Indian Institute of Technology, Mumbai

PG Handbook

2018-19

Centre for Environmental Science and Engineering
# CONTENT

Disclaimer ......................................................................................................................... 3
Message from HOD’s Desk .............................................................................................. 4
Message from ISCP .......................................................................................................... 5
Message from Institute Masters Representative ......................................................... 6
About Department ........................................................................................................... 7
Resources .......................................................................................................................... 9
Laboratories and Research Facilities ........................................................................... 9
CESE Faculty .................................................................................................................. 10
Research Activities ......................................................................................................... 14
Industry Interaction ....................................................................................................... 15
Organizations .................................................................................................................. 16
Environmental Science and Engineering Association (ESEA) ...................................... 16
Institute Level POR’s-ISCP Team CESE ................................................................. 19
Placements ..................................................................................................................... 20
Recruiters ....................................................................................................................... 21
Sports .............................................................................................................................. 22
Non-Teaching Staff ....................................................................................................... 23
Message from PGAC ..................................................................................................... 24
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 inadvertently creep 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.
Message from HOD’s Desk

I heartily welcome you to the Centre for Environmental Science and Engineering at Indian Institute of Technology, Bombay. Rapid Industrialisation poses many environmental challenges but also offers opportunities to find, out of the box solutions. This is the place where you can put efforts to solve these critical issues and create fruitful results which can help society as well as country.

Centre provides you good opportunities which you can use to achieve your goals. We are in pursuit of achieving harmony between faculties and students. The department provides a conducive environment for the students to develop analytical and practical skills. To harness your abilities, institute and department provides many opportunities.

I strongly believe that success lies in modifying and trying different approaches towards the problem. Best in you will come out during tough situations, so keep working hard.

Prof. Sanjeev Chaudhari
Head of department
Centre for Environmental Science and Engineering
Indian Institute of Technology Bombay
Powai, Mumbai, Maharashtra-400076
Message from ISCP

Hello, Friends!

We hope you are just excited to be a part of IIT Bombay as we are. Hearty congratulations on this incredible feat! Institute Students Companion Program (ISCP) welcomes you to one of the most resourceful campuses in India. The next two or three years are going to be the most memorable, impactful, insightful and life changing years which will fly past. We hope you imbibe as much as you can and more from your peers, seniors, faculty and staff. Here’s to your first glimpse of ISCP, the backbone of your journey through the mecca of learning.

ISCP is a program within IIT Bombay Post Graduate (PG) student community. Its primary objective is to develop an atmosphere of cordial interaction amongst the PG entrants and the PG seniors. It will encourage the flow of information, knowledge, and sharing of experiences among the students.

Life in IIT Bombay can appear a little daunting at times, balancing between the academic workload and the plethora of extra-curricular activities. And that is where ISCP can help you blend in and make the most of it. ISCP strives to provide a senior student companion as a mentor to all newly admitted students. New entrants can contact their assigned companion to discuss their academic and non-academic issues or concerns. Student Companions enable the smooth and gentle transition from the graduation days to post-graduation days. New entrants also feel assured that there is somebody on campus to help them and listen to their concerns. Many a times they find a caring friend in companions.

What to expect from a Student Companion:
- Initial information about the campus, courses, academics and extracurricular activities.
- Support in case of any problem or difficulty.
- Organization of various academic and non-academic activities for student’s development.
- Continuous interaction and feedback from students on their needs and requirements.

In short, this is a program by the students of IIT Bombay, for the new students to ensure their overall development through utilization of all the available resources at IIT Bombay.

Let the learning begin. Feel free to contact us anytime!

Email: iscp@iitb.ac.in
Overall Coordinators
Institute Student Companion Programme (2018-19)
Anwesha Lahiri | Sumedh Dey | Basudev Behera
+91-9007766390 | +91-9432152174 | +91-7008955255
Dear Freshmen,

On behalf of all the Master’s students at IIT Bombay, it is my honour to welcome you all here. Congratulations on having made it to one of the premier technical institutes of the country.

You are now a part of the IITB PG community and there are an exhaustive number of services and facilities available to ensure a fruitful educative experience. As post graduate students, you have already been exposed to university level education. While you will delve deeper into understanding your area of interest better, I urge you to explore more. There are several student led bodies on campus focusing on development of skills, sports and extracurricular activities such as dance, drama, music, etc. Your experience will be what you make of it, and your opportunities will be limited only by the limits you place on yourself. Utilize the opportunities to the best of your ability. Along with academics, do explore and make the most of the excellent facilities the institute has to offer.

