIREMENTS

- Matriculated Status
- Approved Plan of Study
- At least 18 credits must be at the 6000 level
- A minimum of 3 courses in an approved concentration
- Minimum 3.0 GPA; minimum 30 credits

### PLAN OF STUDY (minimum of 30 credit hours)

#### I. Required Core Courses (16 credits)

DSES-6520	Enterprise Database Systems
COMM-6420	Foundations of HCI Usability
MGMT-6040	Creating and Managing an Enterprise I
ECSE-4670	Computer Communication Networks
ECSE-6770	Software Engineering I

#### II. Concentrations (9 credits)

Select one area—students must take three courses to complete the concentration

##### Human-Computer Interaction

COMM-6580	Theory and Research in Technical Communications and HCI
COMM-6750	Communication Design for the World Wide Web
COMM-6760	Electronic Coaching Systems
COMM-6810	Studio Design in HCI

##### Information Systems Engineering

DSES-6570	Information Technology and Systems for E-Business (required)
DSES-6610	Systems Modeling in Decision Sciences
DSES-6620	Discrete Event Simulation
CISH-6120	Distributed Database Systems
ECSE-6780	Software Engineering II
MGMT-6170	Advanced Systems Analysis and Design

##### Management Information Systems

MGMT-6140	Information Systems for Management
MGMT-6170	Advanced Systems Analysis and Design
MGMT-6180	Strategic Information Systems Management
MGMT-6810	Management of Technical Projects
DSES-4240	Engineering Project Management

NOTE: A maximum of five MGMT courses may be taken toward the M.S. in IT degree; including Core, Concentration, and Elective courses.

##### Networking

CISH-6220	Lans, Mans, and Internetworking
CISH-6960	Cryptography and Network Security
CSCI-4220	Network Programming
ECSE-6600	Internet Protocols
ECSE-6660	Broadband and Optical Networking

##### Software Design

CISH-6010	Object-Oriented Programming and Design
CISH-6050	Software Engineering Management
COMM-6810	Studio Design in HCI
ECSE-6780	Software Engineering II
MGMT-6170	Advanced Systems Analysis and Design
CSCI-4220	Network Programming

#### III. Elective (3 credits)

An elective is selected to add breadth or depth to the IT degree and must be approved by the IT adviser.

#### IV. ITEC-6800 IT and Decision Systems Capstone (3 credits)

## MASTER OF SCIENCE IN

### Management

Rensselaer's Lally School of Management and Technology offers an AACSB accredited M.S. in Management via distance. This 30-credit program builds on Rensselaer's reputation for excellence in programs that focus on the intersection of management and technology. It is based on the conviction that, for all firms in the future, sustainable competitive advantage will require a technological foundation. The firms that will lead in global markets will be those that build competitive strength around technological competencies.

The M.S. is a specialized program focused in an area chosen by the student. This unique program includes a core of four courses designed to integrate traditional management concepts with technical functions and issues. Students then tailor the program to their unique educational needs by selecting a 12-credit (four course) concentration. The program also allows for students to take one free elective of their choosing, and ends with a capstone course in Strategy. It is required that students have access to a computer and familiarity with spreadsheet and database software.

#### ADMISSION REQUIREMENTS

- Bachelor of Science degree with strong academic performance from an accredited undergraduate institution
- Grades of "B" or better in courses completed since bachelor's degree
- Completed application form
- Official transcripts for all undergraduate and graduate work
- Statement of background and goals: answers to application essay
- Two letters of recommendation
- TOEFL required for international students
- GRE or GMAT (GMAT preferred)
- Resume

#### GRADUATION REQUIREMENTS

- Matriculated status
- Approved Plan of Study with concentration defined
- At least 21 credits must be at the 6000 level
- At least 18 credits must be from the Lally School (MGMT)
- Minimum 3.0 GPA
- Culminating Experience

#### PLAN OF STUDY (30 credit hours)

##### I. Management Core (12 credits)

MGMT-6040	Creating and Managing an Enterprise I
MGMT-6050	Creating and Managing an Enterprise II
MGMT-6020	Financial Management I
MGMT-7740	Accounting for Reporting and Control

##### II. Concentration Courses (12 credits)

Select four courses in one concentration, examples include:

