

## Department of Civil Engineering

The Department of Civil Engineering with its multifaceted faculty continues to maintain and cultivate its strong links with the building and construction industry and academic and research institutions both within and outside the country. Besides high quality teaching and instruction at both UG and PG levels, the Department is actively involved in basic and applied research and consultancy and provides high quality technical advisory support through various R & D projects and consultancy to various organizations. The department has attracted significant amount of sponsored research funding from government and private agencies.

### Academic Programmes

The Department of Civil Engineering offers broad-based undergraduate BTech degree programme. A dual degree BTech-MTech programme is also run in structural engineering. Postgraduate MTech. (admissions through GATE/sponsorships) and PhD (through selections/sponsorships) programmes are offered in the following five specializations:

Transportation Systems Engineering  
Geotechnical Engineering  
Water Resources Engineering  
Structural Engineering  
Geodesy & Remote Sensing

This year, 50 MTech and 15 PhD students were admitted in the above specializations. In the first year, 50 students were admitted in the BTech, and 15 students were admitted in the dual degree BTech/MTech programmes. During the year, 28 BTech, 41 Mtech, 7 DD and 10 PhD students graduated from the Department.

### Awards

**Prof. Kapil Gupta** received the "*Quality of Life Award*" by the Association of Commonwealth Universities (ACU), London to carry out research work at the University of Sheffield, England, UK during May-June 2003.

**Prof. D.N. Singh** received the "*2003 SP Research Award*", by the SP Foundation, Rolla, MO, USA.

### Extension Activities

In order to encourage and facilitate interaction amongst practitioners and researchers, the following activities were organized:

#### CEP Courses

Planning, Design, Construction and Maintenance of Rural Roads, October 20-22, 2003.  
Scientific Design of Landfills, August 23, 2003.  
Urban Drainage Management - State of the Art, April 5-6, 2003.  
Urban Drainage Management – State of the Art, September 29-30, 2003.

### **NPEEE Courses**

Earthquake-Resistant Design of Reinforced Concrete Building, July 2-7, 2003.

Structural Dynamics – Applications to Earthquake Engineering, November 24 to December 5, 2003.

### **OIP Courses**

Recent Developments in Urban Transportation Systems, Economic and Financial Evaluation, EIA for Sustainable Transport Planning, Introduction to UTSP, Preparation of DPR: Investigations, July 21-25, 2003.

Finite Element and Boundary Element Methods with Applications in Civil Engineering, December 1-5, 2003.

Environmental Geotechnics, June 23 to July 4, 2003.

### **Sponsored Research**

13 projects were completed and 14 new sponsored research projects worth about 120 lakhs were initiated during the year. A few of the ongoing and new projects are listed below:

Upgradation of concrete structures with fiber reinforced composites.

Assessment of geo-environmental contamination due to hazardous waste disposal.

GIS for urban transport network planning and monitoring.

Protection of deep water satellite data on waves and wind to shallow water using ANN.

Development of numeric models for the prediction of hydrodynamics and salinity in branched estuary channels.

Establishment of geo-technical centrifuge facility-Phase IV.

IRCC project for stability evaluation.

Fiber reinforced polymer concrete composites for civil construction of 21<sup>st</sup> century.

Earthquake-resistant design of bridges using seismic isolators.

Simplified seismic analysis of piping systems supported on energy dissipating devices.

Seismic risk evaluation in urban area (Mumbai).

National project on earthquake engineering education.

Integrated studies on radionuclide migration at shallow land disposal facility.

Performance based seismic design of structures.

Integrated Watershed Modelling Using IRS Data and Geographical Information Systems (ISRO).

### **Consultancy Work**

233 consultancy projects worth about Rs. 1.7 crore were undertaken during the year by the Civil Engineering Department. 21 faculty members were involved in the above consultancy work.

### **Books/Chapters in Books**

Dhingra S.L, Rao K.V.K. and Tom V.M.,

Environmental Impact Assessment for Sustainable Transport, Handbook of Transport and the Environment (Eds.Hensher D.A. and Button K.J.), Volume 4, 2003.

**Kulkarni M.N.,**

GPS & Its Applications (Edt.), DST-Sponsored Training Course, (Printed Volume & CD), 2003.

**Kulkarni M.N.,**

GPS & Its Application to Landslide Monitoring, Chapter in Landslide Disaster, Edt. R. Nagarajan, Anmol Pub. Pvt. Ltd., N. Delhi, 2004.

### **Journal Papers**

Agarawal J. and **Tom V.M.,**

Parallel GA for Transit Route Network Design, *Journal of Computing in Civil Engineering*, ASCE, Volume 18(3), 2004.

Capart H., **Eldho T.I.**, Huang S.Y., Young D.L. and Zech Y.,

'Treatment of Natural Topography in Finite Volume Computations of Open-Channel Flow', *Journal of Hydraulics Engineering*, ASCE, Volume 129 (5), pp 385-393, May 2003.

Chitnis M.R., **Desai Y.M.**, Shah A.H. and **Kant T.,**

Comparisons of Displacement-Based Theories for Waves and Vibrations in Laminated and Sandwich Composite Plates, *Journal of Sound and Vibration*, Volume 263, No 3. pp 617-642, 2003.

Dafedar J.B., **Desai Y.M.** and Mufti A.A.,

Stability of Sandwich Plates by Mixed, Higher-order Analytical Formulation, *International Journal of Solids and Structures*, Volume 40, No 17, pp 4501-4517, 2003.

Dalainaidu A. and **Singh D.N.,**

A Generalized Procedure for Determining Thermal Resistivity of Soils, *International Journal of Thermal Sciences*, Volume 43(1), pp 43-51, 2004.

Dalainaidu A. and **Singh D.N.,**

A Field Probe for Measuring Thermal Resistivity of Soils, *Journal of Geo-technical and Geo-environmental Engineering*, ASCE, Volume 130(2), pp 213-216, 2004.

**Desai Y.M.**, Ramtekkar G.S. and Shah A.H.,

Dynamic Analysis of Laminated Composite Plates Using a Layer-wise Mixed Finite Element Model, *Composite Structures*, Volume 59, No 2, pp 237-249, 2003.

**Desai Y.M.**, Ramtekkar G.S. and Shah A.H.,

A Novel 3D Mixed Finite-Element Model for Statics of Angle-Ply Laminates, *International Journal for Numerical Methods in Engineering*, Volume 57 (12): pp 1695-1716, 2003.

