Ed-Tech
TELeaD
TUET
EDA
EmergE
Learning
MOOCs
LMS
Instructional
Design

SCP

Decade of EdTech 2010-20

et iitb
Indian Institute of Technology Bombay

EDUCATIONAL TECHNOLOGY DEPARTMENT HANDBOOK

2022

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/statutes 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.

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About the Institute IITB

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 caliber of students graduating from its undergraduate and postgraduate programmes, the institute attracts the best students from the country for its bachelor's, master's 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 also builds links with peer universities and institutes, both at the national and the international levels, to enhance research and enrich its educational programs. 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 programs 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 programs. 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 ET

The Educational Technology Department at Indian Institute of Technology (IIT) Bombay is actively involved in research and education in areas of pedagogies and tools for technology-enhanced learning. The thrust areas of research in the IDP-ET are:
- Technology Enhanced Learning of Disciplinary practices (TELeaD)
- Teacher Use of Educational Technology (TUET)
- Educational Data Analytics (EDA)
- Exploration of Emerging Technologies for Education (EmergE)

The department has been working on 50+ EdTech Projects, 20+ TEL Systems and 250+ publications. The IDP-ET has 6 core faculty members, 1 adjunct faculty, and 17 associate faculty members from academic units across the Institute. The academic staff of IDP-ET has 2 post-doctoral research associates and a number of project research staff & interns.

The Educational Technology department at IIT Bombay celebrated the Decade of EdTech at IITB Bombay in the year 2020. The Educational Technology department at IIT Bombay has multiple labs which facilitate research and development of Educational technology. Facilities in our lab include a library, a video conferencing setup, a smart classroom with digital white-board and a warm dining area.

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Vision @ ET

The Interdisciplinary Programme in Educational Technology (IDP-ET) started in the Institute in the Autumn semester of the academic year 2010-11. The IDP-ET conducts research and education in areas of pedagogies and tools for technology-enhanced learning.

In addition to Institute courses for Ph.D. and M.Tech, the IDP-ET organizes short-term courses and MOOCs on effective teaching-learning with emerging technologies and educational research methods through CEP, NPTEL, and IITBombayX.

Members of the IDP-ET play a significant role in the organization of international conferences, carry out government and industry-sponsored projects and provide consultancy.

VISION

The Vision of IDP-ET is to be a source of ideas and innovations in technology for education and pedagogies for technology-enhanced education.

MISSION

The Mission of IDP-ET is to nurture research, innovation, and outreach leadership among its faculty and students, in areas of educational technology that are critical to the Indian context.

Message from Convener

Dear Prospective Student,

We are delighted to welcome you to M.Tech in Educational Technology at IIT Bombay. Educational Technology may be a new field for many of you but don't worry. We have a strong culture of collaboration and inclusion to support your academic, professional and personal growth. During your program, you will get to explore diverse aspects of this field, such as carrying out research, developing products and outreach activities. You will interact with faculty, other students as well as alumni, and become part of a community. You will learn new skills, make innovations and contribute to this community at IIT Bombay and beyond.

Going beyond one department, IIT Bombay has a lot to offer - in terms of academics, co-curricular and extra-curricular activities. We encourage you to take advantage of this and enthusiastically participate in activities of your interest. We are confident that you will find this M.Tech journey exciting and meaningful. We look forward to personally welcoming you.

On behalf of the faculty and students,
Sridhar Iyer (Convener, Educational Technology)

Message from Faculty Advisor

Dear Students,

Welcome to the ET department and IIT Bombay!

We are very excited to have you here and look forward to seeing you in the ET lab. In the ET department, we place a lot of emphasis on building a tightly knit community of learners who inspire and help each other grow academically and personally. All of you are bringing with you unique experiences that will help this community grow so don't hesitate to talk to people and ask questions.

The ET community works on a range of research topics so explore all the topics, engage in projects that interest you, and embrace challenges that come your way as you begin your ET journey. All the best.

Regards,

Chandan Dasgupta (Faculty Advisor, Educational Technology)

Message from ISCP

Dear new entrants,

Heartfelt congratulations for embarking on one of life's most memorable journeys – the journey of learning at IIT. On the behalf of our prestigious institute of IIT Bombay, team ISCP welcomes you aboard.

Give a pat on your shoulder for having achieved this feat. Your dedication, hard work, and perseverance brought you here, and we know that your experience will lead you towards great opportunities. We can guarantee that your time here on this colossal campus will be exciting and knowledgeable. A degree will just be a small portion of what you will be leaving this institute with. You will also leave with beautiful memories of late-night conversations, interesting wing cultures, and crazy birthday parties (oh you are going to miss those!!).

