# M.S. in Critical Infrastructure Systems

## Degree Requirements

A minimum of 30 degree credits, not including any bridge courses, is required. Candidates must consult with the graduate advisor (not thesis advisor) in designing appropriate programs of study.

Students must attain a minimum GPA of 3.0 in the core courses listed below, and a minimum overall GPA of 3.0.

## Master of Science in Critical Infrastructure Systems

### Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CE 671</td>
<td>Performance and Risk Analysis of Infrastructure Systems</td>
</tr>
<tr>
<td>CE 672</td>
<td>Security Management of Critical Infrastructure</td>
</tr>
<tr>
<td>EM 602</td>
<td>Management Science</td>
</tr>
<tr>
<td>MIP 675</td>
<td>Elements of Infrastructure Planning</td>
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### Electives

Select six courses (or 4 courses and a Thesis) from the following:

#### Critical Infrastructure Life-Cycle Management (CILC)

**Planning and Facilities Management:**
- CE 602  Geographic Information System
- CE 615  Infrastructure and Facilities Remediation

**Engineered Systems:**
- TRAN 705  Mass Transportation Systems
- ECE 610  Power System Steady-State Analysis
- ECE 637  Internet and Higher-Layer Protocols
- ECE 683  Computer Network Design and Analysis
- ECE 673  Random Signal Analysis I
- ECE 642  Communication Systems I

**Program/Impact Management:**
- CE 610  Construction Management
- CE 611  Project Planning and Control
- CE 616  Construction Cost Estimating
- IE 651  Industrial Simulation
- IE 605  Engineering Reliability
- IE 614  Safety Engineering Methods
- ENE 662  Site Remediation
- ENE 663  Water Chemistry
- ENE 671  Environmental Impact Analysis
- HRM 601  Organizational Behavior

#### Critical Infrastructure Security and Emergency Management (CISE)

**Emergency and Preparedness Management (Joint UMDNJ):**
- IS 613  Design of Emergency Management Information Systems
- IS 614  Command and Control Systems

**Enabling Systems and Technologies:**
- MIS 648  Decision Support Systems for Managers
- TRAN 615  Traffic Studies and Capacity
- TRAN 752  Traffic Control
- TRAN 755  Intelligent Transportation Systems
- EM 771  Operations Cost and Management Control
- MGMT 635  Data Mining and Analysis
- MGMT 650  Knowledge Management
### M.S. in Critical Infrastructure Systems

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CS 631</td>
<td>Data Management System Design</td>
</tr>
<tr>
<td>CS 632</td>
<td>Advanced Database System Design</td>
</tr>
<tr>
<td>CS 782</td>
<td>Pattern Recognition and Applications</td>
</tr>
<tr>
<td>IE 706</td>
<td>A Queueing Approach to Performance Analysis</td>
</tr>
<tr>
<td>IE 621</td>
<td>Systems Analysis and Simulation</td>
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**Public Health Systems and Emergency Preparedness:**

- RBHS Courses
  - Principles and Methods of Epidemiology
  - Introduction to Environmental Health
  - Public Health Preparedness I: Agents of Mass Injury or Destruction
  - Public Health Preparedness II: Emergency Management and Response
  - Health/Risk Communications

**Other Electives: Master's Thesis**

**Total Credits**: 30

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1. Students receiving financial aid at any point in their studies must complete 6 credits of CE 701 Masters Thesis.
2. Other suitable electives may be taken subject to approval of program advisor, particularly in the area of Public Health Systems and Emergency Preparedness.