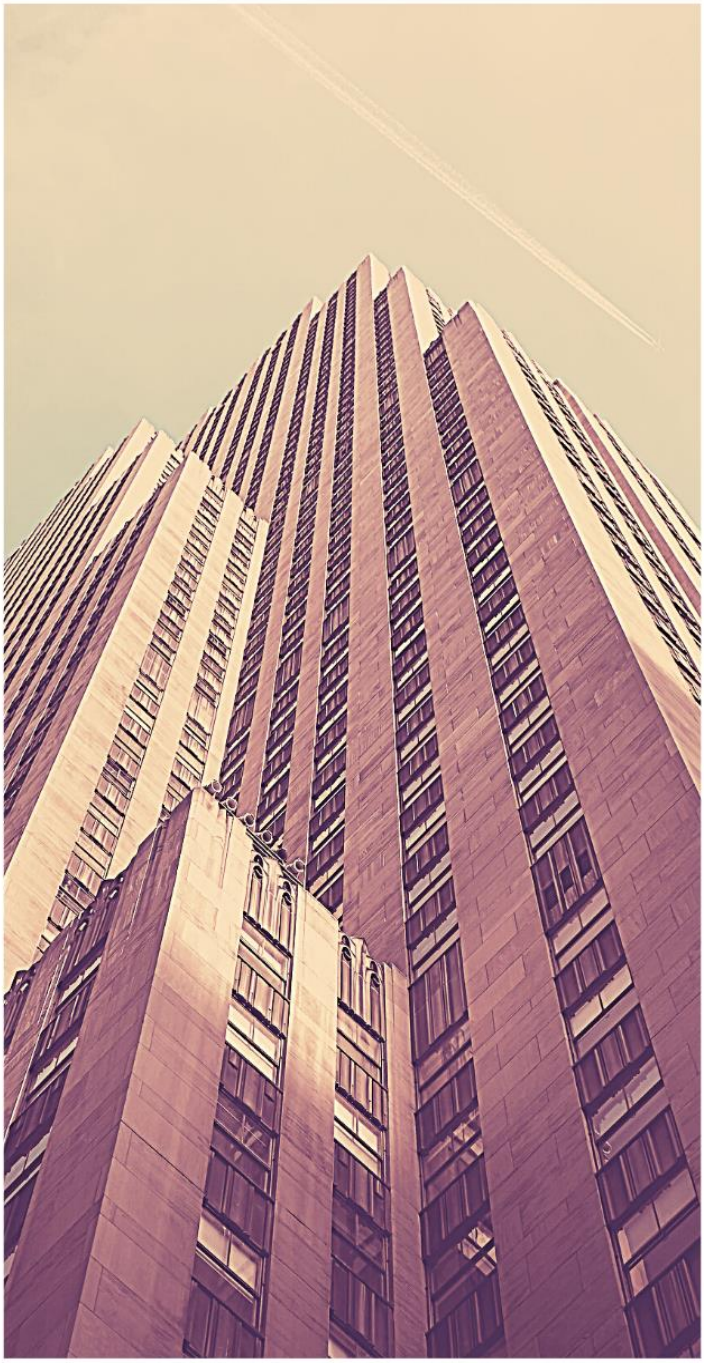

FRESHER'S HANDBOOK

CIVIL ENGINEERING DEPARTMENT

2020-21

Disclaimer

Though the ISCP (Institute Student Companion Program) has taken care while compiling the handbook, neither the council nor the Institute can be held responsible for errors/inadequacies that may have inadvertently crept in. This handbook cannot be used as a basis for making a claim on facilities/concessions/interpretation of rules/statues or the like. If there is some critical information to which the reader of this handbook refers, it is with his or her own responsibility that it is put to use, with cross verification if need be.

Contents

About the Institute

Established in 1958, the second of its kind, IIT Bombay was the first to be set up with foreign assistance. The funds from UNESCO came as Roubles from the then Soviet Union. In 1961 Parliament decreed the IITs as 'Institutes of National Importance'. Since then, IITB has grown from strength to strength to emerge as one of the top technical universities in the world.

The institute is recognized worldwide as a leader in the field of engineering education and research. Reputed for the outstanding calibre of students graduating from its undergraduate and postgraduate programmes, the institute attracts the best students from the country for its bachelor's, masters and doctoral programmes. Research and academic programmes at IIT Bombay are driven by an outstanding faculty, many of whom are reputed for their research contributions internationally. IIT Bombay has secured the first position in India and 172nd rank this year in the Quacquarelli Symonds (QS) World University Rankings (2021). IIT Bombay has secured the fourth position in 'Overall' category, the third position in 'Engineering' category and eleventh position in 'Management' category of the National Institutional Ranking Framework (NIRF) for 2020.

IIT Bombay also builds links with peer universities and institutes, both at the national and the international levels, to enhance research and enrich its educational programmes. The alumni have distinguished themselves through their achievements in and contributions to the industry, academics, research, business, government and social domains. The institute continues to work closely with the alumni to enhance its activities through interactions in academic and research programmes as well as to mobilize financial support.

Over the years, the institute has created a niche for its innovative short-term courses through continuing education and distance education programmes. Members of the faculty of the institute have won many prestigious awards and recognitions, including the Shanti Swaroop Bhatnagar and Padma awards.

Located in Powai, one of the northern suburbs of Mumbai, the residents of the institute reap the advantage of being in the busy financial capital of India, while at the same time enjoying the serenity of a campus known for its natural beauty. A fully residential institute, all its students are accommodated in its 15 hostels with in-house dining; the campus also provides excellent amenities for sports and other recreational facilities.

About the Department

VISION: To be the fountain-head of new ideas and innovations in Civil Engineering.

MISSION: To offer world-class undergraduate and postgraduate education, research guidance, professional consultancy, outreach and manpower training as well as leadership in Civil Engineering.

Civil Engineering Department is part of the Indian Institute of Technology, Bombay since its inception (1958). The Indian Institute of Technology Bombay (IITB) ranks in the top 100 in the world and first in India for its civil engineering course and overall 152nd rank according to QS World University Rankings 2020.

The department has developed strong links with civil infrastructure, academic and research agencies, both within and outside the country. Besides high-quality teaching and instruction, 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 of Civil Engineering, with its multifaceted faculty, continues to maintain and cultivate its strong links with the infrastructural industry and academic and research institutions both within and outside the country.

Message from HOD

Prof. T.I. Eldho
Head of department
Civil engineering
IIT Bombay
Phone: +91-22-2576 7301
Fax: +91-22-2576 7302
E-Mail: hod@civil.iitb.ac.in

Hearty Welcome to the Civil Engineering Department and IIT Bombay. I congratulate you on achieving your goal of pursuing your higher studies in one of the top Civil Engineering Departments of the world. I am sure that your dream of doing higher studies in the best Civil Engineering Department will be fulfilled here in IIT Bombay.

The booklet presented here is meant to give preliminary information on campus life, academic matters and information on many aspects of research and development matters. I appreciate the work of the ISCP team members for their contribution to the preparation of this useful handbook.

During your study period here, I am sure that you will get the needed value addition and gain new knowledge in your chosen area of specialization. Having achieved your dream of taking up post-graduate studies in IIT Bombay's Civil Engineering Department, I hope you will have full enthusiasm and motivation to do your studies in your chosen program. I hope you will do your duties assigned as a part of your teaching assistantship with full enthusiasm and sincerity. Through your interaction with all Faculty, staff and other students, I am sure that you will have the opportunity to develop your full potential and achieve your dreams. I am sure that you will come out with flying colors in your courses and high research output through your dissertation and useful outcome to the society.

During the course of your study, I hope that you would show the highest level of integrity and strictly follow ethical standards of Civil Engineers keeping the reputation of IIT Bombay. Please utilize all the systems and facilities of IIT Bombay to your maximum advantage and achieve an all-around value addition to your personality.

I wish you all the success.

Message from ISCP (OC)

AAKRIT ANSHUMAN
Overall Coordinator
ISCP(2020-21)
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SATYAM RATHORE
Overall Coordinator
ISCP(2020-21)
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Dear New Entrants,
These are tough times, but you are not alone.
We welcome you to one of the most prestigious institutes in the nation. Congratulations on having achieved this incredible feat. You are about to become part of a culture that will leave its traces within you for a long, long time, even if it begins 'untraditionally.' You will be the ones witnessing the first term to happen entirely online in the history of IIT-Bombay. It might feel overwhelming, and for all the right reasons, we must say. There will be several things you might be worried about, from coping up with the academics in online mode to missing out on things; however, as we said, "You are not alone."
Institute Student Companion Programme (ISCP) is a student body with the primary objective of building a relationship of trust and comfort between the final year students and the incoming students of the PG programmes. We are here to help you in getting familiar with the ways of IIT-B, which is even more critical in these times. You will become a part of a culture where people want to perfect their craft and thus work day in and day out at it. The scope of these is not limited just to academics. Various online events are and will be organized by the cultural, technical, and sports clubs in IITB, like Code in Quarantine, Fitness challenges, Dance Challenges, etc. Managing these along with online lectures might seem daunting at first, and hence, to help you with a world of problems including these, we assign you a Student Companion.
The Student Companions are self-motivated volunteers who will genuinely help you in low and high tides as an act of giving back what they received from the programme. You can look up to the team for any form of support, any information before venturing out into an unknown domain, be it academics or extracurricular activities. You can reach out to us for any issue regarding the curriculum, facilities provided, your physical, social or mental health, and last but certainly not the least, reach out to have a chat with us because that is what we are for, for you.
The COVID -19 pandemic has affected all of us. For now, Health concerns prevent your arrival in our beautiful lush-green IIT-B campus, it also prevents your participation in hostel activities, sports, cultural activities. There are many things here at IIT-B waiting for you, but the most important thing is the campus, and the buildings do not define IIT-B. It's you. You set the culture, the activities, you represent IIT-B to the world, and you make IIT-B what IIT-B is. So, knowing that time flies at IITB, we strongly suggest participating in things that happen online other than attending lectures, make memories, reach out to us for any queries, and relax with the comfort of your home. At least till we get an opportunity to welcome you into the campus, let's be safe, let's be optimistic and let's keep our learning spirits high.
Looking forward to getting to know you. Giving out some motivation for these difficult times, we end with a quote by Albus Dumbledore:
"Happiness can be found, even in the darkest of times, if one only remembers to turn on the light."
Stay Safe!