You will have the opportunity to mingle in various clubs and societies where individuals strive to become experts in their fields and devote endless hours. As a result, there will be many chances to learn inside and outside the classroom. So entering this new universe in itself presents both exhilaration and potential difficulties. This is where we will help you by providing the tips you need to handle these difficulties and enjoy your time at IIT Bombay.

Now, you should be thinking, what on earth is this ISCP? Institute Student Companion Programme (ISCP) is a student body with the primary objective of

building a relationship of trust and comfort between the on-roll students and the incoming students of the PG programmes. We are here to help you get familiar with the ways of IITB, guide you through your ups and downs and make sure that each voice is heard. You will become part of a culture where people want to perfect their craft and thus work day in and day out. Various events are organized by the cultural, technical, and sports clubs in the institute throughout the year. Managing these along with 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 want to help you in low and high tides as an act of giving back what they received from the programme. You can rely on the team for any advice or information on anything you are venturing out into, whether it be academics or extracurriculars, any issues that you are facing, any support or requirements that you want to raise as a part of the student community. And at last but undoubtedly not least just for regular interaction because that is all the programme holds at its core.

The knowledge and the experience that our student companions have gained with their stay on the campus will help your transition become smooth. From campus tours to classroom lectures, from the grading system to completing the syllabus, from the profile to placements, from Schezwan Frankie to curry-pakora, they will be there for you.

We are sure that the last couple of years have been rough for many of you. But as we know that life moves on. So, make sure that you make the best out of your

journey at IIT Bombay. Come and contribute to this vast store of knowledge and help it become more vibrant and colorful.

The campus of IIT Bombay awaits your presence; see you there.

Overall Coordinators,
Institute Student Companion Programme (2022-23), IIT Bombay
Email : iscp@iitb.ac.in, iscp2022.23@gmail.com

Abhishek Raman   Dipankar Kuli   Prabhat

Message from PGAC

Welcome Freshers!

We all have gone through a lot in these past couple of years, so firstly congratulations to all of you for securing admission in one of the prestigious institutes in the country. IIT Bombay provides best exposure to its students in all the aspects, both academically as well as non academically. The skills you develop here, the interactions you have with people here will stay with you throughout your life. The post graduation demands something additional compared to the under graduation, more time, more effort, more determination and a ton of dedication. For meeting these primary requirements, often we find ourselves in a daunting situation. In order to make your stay at IIT Bombay convenient, the institute has established the PGAC (Post Graduate Academic Council). Any technical necessity, any placement related assistance, any research queries or any academic grievances, you can always reach out to us. Each department has their own AURAA (Academic Unit Representative of Academic Affairs), whom you can approach directly in case you find any difficulties.

Wishing you all a really convenient and productive IIT journey!

Regards,

Mohit Meena

Institute Secretary, Academic Affairs (Masters)

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Placement Team

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Department Post-bearers

TA Role	POC-1	POC-2	Faculty In-charge
Lab and Space maintenance secretary	Nisumba Soodhani	Vijay Prakash	Prof. Sridhar Iyer
Information, Tools & Equipment Manager	Devanshu Saindane	Suprabha Jadhav	Prof. Ramkumar Rajendran
External interaction secretary	Indra R	Karishma Khan	Prof. Ramkumar Rajendran
Social Media Secretary	Devanshu Saindane	Kabyashree Khanikar	Prof. Chandan Dasgupta
Design and branding	Ram Das Rai	Suprabha Jadhav	Prof. Sahana Murthy
System admin	Jyoti Kolap		Prof. Ramkumar Rajendran
Web Admin	Indra R	Avijit Pandey	Prof. Chandan Dasgupta
Friday meeting secretary	Meera Pawar	Pratiksha Virendra Patil	Prof. Ramkumar Rajendran
Library Secretary	Devanshu Saindane	Suprabha Jadhav	Prof. Ramkumar Rajendran
Youtube video editing team	Gurudeo Thakare	Karishma Khan	Prof. Ritayan Mitra
Cultural secretary	Pratiksha Virendra Patil	Vijaya Singh	

Faculty Members

Core Faculties:

Prof. Sridhar Iyer

Research Interests: Adapt/Extend Teaching-Learning Strategies to Leverage Information and Communication Technologies (ICT), Use/Develop ICT Tools for Education Applications, in the Indian Context, Computer Science Education Research.