**Eldho T.I.,**

Remediation of Contaminated Groundwater – Scope of Onsite Pump and Treat Technology, *Institution of Engineers India – Civil Engineering Journal*, Volume 84, pp 11-17, 2003.

**Eldho T.I.** and Singh A.K.,

'Cultivating Water', *Times Agriculture Journal*, pp 26-29, 2003.

**Eldho T.I.,**

'Sustainable Development Through Integrated Watershed Management', *UPDATE*, IIT Bombay Newsletter, IRCC No 1, pp 11-14, 2003.

Gurumoorthy C. and **Singh D.N.,**

Experimental Methodology to Assess Contaminant Diffusion in Rock Mass, *Journal of Environmental Monitoring and Assessment*, Volume 91, pp 277-291, 2004.

Huggi V.P. and **Rastogi A.K.,**

Estimation of Solute Transport Parameters of Groundwater Systems using Genetic Algorithm, *Water and Energy International*, Volume 60, No 4, pp 38-45, 2003.

Joshi S., **Mukherjee A.** and Schmauder, S.,

Exact Solutions for Electro-Elastically Graded Materials, *Computational Materials Science*, Volume 28 (3-4), pp 548-555, 2003.

Joshi S., **Mukherjee A.** and Schmauder S.,

Exact Solutions for Characterization of Electro-Elastically Graded Materials, *Smart Materials and Structures*, Volume 28, pp 548-555, 2003.

Joshi S., **Mukherjee A.** and Schmauder S.,

Numerical Characterization of Functionally Graded Active Materials under Electrical and Thermal Fields, *Smart Materials and Structures*, Volume 12, pp 571-579, 2003.

Krishnaiah S. and **Singh D.N.,**

A Methodology to Determine Soil Moisture Movement Due to Thermal Gradients, *Journal of Experimental Thermal and Fluid Science*, Volume 27(6), pp 715-721, 2003.

Krishnaiah S. and **Singh D.N.,**

A Device for Determination of Thermal Properties of Soil, *Journal of Testing and Evaluation*, ASTM, Volume 32(2), pp 1-6, 2004.

Kulkarni J.A. and **Jangid R.S.,**

Effects of Superstructure Flexibility on the Response of Base-isolated Structures, *Shock and Vibration*, USA, Volume 10, pp 1-13, 2003.

**Kulkarni M.N.,** Rai D, Pillai P. and Tomar V.S.,

Establishment of a GPS Permanent Ref. Station at Dept. of Civil Engg., IIT Bombay, India, *Acta Geodetica Geophysica, Journal of Hungarian Academy of Sciences*, Volume 39(1), pp 55-59, 2004.

**Kulkarni M.N.,** Likhari S., Tomar V.S. and Pillai P.,

Preliminary Results of the GPS Studies for the January 2001 Gujarat Earthquake, *Survey Review Journal*, Volume 37(292), April, 2004.

Kulkarni S.C., **Desai Y.M., Kant T.,** Reddy G.R., Parulekar Y. and Vaze, K.K.,

Uniaxial and Biaxial Ratcheting Study of SA333 Gr.6 Steel at Room Temperature, *International Journal of Pressure Vessels and Piping*, Volume 80, No 3, pp179-185, 2003.

Kunde M.C. and **Jangid R.S.**,  
Seismic Behaviour of Isolated Bridges: A state-of-the-art Review, *Electronic Journal of Structural Engineering*, Volume 3, pp 140-170, 2003.

Mahadik A.S. and **Jangid R.S.**,  
Active Control of Offshore Jacket Platforms”, *International Shipbuilding Progress*, Volume 50, pp 277-295, 2003.

Matsagar V.A. and **Jangid R.S.**,  
Seismic Response of Base-isolated Structures during Impact with Adjacent Structures”, *Engineering Structures*, Volume 25, pp 1311-1323, 2003.

Mohan B.K., Kadam S.U. and **Rao E.P.**,  
Segmentation of High Resolution Imagery, *GIS Development, The Asian GIS Monthly*, Volume 7, No 11, 2003.

**Mukherjee A.**, Bakis C.E. and Boothby T.E., Maitra S.R. and Joshi M.V.,  
Mechanical Behavior of FRP Wrapped Concrete - Complicating Effects, *ASCE Journal of Composites in Construction*, Volume 8 (2), pp 97-103, 2004.

**Mukherjee A.**, Joshi S. P. and Gradientless A.,  
Technique for Optimal Distribution of Piezoelectric Material for Structural Control, *International Journal of Numerical Methods in Engineering*, Volume 57, pp 1737-1753, 2003.

Pal S.C., **Mukherjee A.** and Pathak S.R.,  
Corrosion Behavior of Reinforcement in Slag Concrete, *Indian Concrete Journal*, pp 87-91, February 2004.

Pal S.C., **Mukherjee A.** and Pathak S.R.,  
Investigation of Hydraulic Activity of GGBFS in Concrete, *Cement and Concrete Research*, Volume 33, pp 1481-1486, 2003.

**Pani B.S.** and Patil L.G.,  
Discussion of an Experimental Study on Turbulent Circular Wall Jets, Adrian Wing-Keung Law and Herlina, *Journal of Hydraulic Engg.*, ASCE, Volume 129(9), pp 738-740, 2003.

Pansare A.P. and **Jangid R.S.**,  
Tuned Mass Dampers for Torsionally Coupled Systems”, *Wind and Structures*, Volume 6, pp 23-40, 2003.

Patil S., **Rastogi A.K.**, Mahajan S.P. and Li C.W.,  
Transport of Pollutants in Open Channels with Short Waves, *Journal of Environmental Fluid Mechanics*, Volume 3(3), pp 235-248, 2003.

Rajeev K.P. and **Singh D.N.**,  
Instrumentation and Testing Methodology for Detecting Contaminants in Soils, *Journal of Testing and Evaluation*, ASTM, Volume 32(2), pp 39-45, 2004.

Ramtekkar G.S., **Desai Y.M.** and Shah A.H.,  
Application of a Three-Dimensional Mixed Finite Element model to the Flexure of Sandwich Plate, *Computers & Structures*, Volume 81, No 22-23, pp 2183-2198, 2003.

**Rao B.V.** and **Eldho T.I.**,  
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Rao K. and **Desai Y.M.**,  
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Rohini K. and **Singh D.N.**,  
A Methodology for Determination of Electrical Properties of Soils, *Journal of Testing and Evaluation*, ASTM, Volume 32(1), pp 62-68, 2004.