Message from PGAC

Sohini Dasgupta
Institue Masters Represntative (2020-21)
Post Graduate Academic Council
IIT Bombay
E-mail: imr@iitb.ac.in

Dear Freshmen,

Congratulations to all freshmen for making it to one of the premier institutes of the country. Despite the stiff competition , you all managed to come out with flying colours. So on behalf of the PG students of IIT Bombay it is my honour to welcome you all here.

So now all of you are a part of IIT Bombay PG community or “PG JUNTA” as we call them. The institute has a wide range of facilities and services to offer to all its students. This will not only ensure a fruitful educational experience but also promote overall skill development. In the institute there are several student run bodies, that focus on development of skills, sports and extracurricular activities such as music, dance, drama etc. Along with academics we urge you all to explore and make the the most of the excellent facilities that the institute has to offer.

As the Institute Master’s Representative , my entire team and I aim to address your grievances and help you to the best of our abilities. This time since the first semester for you all is going to be online , you might have a lot of queries in your mind. Please feel free to contact us any time. Our council PGAC is one that is for the PG students, of the PG students and most importantly by the PG students. So whenever you face a problem , we are always there to help you out. Supporting the students in their academic endeavour is also our foremost priority and we will try to improve the IITB experience in all the ways we can. On this note, I once again welcome you all to IIT Bombay, hoping to welcome you all back in the campus as soon as situation gets better, and wishing you every success in your future endeavours.

Message from ISCP (DC)

Jay Buddhadev
Civil engineering Department Coordinator
Institute Student Companion Programme (2020-21)
Contact: +91 7405909167
E-Mail: mailtojaybuddhadev@gmail.com

Likith M
Civil engineering Department Coordinator
Institute Student Companion Programme (2020-21)
Mobile: +91 9606790602
Whatsapp: +91 7795678506
E-Mail: letters2likith@gmail.com

Welcome juniors.

We congratulate you on having made it to one of the finest institutes in India. You are about to embark on a journey of knowledge and exploration. We know that the current COVID situation is not helpful, and adapting to the new normal can be really daunting and stressful. Sometimes you need to swim against the tide to make it to your destination. You do not have to worry as we are here with you throughout your way to make that task a much simpler and memorable one.

We also would like to invite you to the department of civil engineering, one of the oldest and prominent departments of IIT Bombay. Our professors are well known in the field of academia for their research activities. The resources available and the lab facilities are the best in the country, and we urge you to make use of them as well as you can.

The institute is well known not only for its academic activities but also for its extracurricular activities. There are numerous events organized by the various clubs at IIT Bombay every week and being involved with ones that interest you is undoubtedly helpful in beating the academic stress you might feel. The current situation demands these events be conducted online, but we can assure you they are still a lot of fun. Your stay at IIT Bombay will definitely transform you and make you a different and better version of yourself.

We assure you that the only thing you are missing out on right now is our beautiful campus and living in the 'dream city', Mumbai. We hope that soon this situation will deescalate and we can all meet in person in our beloved campus.

The department ISCP team is always with you at any point in time to address any and every issue you might face, however small or silly they might seem to you. So do not hesitate to come to us because we are here to serve your needs and make you as comfortable as you can. We have already travelled on the path of the journey you are about to embark upon, and we know where the potholes are. Aspiring to be good mentors to you all, we do not want you to make the mistakes we have made. So this is us reaching out to you, hoping that you will reach out to us whenever needed.

Welcome to IIT Bombay!

Academic Overview

The Department of Civil Engineering offers a broad-based undergraduate B.Tech. programme, dual-degree (B.Tech.-M.Tech.) programme. Postgraduate (M.Tech.) and PhD programmes in the following specializations:

- Transportation Systems Engineering
- Geotechnical Engineering
- Water Resources Engineering
- Structural Engineering
- Ocean Engineering
- Remote Sensing
- Construction Technology and Management

CE1 - Transportation Systems Engineering

This specialization has contributed to many projects such as the Bandra-Worli sea link. Transportation systems Engineering specialization has excellent facilities for carrying out teaching, research and consultancy activities in various areas of transportation such as Highway Material Laboratory, Traffic Engineering Laboratory & Advanced Pavement Engineering Laboratory.

Faculty members and their research areas:

 Prof. Avijit Maji	**Research Areas:** Machine intelligence and computer vision in alignment development; Optimization in transportation infrastructure development; Effects of highway infrastructure on driver behavior; Performance based highway infrastructure design; Innovative highway infrastructure design; High speed rail infrastructure planning; Transportation safety and security **Contact:** avimaji@civil.iitb.ac.in https://www.civil.iitb.ac.in/~avimaji 02225767338
 Prof. Dharamveer Singh	**Research Areas:** Characterisation Of Pavement Materials (Asphalt, Hot Mix Asphalt, Soil, And Aggregates), Recycled Asphalt Mixes, Warm Mix Asphalt, Locally Available Materials, Stabilization Of Soil And Aggregates, Intelligent Asphalt Compaction, Constitutive Modeling Of Pavement Materials, Simple Performance Tests (Rutting, Fatigue, Dynamic Modulus) On Asphalt Mixes, Pavements (Flexible And Rigid) Design And Evaluation, Forensic Investigation Of Pavements, Pavement Maintenance And Rehabilitation. **Contact:** dvsingh@iitb.ac.in https://www.civil.iitb.ac.in/~dvsingh 02225767304

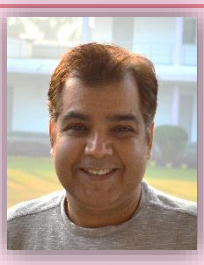
 Prof. Gopal R. Patil	**Research Areas:** Transportation Systems Planning; Transportation Network Optimization; Traffic Operations; And Freight Transportation Modeling. **Contact:** gpatil@civil.iitb.ac.in https://www.civil.iitb.ac.in/~gpatil 02225767308
 Prof. K.V. Krishna Rao	**Research Areas:** Sustainable Urban Transportation Planning, Land Use Transport Modelling, Travel Survey Design And Analysis; Travel Behaviour And Choice Modelling, Air Travel Demand Modelling, Capacity And Level Of Service Of Traffic Facilities. **Contact:** kvkrao@civil.iitb.ac.in https://www.civil.iitb.ac.in/~kvkrao 022257673056
 Prof. Nagendra Rao Velaga	**Research Areas:** Traffic And Intelligent Transportation Systems. Transportation Accessibility And Mobility. GIS And GNSS Applications In Transport. **Contact:** n.r.velaga@iitb.ac.in https://www.civil.iitb.ac.in/~velaga 02225767341
 Prof. Tom V. Mathew	**Research Areas:** Traffic Flow Modelling And Simulation; Transportation Network Optimization, Traffic Control And Management. **Contact:** vmtom@civil.iitb.ac.in https://www.civil.iitb.ac.in/~vmtom 02225767349
 Prof. Vedagiri Perumal	**Research Areas:** Traffic Safety, Modelling Pedestrian Behavior, Traffic Flow Modelling And Simulation, Traffic Management And Control, Public Transit System Design And Operation. **Contact:** vedagiri@civil.iitb.ac.in https://www.civil.iitb.ac.in/~vedagiri 02225767307

CE2 – Geotechnical Engineering

This group of researchers and academicians are involved in various research areas like geotechnical structural designs for different types of loads, soil investigations, laboratory experiments for soil testing, environmental geotechnics, numerical and centrifuge modelling, etc. Some of the most highly equipped laboratories are available to nurture and create possibilities for the students in making their contributions in the field. Interdisciplinary research and instrumentation, which

would be beneficial in understanding the parameters influencing the design of structures is the recent focus of the specialization.