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Prof. Sahana Murthy

Research Interests: Inquiry-based Environments for STEM Education; Development of Scientific Abilities through Technology Enhanced Learning

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Prof. Ritayan Mitra

Research Interests: STEM education, eye-tracking and biosensors, systems thinking, and earth science education

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Prof. Chandan Dasgupta

Research Interests: Designing learning environments for supporting integrated STEM learning (both formal and informal contexts); Use of counterexamples as primary generators for supporting productive disciplinary engagement; Integrating design thinking and scientific inquiry; Providing feedback to teachers and students to scaffold the design thinking process; Exploring the application of neuroscience in engineering education

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Prof. Ramkumar Rajendran

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Prof. Syaamantak Das

Research Interests: Better Textbook Initiative: Design and development of low-cost immersive technology-enabled open textbooks, Analyzing Learner deficiency from MCQ-based Assessments
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Adjunct Faculties:

Prof. M. Sasikumar

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Know your Seniors

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Know your Alumni

M.Tech (2019-2021)

	Pratishtha Negi	Singapore Education Academy (Asia Pacific) Pte Ltd.
	Mayank Sahu	Purple Tutor
	Gaurav Jaiswal	IRRI
	Deepika Kanojia	Singapore Education Academy (Asia Pacific) Pte Ltd.

	Deepak Kumar Pathak	Kotak Education Foundation

M.Tech (2020-2022)

	Raj Gubrele	Hero MoroCorp
	Bhagwan Kishan Kamble	AllCargo Logistics
	Nagesh Pokle	IITB Institute Staff

Labs, Equipments, and Facilities

LABS:

Educational Technology Research Lab (ETRL)

The research laboratory runs strong on the human resources available in the form of Ph.D. and M.Tech. research scholars and research scientists. The research laboratory has a study room and observation room partitioned with a one-side glass window to ensure the smooth conduct of the research experiments. The main space is divided into student work-stations. The pantry area has basic facilities like water purifiers, storage compartments, dining table, & a sitting area. The entire lab space has modular and ergonomically designed furniture.

Educational Technology Development Lab (ETDL)

The objective of ETDL is to provide a safe learning space for students and researchers by providing opportunities to play with emerging technologies and figure out innovative ways of implementing and integrating them to leverage teaching-learning processes. The lab is equipped with two categories of tools based on the medium of communication, where the first category comprises screen-based and head-mounted display-based technologies like Augmented Reality (AR), Virtual Reality (VR), and Leap Motion (for gesture control), etc. The other category is physical computing technologies enabling more tangible interactions like Lego Mindstorm, 3D printers, Arduino, Myo-armband, Cozmo robot, etc.

NextEd Research Lab

A sponsored laboratory in association with Next Education Pvt Ltd. The lab space is equipped with a soundproof room for recording purposes and a workspace for students.

Department Library Book Catalogue:

https://docs.google.com/spreadsheets/d/1rpGx42iKdM1_F2ClX4cs1mv222Klt29s0NPnSYVIz80/edit#gid=0

Department Library Secretaries:

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Equipments:

Cozmo

Cozmo is an artificially intelligent toy truck developed by Anki. Cozmo was used to develop activities for students and modules for teachers that helps in developing computational skills in students.

VR Headset

Virtual reality has the potential to bring revolution in the field of education. Keeping this in

mind, the department is focused on exploring this research area. This VR headset was used in the development of the Speak Up project. Speak Up is a virtual reality (VR)-based application, which enables individuals in improving their oral presentation skills.

Samsung Flip Smartboard

The device is used currently for teaching & presentation purposes. However, it is currently being explored as a CSCL tool.

Leap Motion

This device is used to capture hand and finger motion. Leap motion was used in the project – 'Geometry via gestures'. Geometry via Gestures. i.e. G-v-G allows students to interact with the 3D objects via gestures.

Muse EEG Headband

This headband is used to collect EEG signals which are then used to understand

various aspects of learning processes and products. In one of the current studies, it is used to measure cognitive load during a task.

Shimmer3 GSR/SH3-Dock-01

This GSR (Galvanic skin response) device is used with other data channels to capture the learner's affective states.

3D Printer/ Flashforge/Guider II

It is an industrial-grade 3-D printer developed to provide maximum stability and quality for printing designs. 3-D printing will help us to bridge the gap between ideas and images on a page or screen, allowing for the creation of those ideas/images in the physical, 3-dimensional world.

3-D Printer was used in many studies for creating Functional prototypes, Tooling, and Lightweight components. It is also used to develop artifacts that help in logical thinking for visually- challenged students.

Eye Tracker

The screen-based system shows exactly where people are looking and, with a sampling rate of 120 Hz, it is designed for detailed research into the timing and duration of fixations. Currently, we are using eye trackers Tobii 4C and Tobii Pro/X3-120 Packages for understanding the processes involved in SRL and the role of subtitles in the learning process.

Courses & Grading system

Grading Policy:

IT Bombay follows the Grade Point system known as the CPI system (Cumulative Performance Index). For every course taken by the students, he/she is assigned a letter grade on his/her combined performance in all the assessments. These grades are described by the following letters and corresponding grade points.