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The Seismic Response of Elevated Liquid Storage Tanks Isolated by Lead-rubber Bearings, *Bulletin of the New Zealand National Society for Earthquake Engineering*, Volume 36, pp 141-164, 2003.

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Sreedeeep S. and **Singh D.N.**,  
Laboratory Measurement of Soil Suction, *Indian Geotechnical Journal*, Volume 33(3), pp 279-290, 2003.

Suresh Kumar N. and **Pani B.S.**,  
Tapered Flocculation with Hydraulic Jets, *Journal of Indian Water Works Association*, Volume XXXV(3), pp 167-172, 2003.

**Tom V.M.** and Mohan S.,  
Simultaneous Route and Frequency Coded GA Model for Transit Route Network Design, *Journal of Transportation Engineering*, ASCE, Volume 129(2), pp 186-195, 2003.

Tongaonkar N.P. and **Jangid R.S.**,  
Seismic Response of Isolated Bridges with Soil-Structure-Interaction, *Soil Dynamics and Earthquake Engineering*, Volume 23, pp 287-302, 2003.

Varia H.R. and **Dhingra S.L.**,  
Dynamic User Equilibrium Traffic Assignment on Congested Multidestination Network, *Journal of Transportation Engineering*, ASCE, Volume 130, No 2, pp 211-221, 2003.

**Viswanadham B.V.S.** and Kahachane S.C.,  
Centrifuge Modeling of Drains for Landslide Stabilization, *Landslide Disaster - Assessment and Monitoring* (Ed. R. Nagarajan) pp 278-283, 2004.

Witthüiser K., Arnepalli D. and **Singh D.N.**,  
Determination of Diffusion Characteristics of the Rock Mass, *Indian Geotechnical Journal*, Volume 34(1), pp 96-105, 2004.

### **Conference Papers**

Arur M.G. and **Kulkarni M.N.**,  
Role of GPS & GIS in Implementation of National Mapping Policy, *International Conference of Indian National Cartographic Association*, Dehradun, 2003.

Bhargava A., Hirway S. and **Kulkarni M.N.**,  
High Capacity Bus System with GPS-GIS Integrated System, *International Conference Map India-2004*, N. Delhi, 2004.

Bhajantri M.R., **Eldho T.I.** and Deolalikar P.B.,  
Challenges in Numerical Simulation of Free Surface Flow Over Spillway, *30<sup>th</sup> National Conference on Fluid Mechanics and Fluid Power*, NIT Surathkal, Karnataka, 2003.

Bindu M., **Dhingra S.L.** and **Tom V.M.**,  
A New Activity Diary Format Design in the Context of Developing Countries, *Proceedings of the international conference on Transportation systems planning and operation*, IIT Madras, February 18-22, 2004.

Bindu M., **Dhingra S.L.** and **Tom V.M.**,

A New Activity Diary Format Design in the Context of Developing Cities, *International Conference on Transportation Systems Planning and Operation*, IIT Madras, February 18-22, 2004.

**Desai Y.M., Kant T.,** Kulkarni S.C., Reddy G.R., Vaze K.K., Kushwaha H.S., Gupta C. and Chakravarthy J.K.,

Development of GUI Based Software Package for Elasto-Plastic Static and Dynamic Analysis of Piping Systems, *Proc. Technical Programme Discussion Meeting of BRNS Projects (TPDM-2004)*, BARC, Mumbai, 2004.

Deshmukh A.G., Rao E.P. and **Eldho T.I.,**

Surface Runoff Estimation using Remote sensing, GIS and SCS Method, *International Conference on Advanced Modeling Techniques for Sustainable Management of Water Resources*, NIT Warangal, 2004.

Deshmukh A.G., **Rao E.P.** and **Eldho T.I.,**

Surface Runoff Estimation using Remote Sensing, GIS and SCS Method, *Proceedings of International Conference on Advanced Modelling Techniques for Sustainable Management of Water resources (AMTSMW – 2004)*, Warangal, 2004.

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**Dhingra S.L.,** Sancheti S. and Maheshwari S.,

Economic Feasibility of High Capacity Bus Corridor System for Mumbai City, *2<sup>nd</sup> International Gulf Conference on Road*, Abu Dhabi, 2004.

**Dhingra S.L.,** Sancheti S. and Jayalaxmi U.,

Comparative Evaluation of Economic Analysis Models”, *2<sup>nd</sup> International Gulf Conference on Road*, Abu Dhabi, 2004.

**Dhingra S.L.,** Maheshwari S., Bhargava A. and Mishra S.,

Evaluation of Traffic Management Option for a Small Network Using SATURN and TRANSYT Software Packages, *International Conference on Transportation System*, IIT Madras, February 18-20, 2004.

**Dhingra S.L.** and Maheshwari S.,

Methodology of Environmental Impact Assessment for Transportation Projects, *National Seminar on Environmental Pollution*, CRRRI New Delhi, 2003.

**Dhingra S.L.,**

EIA Methodology for Sustainable Transport, *Key Note Paper at National Conference on Urban Air Pollution: Issues & Management*, NIT Surat, 2003.

**Dhingra S.L.,**

Relevance and Method of Economic Analysis of Rural Roads, *Seminar on Integrated Development of Rural and Arterial Road Network for Socio-Economic Growth*, IRC, New Delhi, pp I-187-208, 2003.



**Dhingra S.L.,**

Environmental Impact Assessment for Sustainable Transport, *Key Note Paper at National Conference on Urban Transport and the Environment*, K.L.E. Society's College of Engineering Belgaum, 2003.

**Dhingra S.L.,**

Problems and Issues with Asphalt Pavements, *One Day Seminar on What Ails Asphalt Roads, The Institution of Engineers (I)*, Mumbai, 2003.

**Dhingra S.L.,**

Planning for an Eco-friendly Integrated Urban Mass Transit System, *2<sup>nd</sup> IUT Annual Congress on Integrated Mass Transit System*, New Delhi, 2004.

**Dhingra S.L.,**

Master Plan for Metro Project, *ASCI-Harvard Workshop on Transportation, Land Use and Environment: Integrated Planning for Indian Cities*, Administrative Staff College of India, Hyderabad, 2004.

**Dhingra S.L.,**

EIA for Sustainable Transport, *Key Note Speaker at National Seminar on Strategies in Traffic Engineering and Management*, M. S. Ramaiah Institute of Technology, Bangalore, 2004.