###### Management Information Systems

MGMT-6140	Information Systems for Management
MGMT-6170	Advanced Systems Analysis and Design
MGMT-6750	Legal Aspects of E-Business and IT
MGMT-6810	Management of Technical Projects

###### Human-Computer Interaction

COMM-6420	Foundations of HCI Usability
COMM-6750	Communication Design for the World Wide Web
COMM-6760	Electronic Coaching Systems
COMM-6810	Studio Design in HCI

#### Innovation and Entrepreneurship

MGMT-6350	International Business
MGMT-6600	Research and Development Management
DSES-6470	Global Strategic Management of Technological Innovation
MGMT-6620	Principles of Technological Entrepreneurship
MGMT-6810	Management of Technical Projects

#### Production and Operations Management

MANE-6800	Manufacturing Systems Integration
MGMT-6350	International Business
MGMT-6450	Manufacturing Systems Management
MGMT-6490	Competitive Advantage and Operations Strategy
MGMT-6810	Management of Technical Projects

Students who wish to design a concentration in other areas such as Mechanical Engineering, Computer Science, or Electrical Engineering may do so with adviser approval.

#### III. Elective (3 credits)

NOTE: If a concentration is chosen outside of the School of Management, then this elective must come from within the School of Management.

1. \_\_\_\_\_

#### IV. Culminating Experience (3 credits)

MGMT-6680	Strategy, Technology, and Global Competitive Advantage
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NOTE: The Lally M.S. program does not include the traditional 3 credit course in statistics. Rather, students are expected to have a basic understanding of statistics before entering the program. To ensure this students are expected to complete an on-line statistics review and tutorial before the completion of their first semester. A faculty instructor will be available for students needing assistance.

## CERTIFICATE IN Bioinformatics

At the intersection of biology, information technology, computer science, and genetic engineering, there is a tremendous demand for professionals who can use technology to digest the growing mass of data. Bioinformatics is the science of storing, extracting, organizing, analyzing, interpreting, and applying the immense volume of research data being generated today. It has become the backbone of leading research laboratories, hospitals, and pharmaceutical companies, as well as the driving force of biotechnology and genetic engineering. This interdisciplinary program combines advanced study in computer science and molecular biology.

### ADMISSION REQUIREMENTS

- Bachelor of Science degree in any science or related engineering field from an accredited undergraduate institution
- Undergraduate GPA of 3.0 or higher
- Basic knowledge of programming in C/C++, biochemistry and molecular biology, organic chemistry, and data structures and algorithms is also required
- Prerequisite requirements for all certificate courses
- Completed application form
- Official transcripts from bachelor's degree or highest degree earned
- TOEFL required for all international students
- Statement of background and goals

### CREDENTIALS EARNED

- 12 Rensselaer graduate credits
- Certificate in Bioinformatics

### CERTIFICATE COMPLETION REQUIREMENTS

- Status as a matriculated or non-matriculated Rensselaer student
- Completion of all four courses with a grade of "B" or better

### PLAN OF STUDY

1. BIOL-696X Bioinformatics I: Sequence Analysis
2. BIOL-696X Bioinformatics II: Molecular Modeling
3. CSCI-4380 Database Systems
4. A fourth course selected with and approved in advance by the faculty adviser, in one of the following areas:
  - Molecular biology
  - Computer science
  - Applied mathematics

NOTE: This program is only available at corporate sites with sufficient enrollments.

## CERTIFICATE IN Human-Computer Interaction

Building on a base of experience and expertise, the Department of Language, Literature, and Communication is proud to offer a graduate level Certificate in Human-Computer Interaction (HCI) for working professionals. As the computer industry has matured, the number of software and hardware products has greatly increased and the release time has shortened considerably. These trends have extended computer use beyond a small cadre of specialists to much of the public, and from a small number of calculation-intensive operations to a wide range of computer and communication tasks.

This program, designed in cooperation with industry experts, provides those involved in the design of human-computer interactions with the knowledge and skills they will need to create new and better ways for people to communicate with and through computers. The certificate, comprised of four graduate courses, provides an overview of HCI usability, in-depth work in electronic coaching systems, communication design for the World Wide Web, and a capstone design experience.