AP	10
AA	10
AB	9
BB	8
BC	7
CC	6
CD	5
DD**	4
FF**	0 Fail (Eligible for one re-exam)
FR**	0 Fail (Repeat the course)
DX***	0 Fail (Lack of attendance-Repeat the course)
II#	Incomplete (on health grounds)
DR	Dropped

PP	Passed
NP	Not Passed
AU	Audit

**FR and FF Grade

The letter grades FF and FR shall be treated as failing grades. FR grade will be awarded in cases wherein the opinion of the instructor, the student hasn't had adequate academic exposure to the course and should, therefore, repeat the course. FR grade may also be awarded in cases of minor malpractice in examinations/assessments. A student, whose in-semester performance is very poor, may be awarded the 'FR' grade by the instructors, even if he/she had missed the end-semester examination due to any reasons. If a student either does not submit his seminar report by the prescribed date or he/she is absent for presentation on the scheduled date he/she shall be awarded an FF grade unless he/she is given an extension by the coordinator under exceptional circumstances. Re-examination may be permitted for a course if he/she obtains an FF grade. After such re-examination, if the student passes in that course, he/she will be awarded the maximum grade of DD in that course. If a student does not take or fails in the re-examination, he/she will be awarded the grade FR. A student getting an FR grade has to re-register for the same course if it is a core subject. If this course is an elective course, he/she may register for an alternative course as prescribed by the DPGC/IDPC/SPGC, without this being counted as an additional course.

***DX Grade

The grade DX in a course is awarded if a student does not maintain the attendance requirement in the Lecture/Tutorial classes. The DX grades may also be awarded to the students having bad or incomplete in-semester records for non-medical reasons. The DX

grade will be declared in the first week of November for the Autumn Semester Courses and in the first week of April for Spring Semester Courses (in general one week before the semester-end exams). A student with a DX grade in a given course is not permitted to take the semester-end examination in that course. She/he is also not eligible for 50% marks reexamination in that course. Such a student has to re-register for the same course whenever offered. DX Given to students with attendance shortages. This does not count in the SPI / CPI. However, it will be counted as a backlog.

Incomplete Grade (II)

Grade 'II' is awarded in a lecture/lab course if a student has satisfactory in-semester performance but has not appeared for the end-semester examination on medical grounds. The student has entitled to 50 marks re-examination given at the end of the particular semester. 'II' grade will be converted into a performance grade (depending on the overall performance in the course) after the re-examination.

Audit Grade (AU)

The student registered for a course as an audit shall be awarded the grade AU if they fulfill the requirement of a minimum of 80% attendance and duly satisfactory in-semester performance as prescribed by the Instructor. The Instructor shall include such as AU grades in the final grade report for that course. If the student does not qualify for the grade AU, it will be assumed that the course has been dropped by that student.

Dropping of course(s)

If any student finds his course load to be too heavy then he can drop one or more of his/her courses within a stipulated time. Even the core courses can also be dropped on the condition that she/he will complete the dropped course(s) within his degree tenure. In the case of electives, the students need not take the same courses, she/he can select any other elective(s) as well. Such courses will appear in the transcripts and final grade card

with a 'W' grade (withdrawn grade). These courses will have no impact on SPI/CPI. The last date for dropping a course by the student will be two weeks after the mid-semester examination for the semester-long courses and one week after the mid-semester examination for the half-semester courses. The last date for course drop will be included in the Academic Calendar.

M.Tech. Curriculum:

First Semester

Course Code	Course Name	L-T-P-C
ET601	Introduction to Educational Technology	3-0-0-6
ET606	Educational Technology Tools Lab	0-0-4-4
ET613	Human-Computer Interaction for Educational Technology	2-0-2-6
ET612	Statistical Methods for Educational Research	2-0-2-6
ET610	Learning Analytics for Educational Data Mining	3-0-0-6
ET694	Seminar	0-0-0-4
ET899	Communication Skills	3-0-0-6
Total		**32(+6)**

Second Semester

Course Code	Course Name	L-T-P-C
ET614	Instructional System Design	3-0-0-6
ET604	Research Methods in Educational Technology	3-0-0-6
	ET Elective - 1	6
	ET Elective - 2	6
	Institute Elective	3-0-0-6
Total		**30**

List of ET electives offered in the second semester

Course Code	Course Name	L-T-P-C
ET602	Research Project	0-0-0-6
ET605	Adaptive Tutoring Systems	3-0-0-6
ET609	Discipline-based Educational Research	3-0-0-6
ET611	Learning Sciences	3-0-0-6
ET607	Educational Game Design	3-0-0-6
ET620	Educational Neuroscience	3-0-0-6

Summer

Course Code	Course Name	L-T-P-C
ET619	Field Work in Educational Technology	0-0-0-18

Third Semester

Course Code	Course Name	L-T-P-C
	ET Elective - 3	3-0-0-6
ET797	M.Tech. Project MTP - 1	0-0-0-30
Total (Includes summer fieldwork)		**54**