**Dhingra S.L.,**

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Dodagoudar G.R. and **Venkatachalam G.,**

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**Eldho T.I.,**

Groundwater Pollution In-situ Remediation/Bioremediation Using Circulation Wells, *National Conference on Advances in Environmental Science and Engineering*, December 8-9, 2003.

**Eldho T.I.,**

Integrated Watershed Management and Water Harvesting for Sustainable Development, Jal Sangrah Shibir, *A National Seminar & Workshop on Rainwater Harvesting*, Proceeding in CD form, IT Bombay, December 6-7, 2003.

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Rainwater Harvesting in the Urban Environment, "Jal Sangrah Shibir", *A National Seminar & Workshop on Rainwater Harvesting*, Proceeding in CD for, IIT Bombay, December 6-7, 2003.

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Application of Cellular Automation in Traffic Flow Modeling, *Proceedings of the International Conference on Transportation Systems Planning and Operation*, Chennai, 2004.

Gupta S. and **Tom V.M.**,  
Financial Evaluation of Road Projects under BOT Scheme in Developing Countries, *83rd Annual Meeting of Transportation Research Board*, Washington DC, January 11-15, 2004.

**Gupta Kapil**,  
An Early Warning System for Improving Resiliency of Transport Systems in Urban Areas during Natural Disasters, *Proceedings, World Congress on Natural Disaster Mitigation*, New Delhi, pp 529-532, 2004.

**Gupta Kapil**,  
Urban Drainage and Flooding Issues in India, *presented at WAPUG (Wastewater Planning Users Group) Spring Meeting 2003, Birmingham, England, U.K.*, Volume 14, 2003.

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A New Approach to Model Contaminant Diffusion Through the Fractured Rock Mass, *International e-Conference*, IIT Madras, Chennai, 2003.

Gurumoorthy C. and **Singh D.N.**,  
A Methodology to Evaluate the Diffusion Coefficient of Radionuclides through Rock Mass in a Short Experimental Duration, *WW'04 Conference*, Tucson AZ., USA, February 29 – March 4, 2004.

**Jangid R.S.**,  
Base isolation for retrofitting of structures, *Workshop on Retrofitting of Structures*, Roorkee, pp 215-226, October 10-11, 2003.

**Jangid R.S.**,  
Optimum Isolator Characteristics under Near-fault Motions, *Response of Structures to Extreme Loadings*, Toronto, Paper No. O107, August 3-6, 2003.

**Kant T.**,  
Analytical Models for Thermal Stress Evaluations in Composite and Sandwich Laminates, in *Thermal Stresses '03*, L. Librescu and P. Marzocca (Editors), *Proc.5<sup>th</sup> International Congress on Thermal Stresses and Related Topics* (Thermal Stresses '03), VPISU, Blacksburg, pp MA-10-1-1:4, 2003.

**Kant T.**,  
Advances in Analytical and Computational Solid and Structural Mechanics, Invited Talk, *Proc. Structural Engineering Convention – 2003* (SEC-2003), Indian Institute of Technology Kharagpur, 2003.

**Kant T.**,

Progress in Mechanics of Laminated Composites, Invited Talk, *Proc. 48<sup>th</sup> Congress of the Indian Society of Theoretical and Applied Mechanics– An International Meet (48<sup>th</sup> ISTAM)*, Birla Institute of Technology, Mesra (Ranchi), 2003.

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**Kulkarni M.N.**,

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Mishra S.K., Jain M.K., **Rastogi A.K.** and Singh V.P.,

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Characterization of Ground Granulated Blast Furnace Slag as Partial Cement Replacement in Concrete. *The International Conference CONMAT-2003*, IIT Kharagpur, 2003.

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**Rao K.G.,**

Spatially Distributed Approaches in Sediment Yield Modeling, *National Seminar on GIS Applications in Disaster Management*, NIRD, Hyderabad, 2004.

**Rao K.V.K. and Kumar M.,**

Discrete Choice Models for Location and Travel in the Context of Developing Countries, *Proceedings (CD-ROM) of the 8<sup>th</sup> International Conference on Computers in Urban Planning and Urban Management*, Sendai, Japan, 2003.

**Rao K.V.K.,**

An Invited Talk on Master Plan for Mumbai Metro, National Seminar on *Strategies in Traffic Engineering and Management (STEM04)*, Bangalore, February 16-17, 2004.

**Rastogi A.K. and Mishra S.K.,**

Numerical Modeling of Groundwater Systems – Key Note Paper–in Groundwater Pollution, *Proc. International Conference on Water and Environment 2003*, pp 141-157, Bhopal, December 15-18, 2003.

**Rastogi A.K.,**

Importance of Groundwater Models as Tools for Effective Water Management – Key Note Paper – *Proc. Of the First International Conference on the Solutions of Water Shortage and Instream Flow Problems in Asia*, Incheon, South Korea, pp 99-121, November 17-19, 2003.

**Rastogi A.K. and Ukrande S.K.,**

Diffused Sea-fresh Water Zone Simulation and Strategies to Check its Growth in Confined Coastal Aquifers – *Prof. International Congress on Coastal Aquifer, Intrusion Technology: Mediterranean Countries (TIAC' 03)* Volume 1, pp 507-512, Alicante, Spain, March 11-14, 2003.

Rastogi R. and **Krishna Rao K.V.,**

Identifying Policies for Promoting Non-Motorised Access Modes, *Proceedings of the International Conference on Transportation Systems Planning and Operation*, IIT Madras, Chennai, pp 121-130, 2004

Rastogi R. and **Krishna Rao K.V.,**

Identifying Policies for Promoting Non-motorised Access Modes, *Proceedings of the International Conference on Transportation systems Planning and Operation*, IIT Madras, pp 121-130, 2004.

Reshmidevi T.V. and **Gupta Kapil**,

Hydraulic Design of a Wetland for Industrial Wastewater Treatment, *National Conference on Advances in Environmental Science and Engineering*, IIT Bombay, 2003.

Satish V.S.K., Ukkusuri, **Tom V.M.** and Travis Waller,

Robust Optimization with Traffic Assignment under Demand Uncertainty, *Institute of Operations Research and Management Sciences (INFORMS) Annual Meeting*, Atlanta, October 19-22, 2003.

Shah P.H. and **Singh D.N.**,

Electrical Properties of Dry Soils, Indian Geotechnical Conference, Roorkee, pp 17-20, 2003.