As the Institute Masters Representative, my team and I, aim to address your grievances and help you to the best of our abilities. Supporting you in your academic endeavours is our foremost priority and we will strive to improve the IITB experience in all the ways we can. On this note, I, once again, welcome you to IIT Bombay and wish you every success in your future endeavours.

Jasmeen Kaur  
Institute Masters Representative  
PG Academic Council  
IIT Bombay  
Email: imr@iitb.ac.in
About Department

The Centre for Environmental Science and Engineering at IIT Bombay was established in 1985. Prior to this, an "Environmental Science and Engineering Group" comprising of faculty members from various allied disciplines existed on campus since 1977. CESE has a dedicated group of ten regular faculty members and one emeritus professor with multidisciplinary background and interests. The Centre offers M.Sc.-Ph.D., M-Tech and Ph.D. programmes in Environmental Science and Engineering. All the programmes are interdisciplinary in nature and consist of course work followed by a research project.

The mission of our department’s post graduate programs is to prepare graduate students to succeed in careers in Environmental Engineering in such diverse employment opportunities as consulting, industry, governments at all levels, and/or higher education. Broadly speaking, the department’s mission includes teaching, research and service. All PG students receive formal education by being taught in classroom settings. In addition, many actively participate in research projects under faculty supervision, thus receiving informal instruction in the planning and conducting of research.

Since inception, the Centre has established and maintained strong links with leading industries, institutions and national and international funding agencies. Research projects are currently funded by renowned agencies such CIAR (Centre for Indoor Air Research, USA), DST (Department of Science and Technology), AERB (Atomic Energy Regulatory Board), MPCB (Maharashtra Pollution Control Board), MCGM (Municipal Corporation of Greater Mumbai), MoES (Ministry of Earth Sciences) and MoEF (Ministry of Environment and Forests).

Major ongoing research deal with contemporary topics like:

- Aerosols and Climate: PM-2.5 and Chemical Constituents from Combustion of Biomass Fuels in the Indian Subcontinent
- Emission Factors of Respirable Aerosols and PAHs from Biofuel Cook stoves.
- Environmental Impact Assessment and Hazardous Waste Management
- Innovative Bioreactors for Wastewater Treatment.
- Modelling of Urban and Regional Scale Air Pollution in India
- Monitoring of Human Exposure to Air Pollution in Highly Industrial Area
- Studies in the Physicochemical Degradation of Radioactive Waste at the Soil-water Interface and Development of a Suitable Clay Liner for Containment of the Waste
- Treatment of Ammoniacal Wastewater from Heavy Water Plan

**ADVISING/MENTORING**

Advising and mentoring are two very important elements in a graduate student’s career. Upon acceptance into the CESE department, graduate students enrolling as Ph.D. research scholar are assigned a faculty advisor, who is identified to the student in the acceptance letter from the department. In most cases, the student will have indicated an area of interest in their application, and the faculty advisor will be specialized in that sub-discipline. Graduates enrolling for master’s program (M-Tech) are assigned faculty advisor after the end of first semester when projects are being assigned.

The graduate coordinator will provide initial guidance on overall academic requirements, program and university policies and procedures, while the faculty dissertation advisor serves more as a mentor providing direction on research, advice on program of study, and guidance on other areas of academic and personal life.

**M-Tech Coordinator:** Prof. Munish Chandel

**PhD Coordinator:** Prof. Harish Phuleria

**MSc-PhD Coordinator:**
Prof. Subhankar Karmakar
Prof. Suparna Mukherji
Resources

Laboratories and Research Facilities:
The laboratories are designed specifically for environmental engineering research and laboratory instruction. The space is well equipped for physical, chemical and biological experimentation as well as engineering testing of processes on a pilot plant scale.

Laboratories at CESE

- Aerosols and Air Quality Monitoring Laboratory (AAQML)
- Air Laboratory
- Air Pollution and Noise Exposure Group (ANERG)
- Chemistry Laboratory
- Environmental Biotechnology Laboratory (EBL)
- Environmental Infrastructure and Clean Technology (EICT) Laboratory
- Environmental System Research Laboratory (ESRL)
- Hazardous Waste Laboratory
- Innovative Technologies for Water Treatment Laboratory (ITWTL)
- Instrumentation Laboratory
- Microbiology Laboratory
- Solid and Liquid Waste Treatment Laboratory (SLWTL)
- Treatment Remediation and Applied Microbiology (TRAM) Laboratory

In addition to a full range of research equipment used for environmental analysis of air and water, the laboratories house specialized instruments, including: Atomic Absorption Spectrophotometer, Automatic Air Particle Size Analyzer, Cascade Impact Air Particle Analyser, COD Digester, Flame Photometer, Ion Chromatograph with Conductivity detector, Micro Orifice Uniform Deposit Impactor, Microwave Digestion System, NOx Analyser, Photo-Biological Reactor, Photo-chemical Reactor, Refrigerated High Speed Centrifuge, Sequencing Batch Reactor, Total Organic Carbon Analyser, UV and Visible Spectrophotometers.

