

NEW JERSEY INSTITUTE OF TECHNOLOGY

I. Objectives

The objectives of the Masters in Emergency Management and business Continuity are to:

- Allow students from most undergraduate degrees to enter a Master's level program in the field of Emergency Management and Business Continuity.
- Encourage those with undergraduate degrees in the Physical, Biological, Social Sciences, Engineering, Management, Public Administration, and Communications to enter this evolving field.
- Facilitate the acquisition of two master's degrees by allowing three relevant courses that can count toward either degree.
- Encourage outstanding students to consider an academic path to a Ph.D. and to conduct research in their original (undergraduate degree) field that is relevant to areas of Emergency Management and Business Continuity. For students going on to a participating Ph.D. program, all 30 credits will be counted toward the 90 graduate credit Ph.D. requirements.
- Provide a part time path to the degree based entirely on courses offered online through the Web, using appropriate group communications technology that allows for active participation with other course and degree students (Virtual Classroom TM and Asynchronous Learning Network approaches).
- Meet the new policy of the International Association of Emergency Managers (IAEM), which will require, beginning in 2010, an academic degree rather than just the current four years of experience requirement.
- Bring about the integration of the endeavors of Emergency Management and Business Continuity into one academic program, given that crises and disasters are impartial about their impact on both public and private sector segments of society.
- Increase the professionalism of this field, which is evolving in importance and societal needs, by increasing its presence in academic, research, and development professional communities.
- Provide an open door to good students in any undergraduate degrees by providing a "bridge" program of certain undergraduate requirements for some of the specialty areas.

II. Need

II. A. Need for the Program

The need and opportunity identified are in the areas of emergency management and homeland security. Given the current emphasis on emergency management to include preparedness within the tri - state region that includes New Jersey, New York and Pennsylvania and given the emphasis on emergency

management and homeland security within the private and public sectors a window of opportunity for NJIT has opened.

Emergency Management Opportunities

Prior to 9/11 FEMA established the Emergency Management Institute (EMI) see <http://training.fema.gov/>. Through EMI, FEMA provides free online (CEU) programs for emergency managers to include police, fire fighters, emergency management techs., and handlers of hazardous materials to name a few. Subsequent to 9/11 private sector business continuity planners have been added to this list. Research indicates “there are more than **11 million** emergency responders and other personnel in this country that would need training to deal with terrorist incidents.” (Center for Domestic Preparedness Fact Sheet, January 2005) The punctuation that was 9/11 created a market for both the training and education of emergency management personnel. In addition the EMI developed the FEMA EMI Higher Education Project <http://www.training.fema.gov/emiweb/edu/> .

A goal stated by the “Project” is

“One goal of FEMA is to encourage and support the dissemination of hazard, disaster, and emergency management-related information in colleges and universities across the U.S. We believe that in the future more and more emergency managers in government as well as in business and industry will come to the job with college education that includes a degree in emergency management. We also believe that in order to build disaster resistant and resilient communities a broad range of college students and professionals need courses that introduce them to hazards, disasters, and what to do about them.

Consistent with the FEMA mission, NJIT co-founded the Information Systems for Crisis Response and Management (ISCRAM) an international organization with a growing membership designed to further scholarship in areas of systems and systems technologies within the dimensions of emergency management. Conducting emergency management programs at the graduate and undergraduate level has the potential to increase enrollment in education programs, so designed, as well as increase opportunities for sponsored research.

II. B. Relationship to the Institute Master Plans

Business management is one of the areas singled out for growth at NJIT. Homeland security is also a major area of interest. This degree fits firmly in both areas.

II. C. Relationship to Similar Programs in the State and Region

NJIT is the only NJ State academic institution registered with the Emergency Management Institute of FEMA when this program was initially approved as an Inter-disciplinary offering.

Fairleigh Dickinson University recently had a Homeland Security Program approved and New Jersey City University has an Emergency Management program. Both are not technical in nature and address public administration and policy topics.

II. D. Distinguished Programs Nationally

Many universities have MA degrees in Emergency management with a political science, public administration, and business focus. Our degree is being offered as a MS and is more technological and engineering oriented than most of the national programs being offered in Emergency Management.