Sharique M. and **Eldho T.I.**,

Hydrodynamics Simulation of Estuaries Using Finite Element Methods, *HYDRO-2003, National Conference*, CWPRS, Pune, 2003.

Singh A.L., Nestmann F. and **Eldho T.I.**,

Anas Catchment – Sharing the Successful Experiences of Integrated Water Management, *First Int. Conference on Hydrology & Water Resources in Asia Pacific Region*, Kyoto, Japan, pp 306-311, March 13-15, 2003.

Singh A.K., Nestmann F. and **Eldho T.I.**,

Watershed Modelling and Assessment for Water Security in a Small Watershed, India, *Third World Water Forum*, Kyoto, Japan, March 16-22, 2003.

Singh A.K. and **Eldho T.I.**,

Water Conservation through Integrated Watershed Management Approach, *8<sup>th</sup> Int. Conference*, IWWA, Mumbai, pp 128-137, September 13-14, 2003.

Singh A.K., Nestmann F. and **Eldho T.I.**,

Estimating Hydrological Parameters for Anas Catchment from Watershed Characteristics, *Intern. Conf. on Advanced Modeling Techniques for Sustainable Management of Water Resources*, NIT Warangal, 2004.

Singh A.K. and **Eldho T.I.**,

Water Conservation through Integrated Watershed Management Approach, *8<sup>th</sup> International Conference*, IWWA, Mumbai, pp 128-137, September 13-14, 2003.

Sreedeeep S., Berton C., Moronnoz T. and **Singh D.N.**,

Centrifuge and Numerical Modeling of Contaminant Transport Through the Unsaturated Silty Soil, *ISSMGE International Conference on Experimental Evidence towards Numerical Modelling of Unsaturated Soils*, Bauhaus Universitat Weimar, September 18-19, 2003.

Sreedeeep S., Thakur V.K.S. and **Singh D.N.**,

Fabrication of a Pore Solution Extractor for Assessing Soil Contamination, *International e-*

Conference, IIT Madras, Chennai, 2003.

**Tom V.M.,**

Combined Traffic Assignment and Signal Control, *Proceedings of the International Conference on Transportation Systems Planning and Operation*, Chennai, pp 631-640, February 18-20, 2004.

Ukarande S.K. and **Rastogi A.K.,**

Modeling of Sea Water Intrusion in Multilayered Coastal Aquifers, *Proc. 2<sup>nd</sup> International Conference on Water Quality Management*, Part II, CBIP, New Delhi, pp 12-25, February 13-15, 2003.

**Venkatachalam G.,** Dodagoudar G.R. and Quadri S.S.,

Landslide Hazard and Risk Assessment using Fuzzy Sets, *Proc. Intl. Conf. N Geo-environmental Engineering*, Singapore, pp 235-242, December 2003.

**Venkatachalam G.,**

Remote Sensing and GIS Techniques in Landslide Studies, *Key Note Paper, Proc. IGC 2003*, Volume 2, pp 761-770, 2003.

**Venkatachalam G.,**

Application of GIS Principles in Modeling of Landslides, *ASCE International Conf. On Earth & Space*, Houston, March 2004.

**Venkatachalam G.** and Dodagoudar G.R.,

Fuzzy Reliability Analysis in Landslide Hazard Mitigation – Two Case Studies Key Note Paper presented at ASCE International Conf. On Earth & Space, Houston, March 2004.

Verma A. and **Dhingra S.L.,**

Planning for an Integrated Urban Mass Transit System in GIS Environment, 7<sup>th</sup> Annual International Conference "Map India 2004" New Delhi, 2004.

**Viswanadham B.V.S.,**

Centrifuge Modeling of Clay Liners of Landfills, *12th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering*, Singapore, 2003.

**Viswanadham B.V.S.,**

Centrifuge Modeling of Liner Systems of Landfills, *12th Asian Regional Conf. on Soil Mechanics and Geotechnical Engineering*, Singapore, 2003.

**Viswanadham B.V.S.,**

Geosynthetics for Road Infrastructure Development, *Proc. Int. Conf. on Role of Plastics and Polymers in Infrastructure development*, Indian Plastic Institute, Mumbai, pp 93-100, 2003.

### **Honorary Works**

**Eldho T.I.,**

Technical Committee Member for National Conference on Integrated Water Resources Planning & Management, BITS Pilani, 2003.

Technical & Organizing Committee member of 2 days workshop “Jal Sangrah Shibir”, A National Seminar & Workshop on Rainwater Harvesting, IIT Bombay. Also member of the team which produced a CD on Water Harvesting, 2003.

Reviewer for Int. Journal of Water, Air and Soil Pollution, Journal Institution of Engineers India (Civil Engineering Section), Journal of Indian Association of Hydrologists, Journal of Spatial Hydrology (Electronic Journal)

**Gupta Kapil,**

External Referee for Ph.D. Thesis, University of Rajasthan, Jaipur

Referee for BTNA Project on “Design Basis Flood for Nuclear Power Plant”.

Member of three International Working Groups of the IAHR/IWA Joint Committee on Urban Drainage:

Sewer Systems and Processes Working Group (SS&PWG)

Urban Rainfall Group (URG)

Technology, Exchange, Transfer and Training Working Group (TETTWG)

Member, National Urban Infrastructure Committee, Indian Buildings Congress, New Delhi

Member, Expert Committee appointed by High Court of Mumbai to look into the Flooding Aspects at CST International Airport, Mumbai.

Member, Expert Committee, Mumbai Disaster Management Plan, BMC, Mumbai

Member, Task Force Committee for Planning Wastewater Disposal in IITB

**Jangid R.S.,**

Reviewer for research papers of ASCE Journal of Engineering Mechanics, Earthquake Engineering and Structural Dynamics, Journal of Sound and Vibration, Structural Engineering and Mechanics, Advances in Structural Engineering-An International Journal, Engineering Structures, Sadhana

**Kant T.,**

Elected a "Fellow of Indian Academy of Sciences" in 2003.

Founder: Indian Association for Structural Engineering and Indian Association for Computational Mechanics;

Fellow: Indian National Academy of Engineering (INAE), The Institution of Engineers (IE) and The Aeronautical Society of India (AeSI);

Reviewer: International Journal for Numerical Methods in Engineering, Journal of Sound and Vibration, Engineering Computations-An International Journal, Mechanics of Composite Materials and Structures; Editorial Board Member: Structural Engineering and Mechanics-An International Journal;

Member: Building and Works Committee of the National Institute of Industrial Engineering Bombay, AERB Committee on Safety Research Projects, Faculty Selection Committees of IISc-Bangalore and

Scientists Selection Committee of SERC-Madras, NBA accreditation teams.