List of ET Electives offered in the third semester

Course Code	Course Name	L-T-P-C
ET615	Designing Learning Environments	2-0-2-6
ET616	Multimodal Learning Analytics	3-0-0-6
ET618	Self-regulation in Technology Enhanced Learning	3-0-0-6
ET617	Educational App Design	2-0-2-6

Fourth Semester

Course Code	Course Name	L-T-P-C
ET798	MTech Project MTP -2	0-0-0-42
Total		**42**

Department Highlights & Projects

Noteworthy highlights:

- <u>Self-paced course on online teaching</u>: The IDP-ET faculty and students created this course at the beginning of the lockdown to support instructors in moving towards teaching online. The course is structured as a website containing concepts, videos, information about tools, research-based recommendations and self-check questions with feedback. The website has seen 23000+ visitors so far.

- <u>Decade of EdTech</u>. The IDP-ET concluded the activities in 2020-21. Several events such as research seminars by students and faculty, industry interactions, alumni interactions and an EdTech Hackathon were conducted to commemorate the 10th year of the IDP-ET.

- <u>EdTech Hackathon</u>. IIT Bombay"s first EdTech hackathon was organized by IDP-ET with a focus on sparking innovation by integrating research and best practices for designing contextually relevant technology-enhanced solutions for teachers and learners. 15 teams with a total of 51 participant) from all over India joined in the virtual mode and collaboratively worked on problems related to one of the four given themes – Learning everywhere, Learning for everyone, Learning without barriers, and Learning for empowerment. IDP-ET alumni from various parts of the world gave expert talks on designing effective EdTech products. During the competition, IDP-ET M.Tech and PhD students mentored the teams.

- <u>EdTech Tulna- Creation of quality standards</u>: The IDP-ET, in partnership with Central Square Foundation is engaged in a project, „EdTech Tulna" to create research-based quality standards for educational technology products in the Indian context. This project is the first of its kind in India.

- <u>ET@10</u>. The IDP-ET recently published a book titled „ET@10" to commemorate the decade-long journey of this program. The book attempts to feature the culture,

practices and processes of this program, that collaboratively works towards achieving collective goals.

Awards

- Sridhar Iyer. ACM Indian Outstanding Contribution to Computing Education (OCCE) award for the year 2020. This inaugural award is to recognize and respect outstanding contributions made by an individual to computing education while working in India. The citation for his award is: "For promoting computing education research in India through guiding PhD students, developing instructional materials for teachers, implementing outreach at scale and providing consultancy to the EdTech industry."
- Sahana Murthy. Prof S P Sukhatme Excellence in Teaching Award, 2020, IIT Bombay
- Veenita Shah, Post-doctoral research scientist. Augmenting Writing Skills for Articulating Research Award (Annual Award 2020). AWSAR is an initiative of the Department of Science and Technology, Government of India. It attempts to disseminate Indian research in Science, Technology & Innovation being pursued by Ph.D. scholars and post-doctoral fellows in popular science writing format.
- Sunita Raste and Falegaonkar Vishvanath Bhaurao, PhD research scholars. Prime Ministers Research Fellowship (PMRF, May 2020). This scheme has been designed for improving the quality of research in various higher educational institutions in the country. With attractive fellowships, the scheme seeks to attract the best talent into research thereby realizing the vision of development through innovation.

R & D Activities

The main research areas of focus of the IDP-ET are:
- TELeaD: Technology Enhanced Learning of Disciplinary Practices (formerly TELoTS). Focuses on investigating and developing students" disciplinary practices.

Disciplinary practices encompass the processes, skills and knowledge used by professionals such as scientists, engineers and designers to do work and achieve their goals. Such practices include but are not limited to scientific inquiry, problem posing, modeling, problem formulation and solving, data analysis, estimation, decision making, design thinking, computational thinking, troubleshooting and so on. We design, develop and evaluate TELeaD environments for various disciplinary practices in different domains.

- *TUET: Teacher Use of Educational Technology. Focuses on the research-informed development and outreach of innovations for empowering teachers in effective use of educational technology. Contributions of TUET include models for learner-centric MOOCs and large scale teacher professional development, development of teachers" design thinking, tools and strategies for effective technology integration.*

- *EDA: Educational data analytics is an emerging field where data pertaining to student behavior in a computer mediated environment are used to analyze cognitive and affective states. Key objectives are: 1. Use of multimodal data such as mouse clicks, MOOC navigation data, eye gaze information, facial emotion recognition, galvanic skin conductance and brain waves to understand learner behavior 2. Use machine learning and big data analytics to model and predict learner behavior 3. Design the next generation of learning products such as intelligent tutoring systems in which the learning content is personalized based on the student's prior knowledge, cognition and emotion.*

- *Emerge: Identify potential benefits that emerging technologies such as augmented reality, virtual reality, wearable devices etc might afford in the teaching-learning process and design appropriate learning activities with use of such technologies.*

Sponsored Projects

Ongoing:

- Next Education Research Lab. Endowed lab sponsored by Next Education India Pvt. Ltd. 2017-22.