Faculty members and their research areas:

 Prof. Ashish Juneja	**Research Areas:** In-situ And Laboratory Engineering Properties Of Soil; Numerical And Physical Modelling In Geotechniques; Earthwork; Ground Improvement **Contact:** ajuneja@iitb.ac.in https://www.civil.iitb.ac.in/~ajuneja/ 02225767327
 Prof. Viswanadham B.V.S	**Research Areas:** Centrifuge modelling; Environmental geotechnics; Soil reinforcements; Slope stabilization; Waste materials utilization **Contact:** viswam@civil.iitb.ac.in https://www.civil.iitb.ac.in/~viswam/ 0222576734
 Prof . Deepankar Choudhury	**Research Areas:** Geotechnical earthquake engineering; Soil dynamics; Foundation engineering; Computational geomechanics; Dynamic soil-structure interaction; Liquefaction **Contact:** dc@civil.iitb.ac.in https://www.civil.iitb.ac.in/~dc/ 02225767335
 Prof. D.N. Singh	**Research Areas:** Environmental Geotechnology; Valorization Of Industrial Waste(s); Gas Hydrates **Contact:** dns@civil.iitb.ac.in https://www.civil.iitb.ac.in/~dns/ 02225764317
 Prof. Jnanendra Nath Mandal	**Research Areas:** Centrifuge modelling of geosynthetic reinforced soil structures; Municipal/hazardous waste landfills; Tsunami reconstruction with geosynthetic containment systems; Ground improvement techniques; Geosynthetic testing; Nanotechnology (smart geosynthetic); Numerical analysis and computer-aided design of geosynthetic reinforced soil retaining walls and slopes, Pavements, Embankments, Reflection Cracking, Coastal And Waterway Erosion Control, Dewatering, Filtration and Drainage. **Contact:** cejnm@civil.iitb.ac.in https://www.civil.iitb.ac.in/~cejnm 02225767328

 Prof. Dasaka Murthy	**Research Areas:** Studies On Earth Pressure Reduction Techniques, Field Behaviour Of Rock Socketed Piles, Stabilization Of Problematic Soils, Mitigation Of Railway-borne Vibrations, Deep Excavation Supporting Systems **Contact:** dasaka@civil.iitb.ac.in 02225767316
 Prof. Prasenjit Basu	**Research Areas:** Energy geotechnics; Thermo-hydro-mechanical characterization of soil; Coupled (thermo-hydro) flow in the ground; Engineering of foundations; Computational geomechanics **Contact:** pbasu@civil.iitb.ac.in https://www.civil.iitb.ac.in/~pbasu 02225767312
 Prof. Santiram Chatterjee	**Research Areas:** Offshore geotechnical engineering; Pipeline geotechnics; Numerical modelling; Offshore soil characterization. **Contact:** sc@civil.iitb.ac.in https://www.civil.iitb.ac.in/~sc/ 02225765327

CE3 – Water Resources Engineering

This specialization deals with research in areas of rainfall-runoff modelling, groundwater flow modelling, climate change, extreme events, watershed management etc. There are three highly equipped laboratories: Fluid mechanics lab, advanced fluid mechanics lab, and advanced hydraulics lab. Advanced fluid mechanics lab houses facilities such as wind tunnel, facilities to measure drag and lift and various types of flumes, turbines and pump experiments. In advanced hydraulics lab, all research-based experiments in open channels, watershed, groundwater etc. can be carried out.

Faculty members and their research areas:

 Prof. Bellie Sivakumar	**Research Areas:** Rainfall and Streamflow Modeling; Hydrologic Extremes; Sediment Transport in Rivers; Large-scale Water Projects; Transboundary Water Management; Groundwater Flow and Transport; Water quality in Rivers; Ecosystem Modeling; Human-Water Interactions; Hydrology Education; Complex Systems and Networks; Chaos Theory; Scaling and Fractals. **Contact**: b.sivakumar@civil.iitb.ac.in **https://www.civil.iitb.ac.in/~b.sivakumar**; 02225767331
 Prof. Kapil Gupta	**Research Areas:** Urban Drainage/storm Water Management; Sedimentation In Channels And Rivers; Urban Water Infrastructure Management; Hydrologic Disaster Management; Water Quality Modelling In Rivers, Ponds, Lakes And Estu**aries.** **Contact:** kgupta@civil.iitb.ac.in https://www.civil.iitb.ac.in/~kgupta/ **02225767324**

 Prof. T I Eldho	**Research Areas:** Groundwater Flow And Pollution Investigation; Computational Fluid Dynamics; Coastal Hydrodynamics; Watershed Management; Application Of Numerical Methods In Water And Environment. **Contact:** eldho@civil.iitb.ac.in https://www.civil.iitb.ac.in/~eldho 02225767339
 Prof.V Jothiprakash	**Research Areas:** Water Resources Systems Analysis, Stochastic Hydrological Modeling, Reservoir Sedimentation, Airport And Road Side Storm Water Drainage System, Water Supply And Sewerage Systems, Genetic Algorithms And Genetic Programming, Artificial Neural Networks, Non-linear Dynamic Analysis Using Chaos Theory, Singular Spectrum Analysis, Single Variate And Multi-Variate Time Series Analysis. **Contact:** vprakash@iitb.ac.in https://www.civil.iitb.ac.in/~vprakash 02225767315
 Prof. Janga Reddy Manne	**Research Areas:** Evolutionary Algorithms For WRS Optimization; Reservoir Operation, Water Supply Systems; Surface Water Hydrology And Watershed Management; Statistical Modeling And Forecasting, Risk Analysis Of Floods And Droughts; Copulas For Uncertainty Modeling; Applications Of Softcomputing Techniques In WRM; Impacts Of Climate Change On Water Resources And Agriculture. **Contact:** mjreddy@civil.iitb.ac.in https://www.civil.iitb.ac.in/~mjreddy 02225767320
 Prof. Subimal Ghosh	**Research Areas:** Hydro-climatology: Regional Modeling And Understanding Of Indian Monsoon; Statistical Downscaling; Atmosphere- Land Surface Interactions; Climate Change Projections And Impacts Assessment; Seasonal And Sub-seasonal Prediction Of Monsoon; Hydro-climatic Extremes; Hydrology: Meso-scale Hydrologic Modeling; Uncertainty Modeling; Eco-hydrology. **Contact:** subimal@civil.iitb.ac.in https://www.civil.iitb.ac.in/~subimal 02225767319
 Prof. Arpita Mondal	**Research Areas:** Detection, Attribution And Impact Of Climate Change, Spatio-Temporal Modeling Of Hydroclimatic Extremes, Regionalization And Frequency Analysis Of Floods And Droughts, Risk Assessment Under Non-stationarity, Urban Flooding, Hydrologic Statistics And Machine Learning, Uncertainty Modeling. **Contact:** marpita@civil.iitb.ac.in https://www.civil.iitb.ac.in/~marpita 02225769305
 Prof. Riddhi Singh	**Research Areas:** Rainfall-Runoff Modelling, Model Diagnostics, Hydrologic Predictions In Data Scarce Regions, Catchment Classification And Hydrologic Similarity, Multi-stakeholder Analysis Of Resource-Constrained Systems, Decision Making Under Uncertainty. **Contact:** riddhi@civil.iitb.ac.in https://www.civil.iitb.ac.in/~riddhi 02225769307

 Prof. BasudevBiswal	**Research Areas:** Conceptualization Of Hydrological And Ecological Processes. Prediction In Ungauged Basins. Global Hydrological Modelling. Recession Flow Hydrology. Large Scale Flood-inundation Modelling. Landscape Evolution Modelling. **Contact:** basudev@civil.iitb.ac.in https://www.civil.iitb.ac.in/~basudev 02225767318

CE4 – Structural Engineering

Various researches are being conducted through this specialization. Some of the researches are on high-speed railway bridges, seismic vulnerability assessment and seismic isolation of buildings and bridges, health monitoring and retrofitting of buildings, analysis and performance-based design of tall buildings, computational mechanics etc. There are highly equipped laboratories such as heavy structures and experimental mechanics laboratories which include shake table, sophisticated UTMs and loading frames capable of testing various types of materials including seismic isolators, elastomeric bearings, column-beam connections etc.

Faculty members and their research areas:

 Prof. Yogesh Desai	**Research Areas:** FEM and control of vibrations; Structural dynamics; Composite mechanics; Rehabilitation of deteriorated structures; Computational mechanics **Contact:** desai@civil.iitb.ac.in https://www.civil.iitb.ac.in/~desai/ 02225767333
 Prof. Alok Goyal	**Research Areas:** Structural dynamics and earthquake engineering; Vibration control; Seismic hazard assessment; Service life assessment, repair, rehabilitation and retrofitting of RC buildings. **Contact:** agoyal@civil.iitb.ac.in https://www.civil.iitb.ac.in/~agoyal/ 02225767342
 Prof. Ravi Sinha	**Research Areas:** Dynamic behaviour of structures; Energy absorbing and base isolating devices; Earthquake resistant design and vulnerability evaluation of structure. **Contact:** rsinha@civil.iitb.ac.in https://www.civil.iitb.ac.in/~rsinha/ 02225767336
 Prof. Naresh K. Chandiramani	**Research Areas:** Nonlinear Dynamics; Stability And Control; Computational Mechanics; Solid Mechanics. **Contact:** naresh@civil.iitb.ac.in https://www.civil.iitb.ac.in/~naresh/ 02225767311