**Rao E.P.,**

Participated in International Conference on Advanced Modelling Techniques for Sustainable Management of Water Resources (AMTSMS-2004) at National Institute of Technology, Warangal, January 28-30, 2004 and Chaired a Session on Hydrological Analysis.

**Rao K.V.K.,**



Appointed as member, Rigid Pavements Committee of IRC  
Reviewed papers submitted to Institution of Engineers (India) Journal, Indian Roads Congress Journals, Indian Geotechnical Journal, International Conferences.

**Kulkarni M.N.,**

Member, Editorial Board, Survey Review International Journal, UK, (from March 2001)

Referee for review of papers for journals: Survey Review, Current Science, GIS at Development, NISCAR Journal, GPS World, Indian Surveyor, Journal of Institution of Surveyors.

Member of National Expert Committee on GPS, DST, Govt of India (from June 2001), Expert Committee for GPS – GIS based System, Mumbai Police Department (from Feb 2001), Expert Subgroup on Advanced Technology Applications, Natural Resource Development & Management Service, DST, Govt. of India, from 3 Sept. 2001, Member, Assessment & Promotion Committee, IIG, Panvel, Nov., 2003 and NGRI-CSIR, Hyderabad, Nov., 2003, Indian National Science Academy Committee on Geodesy (since Sept., 2003)

**Mukherjee A.,**

Reviewed manuscripts from: ASCE Journal on Composites for Construction, ASCE Journal on Computation in Civil Engineering, Smart Materials and Structures, International Journal of Solids and Structures, Sensors and Actuators A, Journal of Structures and Mechanics, Indian Concrete Journal, and Journal of Institutions of Engineers

**Rao K.G.,**

Examiner, Ph.D. Thesis and M.Tech. Dissertation JNPTU Hyderabad.

**Singh D.N.,**

Co-Editor, Indian Geotechnical Journal

Reviewer of FUEL, Reviewer, Journal of Korean Geotechnical Society, Reviewer, Journal of Civil Engineering, The Institution of Engineers (India).

Expert TIFAC-CORE, Mission REACH, for the CORE on Disaster Mitigation, at IIT Roorkee

Post-Doctoral Supervision: Dr. Kai Witusser, Lecturer, Geological Institute, University of Bonn, Germany, (from 1.4.2003 to 31<sup>st</sup> July 2003, under DAAD fellowship scheme)

**Tom V.M.,**

Coordinator for the development of the Web based NPTEL course.

**Venkatachalam G.,**

Delivered key note lectures at IGC-2003, Roorkee and ASCE International Conference Earth & Space 2004.

Examiner for Ph. D. Thesis from IISc Bangalore, REC Warangal and IIT Roorkee.

Member, Accreditation Committees, National Board of Accreditation, AICTE.

Expert Member and Coordinator, AICTE Project on Model Curriculum in Civil Engineering.

Member, Tripartite Awards Committee, Directorate General Factory Advice Service and Labour Institutes, Ministry of Labour.

Member, Sub-Committee on Reviewing Norms for Vishwakarma Award for Innovation in Industry.

Expert Member, Technology Leadership Evaluation Program, L & T, Mumbai

**Viswanadham B.V.S.,**

Member of Technical Committee TC2 of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE) on centrifuge testing representing India, Member of Institute Scholarship Committee since 2003.

**Invited Lectures**

**Prof. S.L. Dhingra** delivered key-note/invited speech at conferences/workshops at many institutions like, NIT Bhopal, NIT Calicut, NIT Surat, MSU Baroda, NATPAC Cochin, K.L.E. Society's College of Engineering Belgaum, M. S. Ramaiah Institute of Technology Bangalore.

**Prof. T.I. Eldho** delivered a lecture on "Sustainable Development through Integrated Watershed Management & Rainwater Harvesting", at Maharashtra Nature Park, Dharavi, Mumbai, 2003.

**Prof. T.I. Eldho** delivered a lecture on 'Rainwater Harvesting in Urban and Industrial Environment', at Workshop organized by Naik-Enviro Group, Mumbai, 2003.

**Prof. T.I. Eldho** delivered a lecture on 'Integrated Watershed Management & Rainwater Harvesting for Sustainable Development', at Seminar organized by Everything About Water, Mumbai, 2003.

**Prof. T.I. Eldho** delivered a lecture on 'Sustainable Development through Integrated Watershed Management', at Seminar organized by Group for Rural Activities, IIT Bombay, Alumni Meeting, 2003.

**Prof. T.I. Eldho** delivered a lecture on 'Rain Water Harvesting in the Urban Areas for Industrial Use', at Seminar organized by Indian Chemical Manufacturers Association, World Trade Center, Mumbai, 2003.

**Prof. T.I. Eldho** delivered a lecture on "Jal Sangrah Shibir", A Workshop on Rainwater Harvesting, IIT Bombay titled "Integrated Watershed Management and Water Harvesting for Sustainable Development", 2003.

**Prof. T.I. Eldho** delivered a lecture at AICTE Short-term on Rainwater Harvesting course for Engineering College teachers organized by School of Engineering, Cochin University, titled "Integrated Watershed Management Approach", 2004.

**Prof. T.I. Eldho** delivered a lecture at AICTE Short-term course on Rain Water Harvesting for Engineering College teachers organized by School of Engineering, Cochin University, titled "Urban Rainwater Harvesting", 2004.

**Prof. T.I. Eldho** delivered a lecture on AICTE Short-term course on Rain Water Harvesting for Engineering College teachers organized by School of Engineering, Cochin University, titled "Integrated Watershed Modeling", 2004.

**Prof. T.I. Eldho** delivered a lecture on AICTE Short-term course on Rain Water Harvesting for Engineering College teachers organized by School of Engineering, Cochin University, titled “Interlinking of Indian Rivers”, 2004.

**Prof. K. Gopal Rao** delivered Guest lectures on Photogrammetry and 2) Remote Sensing. AICTE-ISTE Short Term Course: 9<sup>th</sup> to 21<sup>st</sup> June, 2003, at Department of Civil Engineering, College of Engineering, Karad, Maharashtra.