- Educational Services for Outreach at Scale (ESOS) sponsored by MHRD. 2017-22.

- Edtech Product Rating. Sponsored by Central Square Foundation, 2020-23.

- Teaching Learning Center for Information and Communication Technologies (TLC), sponsored by MHRD. 2017-21.

- Personalized Adaptive Tutoring System to Train the Employees, Sponsored by Bank of Baroda Innovation Center, Aug 2020 – July 2022

- Multimodal Learning Analytics for Intelligent Tutoring Systems, Sponsored by Science and Engineering Research Board, Startup research grant. (Jan 2021 – Dec 2022)

- EdTech Hackathon 2021. Project sponsored by Commonwealth Educational Media Center for Asia (CEMCA) for promoting development of innovative and research-based educational technology products and processes. (Feb 2021 – Jun 2021)

- Leveraging eye tracking and allied bio-sensing for education research. IIT Bombay IRCC Seed Grant.

- Reasoning About Uncertainty and Efficient Decision-making in Engineering Design. IIT Bombay IRCC Seed Grant.

- Modeling User"s Self-Regulated Learning Behavior using Multi-Modal Learning Analytics. IIT Bombay IRCC research internship grant. (2018 – 21).

- Interface development and pilot-testing of a novel classroom feedback system. IIT Bombay IRCC research internship grant.

Completed

- ARPIT – Annual Refresher Programme in Teaching for faculty in Higher Education Institutions through Swayam. MHRD. 2019-2021

- *Central sector scheme for MOOC compliant e-content (NPTEL Phase IV), MHRD. 2016-19.*
- *Pedagogy for effective use of ICT by school teachers. Sponsored by Next Education India Pvt Ltd. 2017-20.*

Consultancy Projects

Ongoing
- *Advice on R&D of current and future education projects. Next Education India Pvt Ltd. 2016-19.*
- *Advice on EdTech projects and policy. Central Square Foundation. 2019-2021.*
- *Development of training modules for promoting Computational Thinking amongst K-12 teachers.*
- *Commonwealth of Learning. 2020-2021.*

ET @ Social Media

	LinkedIn	https://www.linkedin.com/school/edtech-iitb/
	Facebook	https://www.facebook.com/edtech.iitb
	Twitter	https://twitter.com/edtechIITB
	Slack	https://slack.com/intl/en-in/
	YouTube	https://www.youtube.com/channel/UCEDeFWBgvF96jlBKyhIs7wQ

Department Social Media Secretaries:

Devanshu Saindane, M.Tech. (2021-23)

Email: 213380005@iitb.ac.in

Contact: +91-9827571508; +91-9321652463

Kabyashree Khanikar, Ph.D.

Email: 214380001@iitb.ac.in

Contact: +91-8340475695

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. You would have more responsibilities to handle at the hostel and at the academic level. 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. It is important to understand that students often lose their focus and give in to these pressures. If not attended to at the right time, this could lead to poor performance -- both academically and personally.

To help you refrain from losing focus and being unhappy, we as Counselors encourage you to approach us for any problem that you are facing- be it academic, emotional, social or financial- without hesitation. Counseling provides an opportunity for individuals to learn to make better choices, improve interpersonal skills, develop confidence and increase educational effectiveness. In a one-on-one meeting with a counselor, students are helped to explore and express feelings, examine beliefs and ways of thinking about their present situation, reflect on patterns of behavior and work toward making healthier and happier changes.

Typical concerns of students who seek counseling are:
● Transition and change
● Uncertainty about values and goals
● Academic pressure
● Dealing with new academic patterns
● Personal relationships with the special one and with friends
● Family concerns

● *Stress, depression, and anxiety*

● *Lack of motivation, concentration difficulties*

Find more details on the website:

http://www.iitb.ac.in/swc/en/about-student-wellness-centre

Email: wellness@iitb.ac.in

Contact: Mr. Shoukath Ali- 8590594136/ 8174867876

Gender Cell

IIT Bombay's Gender Cell is an institutional body that works toward promoting equality, non-discrimination, and gender justice on campus. It enquires into complaints of sexual harassment through its Internal Complaints Committee (GC-ICC).

The Gender Cell's Internal Complaints Committee enquires into complaints of sexual harassment. Sexual harassment includes any one or more of the following unwelcome acts or behavior:

1. Physical contact and advances;

2. A demand or request for sexual favors;

3. Making sexually colored remarks;

4. Sending, displaying, or showing pornographic material in physical form or through any electronic media;

5. Any other unwelcome physical, verbal or non-verbal conduct of sexual nature, and

6. Any other acts or omissions that are of like nature to the instances above.

Gender Cell frequently organizes training sessions, gender sensitization workshops, and talks related to gender-based issues for faculty, staff, and students. They also organize painting competitions, film screenings, and other cultural events highlighting contributions by women or related to gender issues.