Several computational facilities which are available at CESE have always helped students to contribute solutions to different research problems and have made research a bit faster.
CESE Faculty

Prof. Sanjeev Choudhari (Professor)
sanjeev@iitb.ac.in
Arsenic removal from water, Biological nutrient removal from wastewater, Application of Natural coagulants for water and Wastewater treatment, Treatment of textile wastewater by biological and physicochemical processes.

Prof. Shyam R. Asolekar (Professor)
asolekar@iitb.ac.in
Hazardous, municipal & biomedical waste management, Eco-industrial networking, Eco-centric and low-cost wastewater treatment, Treatment of leachate and special industrial wastewaters, Environmental policy and preventive environmental management.

Prof. Virendra Sethi (Professor)
vsethi@iitb.ac.in
Aerosol and air quality, Hot gas clean-up (thermal gasification), Nano-Powder synthesis, Satellite remote sensing for air quality.

Prof. Anil Kumar Dikshit (Professor)
dikshit@iitb.ac.in
Water Supply; and Water & Wastewater Treatment, Urban and Industrial Solid Waste Management, Environmental Management; and Environmental Systems Modelling & Optimization, GIS for Environment, Industrial Effluent and Sludge Management.
Prof. Suparna Mukherji (Professor)

mitras@iitb.ac.in

Biotransformation and toxicity evaluation of complex organic pollutants, Fate and transport of pollutants in aquatic and subsurface systems, Physicochemical and biological treatment processes, Hazardous waste minimization and pollution prevention, Environmental statistics and design of experiments.

Prof. Anurag Garg (Associate Professor)

a.garg@iitb.ac.in

Advanced oxidation processes (catalytic wet oxidation and Fenton) for the removal of persistent organic and inorganic compounds from industrial wastewater, Nutrients removal from wastewater using a combination of physico-chemical and biological processes, Treatment of leachate (generated from Municipal solid waste landfill) using physico-chemical processes, Mechanical biological treatment of municipal solid waste (MSW), Energy recovery from solid recovered fuel (derived from MSW) and sludge generated from sewage treatment plants and industries.

Prof. Subhankar Karmakar (Associate Professor)

skarmakar@iitb.ac.in


Prof. Munish Chandel (Associate Professor)
munish.chandel@iitb.ac.in

Prof. Harish Phuleria (Assistant Professor)
phuleria@iitb.ac.in
Aerosol & air quality characterization with a focus on nano/ultra-fine particles, Size-resolved outdoor PM chemical composition, Improved cook stoves efficiency, longevity and adoption assessment, Environmental noise exposures, Exposure modelling using GIS, Land use, questionnaire data.

Prof. Amritanshu Shriwastav (Assistant Professor)
amritan@iitb.ac.in
Ecology of microorganisms, Water and wastewater treatment, Algal bio-refinery for biofuel production, Algal-bacterial photo-bioreactors, Remediation of heavy metal contamination.
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Dissertation Title (Alphabetical order)</th>
<th>Guide, Co-guide</th>
<th>Name of the Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Assessment of municipal solid waste based biogas plants in India</td>
<td>MKC</td>
<td>Indurkar Mugdha Sunil (Tata Fellow)</td>
</tr>
<tr>
<td>2.</td>
<td>Drum Composting of Household Biodegradable Solid Waste</td>
<td>AG</td>
<td>K. Prasad</td>
</tr>
<tr>
<td>3.</td>
<td>Environmental footprint analysis to evaluate the sustainability of a city</td>
<td>MKC</td>
<td>Ravi Kaushik</td>
</tr>
<tr>
<td>4.</td>
<td>Estimation of field-based emission factors of aerosol mass and its chemical constituents from solid biomass cooking fuels</td>
<td>HCP, *CV</td>
<td>M. Nagaraju</td>
</tr>
<tr>
<td>5.</td>
<td>Experimental study to evaluate emissions from cookstoves using solid fuels with a focus on reduction of exposure</td>
<td>VS, *SA</td>
<td>Prerit Tak (Tata Fellow)</td>
</tr>
<tr>
<td>6.</td>
<td>Removal of heavy metals from water using Nanomaterials</td>
<td>SM</td>
<td>Manish Bagul</td>
</tr>
<tr>
<td>7.</td>
<td>Selenium removal from drinking water</td>
<td>SKC</td>
<td>Mridula Singh</td>
</tr>
<tr>
<td>8.</td>
<td>Studies on photocatalytic denitrification for water purification</td>
<td>AS</td>
<td>Sukhman Sandhu</td>
</tr>
<tr>
<td>9.</td>
<td>Sustainable approach to rejuvenation of Powai lake using engineered constructed wetland</td>
<td>SRA</td>
<td>Dipanjan Saha</td>
</tr>
<tr>
<td>10.</td>
<td>Design for sustainable solid waste (organic biodegradable fraction) treatment unit</td>
<td>AKD</td>
<td>Saypariya Dakshesh Chimanbhai</td>
</tr>
</tbody>
</table>