 Prof. Pradipta Banerji	**Research Areas**: Earthquake vibration control; Damage detection in structures; Guided wave propagation and scattering; Condition monitoring of bridge structures. **Contact**: pbanerji@civil.iitb.ac.in **https://www.civil.iitb.ac.in/~pbanerji/** 02225767334
 Prof. R. S. Jangid	**Research Areas**: Base isolation for earthquake-resistant design; Vibration control using tuned mass dampers; Non-linear dynamic analysis; Non-classically damped systems; Stochastic earthquake analysis **Contact**: rsjangid@civil.iitb.ac.in https://www.civil.iitb.ac.in/~rsjangid/ 02225767346
 Prof. Kamal M Bajoria	**Research Areas:** Computer Aided Design Of Structures; Earthquake Resistant Structures; Nonlinear Structures; Nuclear Containment Structures; Structural Stability; Structural Dynamics; **Contact:** kmb@iitb.ac.in https://www.civil.iitb.ac.in/~kmb/ 02225767332
 Prof. Sauvik Banerjee	**Research Areas:** Structural health monitoring using vibration and wave based approaches; Condition assessment of structures using NDT; Ultrasonic NDE and Imaging of materials; Passive Acoustic Emission (AE) Monitoring of structures; Guided wave propagation; Modelling of laminated composite and sandwich structures; FRP retrofitting of structures; Impact response of structures **Contact:** sauvik@civil.iitb.ac.in https://www.civil.iitb.ac.in/~sauvik/ 02225767343
 Prof. Siddhartha Ghosh	**Research Areas:** Earthquake engineering; Reliability of structures; Structural dynamics; Vulnerability/fragility assessment; Risk analysis; Uncertainty quantification; Structural steel; Cold-formed steel; Inelastic analysis and design; Stone block masonry. **Contact:** sghosh@civil.iitb.ac.in https://www.civil.iitb.ac.in/~sghosh/ 02225767309
 Prof. Amit Das	**Research Areas:** Design and analysis of steel and concrete structures; Computational Mechanics; Finite element analysis; Field dislocation mechanics; Analysis of PDEs; Grain boundary modelling **Contact:** amitdas@civil.iitb.ac.in https://www.civil.iitb.ac.in/~amitdas/ 02225767301

 Prof. Mandar Inamdar	**Research Areas**: Application of structural; solid, fluid, and statistical mechanics to biological systems; Mechanics of biopolymer networks; Cellular adhesion and motility, DNA mechanics; Mechanics of biofilms **Contact:** minamdar@civil.iitb.ac.in https://www.civil.iitb.ac.in/~minamdar/ 02225767314
 Prof. Arghadeep Laskar	**Research Areas:** Experimental Study of Reinforced and Pre-Stressed Concrete; Finite Element Analysis of Concrete Structures; Seismic Simulation **Contact**: laskar@civil.iitb.ac.in https://www.civil.iitb.ac.in/~laskar/ 02225765326
 Prof. Jayadipta Ghosh	**Research Areas:** Structural reliability and risk assessment; Earthquake engineering; Ageing and corrosion deterioration problems; Seismic fragility analysis; Bridge engineering; Machine learning **Contact:** jghosh@iitb.ac.in https://www.civil.iitb.ac.in/~jghosh/ 02225767337
 Prof. Swagata Basu	**Research Areas:** Earthquake Risk and Reliability Analysis of Bridges, Disaster Resilience of Bridges and Highway Systems, Multihazard analysis **Contact:** swagata@civil.iitb.ac.in http://swagatabasu.wixsite.com/swagata 02225767317
 Prof. Meera Ragunandhan	**Research Areas:** Earthquake engineering; Probabilistic seismic risk analysis of structures; Performance prediction of structures under dynamic loads; Building code Evaluation **Contact:** meerar@civil.iitb.ac.in https://sites.google.com/site/meeraraghunandan/ 02225767322
 Prof. Manish Kumar	**Research Areas:** Earthquake Engineering, Seismic Isolation, Blast and Impact Resistant Structures **Contact:** mkumar@civil.iitb.ac.in http://www.manishkumar.org/ 02225767329

CE5 – Ocean Engineering

It is a relatively new course in Civil Department which includes coastal, port and harbour engineering, wave hydrodynamics, coastal, marine and offshore structures, wave-structure interaction, coastal erosion and mitigation measures, physical and numerical modelling of coastal/ocean dynamics, design of port/harbour and offshore structures, design of coastal protection and waterfront

structures. Tidal, estuarine and bay hydrodynamics, sediment transport, harbour agitation/layout/planning, application of neural networks and soft computing for offshore engineering related problems are also studied under this specialization.

Wave Simulator, a physical wave flume testing facility with computer-controlled wavemaker is established in the ocean engineering laboratory. The wavemaker is capable of generating regular, random and non-linear waves of different heights and periods. A range of instruments such as wave gauges and underwater dynamic pressure sensors, Qualisys motion capture system is recently acquired.

Faculty members and their research areas:

 Prof. M. C. Deo	**Research Areas:** Ocean engineering (wave hydrodynamics, Ocean structures, statistical and stochastic analysis); Hydrology **Contact:** mcdeo@civil.iitb.ac.in https://www.civil.iitb.ac.in/~mcdeo/ 02225767330
 Prof. Balaji Ramakrishnan	**Research Areas:** Coastal engineering; Wave structure interaction; Tidal hydrodynamics; coastal processes **Contact:** rbalaji@iitb.ac.in https://www.civil.iitb.ac.in/~rbalaji/ 02225767321
 Prof. Manasa Ranjan Behera	**Research Areas:** Ocean and Coastal Engineering; Computational Ocean and Coastal Hydrodynamics; Modelling of Tide, Storm and Tsunami; Impact of Changing Climate; Wave and Tidal Energy; Wave Current Interaction; Multi-phase Flow **Contact:** manasa.rb@iitb.ac.in https://www.civil.iitb.ac.in/~manasarb/ 02225767313

CE6 – Remote Sensing

This specialization deals with research in areas of Surveying and Remote Sensing. UAV(s)/ Drones (both fixed-wing and rotary-wing) have recently been included in instruments owned by the department. It can be used for large scale mapping and real-time assessment and monitoring activities of various applications ranging from precision agriculture to structural engineering. It can also be used in the generation of DEM, Ortho maps and 3D models etc. The specialization has also access to instruments like TLS, GPS, Total Station, Ground-penetrating Radar (GPR) and corresponding processing software.

Faculty members and their research areas:

 Prof. RAAJ Ramsankaran	**Research Areas:** Remote Sensing And GIS Applications In Surface Hydrology And Water Resources Management, Hydro-Data Assimilation, Cryosphere Remote Sensing; Precision Agriculture; High Definition Surveying; Remote Sensing Of Ocean And Coastal Areas. **Contact:** ramsankaran@civil.iitb.ac.in https://www.civil.iitb.ac.in/~ramsankaran 02225767348
 Prof. Indu J	**Research Areas**: Microwave Remote Sensing; Uncertainty In Radar Based Rainfall; Nowcasting Of Precipitation; Applications in Hydrology And Water Resources; Image Processing Using Synthetic Aperture Radar (SAR); Fuzzy Logic **Contact**: indusj@civil.iitb.ac.in https://www.civil.iitb.ac.in/~indusj 02225769304
 Prof. Eswar Rajasekaran	**Research Areas:** Thermal Remote Sensing, Modelling Evapotranspiration From RS, RS Applications In Hydrology, Drought Monitoring. **Contact:** eswar.r@civil.iitb.ac.in https://www.civil.iitb.ac.in/~eswar.r 02225767325

CE7 – Construction Technology and Management

This specialization was instituted in 2016. The vision of the programme is to create a sustainable construction infrastructure system for the society through high-quality teaching, research, outreach, manpower training and academic leadership in the area of Construction Materials and Management. The division has developed strong links with the academic institutions, research organizations and construction industry both within and outside the country.

The specialization includes construction technology that mainly focuses on Construction Materials, Concrete Technology, mineral and chemical admixtures, rheology and particle packing of cement-based materials, Alkali activation, geo-polymerization, Mineral carbonation, Industrial residue valorization, sustainable construction materials. Construction management that consists of infrastructure contracts, Building Information Modelling, Machine learning-enabled construction safety management.

Faculty members and their research areas:

 Prof. Prakash Nanthagopalan	**Research Areas:** Rheology Of Cement Based Materials; Design And Development Of Ultra High Performance Concrete; Cement And Lime Based Plasters/renders; Product Development Using Industrial And Agro Based By-products. **Contact:** prakashn@iitb.ac.in https://www.civil.iitb.ac.in/faculty/details/prof-prakash-nanthagopalan 02225767323

 Prof. Venkata Santosh Kumar Delhi	**Research Areas:** Infrastructure project governance, Construction project management, Organization in construction projects and infrastructure sustainability, Structural Engineering. **Contact:** venkatad@civil.iitb.ac.in https://www.civil.iitb.ac.in/~venkatad 02225765325
 Prof. Muhammad Salman	**Research Areas**: Construction Materials, Concrete Technology, Alkali activation, Geo Polymerization, Mineral carbonation, Slags. **Contact**: msalman@civil.iitb.ac.in https://www.civil.iitb.ac.in/~msalman 02225769306
 Prof. Albert Thomas	**Research Areas:** Sustainable Construction Management Practices, Building Energy Simulation, Lean Construction, Life Cycle Energy Analysis, Project Scheduling and Earned Value Analysis, Construction Project Lifecycle Management. **Contact:** albert@iitb.ac.in https://www.civil.iitb.ac.in/~albert 02225767347

Department Facilities

The department has excellent infrastructure facilities for carrying out teaching, research, and consultancy activities in various disciplines of Civil Engineering. The laboratory facilities in the department are as follow:

Transportation Engineering

- Highway Material Testing Laboratory
- Traffic Engineering Laboratory
- Transportation Planning Laboratory
- Advanced pavement Laboratory

Geotechnical Engineering

- Geotechnical Engineering Laboratory
- Environmental Geotechnology Laboratory
- Geo-textiles and Geosynthetics Laboratory
- National Geotechnical Centrifuge Facility
- Advance & Dynamic Soil Testing Laboratory
- Advanced Geotechnical Engineering Laboratory
- Geotechnical Earthquake Engineering Laboratory

Water Resources Engineering

- Hydraulics Engineering Laboratory
- Fluid Mechanics Laboratory

Structural Engineering

- Heavy Structures Laboratory
- Experimental Mechanics Laboratory
- Structural Safety, Risk and Reliability Laboratory
- Structural Health Monitoring & Retrofitting Laboratory
- Structural Nano & Bio Mechanics Laboratory
- Disaster Risk Mitigation Laboratory

Ocean Engineering

- Ocean Engineering Laboratory

Remote Sensing

- Surveying Engineering Laboratory
- Photogrammetry Laboratory
- Advanced Engineering Surveying Laboratory

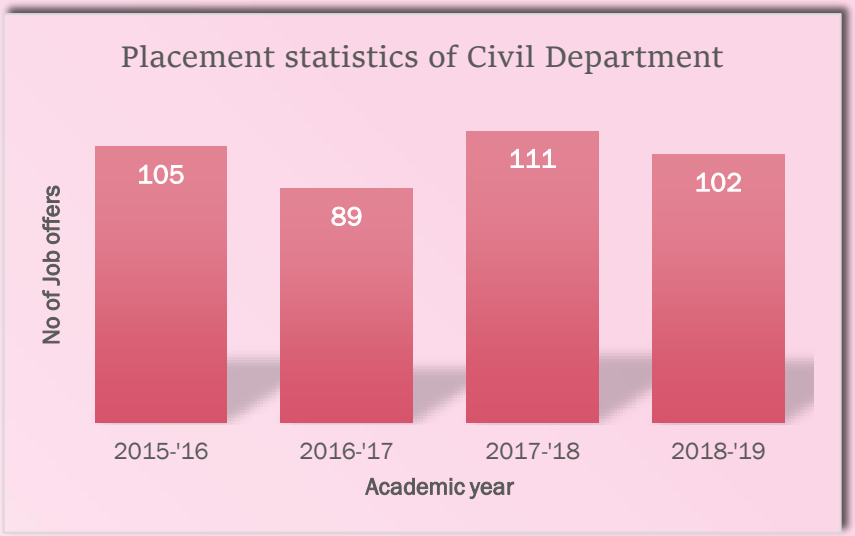
Construction Technology and Management

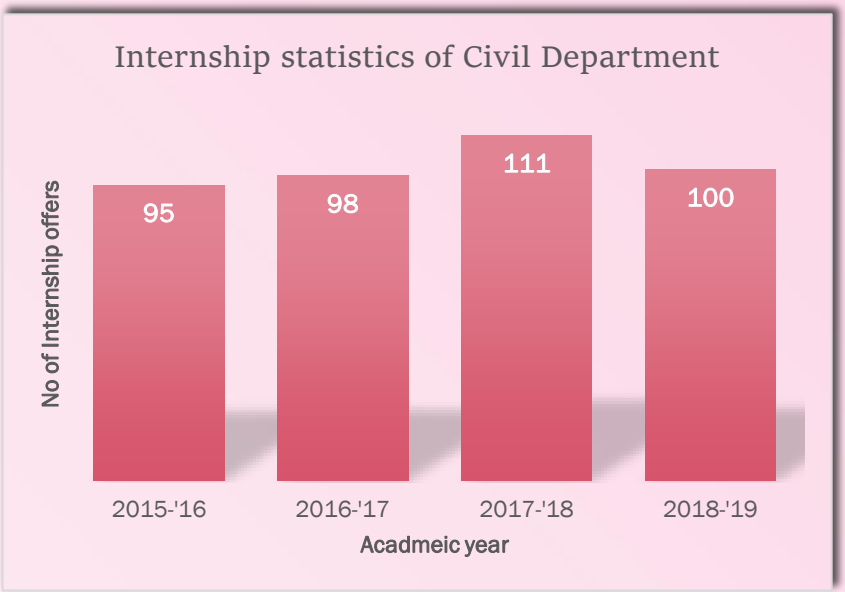
- Structural Evaluation and Materials Technologies Laboratory
- Material Characterisation Laboratory
- Construction Management Laboratory

Computational Laboratory

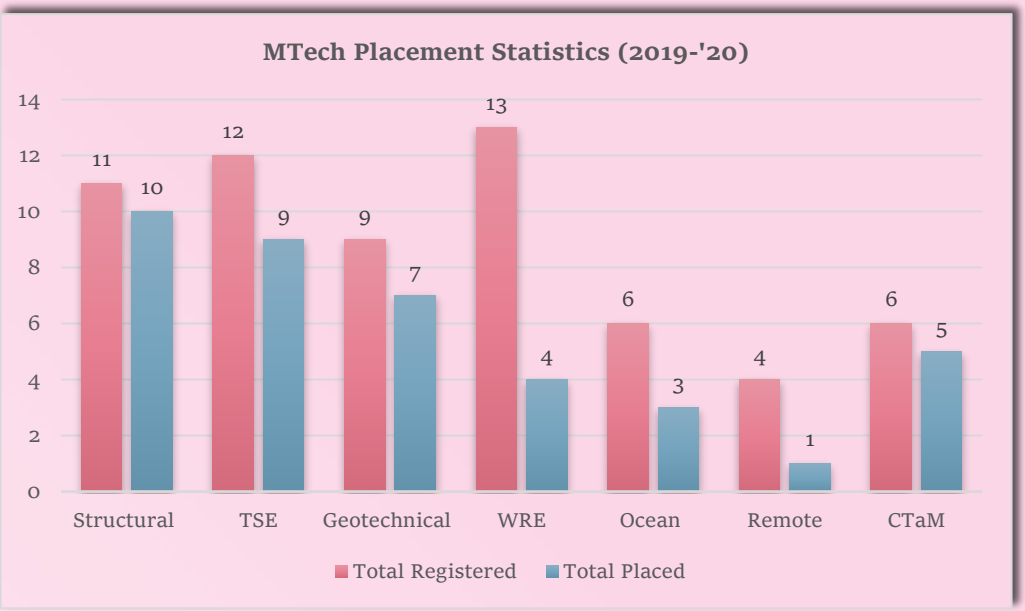
Department Placement Information

Placements at IITB have always been the best in India. The amount and quality of profiles offered are class-leading as in the compensation. The placement process is completely managed by a student body, who works under the supervision of a placement manager. The placements stats for the department are as follow:





Placement statistics of Civil Department MTech 2019-20 batch	
Total number of registered students	54
No of students placed on campus	29
No of students placed off-campus (PSU/State)	10
Total Placed	39
Percentage placed	**72.22%**


MTech Placement Statistics (2019-'20)
14
12
10
8
6
4
2
0
11
10
12
9
9
7
13
4
6
3
4
1
6
5
Structural
TSE
Geotechnical
WRE
Ocean
Remote
CTaM
Total Registered
Total Placed

Grading Policy

The Indian Institute of Technology Bombay follows the grading system. Based on the combined performance in all assessments, the student is awarded a letter grade in every course taken as per the curriculum. These letter grades not only indicate a qualitative assessment of the student's performance but also carry a quantitative (numeric) equivalent called the Grade Point. The letter grades and their equivalent grade point are given below:

Letter Grade	Grade Point
AP	10
AA	10
AB	9
BB	8
BC	7
CC	6
CD	5
DD	4
FF	0 (Fail- Re-examination)
FR	0 (Fail- Repeat the course)
DX	0 (Attendance below 80%- Repeat the course)
PP	Pass
NP	Not Pass
AU	Audit
II **(a)**	Incomplete
DR **(b)**	Dropped
W	Withdrawn

(a) Placeholder, awarded on medical grounds; gets converted to an appropriate grade after Semester end re- examination

(b) Placeholder indicating that the course has been dropped and it has to be cleared in subsequent semesters.

i. A student passes the course if he/she gets any grade in the range of AP to DD (AU in the case of an audit course), but fails if he/she gets the grade FF, FR or DX. II and DR are placeholders. II is awarded temporarily on medical grounds and gets converted to an appropriate grade after the Semester end re-examination. On the other hand, DR indicates that the course has been dropped and it has to be cleared in subsequent semesters.

ii. The grade AP indicates exceptional performance and is awarded only in the Course/(s) in which the number of registered students is more than 50. It should not exceed 2 % of the total strength of the theory or lab course. The grade AP is not awarded for projects/seminars.

iii. FF grade will be awarded in case/(s) where the students' performance in the examinations is not satisfactory (falls below the DD grade). A student is eligible for re-examination, which is conducted as per the Academic Calendar. A student taking the re-examination after FF grade may get (1) DD grade if she/he passes the

re-examination or (2) FR grade if she/he fails in the re-examination or fails to appear for re-examination.

iv. FR grade will be awarded in case/(s) where, in the opinion of the instructor (panel of examiners in the case of projects), the student has inadequate academic exposure to the course / has very poor performance in the in-semester and/or semester-end examinations.

