

OVERVIEW

Transportation is the backbone for the economic and financial well being of any society. Hence, it is essential that the transportation system that involves mobility for goods and people be highly efficient and robust. The two main aspects of transportation are throughput and safety. Throughput measures the quantitative aspect of the efficiency of the system, while safety is related to the qualitative aspect. Many technology based solutions are being implemented and developed at a furious pace all over the world. These include using sensors, communications, and control devices in the infrastructure, on the vehicles as well as in person.

This course is designed to teach the dynamics of the traffic system and also how to design controllers for various subsystems. Specifically, the course will address the topics listed in course modules.

OBJECTIVES

The course objectives are as follows:

1. Exposing participants to the fundamentals of transportation dynamics and control methods
2. Building in confidence and capability amongst the participants in the application of engineering technology in terms of sensors, actuators, processors, software methods and control design principles for transportation problems
3. Providing exposure to practical problems and their solutions.
4. Enhancing the capability of the participants to use mathematical modeling and control design techniques to solve traffic and vehicle related problems..

WHO CAN ATTEND ?

- Executives, engineers and researchers from transportation sector and government organizations including R&D laboratories.
- Student at all levels (BTech/ MSc/ MTech/ PhD) or Faculty from reputed academic institutions and technical institutions.

COURSE MODULES

Prerequisite Modules:

- Pre-Module A: Calculus Review
- Pre-Module B: Ordinary and Partial Differential Equations
- Pre-Module C: Overview of Python Language
- Pre-Module D: Numerical Methods for Simulations
- Pre-Module E: Arduino Board and Embedded Systems Development

Main Modules:

- Module A: Macroscopic Traffic Dynamics
- Module B: Mesoscopic Traffic Model
- Module C: Microscopic Traffic Dynamics
- Module D: Architecture, electronics, and planning
- Module E: Traffic Control
- Module F: Vehicle control
- Module G: Pedestrian dynamics and control



*Two-week course
on*

Transportation Systems: Dynamics and Control for Traffic, Vehicles, and Pedestrians

at

**Indian Institute of Technology Delhi
New Delhi, India**

02-13 December 2019



Course Cordinators

Dr. Geetam Tiwari
MoUD Chair Professor

Dr. K. Ramachandra Rao
MoUD Chair Professor
Department of Civil Engineering and
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COURSE FACULTY



Dr. Pushkin Kachroo is the Lincy Professor in the Department of Electrical and Computer Engineering at the University of Nevada Las Vegas (UNLV), USA. He is also an adjunct Professor at UNLV School of Medicine besides being the Director of Mendenhall Innovation Program at UNLV. His interest in the fields of Nonlinear and Hybrid Control (Sliding Mode, H infinity), Differential Geometry, Partial Differential Equations, Artificial Intelligence with applications in Transportation Systems and Transportronics. Dr. Kachroo has several books and papers to his credit.



Dr. Geetam Tiwari is an MoUD Chair Professor in the Department of Civil Engineering and Transportation Research and Injruy Prevention Programme (TRIPP) at Indian Institute of Technology (IIT), Delhi. Her research interests are Transportation Planning, Highway Safety, Planning of Public Transport Systems and Sustainability. She is currently the Editor-in-Chief of 'International Journal of Injury Control and Safety Promotion' Taylor and Francis.



Dr. K. Ramachandra Rao is an MoUD Chair Professor in the Department of Civil Engineering and Transportation Research and Injury Prevention Programme (TRIPP) at Indian Institute of Technology (IIT), Delhi. His research interests are Heterogeneous traffic flow modelling, pedestrian dynamics and urban freight modelling.

REGISTRATION PROCEDURE

Step 1: GIAN Web Portal Registration: Register at <http://www.gian.iitkgp.ac.in/GREGN/index>, by paying Rs. 500/- online. Registration to this portal is one-time affair and will be valid for lifetime of GIAN. *Please note that Course fee is separate.*

Step 2: Course Registration: Login to the GIAN portal with the registered User ID and Password. Choose the Course registration option. Select the course titled "Transportation Systems: Dynamics and Control for Traffic, Vehicles, and Pedestrians" from the list and click the "Save" option. Confirm your registration by clicking the suitable option.

Last date for the registration: 24th Nov, 2019

Step 3: Course Shortlisting: Candidates will be intimated through email regarding their selection.

Step 4: Course Fee Remittance: Once selected for the Course, the fee (as applicable) has to be paid. The course fee is as follows:

- Students from other Academic Institutes: Rs. 7,500/-
- Faculty from other Academic Institute: Rs. 12,000/-
- Professionals (Industry/ Research) Org.: Rs. 20,000/-
- Participants from abroad: USD 300
- IIT Delhi students need not pay the course fees

The above fee includes all instructional materials, computer use for tutorials, assignments and laboratory equipment usage charges. Accommodation charges are separate and shall be available on request.

The details of fee payment by Electronic Clearing Service/ RTGS in the name of "IITD CEP ACCOUNT":

Bank Name: **State Bank of India**
Branch: **IIT Delhi, Hauz Khas, New Delhi-110016**
IFS Code: **SBIN0001077**
MICR Code: **110002156**
Type of Account: **Saving Account**
Bank A/C No.: **36819334799**
SWIFT Code: **SBININBB547**
IITD PAN No.: **AAATI0393L**

Step 5: Send Registration Form: Fill up the registration form with the details of bank transaction and other required information.

Please send the registration form to the Course coordinator at geetamt@gmail.com or rkralaga@civil.iitd.ac.in on or before 24th Nov 2019

REGISTRATION FORM

GIAN Course on
**Transportation Systems:
Dynamics and Control for
Traffic, Vehicles, and Pedestrians**
IIT Delhi (02-13 Dec 2019)

Name: _____

Designation: _____

Organization: _____

Address: _____

Email: _____

Phone: _____

Mobile: _____

Fax: _____

Fees payable to "IITD CEP ACCOUNT", SBI IIT DELHI

Transaction No.: _____

Amount: Rs. _____

Dated: _____

Bank Name: _____

Branch Name: _____