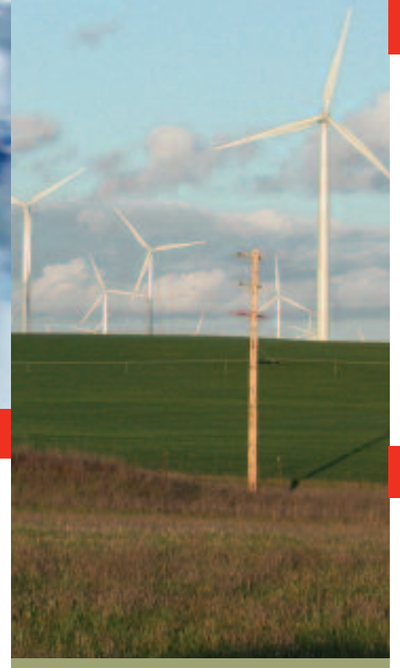
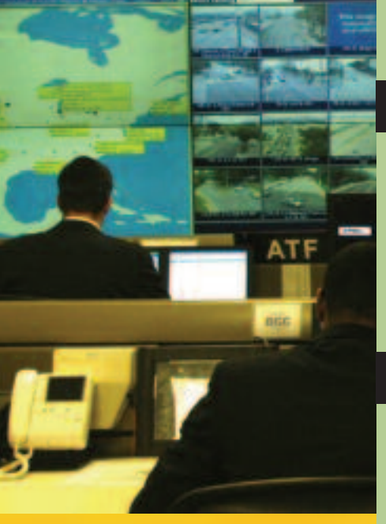




NJIT's New MS in Critical Infrastructure Systems

NJIT's new MS in Critical Infrastructure Systems is a unique multidisciplinary program designed to meet the demand for skilled professionals to upgrade, secure and manage the nation's infrastructure. The program draws upon the full resources of New Jersey's Science and Technology University with course offerings from civil engineering, industrial engineering, electrical and computer engineering, engineering management, information systems, architecture, and management. Courses in public health are also available in collaboration with the University of Medicine and Dentistry of New Jersey. The program covers all engineered public and private sector infrastructure (civil and engineered systems including buildings/urban development, transportation (highways/tunnels/bridges/airports), power plants/systems, environmental (water/wastewater/ecological), telecommunications, computer networks and cyber infrastructure), banking and finance, and public health infrastructure management.

Core Courses

CE 671: **Critical Infrastructure I: Performance and Risk Analysis of Infrastructure Systems** presents a comprehensive systems approach to infrastructure asset management across areas of public and private infrastructure. Topics include the framework of integrated asset management illustrated in transportation, water and wastewater systems, the economic evaluation of infrastructure options, using life cycle cost analysis (LCCA) and cost-benefit analysis (CBA).

CE 672: **Critical Infrastructure II: Security Management of Critical Infrastructure** focuses on the areas of vulnerability assessment and security management of critical infrastructure systems, including approaches to vulnerability analysis and critical infrastructure protection strategies. Critical infrastructure sectors include water supply/environmental, transportation, power and fuel systems, SCADA systems, cyber-infrastructure, telecommunications and public health.

EM 602: **Management Science**: Prerequisites: undergraduate calculus and probability and statistics. Course work includes linear programming: formulation, methodology, and application; the transportation problem; the assignment problem; Markov chains and their applications in decision making; queueing systems; deterministic and stochastic inventory models.

ARCH 675: **Elements of Infrastructure Planning:** Introductory survey covers the basic principles, operation and design of physical infrastructure systems including roads, public transportation, community facilities, public open space, surface drainage, and electric, gas, water, waste disposal, and telecommunications services.

Areas of Concentration

Planning and Facilities Management

CE 602	Geographic Information Systems
CE 615	Infrastructure & Facilities Remediation
IE 605	Engineering Reliability
IE 614	Safety Engineering Methods

Engineered Systems

TRAN 705	Mass Transportation Systems
ECE 610	Power Systems Analysis
CE 650	Urban Systems Engineering
ECE 637	Introduction to Internet Engineering
ECE 683	Computer Network Design & Analysis
ECE 673	Random Signal Analysis I
ECE 642	Communication Systems
ECE 683	Computer Network Design and Analysis

Public Health Systems (Joint UMDNJ)

PHCO 0502	Principles and Methods of Epidemiology
PHCO 0503	Introduction to Environmental Health
EnE 663	Water Chemistry
EnE 671	Environmental Impact Analysis
EnE 610	Hazardous Site Operations
ENE 662	Site Remediation

Program/Impact Management

EM 636	Project Management
EM 637	Project Control
CE 610	Construction Management
CE 616	Construction Cost Estimating
EM 771	Operations Cost and Management Control
CE611	Project Planning and Control
IIE 651	Industrial Simulation
HRM 601	Organizational Behavior