v. The grade DX in a course is awarded if (i) a student does not maintain the minimum 80% attendance in the Lecture/Tutorial classes, or (ii) severely incomplete in semester evaluation record due to non-medical reasons (for example when a student has missed all tests and midsem), (iii) incomplete assignment submissions etc. The DX grade will be declared one week before the semester-end examination and intimated to the academic office immediately thereafter. A student with DX grade in a given course is not permitted to take the semester-end examination. The DX grade is treated as FR for CPI calculation and requires re-registration for the course.

vi. "II" is awarded in a lecture/laboratory course if a student has satisfactory in-semester performance and has fulfilled the attendance requirement but has not appeared for the semester-end examination due to medical reasons. Such students are eligible for make-up for the Semester-end examination only on medical grounds / valid reasons AND on the production of medical certificate issued/authenticated by CMO, IIT Bombay Hospital or other supporting documents as required. The application must be submitted to the Academic Office, for consideration by PGAPEC, before the last date for registration for such make-up examination announced in the Academic Calendar. (See Sec.3.5 and 3.6 for full details). For a student resent in the semester-end re-examination, the instructor will award a regular performance grade (AP-FR) depending on the overall performance in the course including the re-examination. If a student fails to appear for the re-examination too, the instructor will award II grade again. If the absence is due to medical/valid reasons, the student must submit supporting documents as mentioned above, within seven days of the scheduled date of the re-examination, to the Academic Office. PGAPEC will examine such cases and convert the II grade into a dropped course status (DR) in bonafide cases. In all other cases, the II grade will be converted to FR grade. In any case, the II grade will not be continued beyond the commencement of the subsequent semester.

vii. There are, however, a few other academic requirements for the Program. The following two grades viz., PP (Pass) and NP (Not pass), will be awarded for non-credit courses. No grade points are associated with these grades and performance in these courses is not considered in the calculation of the performance indices (SPI, CPI). However, the award of the degree is subject to obtaining a PP (Pass) grade in all such courses, as part of the course curriculum.

Viii. AU grades are awarded for those who have audited a course, in accordance with the prescribed procedure.

Civil Engineering Association

The Civil Engineering Association (popularly known as CEA) at IIT Bombay, was established with a prime objective to proliferate knowledge & address industrial issues by bringing corporates, professors, and students on a common platform. We aim to promote Civil Engineering by providing the much-needed practical exposure to the community members through its regular activities like technical seminars, research symposiums, talks on ongoing research practices throughout the globe and many other related topics from distinguished practitioners of the trade. Collaboration between the school and industry is important for the advancement of engineering teaching and research. With this aim, to give our students some practical insight into Civil Engineering, we organize several visits throughout the year to ongoing construction sites and research centres thus giving them a chance to interact with key personnel of the industry.

CEA also undertakes the responsibility of proper nurturing of students by organizing some social events as a part of extracurricular. Valedictory function for the introduction of students with insights into the department and AAKAAR team, kurta day for the healthy interaction between freshers and seniors, department T-shirt competition, department trips, sports weekend including sports like badminton, volleyball, basketball, etc and many more for newcomers at UG and PG level which are organized by CEA throughout the year.

CEA General Secretary (2020-21): Samkit Rohan Mehta

AAKAAR

The student body of Civil Engineering Association, IIT Bombay, organizes AAKAAR, the annual festival of Civil Engineering Department, IIT Bombay. AAKAAR provides a platform to budding civil engineers across the country to create, innovate and learn various aspects of civil engineering through competitions, events, and Symposium (research paper conference). AAKAAR has gone on to become the undisputed front-runner among civil engineering festivals.

PG Sports

PG Sports has a place of pride in the IITian's calendar for obvious reasons. It is an event that witnesses the confluence of sports enthusiasts and celebrates excellence, endeavour, and team spirit. This is a much-needed diversion from the rigorous routine academics, bringing with it promises of an energizing and exhilarating experience. At the participation and organizational levels, this is a wide entry into a whole new world of opportunities. IIT Bombay exposes the adage' a sound mind in a sound body'. A delicate balance between a robust physique and a sharp mind is the prerequisite for a healthy, meaningful life. All PG aspirants can be a part of this celebration.

Civil Engineering department PG achievers from 2019-20.

Sports Event	Medal	Player
Table tennis Girls	Gold	Elizabeth, Swati, Adrija Roy, Aishwarya
Carrom Boys	Gold	Anas, Prakash Badal, Parag, Rohan
Carrom Girls	Gold	Resmi M, Divya, Melna, Shana, Soujanya
Basketball Girls	Silver	Pujitha, Aparna, Navya, Priya
Squash Boys	Silver	Rahul, Harshit, Anas, Shubham Gorase

PG Culturals

PG Cult is the annual cultural festival targeted exclusively for the postgraduate community of IIT Bombay (or PG junta in short). Since its inception in the year 2008, this would be the 10th edition of this cultural extravaganza. The events spread across nine genres-3 performing arts: Dance, Music and Dramatics and five nonperforming arts: Fine Arts, Literary Arts, Speaking Arts, Design, Photography, and Film & Media. Interspersed throughout the calendar year, the PG Cultural Council headed by the PG Cultural Nominee along with the PG Coordinators and Conveners for each genre organizes several workshops to cater to the varied tastes and skills of the multitalented PG's of IITB.

Department Highlights 2019-20

Awards and Honours

- The Shanti Swarup Bhatnagar Prize for the year 2019 in Earth, Atmosphere, Ocean and Planetary Sciences has been awarded to Dr Subimal Ghosh, Professor of Indian Institute of Technology Bombay, Bombay for his significant contribution to our understanding of the coupling of land-surface processes and the Indian monsoon as well as for improving regional monsoon simulations and predictions.

Prof. Subimal Ghosh

- Departmental award for Excellence in Teaching in Civil Engineering for is this year awarded to Prof. Alok Goyal and Prof. Ravi Sinha.

Prof. Alok Goyal

Prof. Ravi Sinha

Seminars and Lectures

- Seminar on the topic "Resilience, Risk, and decision analysis" by DR. Sebastian Thons, Associate Professor,Technical University of Denmark.
- Seminar on the topic "Hydrological Remote Sensing and Modelling" by Dr. Christoph Rudiger, Associate Professor, Monash Universoty, Australia.
- Seminar on the topic "Soil Stabilization in Unsealed Road Pavements" by Dr. Dilan Robert, Senior Lecturer, RMIT University , Australia.
- Seminar on the topic "The New IS 15462 specification on PMBs, and sustainable Roads with RAP+Rejuvenators" by Prof. Hussain U Bahia,Professor amd Director of MARC, University of Wisconsin-Madison, USA.
- Seminar on the topic "UK Rail Infrastructure Investment" by Dr. Shobhana Madhavan, University of Westminster and Dr. Robert Barrass,European Commission,UK.
- Seminar on the topic "Flood Risk Management-Best Practices" by Dr. Andres salazar and Mr. Hrushikesh Sandhe, Principal/ Managing Director of Water Resources Engineering, Walter P. Moore, Texas, USA.

Other Highlights

- The Annual Magazine of Civil Engineering Department' CIVIL INSIGHTS' was launched on the occasion of 57th Convocation of the Department, by the chief guest of the Convocation Dr. V V Nori (Chairman, Shirish Patel & Associates Consultants Private Limited Mumbai).

- Department went on a trip to ESSEL world.

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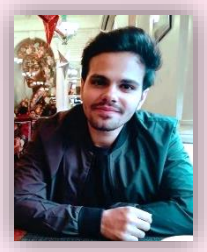

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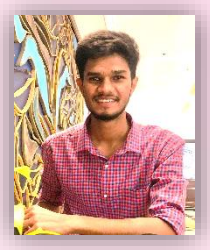

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4	Ganesh Adane	Jr. Mechanic	ganesha[at]civil.iitb.ac.in	2225767306
5	M G Doddamani	Technical Superintendent	cvazhard[at]iitb.ac.in	2225767306
6	Anil Kumar Vishwakarma	Jr. Lab Assistant	anilkumar[at]civil.iitb.ac.in	2225764303
7	Shivraj Dattatray Patil	Technical Superintendent	shivrajiitb[at]gmail.com	2225767306
8	Mahendra Kumar Palsania	Jr. Mechanic	mahendra[at]civil.iitb.ac.in	2225764321
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14	Gurudatta Narvekar	Jr. Mechanic	gurudatta[at]civil.iitb.ac.in	2225764338
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16	Prem Pun	Sr. Lab Helper	punpb[at]civil.iitb.ac.in	2225764318
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3	Ekta Warik	Jr. Assistant	ektasw[at]civil.iitb.ac.in	2225767301
4	Sashank Bastav	Jr. Attendant	shashankmb[at]civil.iitb.ac.in	2225767306
5	Sandeep Chaturvedi	Jr. Administrative Assistant	sandeep[at]civil.iitb.ac.in	2225767303
6	Aravind Jadhav	Jr. Assistant	aravindjadhav@civil.iitb.ac.in	2225767306

Useful Information

- **LDAP Id:** It is a unique identification number of each individual in IIT Bombay. LDAP Id essentially is the student's roll number. LDAP Id is used to access various IIT B services. Once the registration process of a student is completed, a password will be generated which can be used to login along with LDAP id to various IIT B internal websites and services.