Who can contact Gender Cell for help?

Any student, faculty, staff member, or a service provider who is associated with IITB may contact the Gender Cell. Any woman who comes to IIT Bombay for work-related reasons may also contact the Gender Cell.

Visit the site at http://www.gendercell.iitb.ac.in/en

SC-ST-OBC-Liaison Cell

SC-ST-OBC-Liaison Cell addresses academic and non-academic issues and complaints received from students in reserved categories. The institute strives to maintain an environment where all communities can participate in academic and research activities without any sort of discrimination with respect to caste or creed. In order to maintain such an atmosphere, the SC/ST students' cell is responsible for sensitizing the campus community about the importance of having diversity. The cell aims to ensure that anti-discrimination laws in the context of race/caste/creed are followed in letter and in spirit.

The Institute strives to maintain a work environment wherein faculty and staff members from different communities can work in a coherent environment. It is the Institutes endeavor to ensure that no kind of caste based discrimination take place at workplace. We have appointed a Liaison Officer who can be contacted in the event of any incident of caste based discrimination.

Particulars of Liaison Officer are as under:

Dr. S. G. Patil

Email- sgpatil@iitb.ac.in

022-25767051

For more details, visit this

https://www.iitb.ac.in/en/about-iitbombay/sc-st-obc-liaison-cell

Student Alumni Relations Cell (SARC)

Student Alumni Relations Cell (SARC) is a student body run under the guidance of the Dean ACR Office, IIT Bombay. It works with a vision of bringing the alumni and student communities of IITB together to create a synergy of ideas, respect, knowledge and everything that our Institute stands for. Its events and initiatives include:

- *Alumnition: Flagship event of Student Alumni Relations Cell*
- *Student Alumni Meets: SAMs are meets organized in various alumni chapters (cities where they reside) with different motives.*
- *Phonathon: Telephonic marathons to connect with alumni*
- *Reunions: The most awaited yearly alumni reunions.*
- *Institute Valedictory Function: The last event of an IITB student's insti life.*
- *Core Talks: Department-specific talks from the experts, our own alumni.*
- *ASMP: Alumni Student Mentorship Programme.*
- *ILP: Industrial Learning Programme.*
- *HATS: Hostel Alumni Team Stewardship.*
- *Alumni Sports Weekend: A fun-filled sports weekend for the alumni and the students.*
- *ProVachan: Non-core fundae talks by our very own alumni.*
- *SARCasm: Head scratching online cryptic hunts for the students.*
- *Institute Yearbook: "Thousand Thoughts. Million Memories. Infinite Feelings."*

E- Cell

The Entrepreneurship Cell shares the common belief that for India to emerge as a world power, the youth has to break the shackles of prejudices and inertia that has kept them from starting up. Creating an entrepreneurial ecosystem to provide the platform for individuals with creative minds and ideas with potential for substantial business opportunities, is what we strive towards continually.

We enable smooth and efficient interaction between its principal components spanning students, faculty, working professionals, aspiring and existing entrepreneurs, mentors, angel investors and venture capitalists.

Contact:

Vishesh Agarwal

Events Head, E-Cell

visheshagarwal@ecell.in

9717369148

Devanshu Saindane

Events, Marketing, and Corporate Relations Coordinator

idevanshus.ecell@gmail.com

+91-9827571508

For more details, please visit https://www.ecell.in/2020/index.php

PG Sports

PG Sports have 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, endeavor, and team spirit. This is a much-needed diversion from the rigorous routine of 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.

PG Sports Convener:

Devanshu Saindane, M.Tech. (2021-23)

Email: 213380005@iitb.ac.in

Contact: +91-9827571508; +91-9321652463

Department PG Sports Secretary:

Antony Prakash, Ph.D.

Email: 204380004@iitb.ac.in

Contact: +91-9551624829

PG Cult

PG Cult is the annual cultural festival targeted exclusively at the postgraduate community of IIT Bombay (or PG junta in short). Since its inception in the year 2008, the events spread across nine genres-3 performing arts: Dance, Music, and Dramatics and five non-performing 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 PGs of IITB.