Emergency and Preparedness (Joint UMDNJ)

ECE 638	Network Management and Security
MGMT 612	Principles of Emergency Management
ENOH	Public Health Preparedness I: Agents of Mass Injury or Destruction
ENOH 0696	Public Health Preparedness II: Emergency Management and Response
HEBS 0679	Health Communications/ RiskCommunications
IS 613	Design of Emergency Management Information Systems
IS 615	Improvisation in Emergency Management
IS 614	Command and Control Systems

Enabling Systems and Technologies

MIS 648	DSS for Managers
TRAN 752	Traffic Control
TRAN 615	Traffic Studies and Capacity
TRAN 755	Intelligent Transportation System
MGT635	Data Mining & Analysis
MGT 650	Knowledge Management
CS 631	Database Mgmt Systems
CS 632	Advanced DB Mgt Design
CS 782	Pattern Recognition and Applications
IE 621	Systems Analysis and Simulation

"We will build the roads and bridges, the electric grids and digital lines that feed our commerce and bind us together.
We will restore science to its rightful place and wield technology's wonders to raise health care's quality and lower its costs.
We will harness the sun and the winds and the soil to fuel our cars and run our factories. And we will transform our schools and colleges and universities to meet the demands of a new age.
All this we can do. All this we will do."

BARACK OBAMA
President of the United States

Employment Opportunities

Private and Public Sectors: Practicing and future professionals who manage any elements of the nation's critical infrastructure or are tasked with developing and implementing solutions for its rehabilitation and expansion;

- **Multi-Industry:** Current and future professionals from the engineering, computing, transportation, public utility and other disciplines tasked with the operations and systems support aspects of lifecycle capital, maintenance and emergency management surrounding the rehabilitation and protection of public and private infrastructure and the mitigation of possible event consequences;
- **Multi-Function:** Facility managers, engineers, architects, emergency planners, state and local infrastructure and DHS officials and planners, DOD, Corps of Engineers and infrastructure engineers and managers in both the public and private sectors.

Elective Areas

The MS program in Critical Infrastructure Systems offers two complementary and synergistic perspectives:

- **Critical Infrastructure Life-cycle Management**, including sector-based and cross-sector life-cycle asset management, maintainability and safety engineering, vulnerability analysis, hazard/crisis impact analysis and mitigation, infrastructure inter-dependencies, and rehabilitation technologies. Electives for this track could include:
  - **Planning and Strategic Asset Management:** Geographic Information Systems, maintainability engineering, remote sensing, environmental monitoring networks, lifecycle building, and information management.
  - **Engineered Systems:** Water/wastewater, mass transportation systems, power systems analysis, urban systems engineering, Internet Engineering, and computer network design and analysis.
  - **Program/Impact Management:** Environmental impact, safety engineering, project planning and management.
- **Critical Infrastructure Security and Emergency Management**, including emergency information and management systems, public health preparedness, enabling and protective technologies for homeland security and critical infrastructure. Electives could include:
  - **Emergency and Preparedness Management:** Design of emergency management information systems, command and control centers, health/risk communications, public health preparedness.
  - **Enabling Systems and Technologies:** Protective technologies, advanced database design, pattern recognition, data mining and analysis, traffic control, intelligent transportation systems, decision support systems.

Research Opportunities

NJIT's Department of Civil and Environmental Engineering has an extensive research program with focal areas including critical infrastructure, transportation, environmental engineering, geospatial engineering, and construction engineering and management. Research initiatives include:

- Flood Detection: Warning-Response systems
- Risk-based Integrated Maintenance and Security Model for Critical Infrastructure in Oil and Gas Sector
- Integrated Decision Support System for Planning Inter-dependent Urban Infrastructure for Resiliency and Sustainability

