



# M.Tech. in Transportation System Engineering



**BVM Engineering College/ ISTAR**  
Vallabh Vidyanagar

## The Campus and Institutes

Two of the chief social reformists Bhailalbai an engineer and Shri Bhikhabhai -an educationist volunteered for a stupendous task of establishing an educational township where the entire spectrum of education right from primary education to the highest of doctoral and post-doctoral studies would be available in the serene rural set up. Sardar Patel not, only heartily approved it, but also managed to get blessing of Mahatma Gandhi under the Trust named as Charutar Vidya Mandal (CVM) since 03.03.1946.

Birla Vishvakarma Mahavidyalaya (BVM) Engineering College and Institute of Science and Technology for Advanced Studies & Research (ISTAR) are managed by Charutar Vidya Mandal (CVM) which is the registered Charitable education trust which manages 38 Institutes from primary level to doctoral level. The BVM is the first degree Engineering college of the Gujarat State, inaugurated on 14th June 1948, which is completing 60 years of its existence during this academic year. It has produced more than 16,000 graduates.

ISTAR is offering various PG courses in Science and Technology wherein Engineering PG programmes are run jointly with BVM.



The institutes are committed to train the mind of budding engineers for mastering the skill in the area of engineering and technology for harnessing the technology to produce competent, creative, imaginative engineers and techno-managers towards profitable and productive processes of economic growth and social well-being in context of present scenario of world trade and globalization. The PG Programmes offered in Engineering and Technology are recognized by AICTE and affiliated to Sardar Patel University Vallabh Vidyanagar.

Master of Engineering in (1) Environmental (2) Structural Engineering (3) Construction Engineering & Management (4) Machine Design (5) Computer Engineering & Master of Technology (6) Transport System Engineering.

Department of Civil Engineering and Department of Structural Engineering are offering following PG Programmes with Number of seats

- (a) Master of Engineering in
- Environmental Engineering 18
  - Structural Engineering 18
  - Const. Engineering & Management 18
- (b) Master of Technology in.
- Transport System Engineering 18



# M.Tech. in Transportation System Engineering

Transportation infrastructure planning, design, construction, operation, maintenance, using state of art and advanced technology in the areas are need of present time.

Programme covers areas of surface, subsurface, water, and air transportation, with main focus on Highways, Urban transport and traffic engineering and management.

## Eligibility Criteria

- B.E.(Civil)/ B. Tech.
- B. Arch.
- Min.50% marks or CPI 5 on 10 point scale

## Important Features of the programme

- This programme is approved by All India Council of Technical Education (AICTE) and affiliated to Sardar Patel University
- Present intake : 18 students
- Duration : 4 Semesters consisting of minimum 2 years
- Er. C.B. Patel Gold Medal is awarded by Sardar Patel University to the student who secures overall highest marks/CPI
- The courses offered in the programme cover a wide range of areas such as Transportation Planning, Traffic Engineering field studies, theories and management of traffic - TSM, Highway Materials and Construction, GIS GPS application in transportation projects, EIA of Transportation projects. The students will get first hand experience of laboratory tests and field studies. They will also be trained on Arc GIS, TransCAD and related softwares.

All students have to carry out two compulsory seminars and research thesis for one year for their major project. The programme is of two years duration for full-time students and three years for Part-Time students.

## Laboratory & Computational Facilities

The transportation laboratory offers all major facilities to support the M.Tech. TSE programme. The laboratory has facilities for highway materials aggregates, bitumen Bit. Mix Design and Cement Mix. Design facilities.

The equipment required for traffic related filed studies - video based traffic data collection system, Traffic Speed radar, Noise meter etc. are available. For pavement testing Bump Integrator and Benkelman Beam is available. TransCAD software and Arc GIS software available.

## Course Curriculum

### 1. TE 501 Modeling, Analysis & Simulation

The course covers concepts, techniques and tools for modeling and simulation systems. Coverage includes Modeling Process, curve fitting techniques, time series, probability distributions, cluster analysis, Graphical and Matrix models, Routing problems, Monte Carlo Methods, Stochastic simulation etc.