- **Application Software Centre (ASC)**: https://asc.iitb.ac.in/acadmenu/index.jsp
  Purpose: This website is the primary interactive website for a student for all of his/ her administrative requirements. From paying your fees to checking your grades, all can be done on this website. The website also has links to all other websites of the institute. Some of the important facilities offered by this website are given under:
    - Payment of fees
    - Registration and deregistration from courses
    - Checking previous year's grading stats for any subject
    - Brief contents of all subjects being offered
    - Own personalized timetable
    - Checking of own academic performance (grades)

  Note: VPN connection may be needed to access ASC.

- **Secure Webmail:** https://webmail.iitb.ac.in/
  Purpose: This is your personalized email in IIT. Every student gets one when you enrol. Along with regular mail, here you also get alerts for registration/ deregistration of courses, fees payment and any broadcast on moodle among others. The general email Id looks like: [yourrollnumber]@iitb.ac.in

- **Moodle:** https://moodle.iitb.ac.in/
  Purpose: This website provides academic interaction between students and faculty for all courses enrolled by a student. You can download study material/ books/ notes uploaded by a professor/ TA and also submit projects etc. here. The website also offers an interactive platform where you can interact with the Professor/ TAs/ other students on any subject related matter.

- **IITB library:** http://www.library.iitb.ac.in/index.php
  Purpose: The website for the central library offers a search engine for books available in the library. You can also check the number of books issued at any given time, renew them and "queue" up for any book already drawn by some other individual.

- **VPN setup instructions:** https://www.cc.iitb.ac.in/page/services-vpnssh
  Purpose: To access IIT B internal websites, one must be connected through VPN.

- **IITB Wireless configuration:** https://www.cc.iitb.ac.in/page/configurewireless
  Purpose: To access IIT B wireless (WiFi) in your mobile phones, laptops or desktops, you must configure the wireless settings following these instructions.

- **Access GPO mail on mobile:** Instructions to set up GPO mail (Webmail) on your mobile.
  http://homepages.iitb.ac.in/~yatindestel/docs/GPO%20in%20Gmail.pdf

Important Links

- **Department Website**: https://www.civil.iitb.ac.in/
- **Downloadable Forms**
  https://www.civil.iitb.ac.in/Form%20to%20be%20uploaded/index.html
- **Registration Instructions:**
  https://docs.google.com/document/d/1IilyR49FuNJE7l2cgrT-iWWPCFItvNVR4A57N1hA-NA/
- **IITB Computer Centre:** https://www.cc.iitb.ac.in/
- **Student Wellness Centre:** http://www.iitb.ac.in/swc/en
- **Entrepreneurship cell:** www.ecell.in
- **Gymkhana IITB:** https://gymkhana.iitb.ac.in
- **SARC:** http://www.sarc-iitb.org/#
- **International relations**: http://www.ir.iitb.ac.in/
- **Lost and found:** https://gymkhana.iitb.ac.in/~hostels/lostnfound.php
- **ISCP:** https://gymkhana.iitb.ac.in/~scp/scp/index.html

Important Apps

- **InstiApp:** InstiApp is an Android App that helps you navigate through the IIT Bombay Campus. It is a one-stop solution for all the aspects of one's insti life, weaving around hostels, academics, co-curricular activities and recreation.
  https://play.google.com/store/apps/details?id=app.insti&hl=en_IN
- **OpenVPN Connect App:** OpenVPN Connect is the official VPN application for Android developed by OpenVPN, Inc. It can be used for connecting with IITB Internal sites using VPN.
  https://play.google.com/store/apps/details?id=net.openvpn.openvpn&hl=en_IN
- **m-Indicator:** This app contains the Local Train Timings of Mumbai and also details the local train routes for IIT Bombay. One can also find the various bus routes and the bus numbers on this app.
  https://play.google.com/store/apps/details?id=com.mobond.mindicator
- **MYBYK App:** Whether you want to ride a cycle at home or use it to commute within your campus, whenever you need a cycle, find a MYBYK near you. Unlock using your smartphone and pedal your way to a healthy life.
  https://play.google.com/store/apps/details?id=in.greenpedia.mybyk
- **SHIRU CAFÉ:** Wanna have a free drink? Just tap a button on this app and you can get free refreshing juice or hot tea and coffee.
  https://play.google.com/store/apps/details?id=jp.co.enrission.shirucafe

Important Softwares

- **MATLAB:** MATLAB is a high-performance language for technical computing. It integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation.
  https://www.cc.iitb.ac.in/
- **ArcGIS:** ArcGIS is a platform for organizations to create, manage, share, and analyze spatial data. It consists of server components, mobile and desktop applications, and developer tools.
  (available in Department Computer Lab)
- **QGIS:** QGIS is a free and open-source cross-platform desktop geographic information system (GIS) application that supports viewing, editing, and analysis of geospatial data.
  https://qgis.org/en/site/forusers/download.html
- **Codeblocks:** Codeblocks is a free C, C++ and Fortran IDE. It's used for programming and is commonly used in Computing in Civil Engineering course.
  http://www.codeblocks.org/downloads
- **AutoCAD:** AutoCAD is a commercial computer – aided design (CAD) and drafting software application. Developed and marketed by Autodesk. AutoCAD is used in industry by architects, project managers, engineers, graphic designers, city planners and other professionals.
  For Student Version(should be used only for educational purposes):
  https://www.autodesk.com/education/free-software/autocad
- **Python:** Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built-in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together.
  https://www.python.org/downloads/
- **R:** R is a programming language and free software environment for statistical computing and graphics supported by the R Foundation for Statistical Computing. The R language is widely used among statisticians and data miners for developing statistical software and data analysis
  https://rstudio.com/
- **Staad Pro:** STAAD Pro is a structural design oriented program with a user interactive interface which allows for the user working on it extremely easy. It can be used for modelling, designing and analyzing various structures and structural configurations.

Geotechnical Engineering

- **Plaxis**: Plaxis is a computer programme that performs finite element analysis (FEA) within the realm of geotechnical engineering, including deformation,

stability and water flow. The input procedures enable the enhanced output facilities provide a detailed presentation of computational results.
https://www.plaxis.com/support/software-updates/plaxis-2d-2019-00/

Ocean Engineering

- **OpenFOAM:** OpenFOAM is a C++ toolbox for the development of customized numerical solvers, and pre-/post-processing utilities for the solution of continuum mechanics problems, most prominently including computational fluid dynamics (CFD).
  https://openfoam.org/
- **SACS:** SACS is an integrated finite element structural analysis suite of applications that uniquely provides for the design, fabrication, installation, operations, and maintenance of offshore structures, including oil platforms and wind farms.
- **SESAM:** Sesam is a software suite for structural and hydrodynamic analysis of ships and offshore structures. It is based on the displacement formulation of the Finite Element Method.
- **Reef 3D:** REEF3D is an open-source computational fluid dynamics program. With a strong focus on hydraulic, coastal, offshore and environmental engineering, as well as Marine CFD, the use of the level-set method enables it to calculate complex free surface flows.
  https://sourceforge.net/projects/reef3d/
- **SimCLIM:** SimCLIM is a software tool designed to facilitate the assessment of risks from climate change for sustainability officers, consultants, policymakers, academics, non-governmental and governmental organizations and students.

Remote Sensing

- **Erdas Imagine:** Erdas Imagine is an image processing software package that allows users to process both geospatial and other imagery as well as vector data. Erdas can also handle hyperspectral imagery and LiDAR from various sensors.
  (available in Department Computer Lab)
- **SNAP**: SNAP stands for Sentinels Application Platform and is a common software architecture on which a collection of free open-source toolboxes for the scientific exploitation of Earth Observation missions is available.
  http://step.esa.int/main/download/snap-download/

Transportation Systems Engineering

- **IITPAVE**: IITPAVE is a multilayer analysis programme specifically used for analysis programme specially used for analysis and design of pavement based on IRC: 37 – 2012.
  (would be provided with the course material)
- **Civil 3D**: Civil 3D is a civil engineering design software that supports BIM (Building Information Modelling) with integrated features to improve drafting, design and construction documentation.
  For Student Version(should be used only for educational purposes):
  https://www.autodesk.com/education/free-software/civil-3d

- **NLOGIT**: NLOGIT software is used in transportation planning. It provides programs for estimation, model simulation and analysis of multinomial choice data, such as brand choice, transportation mode and for survey and market data in which consumers choose among a set of competing alternatives.
  (would be provided with the course material)