Clubs @ IITB

Cultural Clubs:

1. IN SYNC (Dance Club)
2. Fourth Wall (Dramatic Club)
3. SILVERSCREEN (Film and Media Club)
4. SAAZ (Hindi Music Club)
5. TACCATO (Western Music Club)
6. RANG (Fine Arts Club)
7. PIXELS (Photography Club)
8. Literati (Literary Arts and Quiz Club)
9. Book Club
10. VAANI (Speaking Club)

Technical Club:

1. Tinkerer's Lab
2. Technovation
3. Aeromodelling Club
4. Electronics Club
5. KRITTIKA— the Astronomy Club,
6. Maths and Physics Club, The Robotics Club,
7. WnCC—Web and Coding Club
8. TechGSR - Tech Geek Social Responsibility: a Socio Tech non-profit Student body
9. PRATHAM: IIT Bombay's student Satellite program; home to one of the country's
10. first student satellite projects
11. IIT Bombay Racing: Racing Team builds actual race-cars that participate (and win) in international student competitions like Formula Student.

12. UMIC: The Innovation Cell at IIT Bombay aims towards the successful completion of large scale student projects

Sports Club:
1. AQUATICS
2. ATHLETICS
3. BADMINTON
4. BASKETBALL
5. BOARD GAMES
6. CRICKET
7. FOOTBALL
8. HOCKEY
9. KHO KHO
10. LAWN TENNIS
11. SQUASH
12. TABLE TENNIS
13. VOLLEYBALL
14. WEIGHTLIFTING
15. ADVENTURE SPORTS
16. DARK KNIGHT
17. YOGA

Important links: websites/ webpages

LDAP Id: It is a unique identification number of each individual in 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 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 enroll. 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 a VPN.

IITB Wireless configuration: https://www.cc.iitb.ac.in/page/configurewireless

Purpose: To access IIT B wireless (WiFi) on 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

Slack: This is a communication platform made up of channels where people from the same workspace can communicate and work together. ET Department uses this platform to share its domain related news and to give an update about the department meetings. https://slack.com/intl/en-in/

CAMP: This website is used for Changing Password, Changing UserID (Only Once), Modifying Personal Details, Set / Reset mail Auto Reply Text, Set / Reset mail Forwarding Address, Department Sys-Ads List, Hostel Sys-Ads List, and Find your UserID from Roll number / Employee Number

https://camp.iitb.ac.in/

Important Links:

Department Website: https://www.et.iitb.ac.in/

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 a 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 an 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:

Technology tools useful for online learning: As an educational technology expert, you should know how to make online teaching effective. The below resources will help you to achieve this goal.

Mendeley: Mendeley is a free reference manager and academic social network that can help you organize your research, collaborate with others online, and discover the latest research. Link to download Mendeley: https://www.mendeley.com/downloaddesktop-new/

Latex: is open-source software. LaTeX is a high-quality typesetting system; it includes features designed for the production of technical and scientific documentation. LaTeX is the de facto standard for the communication and publication of scientific documents. Link to download Latex: https://www.inqscribe.com/download.html

Flash Print: This software provides an interface for preparing 3D designs for printing on 3D printers. Link to download:
https://www.flashforgeeu.com/info/2017/11/29/download-flashforge-flashpriint-3-200/

Resources:

Programming language

R- language: R language is used for statistical computing and graphics. The R language is widely used among statisticians and data miners for developing statistical software and data analysis. R and its libraries implement a wide variety of statistical and graphical techniques, including linear and nonlinear modeling, classical statistical tests, time-series analysis, classification, clustering, and others.

Various Sources to learn R-Language:
1. Introduction to R software (Prof. Shalabh, IIT Kanpur) NPTEL videos Link: https://swayam.gov.in/nd1_noc19_ma33/preview
2. Rprogramming with real exercises (Udemy) Link: https://www.udemy.com/r-programming/
3. Rprogramming (Coursera) Link: https://www.coursera.org/learn/r-programming
4. R-programming courses on Edx: https://www.edx.org/learn/r-programming

Python: Python is an object-oriented programming language. Which aims to help programmers write clear, logical code for small and large-scale projects. Python is an easy to learn, powerful programming language. It has efficient high-level data structures.

Various Sources to learn Python:

1. *Prof. Prabhu Ramachandran (Department of Aerospace engineering, IIT B) Link: https://drive.google.com/drive/folders/1kdm9AX9edDoFtSErr93_ErSH-u4QF8C?usp=sharing*

2. *Massachusetts Institute of Technology (MIT) Python Link (Edx): https://www.edx.org/course/introduction-to-computer-scienceandprogramming-using-python-*

Reaching IITB

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 station 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 Airplane

Those traveling 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_ENGPRINT.jpg or in the Insti app: https://insti.app/map

IIT BOMBAY
Campus Map

Indian Institute of Technology Bombay, Powai, Mumbai - 400076, INDIA
T: +91 22 2572 2545   F: +91 22 2572 3480   Web: www.iitb.ac.in

Map Design
Shishir Bhagade, IDC, IITB

Project Guide
Prof. Mandar Rane, IDC, IITB

© 2014
Version: 20th Feb 2015

Map is not to scale

Parking   Bus Stop   Garden

Gallery