**Prof. K. Gopal Rao** delivered a talk on Spatial Information System Approach in Modelling of Landslides at: Indian Geo-Technical Society (IGS) Mumbai Chapter: National Seminar on Slope Stability Studies, Institute of Engineers (India), Haji Ali, Bombay, July 6, 2003.

**Prof.K.Gopal Rao** delivered a lecture at Karl Terzaghi Memorial Workshop on Geotechnical Issues of Konkan Region, Konkan Railway Corporation Ltd., Belapur, Navi Mumbai, Modelling of Landslides: A Spatial (Geographic) Information System Approach and Participated in the Panel Discussion, October 2, 2003.

**Prof. K. Gopal Rao** delivered Guest Lectures on Digital Analysis of Remotely Sensed Data. Training Programme, National Water Academy (NWA) Khadakwasla, PUNE. 13th Feb. 2003 and 9th January, 2004.

**Prof. K. Gopal Rao** delivered lectures in DST Sponsored Training Program on Global Positioning System on a) Introduction to remote Sensing, b) Introduction to Geographic Information Systems during 6 - 10 May, 2003

**Prof. Kapil Gupta** delivered a lecture on “Role of Hospitals in Disaster Management”, Ninth Annual Scientific Meet, Lokmanya Tilak Municipal Hospital and Medical College, Mumbai, March 21, 2003.

**Prof. Kapil Gupta** delivered lectures for the course Planning, Design, Construction and Maintenance of Rural Roads, organized by Prof. S.L. Dhingra.

**Prof.K.V.Krishna Rao** delivered an invited lecture on *Master Plan for Mumbai Metro* in National Seminar on *Strategies in Traffic Engineering and Management* (STEM04) held during at M.S. Ramaiah Institute of Technology, Bangalore, 2004.

**Prof. M.N. Kulkarni** delivered a lecture on Advances in Space Technology, Orientation Programme, IIT Bombay, 2003

**Prof. M.N. Kulkarni** delivered a lecture on GPS & Its Applications, Research Scholars’ Forum, IIT Bombay, 2003

**Prof. M.N. Kulkarni** delivered a lecture on GPS & Its Applications, VNIT, Nagpur, 2004

**Prof. M.N. Kulkarni** delivered a lecture on GPS & Its Application, MIT, Pune, 2004

**Prof. A. Mukherjee** delivered Lecture series on Application of Fiber Reinforced Composite Materials in Structures at Delhi, Kolkata, Bangalore, Hyderabad, Chennai, Ahmedabad, Sponsored by Fosroc (I) Ltd., 2003-2004.

**Prof. A. Mukherjee** delivered Lecture on Fiber Reinforced Composites in Transportation Structures at Central Road Research Institute, New Delhi, on February 17, 2004

**Prof. A. Mukherjee** delivered Lecture on Modern Materials in Concrete at Indian Railways Seminar on advanced Topics, January 12, 2004

**Prof. A. Mukherjee** delivered Lecture on Smart Piezoelectric Materials at AICTE Seminar on Mechatronics, Vidyavardhinis College of Engg, Vasai, January 1, 2004.

**Prof. A. Mukherjee** delivered Lecture on Fiber Reinforced Composites in Structures at Seminar on Modern Materials and Techniques in Civil Engineering, UICT, Mumbai, January 3, 2004.

**Prof. A. Mukherjee** delivered Lecture on Fiber Reinforced Composites in Transportation Structures, at IRC, January 15, 2004.

**Prof. A. Mukherjee** delivered Lecture on Modelling Functionally Gradient Materials at International Workshop on Multiscale Material Modelling, BARC, Mumbai, April 8, 2003

**Prof. A. Mukherjee** delivered Lecture on Upgradation of Structures Using Fiber Reinforced Composites at Bengal Engineering College, Deemed University, Howrah, April 24, 2003.

**Prof. A.K. Rastogi** delivered Key Note Address on Numerical Modelling of Groundwater Systems at the International Conference on Water and Environment (WE 2003), RRL Bhopal, December 2003.

**Prof.A.K.Rastogi** Chaired two sessions on Ground Water Pollution and Water Resources and was on the panel of Experts along with those from USA, France, Italy, Australia and UK.

**Prof.A.K. Rastogi** delivered Key Note Address on Importance of Groundwater Models as Tools for Effective Water Management in the International Conference on the Solutions of Water Shortage and in Stream Flow Problems in Asia, pp 99-121, Incheon Regional Environmental Technology Development Centre, Incheon Korea, November 17-19, 2003.

**Prof. D.N. Singh** delivered lectures for the course Planning, Design, Construction and Maintenance of Rural Roads organized by Prof.S.L.Dhingra.

**Prof. B.V.S. Viswanadham** delivered a lecture entitled "Physical Modelling of Geotechnical Structures" was given to academicians and practicing engineers at the department of Civil Engineering, IIT Chennai on December 4, 2003. The lecture was given as a part of AICTE/QIP short term course organized by IIT Chennai, 2003.

**Prof.B.V.S.Viswanadham** delivered a keynote lecture entitled "Geosynthetics for Infrastructure Development was given during the Int. Conf. on Role of Plastics and Polymers in Infrastructure Development organized by Indian Plastic Institute, 2003.

## Specializations of the Faculty

**N.K. Bairagi**, PhD (IIT Bombay)

*Professor*

Structural engineering: Elastic shells, Recycled aggregate concrete, Twisted reinforcements.

**K.M. Bajoria**, PhD (Cambridge)

*Assistant Professor*

Structural engineering: Computer aided design, Non-linear analysis, Nuclear structures.

**P. Banerji**, PhD (Berkeley)

*Professor*

Structural engineering: Earthquake analysis, Risk assessment, Artificial neural networks, Nuclear structures.

**D.N. Buragohain**, PhD (IIT Bombay)

*Professor (on lien)*

Structural engineering

**V.S. Chandrasekaran**, PhD (Liverpool)

*Professor*

Geotechnical engineering: Soil-structure interaction, Offshore Foundations, Centrifuge modelling.

**D. Choudhury**, PhD (IISc Bangalore)

*Assistant Professor*

Geotechnical engineering: Earth retaining structures, Slope Stability, Anchor, Pile, Bearing capacity problems, Fundamentals of soil behaviour for fine grained soils, DDL theory.

**M.C. Deo**, PhD (IIT Bombay)

*Professor*

Off-shore Engineering, Wave hydrodynamics, Analysis of random data, Neural networks and Statistical analysis.