*CV: Prof. Chandra Venkataraman, Chemical Engineering Department, IIT Bombay; *SA: Professor Satish Agnihotri, CTARA, IIT Bombay
Research Activities

Research and Development is a key component of CESE activities and spans a wide range of areas from basic to applied science in tune with national and global requirements. The Centre is offering wide professional expertise and is actively pursuing sponsored research, consultancy and technical services. It has established strong links with leading industries, institutions and national/international agencies.

Consultancy Projects

- Adaptive Technology - Environmental Systems
- Air Dispersion Modelling of Thermal Power Stations using ISC Software
- Air Monitoring at Panvel Junction
- Air Pollution Dispersion Modelling for Trombay Thermal Power Station
- Air Quality Prediction Modelling from HPCL Mumbai Refinery
- Ambient Air and Marine Water Quality Monitoring from JNP, Nhava Sheva
- Biological Treatment of Steel Plant Effluents
- Capacity Building in Environmental Impact Assessment (EIA) Caustic Concentration Systems
- Development and Design of Wastewater Treatment Facility
- Development of Treatment Methodologies
- Dry Inventorization of Effluent Generation by MIDC, Bombay
- Environmental Database Management Systems for Power Plants
- Environmental Impact Assessment of a Combined Hazardous Waste Disposal Facility
- Environmental Management Plan for Jawaharlal Nehru Port Trust.
- Environmental Status of Kalyan Municipal Corporation Environmental Status Survey
- Field Air Monitoring for Mumbai Urban Transport Project
- Indoor Air Quality Monitoring for Industrial Development Bank of India Tower
Industry Interaction

CESE has frequent interaction with a range of organizations from various industrial sectors listed below and students of CESE are suitably placed with them. AIC Watson, Asian Paints, Associated Cement Companies Limited, BAIF Development Research Foundation, Batliboi & Co. Ltd. Enron Projects, Coal India, Dar Al-Handasah, Dorr Oliver Humphry & Glassgow, Environmental Management Centre, Essar Limited, Ganpat University, GIST Advisory, Gloob Décor, Hindustan, Indian Dyes Stuff Industries, Kirloskar Consultancy, Maruti Udyog Limited, MWH global, Procter& Gamble, Reliance Industries, S’O’A University, Tata Consultancy Industries, Tata Risk & Management Services, Thapar University.
Organizations

Environmental Science and Engineering Association (ESEA)

Vision:

The Environmental Science and Engineering Association (ESEA), represents the entire community of academicians, students and professionals dedicated to the cause of environmental protection and sustainability. Essentially, it is a student organisation of the Centre for Environmental Science and Engineering, Indian Institute of Technology-Bombay.

Mission:

- Exchange of knowledge between industry and academicians.
- Improve public appreciation of environmental issues.
- Advancing environmental engineering and technology.