III. Students

The market consists of public and private sector organization employees working in both emergency management and HLS positions. This market includes but is not limited to the following:

- EMTs
- Firefighters
- Police (local, county, State, Port Authority)
- Organizational CERT teams
- Organizational Business Continuity of Operations personnel
- National Guard
- Network security and administration
- EOM and OHSP employees, supervisors, managers
- Hospital and healthcare professionals
- Federal Government employees (DOD, Armed forces)

A program industry advisory board is being formed to provide governance and to provide assistance in the marketing effort that will be required.

IV. Resources to Support the Program

No specific resources other than classroom and existing lab facilities are anticipated. Many of the courses will have on line content but existing NJIT course management technologies such as WEBCT and Moodle can be used for pedagogical purposes. Video conferencing will be explored as well as the use of NJ Edge to extend course delivery to community colleges as well as other Universities in NJ to include the State OHSP (Office of Homeland Security and Preparedness). In addition desktop synchronous technology is being explored to conduct face to face courses online. All these technologies exist at NJIT and/or are freely available to higher education institutions in NJ.

IV.A. Course Development

All of the courses applicable to the new degree are already offered in NJIT's relevant colleges and departments (see program specialty areas). There are sufficient NJIT faculty members involved at NJIT to support course delivery. As can be seen by the

courses included in the program all have been developed and are currently being taught. Any course enhancements for the program will be no different time wise than enhancements that normally take place.

It is anticipated that new specialty areas will be added from time to time and Homeland Security is one of them. NJIT is a partner with the Naval Post Graduate School and the Department of Homeland Security and as part of that partnership can draw on their existing Homeland Security offerings (courses, syllabi, lectures, video recordings etc.) in order to minimize new course development in that specialty area when offered.

IV.B. Faculty

There are a significant number of faculty members with credentials and research interests in NJIT to address the courses being offered.

IV.C. Libraries and Computing Facilities

Since this program will draw upon many existing courses and upon the same supplemental literature that supports other related NJIT programs, library holdings are more than adequate to support the new program. NJIT's Van Houten Library has a collection of more than 130,000 books and subscribes to about 160 printed journals and about 15,000 electronic journals. The library purchases between 2,500 and 3,000 new books each year including a small but growing collection of electronic books. Requests for new books or journals are made through the academic department's faculty representative to the library.

The library's home page provides access to the library's online catalog and links to a wide array of information services. The library has an information commons with 120 networked PCs that provide access to a large number of electronic search tools and bibliographic and full-text sources. These include journal and conference literature in computer science, engineering, science, information systems and management, and other subject areas. All are available onsite and remotely with a current university UCID and password login. Among the 100+ databases available online are SCOPUS, IEEEEXplore, ACM Digital Library, Business Source Premier, Wilson Omnifile, the HSDL (Homeland Security Digital Library) and many more. The library also obtains books on loan and article photocopies for users through inter-library loan.

The libraries web site describes the services and resources more completely. Please see www.library.njit.edu.

As a technological research university, NJIT has excellent computing systems, networks and software to support this program. The Newark campus' gigabit Ethernet network backbone connects more than 6,000 nodes in classrooms, laboratories, residence halls, faculty and staff offices, the library, and student organization offices. Wireless access is available in over 90% of campus buildings and locations. The network provides access to a wealth of shared information services. Some of these include high-performance computing servers providing CPU cycles for simulation and computational research, disk arrays for storage of large data sets, communication servers for electronic mail and document exchange,

databases, digital journal subscriptions and a virtual "Help Desk." A virtual private network combined with Internet access, plus a large ISDN modem bank extend access to campus information resources to faculty, staff and students working at home, work, any of the university's extension sites or throughout the world. Wide-area network access through NJEDge.Net, New Jersey's Higher Education Network, and through Internet2 provides collaboration opportunities with students, faculty, and researchers, locally, regionally, nationally, and throughout the world.

IV.D. Classrooms and Laboratories

There is a broad range of classrooms and laboratories available to offer the courses and projects in this program, including many with Internet access and multimedia facilities. Thus, no new classrooms or laboratories are specifically needed for the program.