Construction Technology and Management

- **Microsoft Project (MSP)**: Microsoft Project is a project management software product, developed and sold by Microsoft. It is designed to assist a project manager in developing a schedule, assigning resources to tasks, tracking progress, managing the budget, and analyzing workloads.
  https://www.cc.iitb.ac.in/
- **Primavera:** Primavera is an enterprise project portfolio management software. It includes project management, scheduling, risk analysis, opportunity management, resource management, collaboration and control capabilities, and integrated with other enterprise software such as Oracle and SAP's ERP systems.
- **Autodesk Revit:** Revit is a building information modelling software for architects, landscape architects, structural engineers, mechanical, electrical, and plumbing (MEP) engineers, designers and contractors.
  For Student Version(should be used only for educational purposes):
  https://www.autodesk.com/education/free-software/revit
- **Autodesk Navisworks:** Navisworks is a 3D design review package for Microsoft Windows. Used primarily in construction industries to complement 3D design packages, Navisworks allows users to open and combine 3D models; navigate around them in real time; and review the model using a set of tools.
  For Student Version(should be used only for educational purposes):
  https://www.autodesk.com/education/free-software/navisworks-manage
- **SimaPro:** SimaPro is the professional tool to collect, analyze and monitor the sustainability performance data. The software can be used for a variety of applications, such as sustainability reporting, carbon and water footprinting, product design, generating environmental product declarations and determining key performance indicators.
- **DesignBuilder:** DesignBuilder is an EnergyPlus based software tool used for energy, carbon, lighting and comfort measurement and control. It is developed to ease up the building simulation process.
- **Microsoft Visio:** Visio is a vector graphics application and is part of the Microsoft Office family.
  https://www.cc.iitb.ac.in/
- **Origin:** Origin is a proprietary computer program for interactive scientific graphing and data analysis. It is produced by OriginLab Corporation and runs on Microsoft Windows. Graphing support in Origin includes various 2D/3D plot types.
  https://www.cc.iitb.ac.in/

Structural Engineering

- **ETABS (Extended Three-dimensional Analysis of Building Systems):** Engineering software product that caters to multi-story building analysis and design, modelling tools and templates, code-based load prescriptions, analysis methods and solution techniques, all coordinate with the grid-like geometry unique to this class of structure
- **ANSYS (Analysis System)**: Finite element analysis software for simulating computer models of structures, electronics, or machine components for analyzing strength, toughness, elasticity, temperature distribution, electromagnetism, fluid flow, and other attributes
  For Student Version(should be used only for educational purposes):
  https://www.ansys.com/en-in/academic/free-student-products
- **SAP 2000:** 3D object based graphical modelling software for wide variety of analysis and design options completely integrated across powerful user interface and well-integrated, productive and practical general-purpose structural program
- **MIDAS:** To create high quality designs with unprecedented levels of efficiency and accuracy distinctively user-friendly interface and optimal design solution functions that can account for construction stages and time dependent properties, highly developed modelling and analysis functions enable engineers to overcome common challenges and inefficiencies of finite element analysis
- **OpenSees: F**inite element applications for simulating the response of structural and geotechnical systems subjected to earthquakes
  https://opensees.berkeley.edu/OpenSees/user/download.php
- **FEAST (Finite Element Analysis of Structures):** Structural and heat transfer analysis software based on finite element method
- **PACT (Performance Assessment Calculation Tool): E**lectronic calculation tool, and repository of fragility and consequence data, that performs the probabilistic calculations and accumulation of losses.
  https://femap58.atcouncil.org/pact
- **SeismoStruct:** Finite Elements package capable of predicting the large displacement behaviour of space frames under static or dynamic loading, taking into account both geometric nonlinearities and material inelasticity
- **CSiBridge:** Graphic designing software for analysis, and design of bridge structures
- **LS-DYNA: A**dvanced general-purpose multiphysics simulation software package

Water Resources Engineering

- **Gephi:** Gephi is open-source software for network visualization and analysis. It helps data analysts to reveal patterns and trends, highlight outliers intuitively and tells stories with their data. It uses a 3D render engine to display large graphs in real-time and to speed up the exploration.
  gephi.org

- **KYPipe:** KYPipe models' water, petroleum, refined products, chemicals, refrigerants, low-pressure sewer systems, and more. It can be used for selecting and sizing pipes, pumps, valves, tanks, and other devices. Calibration tools and pump operation optimization features help ensure sound modelling.
  www.kypipe.com
- EPANET: EPANET is a software application used throughout the world to model water distribution systems. It was developed as a tool for understanding the movement and fate of drinking water constituents within distribution systems and can be used for many different types of applications in distribution systems analysis.
  https://www.epa.gov/water-research/epanet
- **HEC-HMS:** The Hydrologic Modeling System (HEC-HMS) is designed to simulate the precipitation-runoff processes of dendritic drainage basins. It is designed to be applicable in a wide range of geographic areas for solving the widest possible range of problems.
  https://www.hec.usace.army.mil/software/hec-hms//downloads.aspx
- SWMM: EPA's Storm Water Management Model (SWMM) is used throughout the world for planning, analysis, and design related to stormwater runoff, combined and sanitary sewers, and other drainage systems.
  https://www.epa.gov/water-research/storm-water-management-model-swmm
- **Ansys FLUENT**: Ansys FLUENT software contains the broad physical modelling capabilities needed to model flow, turbulence, heat transfer, and reactions for industrial applications ranging from airflow over an aircraft wing to wastewater treatment plants with Unparalleled breadth of turbulence models and acoustics modelling tools.
  ftp://ftp.iitb.ac.in/IITB_private/Ansys/
- **QUAL2K:** A Modeling Framework for Simulating River and Stream Water Quality. e. Application of the model extends to the presence of multiple pollution discharges and withdrawal locations and tributaries flowing into the mainstream. Data input to the QUAL2K model include geometric data of the river system, hydraulic data, parameters, and data of the surroundings
  https://www.qual2k.com/

Gender Cell IIT Bombay

IIT Bombay's Gender Cell is an institutional body which works towards promoting equality, non-discrimination and gender justice on the campus. It inquires into complaints of sexual harassment through its Internal Complaints Committee (GC-ICC). Its objectives are:

- To uphold the dignity of any person at IITB.
- To facilitate a gender sensitive and congenial working environment at IITB so that any gender whether employee or student, are not subjected to gender specific discrimination or sexual harassment.

Procedure to Complain

- Do not ignore harassment in the hope that it will stop on its own. Come forward and complain.
- Do not feel the sense of shame. Tell the harasser clearly that you find behaviour offensive.
- If informal methods such as telling the perpetrator to stop harassing do not help, the victim can contact any of the member of gender cell directly through their email or phone call and should lodge complaint at
- One can take help of their companion for filing complaint and can talk to someone who they trust.
- Keep a record of all incidents of harassment, so that it will be helpful when you register a complaint.
- The complainant's name and identity is always kept confidential.

Location

3rd floor Main Building
Next to Student Wellness Center
IIT Bombay, Powai, Mumbai 400076
Office Hours: Monday and Thursday:10.00 am to 12.00 pm
Tuesday, Wednesday and Friday : 3.00 pm to 5.00 pm

Contact Info

Email id: gendercell@iitb.ac.in
Office number: 5052 (available during office hours)
Website: http://www.gendercell.iitb.ac.in/

Student Wellness Center

After securing admission at the Institute and starting your stay here, you may feel that a lot of parameters around you are different. There are a few issues that almost everyone in the Institute faces initially like academic concerns, social (family and peer) pressure etc, leading to feelings of loneliness, low confidence, anxiety, stress, anger and sadness, to name a few. Student Wellness Center provides counselling opportunity for individuals to learn to make better choices, improve interpersonal skills, develop confidence and increase educational effectiveness.

Typical concerns you can seek counselling for are:

- Transition and change
- Uncertainty about values and goals
- Academic pressure
- Personal relationships with the special one and with friends
- Family concerns
- Issues of grief and loss
- Stress, depression and anxiety
- Lack of motivation; concentration difficulties
- And others...

Location: Student Wellness Centre
3rd floor, above Academic section, Main building

Timing: Monday to Friday:
Timing: 9.30-5.30

Contact: 022-2576-9070

Contact in Lockdown: Ms. Lavina Lewis
+91 9769340435 (11 am to 1 pm and 4 pm to 6 pm)

Website: http://www.iitb.ac.in/swc/en
For appointment, visit website.

Reaching IIT Bombay

Reaching Mumbai through Train

Stations for Through Trains Coming to Mumbai

Central Railway : CST, Dadar, Kurla, Thane.

Western Railway : Mumbai Central, Dadar, Bandra, Andheri, Borivali.

Those coming by **Central Railway** can take the Central Railway Suburban train and get down at **Kanjur Marg** station which is the nearest stations from IITB. Please ensure to take only a **slow local train** as the fast ones do not stop at Kanjur Marg.

If you come via **Western railway**, you can board a **Western Railway line** suburban train and reach **Dadar**, where you can change to the **central railway line** and board a suburban train to **Kanjur Marg**.

Once you get down at Kanjur Marg railway station, come out through the **western-side** gate and take a bus or, auto-rickshaw to IIT main gate.

Reaching Mumbai through Aeroplane

Those travelling by air can take **taxis/auto-rickshaws** from the domestic (40-60 min travel time)/international (20-40 min travel time) airport to reach IIT Bombay.

Campus Map

The campus map can be accessed using the following link:
http://www.iitb.ac.in/sites/default/files/article/images/IITB-Map---2D_ENG-PRINT.jpg
or in Insti app: https://insti.app/map

Credits

Content

Department Website

•https://www.civil.iitb.ac.in/

ISCP Website

•https://gymkhana.iitb.ac.in/~scp/scp/index.html

AAKAAR Website

•http://aakaariitb.in/

PG Sports Facebook Page

•https://www.facebook.com/groups/414517262018650/about/

PG Cult Website

•https://gymkhana.iitb.ac.in/~cultural/pg-cult/about.php#about

IIT B Placements Website

•http://placements.iitb.ac.in/

Complied by:

Team ISCP

Welcome to IIT Bombay