### ADMISSION REQUIREMENTS

- Bachelor of Science degree in an applicable area from an accredited undergraduate institution
- Cumulative GPA 3.0 minimum
- Prerequisite requirements for all certificate courses
- Completed application form (requesting non-matriculated status)
- Official transcripts for all undergraduate and graduate work
- TOEFL required for all international students
- Brief statement of background and goals as it applies to the program

### CREDENTIALS EARNED

- 12 Rensselaer graduate credits
- Certificate in Human-Computer Interaction

### CERTIFICATE COMPLETION REQUIREMENTS

- Status as a matriculated or non-matriculated Rensselaer student
- Completion of all four courses with a grade of "B" or better

### PLAN OF STUDY

1. COMM-6420 Foundations of HCI Usability
2. COMM-6750 Communication Design for the World Wide Web
3. COMM-6760 Electronic Coaching Systems
4. COMM-6810 Studio Design in HCI

## CERTIFICATE IN

### Information Technology

Rensselaer's multidisciplinary certificate in Information Technology is designed to provide a comprehensive grasp of a broad range of IT topics, ranging from software development to technical project management. Students must complete courses in four of the five areas listed below. Students with a significant background in one of the areas should complete courses in the remaining areas. A minimum of two of the four courses must be at the 6000 level.

#### ADMISSION REQUIREMENTS

- Bachelor's degree with a competitive academic record from an accredited undergraduate institution
- Applicants requesting admission to this certificate must have already completed a minimum of a three-semester sequence in computer science that is equivalent to Rensselaer's courses titled Computer Science I (Fundamentals of Computer Science), Computer Science II (Data Structures, Introductory Algorithm Analysis), and "Advanced" Data Structures and Algorithm Analysis. Please consult the Rensselaer catalog for full course descriptions.
- Prerequisite requirements for all certificate courses as listed in the Rensselaer catalog
- Completed application form
- TOEFL required for all international students
- Official transcripts from bachelor's degree or highest degree earned

#### CREDENTIALS EARNED

- 12-14 Rensselaer graduate credits
- Certificate in Information Technology

#### CERTIFICATE COMPLETION REQUIREMENTS

- Status as a matriculated or non-matriculated Rensselaer student
- Completion of all four courses with a grade of "B" or better

#### PLAN OF STUDY

Complete one course from four of the following five areas:

##### I. Networking

ECSE-4670 Computer Communication Networks

##### II. Database Systems

CSCI-4380 Database Systems (for entry-level students)

DSES-6520 Enterprise Database Systems (for students who completed a database course)

##### III. Software Engineering

ECSE-6770 Software Engineering I

OR

ECSE-6780 Software Engineering II

##### IV. Management of Technology

MGMT-6040 Creating and Managing and Enterprise I

##### V. Human-Computer Interaction

COMM-6420 Foundations of HCI Usability

## CERTIFICATE IN

### Innovation and Technology Management

The Lally School of Management and Technology certificate program in Innovation and Technology Management combines an introduction to fundamental management best practices with specialist topics in emerging technology, innovation, and entrepreneurship. The program is designed for technology professionals and others committed to developing critical managerial skills to lead technologically intensive initiatives and organizations. Participants will develop, implement, and refine an actionable set of management best practices unique to their own organizations.

#### ADMISSION REQUIREMENTS

- Bachelor of Science degree from an accredited undergraduate institution
- Undergraduate GPA of 3.0 or higher
- Prerequisite requirements for all certificate courses
- Completed application form
- Official transcripts from bachelor's degree or highest degree earned
- TOEFL required for all international students
- Access to a computer and familiarity with spreadsheet and database software

#### CREDENTIALS EARNED

- 12 Rensselaer graduate credits
- Certificate in Innovation and Technology Management

#### CERTIFICATE COMPLETION REQUIREMENTS

- Status as a matriculated or non-matriculated Rensselaer student
- Completion of all four courses with a grade of "B" or better

#### PLAN OF STUDY

- |              |   |
|--------------|---|
| 1. MGMT-6040 | Creating and Managing an Enterprise I           |
| 2. MGMT-6050 | Creating and Managing an Enterprise II          |
| 3. MGMT-6810 | Management of Technical Projects                |
| 4. MGMT-696X | Managing in the Technology Intensive Enterprise |
|              | or  |
| MGMT-6620    | Principles of Technological Entrepreneurship    |

## CERTIFICATE IN

### Microelectronics Technology and Design

The rapid development of microelectronics technology has tremendously expanded the knowledge requirements of electronics engineers and provided industry with more highly sophisticated CAD tools and device models.