V. Curriculum

The MS in Emergency Management and Business Continuity will be managed and directed as an interdisciplinary program, but housed within the Department of Information Systems at NJIT. The IS Department will be responsible for setting admission standards and reviewing applications.

The program will consist of the following governance structure and through this structure guidance and direction to courses, course development, and specialty area development will be given. A program committee, who will be responsible for program standards and curriculum, will consist of:

1. Program Manager
2. Representative from the IS graduate curriculum development committee
3. Representative from Sponsored Research
4. Representative from CPE
5. Representative from School of Management
6. Representative from Civil and Environmental Engineering
7. Representative from Electrical and Computer Engineering
8. Representatives from the Industry Board of Advisors

MS in Emergency Management and Business Continuity Curriculum

(Total Credits Required 30 credits)

Basic Requirements of the Program

Summary Table

Fundamental Courses	6 credits
Elective Courses	6-18 credits
Specialty Area Courses	6-12 credits
Total	30 credits

Fundamental Courses: Choose two of the Following.

IS 613 - Design of Emergency Management Information Systems (3 credits)

IS 614 - Command and Control Systems (3 credits)

Mgmt 612 - Principles of Emergency Management (3 credits)

Mgmt 615/ IS616 - Learning Methodologies and Training Technologies (3 credits)

Electives: Choose four (or more) of the following items and this may include any of the two you did not choose in the fundamental courses. This also may include a master's project or thesis, and students who have not worked in this area are advised to consider doing a project or thesis.

CE 602 - Geographic Information Systems (3 credits)

EvSc 625/ IS 617 - Social Dimensions of Risk (3 credits)

Mgmt 650 - Knowledge Management (3 credits)

IS 615 - Improvisation in Emergency Management (3 credits)

IS 679 - Management of Computer and Information Systems (3 credits)

IS 680 - Information Systems Auditing (3 credits)

IS 681 - Computer Security Auditing (3 credits)

IS 687 - Transaction Mining and Fraud Detection (3 credits)

Masters Project - one course (3 credits) or **Master's Thesis** -two courses (6 credits)

Specialty/Application Area: Students may take a coherent set of two to four additional courses in another field that are related to Emergency Management. Usually this would be in their current professional area as specified by their undergraduate or other graduate degrees. Such courses may be applied to a second masters or a Ph.D. program with prior approval of the cooperating department.

There is an advisor for each specialty area that may be contacted for questions on that specialty area and for advice on choosing courses. The specialty areas currently include:

Specialty Areas:

Civil Engineering and Transportation Science: - The physical infrastructure of the environment and the understanding of its normal status and their vulnerabilities to natural and man-made threats are critical to successful planning with respect to the details of determining the possible mitigation policies and resources needed for timely response to a wide range of potential risks. The ability to judge in a disaster situation a correspondence between degrees of damage, response resource requirement, and allocation is critically important. The development of realistic plans and adequate training underlying those plans for things like evacuations, safe shelters, emergency services, etc, is the challenge for those with an understanding of the complex relationships among a diverse set of facilities that make up our critical infrastructure.

- CE 601 - Advanced Remote Sensing (3 credits)
- CE 602 - Geographic Information System (3 credits)
- CE 603 - Introduction to Urban Transportation Planning (3 credits)
- CE 610 - Construction Management (3 credits)
- CE 611 - Project Planning and Control (3 credits)
- CE 614 - Underground Construction (3 credits)
- CE 615 - Infrastructure and Facilities Remediation (3 credits)
- CE 625 - Public Transportation Operations and Technology (3 credits)
- CE 634 - Structural Dynamics (3 credits)
- CE 635 - Fracture Mechanics of Engineering Materials (3 credits)
- CE 636 - Stability of Structures (3 credits)
- CE 644 - Geology in Engineering (3 credits)
- CE 650 - Urban Systems Engineering (3 credits)
- CE 671 - Performance and Risk Analysis
- CE 672 - Security Management of Infrastructure Systems
- Tran 615 - Traffic Studies and Capacity (3 credits)

Computer Engineering: - The design and assurance of communication infrastructure is critical to all aspects of emergency management. Being able to evaluate and insure the mitigation of vulnerabilities for such systems is an important contribution to the infrastructure survivability of such systems. Students with an undergraduate degree in Computer Engineering are encouraged to consider this specialty area.