NJIT New Jersey's Science & Technology University

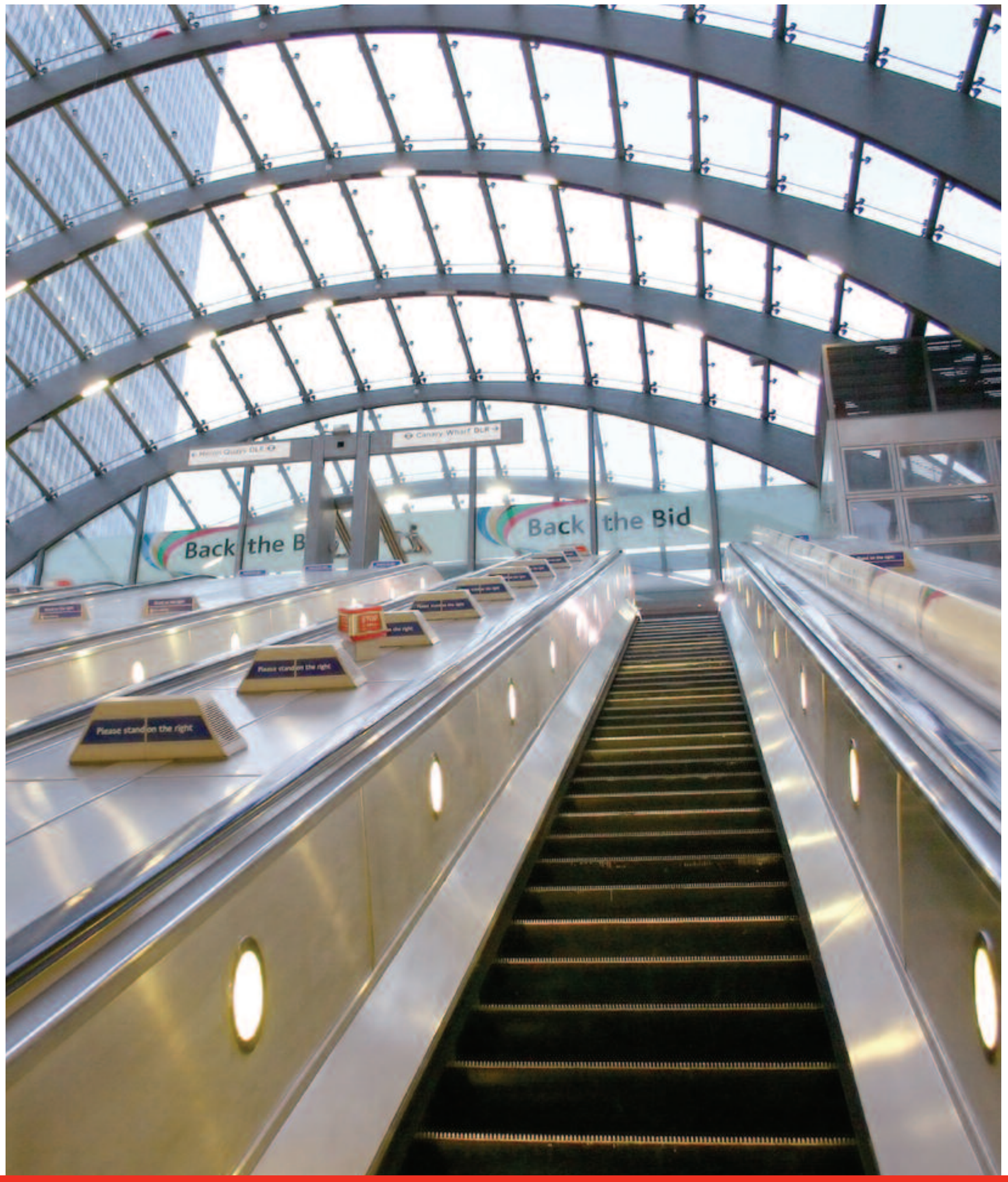
MASTER OF SCIENCE IN CRITICAL INFRASTRUCTURE SYSTEMS

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

NEWARK COLLEGE OF ENGINEERING

NEW JERSEY INSTITUTE OF TECHNOLOGY

>>> rise to the challenge of rebuilding America's infrastructure



>>> water systems

>>> power systems

>>> communications

GAIN THE EDGE IN KNOWLEDGE AT NJIT WITH >>>

The New **Master of Science** Program in **Critical Infrastructure Systems**

Critical infrastructure represents one of the great technical challenges of the 21st century. America's aging infrastructure is crumbling: bridges have collapsed, levees have burst and highways have fallen. Many of our ports, industries and transportation centers need to be better secured. The hurricane disasters along the Gulf Coast have underscored the critical role of infrastructure systems including the complex network of highways, bridges, tunnels, airports, seaports, railroads, public buildings, flood control structures, water supply, power grid, computer and communications systems, energy commodities networks, and waste disposal systems. The certainty of future extreme events – natural disasters, accidents and unintentional acts – demands skilled resources and intelligent investment to:

- create a robust and sustainable infrastructure that is resilient against multiple hazards.
- build operational, systems and programmatic capabilities for detection, protection, prevention, mitigation and response.

NJIT's new MS in Critical Infrastructure Systems draws on the university's expertise in civil, industrial and electrical engineering, information systems, architecture and management in a unique interdisciplinary curriculum designed to prepare skilled professionals to lead the effort to restore, upgrade and secure the nation's infrastructure.

For more information, contact:
Prof. Fadi A. Karaa
973 642-4198
fadi.a.karaa@njit.edu

To apply, contact:
Office of Graduate Admissions
1-800-925-NJIT
www.njit.edu/admissions/graduate/howtoapply

NJIT®
New Jersey's Science & Technology University