### 2. TE 502 Traffic Engineering & Field Studies.

The course is designed to give knowledge of traffic engineering problem assessment based on studies like : Traffic characteristics, traffic field studies database presentation and use of advanced technology in the area.

### 3. TE 503 Highway Materials & Testing

Subject enhances understanding about highway materials and characterization for subsequent design and quality control. The area covered is aggregates, binders (Bitumen, Cement, Soil) mix design and related standards for testing.

### 4. TE 504 Highway Geometric Design

Design control and criteria, capacity analysis and lane requirements, Alignment design and intersection design is included in this course.

5. TE 505 GIS-GPS in Civil Engineering

The subject covers GIS-GPS terminology, GIS-data models, Database creation for TAZ and Network. Network coding and inventory mapping. Trans CAD and Arc GIS software exposure is provided to students.

6. TE 506 Transportation & Environment

Modes of transportation in mixed traffic, transport related pollution, Technology Vision 2021 Sources of Air & Noise pollution, vehicular emission parameters, Pollutants standards, measurement, procedures as per MOEF / World Bank / IRC / UK Guide lines.

7. TE 507 EIA for CE Projects

Elements of EIA, Environmental Attributes: Methodology for EIA, Techniques of Analysis, Environmental Audit, Use of Computers, Public Participation, Case Histories.

8. TE 508 Traffic Flow Theory & Management

Components of traffic flow system, mode concepts, Mathematical Modeling, Headway, Gaps, Microscopic Models, Car Following Models, Queuing theory, Traffic Management , City wide Traffic Control etc.

9. TE 509 Transportation Economics & Project Evaluation

Basic Principles, Cost/Benefit Ratio, Methods of Economic Analysis, Techno economic Feasibility studies, Transportation Financing.

10. TE 510/12

Seminar on Traffic Engineering and Pavement System for improving understanding of subject, to cultivate technical writing and presentation skills of students.

11. TE 511 Dissertation

To take up case studies and prepare comprehensive technical research report comprehensive.

## 12. Elective Courses

### 12(a) Present offered elective courses

- TE518 Highway Construction  
The course is designed to teach different mixes used in Highway Pavement construction. Bituminous and cement concrete, Construction techniques, Specifications, SQC, Maintenance and Rehabilitation and remedial measures.
- TE521 Airport Planning and Design  
The main objective of this course is to highlight Aircraft characteristic and Geometric Design of runway, taxiway and apron. Runway Pavement Design Methods, Navigation Aids at airport and planning of Terminal Building.
- TE522 Transportation Planning  
The course highlights hierarchical level of planning, passenger & goods travel forecasting models, land use transport interactions, State wide & Regional Transport Planning.
- TE523 Mass Transportation System  
History & role & transit, trends, characteristics, urban mass transport planning, terminals, vehicle dispatch policy and related topics are covered in this course.

### 12(b) Other elective courses

- TE514 Pavement System Management
- TE515 Pavement Analysis and Design
- TE516 Highway Sub-grade and Foundation Analysis
- TE517 Low cost Roads
- TE520 Multimodal Transportation System Planning and Design
- TE524 Intersection Design and Analysis
- TE525 Transportation System Analysis

## Faculty involved in teaching

Dr. F. S. Umrigar Coordinator and Principal	Transportation Planning, Traffic Engineering and Management, Airport Planning and Design, Pavement Design and evaluation
Prof. J. H. Patel Head CE Dept	Transport and Environment, EIA and EIS of Transportation Projects
Prof. L. B. Zala Assistant Professor & Co-ordinator	Transportation Planning, Highway Construction, Airport Planning and Design, Traffic Engineering
Shri C.B.Mishra Lecturer	Highway Materials, Pavement Engineering, Highway Safety
Dr. T. A. Desai	Applied Mathematical Modeling
Prof. S.M.Thakar Assistant Professor	Environmental Engineering, Air Pollution Control
Prof. D. S. Vyas Assistant Professor	Environmental Engineering, Air Pollution Control
Shri H.J. Chauhan Lecturer	GIS and GPS, Remote Sensing applications to Transportation Systems

In addition to in-house faculty , experts from the Industry are also invited to give special lectures and industrial visits are arranged for field exposure.

### Contact Persons

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