Current Committee:

The ESEA committee is headed by the head of the department as president followed by any faculty member as vice-president. The remaining team is constituted by the students from both M-Tech as well as Ph.D. The present president of ESEA is Prof. Sanjeev Chaudhari and vice president is Prof. Virendra Sethi.
Shruthi Sharma  
Secretary, General affairs  
Contact No: 09643465741  
Email: sharmaiitb22@gmail.com

Dipanjan Saha  
Secretary, Public Realtions & Department Placement Coordinator  
Contact No: 07980647284  
Email: 173180007@iitb.ac.in

Prashanth Sinha  
Secretary, social affairs  
Contact No: 09456374039

Manish Bagul  
Secretary, Seminar  
Contact No: 08149704901  
Email:173180013@iitb.ac.in
Saypariya Dahshesh Chimanbhai
Treasurer
Contact No: 8866653940
Email: daksheshpatel3@gmail.com

Mridula Singh
Department Sports secretary (Girls)
Contact No: 08175053050
Email: mridula.lm@gmail.com

Vinay Kumar
Department sports secretary (Boys)
Contact No: 9987093963
Email: vinay2611@gmail.com
Institute Level POR’s- ISCP Team CESE

K Prasad
Department Coordinator – ISCP
Contact No: 8179489899
Email: prasad21.iitb@gmail.com

Arhma Ansari
Student Companion – ISCP
Contact No: 8329977911
Email: arhma.ansari8482@gmail.com

Prerit Tak
Student Companion – ISCP
Contact No: 9460933496
Email: prerittak@gmail.com

Saypariya Dakshesh Chimanbhai
Student Companion – ISCP
Contact No: 8866653940
Email: daksheshpatel3@gmail.com
Placements

The placements in CESE were reached 92.3% this year with highest package of 13 Lpa for Harsh Bansal and the average package is 7.2 Lpa. The recruiters were Larsen& Toubro, Bosch, Next Education, Edelweiss, IPCA, Stantec, Shri Ram Educorp e.t.c.

Placement Statistics (2016-18)
Recruiters
Students of CESE were very active in participating different sports events in the campus. The achievements of CESE in 2017-2018 is below

<table>
<thead>
<tr>
<th>Event</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volley Ball</td>
<td>1st Place</td>
</tr>
<tr>
<td>Basket Ball</td>
<td>2nd Place</td>
</tr>
<tr>
<td>Tug of war boys</td>
<td>2nd Place</td>
</tr>
<tr>
<td>Tug of war Girls</td>
<td>3rd Place</td>
</tr>
<tr>
<td>Carrom</td>
<td>4th Place</td>
</tr>
<tr>
<td>Table tennis</td>
<td>4th Place</td>
</tr>
</tbody>
</table>

Apart from that CESE has participated in several sports events like Cycle racing, Badminton, Football, Swimming, Tennis.
## Non-Teaching Staff

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Email</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrs. Vimala Sadanandan</td>
<td>Sr. Superintendent</td>
<td><a href="mailto:vimala@iith.ac.in">vimala@iith.ac.in</a></td>
<td>+91-22-25767851/52</td>
</tr>
<tr>
<td>Mr. Ravindra Surve</td>
<td>Sr. Superintendent</td>
<td><a href="mailto:surve@iith.ac.in">surve@iith.ac.in</a></td>
<td>+91-22-25764818</td>
</tr>
<tr>
<td>Mrs. Rupa Sorte</td>
<td>Jr. Technical Superintendent</td>
<td><a href="mailto:rupasorte@iith.ac.in">rupasorte@iith.ac.in</a></td>
<td>+91-22-25764864</td>
</tr>
<tr>
<td>Mr. Ramakant Bhandare</td>
<td>Jr. Technical Superintendent</td>
<td><a href="mailto:ramakanthb@iith.ac.in">ramakanthb@iith.ac.in</a></td>
<td>+91-22-25764869</td>
</tr>
<tr>
<td>Mrs. Aditi Mittal</td>
<td>Superintendent</td>
<td><a href="mailto:aditimittal@iith.ac.in">aditimittal@iith.ac.in</a></td>
<td>+91-22-25767851/52</td>
</tr>
<tr>
<td>Mr. Rajan Agawane</td>
<td>Office Staff</td>
<td><a href="mailto:rbagawane@iith.ac.in">rbagawane@iith.ac.in</a></td>
<td>+91-22-25767851/52</td>
</tr>
<tr>
<td>Mrs. Mugdha Padawe</td>
<td>Jr. Lab Assistant</td>
<td><a href="mailto:Mugdha.padawe@iith.ac.in">Mugdha.padawe@iith.ac.in</a></td>
<td>+91-22-25764862</td>
</tr>
</tbody>
</table>
"The Greatest Threat to Our Planet Is the Belief That Someone Else Will Save It"

~Robert Swan
CREDITS

Department Website: http://www.cese.iitb.ac.in/

ISCP website: https://gymkhana.iitb.ac.in/~scp/scp/

Compiled by

K Prasad Udayar

(Department Coordinator, ISCP)

&

ISCP Team CESE