- ECE 699 - Selected Topics in Electrical and Computer Engineering II (3 credits)
- ECE 645 - Wireless Networks (3 credits)
- ECE 683 - Computer Network Design and Analysis (3 credits)
- ECE 637 - Introduction to Internet Engineering (3 credits)
- ECE 639 - Principles of Broadband Networks (3 credits)
- ECE 789 - Selected Topics in Electrical and Computer Engineering II (3 credits)

Environmental Science: - With the increasing complexity of our society, so is there increased risk of severe increases in the accidental and deliberate release of a wide range of hazardous materials, both chemical and biological. Those trained to be able to make a meaningful contribution to the understanding of the associated risks, how to detect and track the implications of their occurrence, and how to respond meaningfully to their mitigation represent an important professional talent that needs to be available in the Emergency Management and Business Continuity area. All organizations dealing with hazardous materials should have this sort of talent in their Emergency Management team.

EvSc 603 - Hazardous Waste Operations and Emergency Response (3 credits)

EvSc 610 - Environmental Chemical Science (3 credits)

EvSc 611 - Hazardous Waste Management (3 credits)

EvSc 612 - Environmental Analysis (3 credits)

EvSc 613 - Environmental Problem Solving (3 credits)

EvSc 614 - Quantitative Environmental Risk Assessment (3 credits)

EvSc 616 - Toxicology for Engineers and Scientists (3 credits)

EvSc 711 - Advanced Environmental Analysis (3 credits)

EM 631 - Legal Aspects in Environmental Engineering (3 credits)

EPS courses with approval of an advisor

Information Systems: The application of computing to information and communication in the Emergency Management and Business Continuity field represents the potential use of technology to integrate all the functions that must take place before, during, and after the disaster, as well as among the different organizations and units of organizations that must be involved in preparedness, response, and recovery. Information systems are the glue that puts together planning, mitigation, detection, training, command and control, response, and recovery into one unified process that provides the necessary infrastructure for the overall responsibilities. As such, they must be designed and developed with the evolving needs of the users and the organizations integrated into the development process.

IS 615 - Improvisation in Emergency Management (3 credits)

IS 623 - Qualitative Research on Information Systems (3 credits)

IS 634 - Information Retrieval (3 credits)

IS 658 - Multimedia Systems (3 credits)

IS 675 - Information System Evaluation (3 credits)

IS 679 - Management of Computer and Information Systems (3 credits)

IS 680 - Information Systems Auditing (3)

IS 681 - Computer Security Auditing (3 credits)

IS 687 - Transaction Mining and Fraud Detection (3 credits)

Management: - The professionals in Emergency Management must be able to integrate the development of plans for response processes (within their organization and across necessary external organizations). They must also insure that everyone will receive adequate training and that in times of disaster

those involved can work as well motivated and coordinated teams, no matter what degree of heterogeneity of expertise and level of experience exists among respondents. The emergency manager or business continuity professional must be able to be an entrepreneur or champion of emergency preparedness, and to prove and present people the best possible justifications for investing in an organizational function that may not be viewed as absolutely necessary by all those concerned, especially in times of restricted budgets. He or she must be able to stimulate planning, communication, and coordination among all parts of the organization or organizational units necessary to bring about effective crisis planning and response.

Acct 615 - Managerial Accounting

Fin 600 - Economic and Financial Environments

Fin 624 - Corporate finance

HRM 601 - Organizational Behavior

HRM 630 - Managing Technological and Organizational Change

MIS 645/IS 677 - Information Systems Principles

MIS 648 - Decision Support Systems

Mgmt 630 - Decision Analysis

Mgmt 650 - Knowledge Management

Mgmt 635 - Data Mining and Analysis

Mgmt 698 - Independent Studies in Emergency Management