Intelligent Transportation Systems

The Intelligent Transportation Systems (ITS) Certificate Program aims on studying ITS in a systematic and focused way. This certificate program provides the current and future ITS workforce with flexible, accessible ITS learning through training, technical assistance, and educational resources. The program will assist graduate students, educators, and transportation professionals in developing their knowledge, skills, and abilities to build technical proficiency for ITS.

Who would be suited to take this program?

This certificate program is ideal for emerging Intelligent Transportation System (ITS) engineers or project managers in the field. Some job titles include:

- ITS Analyst
- ITS Project Manager
- ITS Engineer

What will I learn?

- *Traffic Studies and Capacity* - 1) elementary probability and statistics; 2) characteristics of the traffic stream; 3) fundamental traffic flow relationships. Also, the principal methodologies used to perform transportation facility capacity analyses for: basic freeway sections, weaving areas, ramps and ramp junctions, multi-lane and two lane roadways, signalized and unsignalized intersections.
- *Intelligent Transportation Systems Introduction* - The fundamentals of ITS, including ITS national/regional architectures, designing process, and the state-of-the-practice technologies used to improve the safety, efficiency and control of surface transportation systems, including Connected Vehicles.Technological and operational issues of ITS and using them for advanced traffic management and connected vehicles.
- *Advanced Transportation Modeling* - Discuss advanced modeling techniques for the evaluation of ITS applications. The modeling techniques covered will include Macroscopic, Mesoscopic, and Microscopic modeling tools to hone students' hands-on skills and practical experience for ITS project design and evaluation.
- *Geographic Information System* - Geographic Information System (GIS) and its applications for Intelligent Transportation Systems (ITS). Topics include fundamental data structures and basic functions, methods of data capture and sources of data, and the nature and characteristics of spatial data and objects. Students will be designing, building, querying, updating, maintaining and managing relational databases, using the Structured Query Language (SQL).
- *Database Fundamentals* - extensive, pragmatic experience in designing, building, querying, updating, maintaining and managing relational databases, using the Structured Query Language (SQL). You will also learn logical and physical database design. SQL will be extensively covered, and students will design and implement sophisticated SQL queries.
- *Data Management System Design* - methods of database design and conceptual modeling, physical storage for database information and fundamental notions of concurrency control and recovery in database systems. This topic requires basic knowledge of data structures and relational database technology.

Why study Intelligent Transportation Design (ITS) at NJIT?

NJIT has long been offering both the MS in Transportation, for transportation engineers, and the MS in Computer Science, for technology journeymen. This program combines the strengths of both in tightly focused package.

Into what industries might holders of this program find employment?

- Federal/State/Local Department of Transportation (e.g., USDOT, NJ DOT)
- Private consulting company conducting ITS Design, Operation, and Evaluation (e.g., Cambridge Systematics, Leidos, Booz Allen Hamilton)
- Information Technology (IT) company developing ITS, Smart City, and Connected Vehicle technologies and applications (e.g., SIEMENS, IBM)

Prerequisites

Applicants should have a bachelor's degree from an accredited institution with some undergraduate background in economics, mathematics, probability and statistics, and computers (specifically, database design). Students who lack an appropriate background may be admitted and required to make up deficiencies by taking a program of courses designed in consultation with graduate advisors.

Related Degree Programs

What are the Required Courses?

Code	Title	Credits
Core Courses		
TRAN 615	Traffic Studies and Capacity	3
TRAN 755	Intelligent Transportation Systems	3
TRAN 698 Advanced Transportation Modeling		3
Electives		
Select one of the following:		3
TRAN 602	Geographic Information Systems	
IS 531	Database Fundamentals	
CS 631	Data Management System Design	