To remain competitive, electronic engineers need continuing education that reflects these technological changes, yet still provides the fundamental concepts needed to develop future generations of technology. This four-course program is designed to meet this need and provides specific emphasis on semiconductor devices, physics, and design.

#### ADMISSION REQUIREMENTS

- Bachelor of Science degree in electrical engineering or a related field from an accredited undergraduate institution
- Undergraduate GPA of 3.0 or higher
- A working knowledge of semiconductor electronic devices, device physics, circuit analysis, and analog electronics
- Prerequisite requirements for all certificate courses
- Completed application form
- TOEFL required for all international students
- Official transcripts from bachelor's degree or highest degree earned

#### CREDENTIALS EARNED

- 12 Rensselaer graduate credits
- Certificate in Microelectronics Technology and Design

#### CERTIFICATE COMPLETION REQUIREMENTS

- Status as a matriculated or non-matriculated Rensselaer student
- Completion of all four courses with a grade of "B" or better

#### PLAN OF STUDY

1. ECSE-6230 Semiconductor Devices and Models I
2. ECSE-6290 Semiconductor Devices and Models II
3. ECSE-6260 Semiconductor Power Devices
4. ECSE-6270 Optoelectronics

## CERTIFICATE IN

### Semiconductor Power Device Technology

Continual improvement in the performance of power semiconductor devices has made it possible to achieve much higher levels of precision and efficiency in the conversion of electrical energy from one form to another, leading to many new applications in electric power, industrial automation data processing, and other fields. Producing these high-performance devices requires an understanding of solid-state physics, device processing, materials, and heat transfer, as well as the use of sophisticated CAD tools and models.

In this certificate program, technology development and process engineers will learn how to apply these multidisciplinary concepts in semiconductor device physics, design and fabrication to the manufacture of semiconductors that will offer even greater levels of performance demanded by future applications.

#### ADMISSION REQUIREMENTS

- Bachelor of Science degree in electrical engineering or a related field from an accredited undergraduate institution
- Undergraduate GPA of 3.0 or higher
- Undergraduate course in microelectronics technology required
- Second undergraduate course in microelectronics technology or solid-state physics strongly recommended
- Prerequisite requirements for all certificate courses
- Completed application form
- TOEFL required for all international students
- Official transcripts from bachelor's degree or highest degree earned

#### CREDENTIALS EARNED

- 12 Rensselaer graduate credits
- Certificate in Semiconductor Power Device Technology

#### CERTIFICATE COMPLETION REQUIREMENTS

- Status as a matriculated or non-matriculated Rensselaer student
- Completion of all four courses with a grade of "B" or better

#### PLAN OF STUDY

1. ECSE-6230 Semiconductor Devices and Models I
2. ECSE-4250 Integrated Circuit Processes and Design,  
OR  
MTLE-4160 Semiconductor Materials
3. ECSE-6260 Semiconductor Power Devices
4. Select one of the following:  
EPOW-4080 Semiconductor Power Electronics  
ECSE-4250 Integrated Circuit Processes and Design  
ECSE-4720 Solid State Physics  
ECSE-6270 Optoelectronics  
ECSE-6290 Semiconductor Power Devices and Models II  
ECSE-XXXX Semiconductor Device Characterization\*  
ECSE-696X Modern Power Devices  
MTLE-4160 Semiconducting Materials

\*Requires specific laboratory facilities and personnel; availability TBD





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Sikorsky Aircraft

XEROX

**INFORMATION AND CONTACTS:**

**General Program Inquiries**

Mike Gunther – (518) 276-8351; gunthm@rpi.edu

**Distance Learning Application Questions**

Ronnie Rowe – (518) 276-2347; rower@rpi.edu

**Troy Campus Application Questions**

Admissions Office – (518) 276-6216; admissions@rpi.edu

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