**Y.M. Desai**, PhD (Manitoba)

*Associate Professor*

Structural engineering: Wind induced vibrations, Computational mechanics, Nonlinear analysis, Finite elements, Parallel computing, Fibre reinforced polymer composites, Composites in construction.

**D.M. Dewaikar**, PhD (IIT Bombay)

*Professor*

Geotechnical engineering: Offshore foundations, Ground improvement, Seepage.

**S.L. Dhingra**, PhD (IIT Kanpur)

*Professor*

Transportation Systems Engineering: Modelling, Simulation, Economics, Environmental Impact Assessment, GIS, Expert systems, Artificial intelligence, Genetic algorithms, Fuzzy Set theory.

**T.I. Eldho**, PhD (IIT Bombay)

*Assistant Professor*

Water resources engineering: Groundwater flow, pollutant transport, remediation – numerical & experimental investigations Computational fluid dynamics – Incompressible viscous flows, shallow water flow, estuary dynamics, pollutant transport Watershed management – applications of numerical models, Geographical Information Systems, Remote sensing.

**K. Gopal Rao**, PhD (IIT Bombay)

*Professor*

Surveying and remote sensing, Digital Analysis and modelling, GIS, Decision support systems, Software development.

**Alok Goyal**, PhD (Berkeley)

*Professor*

Structural engineering: Base isolation systems and energy absorbing devices, Earthquake analysis and design, Liquid storage tanks, Bridges, Vibration control of structures, Service life assessment of buildings.

**S. Ghosh**, Ph.D (Michigan)

*Assistant Professor*

Structural engineering: Performance-Based Seismic Design, Reliability-Based Seismic Design, Plastic Design of Steel Structures, Life Cycle Cost Analysis of Buildings.

**Kapil Gupta**, PhD (Sheffield)

*Associate Professor*

Water resources engineering: Urban water supply systems, Urban drainage, Urban water infrastructure management, Flood Protection structures, Computational fluid dynamics, Optimization, Environmental Impact assessment, Water quality analysis and modelling, Constructed Wetlands, Urban Disaster Management.

**R.S. Jangid**, PhD (IIT Delhi)

*Associate Professor*

Structural engineering: Structural mechanics, Structural dynamics and earthquake engineering, earthquake-resistant design, base isolation for a seismic design of structures, seismic isolation of bridges and liquid storage tanks, non-classically damped system.

**Tarun Kant**, PhD (IIT Bombay)

*Professor*

Structural engineering: Solid mechanics, Plates, Shells, Fibre reinforced polymer composite laminates, Higher order theories, Thermal stresses, Transient dynamic techniques, Finite elements, Numerical techniques, Polymer composites in construction, Composite mechanics, Computational mechanics.

**R.K. Katti**, PhD (Iowa)

*Professor Emeritus*  
Geotechnical engineering.

**Madhav N. Kulkarni**, PhD (Ohio State)

*Professor*

Surveying and remote sensing: Global positioning system (GPS), Space geodesy, Geodetic Studies for geodynamics and earthquake monitoring, Mapping, GIS.

**J.N. Mandal**, PhD (IIT Kharagpur)

*Professor*

Geotechnical engineering: Geosynthetics for civil engineering construction.

**R. Misra**, PhD (IISc Bangalore)

*Assistant Professor*

Water resources engineering: Canal automation and control, Contaminant/solute transport, Computational fluid dynamics.

**A. Mukherjee**, PhD (IIT Kharagpur)

*Professor*

Structural engineering: Composite materials, Environmental effects, Artificial neural networks, Artificial intelligence, Fibre reinforced composites.

**S. Narasimhan**, PhD (Iowa)

*Professor Emeritus*

Water resources engineering.

**B.S. Pani**, PhD (Alberta)

*Professor*

Water resources engineering: diffusion of jets and plumes, multiple diffusers, offshore pipelines, scour problems, cooling water structures.

**C.K. Ramesh**, PhD (Leeds)

*Professor Emeritus*

Structural engineering.

**R. Ranganathan**, PhD (IIT Kanpur)

*Professor (Retired)*

Structural engineering: Reliability analysis and design of structures, Structural optimization, Code calibration and establishing safety factors, Fatigue reliability analysis, RCC, Pre-stressed concrete and steel design.

**B.V. Rao**, PhD (IISc Bangalore)

*Professor*

Water resources engineering: Separation control in diverging channels, 3-dimensional flow, Multireservoir systems, Multiaquifer basins, Interbasin transfer.

**C.S. Rao**, PhD (IIT Bombay)

*Associate Professor*

Remote sensing: Image processing, Geodetic adjustment, Non-linear optimization, Field astronomy.

**E.P. Rao** , PhD (IIT Bombay)

*Assistant Professor*

Remote sensing: Remote sensing applications to water resources, Runoff modelling, Water distribution systems optimization.

**K.V. Krishna Rao** , PhD (IIT Madras)

*Associate Professor*

Transportation systems engineering: Travel demand modelling; Evolutionary algorithms, neural networks and GIS in transport planning; Traffic design and analysis.

**A.K. Rastogi**, PhD (Birmingham)

*Professor*

Water resources engineering: Groundwater flow modelling of aquifers, Ground water quality modelling.

**P.K. Sikdar**, PhD (Waterloo)

*Professor (on lien)*

Transportation systems engineering.

**D.N. Singh**, PhD (IIT Kanpur)

*Professor*

Geotechnical engineering: Soil exploration and characterization, Foundation analysis and design, Stability analysis, Environmental geotechnics, Soil contamination detection and modelling, radioactive waste disposal, Solid waste utilization, Geotechnical centrifuge modelling.

**Ravi Sinha**, PhD (Northwestern)

*Professor*

Structural engineering: Earthquake engineering, Vibration control and isolation, Structure rehabilitation and condition monitoring, Disaster management.

**V.M. Tom**, PhD (IIT Madras)

*Assistant Professor*

Transportation Systems Engineering: Traffic flow modeling and simulation, Transportation network optimization, control and management

**G. Venkatachalam**, PhD (Leningrad)

*Professor and Head*

Geotechnical engineering: Finite element analysis, Digital image processing, Digital terrain modelling, Centrifuge, Numerical and GIS modeling of landslides.

**B.V.S. Viswanadham** , PhD (Ruhr)

*Associate Professor*

Geotechnical engineering: Centrifuge modelling, Soil reinforcement, Ground improvement, Environmental geotechnics- waste materials behaviour, waste containment systems.