



Research and Development Committee

Vision

“Ideate, Invent and Innovate propositions with enduring value to ecosystems”

Mission

- To inculcate research oriented approach to the future generation through research, scholarship, education, preservation, and excellent academic practice that can serve all sectors of society.
- To carry out free exchange of ideas in an ethical, interdependent, and diverse community of faculty, students, and alumni.

Objectives

- To encourage and promote cutting-edge research based on the proven capabilities and expertise of our faculty and students.
- To help facilitate strengthening of the Institute's research capabilities; proactively promote basic research and monitor quality of research work done.

Strategies

- Identify and develop opportunities for the faculty to engage in research.
- Define criteria and modalities for students to avail research opportunities.
- Propose roundtables, conferences and working groups on a series of thematic areas central to the research work, publication of papers and reports of the students.
- Modalities of accepting, reviewing, and benchmarking research work.
- Establish linkages with institutions and universities in India and outside to secure resources to provide facilities to scholars.

Short Term Goals

- Getting sponsorships/stipends for students to develop products.
- Improve the quality of publications in standard journals.
- Conduct student's development programs on cutting edge Technologies.

Long Term Goals

- Collaborating with agencies at national/ international levels for IPR and consultancy.

Offerings from R & D

- Conducting the events categorized into workshops, seminars, training, and certification.
- Motivate students/faculty to organize and attend conferences/workshops/Training.
- Helping students/faculty in execution of research initiatives planned by team R&D.

Industry Mentoring

Industry has been providing many mentorship sessions for students and faculty for Industry exposure, latest technology and providing mentoring sessions for their startup. These sessions are being held on a year to year basis.

Alumni

SP-IT Alumni has been instrumental in mentoring and helping students for Internship and better placements. The mentoring sessions by SP-IT Alumni have been great in clarifying students' doubts and a great guide for planning their future. The structured mentoring sessions for sponsored products are being worked out and would start soon with a pilot run soon.

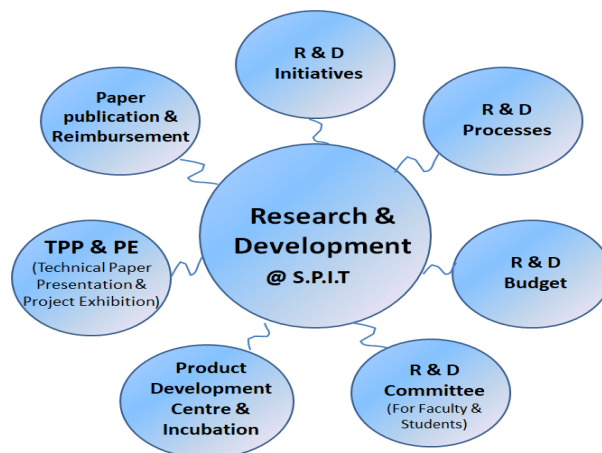


Fig.1: Key attributes of SP-IT R&D Cell

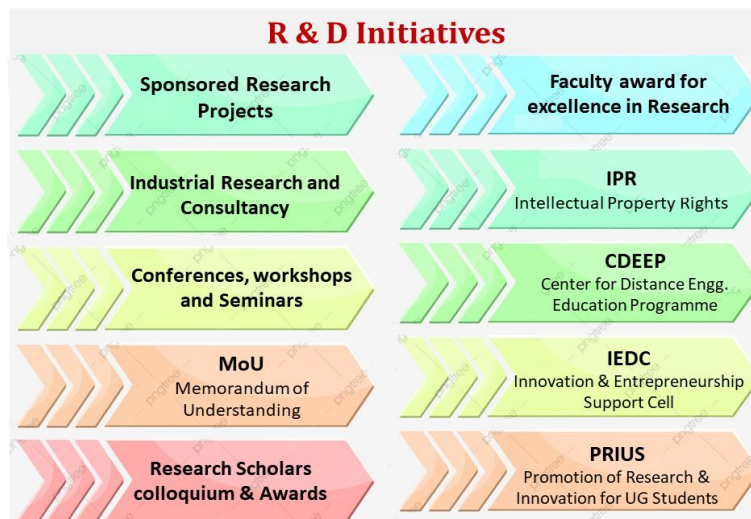
Departmental Research Cell and Major Thrust Areas

- R & D is set up to provide specialized administrative and managerial support for the operation of sponsored research, consultancy and other R&D related activities of the Institute. The overall R&D structure as shown in Fig.1 encompasses the Executive Committee, Faculty Research committee and Student Research committee.
- Departmental research cells are formulated with faculties and students. Faculties of SP-IT are very much dedicated and research oriented and thus seed the same research attributes within students.
- SP-IT faculty team consists of vibrant and proactive faculty who supervise and organize activities for encouraging research culture through paper presentation and project exhibition competitions. The center is having a vibrant 24x7 Culture and running on a dedicated area admeasuring nearly 4000 square feet.

R & D Lab

Departments are equipped with state-of-the-art laboratories such as Networking Lab, IoT Lab, Communication Lab, Algorithm Lab, VLSI Lab, Instrumentation and Control Lab, DSP Lab, Database and Cloud Computing Lab, etc; which facilitate to accomplish the research objectives for developing robust solutions using latest technologies across the Departments. This helps increase productivity and development of new ideas using emerging technologies.

S.P.I.T. R&D Initiatives



- **Promotion of Research and Innovation for Undergraduate Students (PRIUS):** R&D Centre supports undergraduate students in the research laboratories, for international collaborative research projects, and encouraging projects leading to innovation.
- **Innovation and Entrepreneurship Support Cell (IEDC):** R & D center supports to create entrepreneurial culture in the parent institution and other institutions in the region and to promote entrepreneurship through student projects. S.P.I.T. IEDC cell helps the innovator for successful filling of the patent application.
- **Center for Distance Engineering Education Programme (CDEEP):** R & D several Continuing Education Programs (CEPs) and short term courses for students and faculty with IIT-Bombay are organized to update their knowledge and skills, and also to train them in state-of-the-art facilities.
- **Sponsored Research Projects:** The R & D section facilitates the submission of sponsored research projects by faculty members to various funding organizations such as Department of Science and Technology (DST), Council of Scientific and Industrial Research (CSIR), Board of Research in Nuclear Sciences (BRNS), Department of Biotechnology (DBT), Indian Council of Social Science Research (ICSSR), and many more.
- **Industrial Research and Consultancy:** In order to foster strong links with industry for collaborative research, technology transfer, and specialized human resource development, consultancy services are offered to industrial partners, government organizations, and other agencies in niche areas of expertise available within the institute.

- **Conferences, Workshops and Seminars:** Several conferences, workshops and seminars are organized at national and international levels to facilitate interaction and sharing of the latest results and findings in various specialized areas. Such events also act as an interface between industry, academia and government organizations and promote exchange of ideas.
- **Memorandum of Understanding (MoU):** S.P.I.T. has signed MoUs for conducting training programs, availing R&D facilities etc. with Texas Instruments, Bangalore, DPLM Software Solutions Limited, Geometric Ltd., Mumbai, Simtek Medico System Pvt. Ltd, Microtech Inductions Pvt. Ltd, Mumbai, D Link India Ltd. Indian Institute of Technology, Bombay, Gadhia Solar Energy System Pvt. Ltd. Valsad, Ministry of Science and Technology, New Delhi, Xilinx, XUDP, USA, Ericsson India Pvt. Ltd, Haryana, Secure Matrix India Pvt. Ltd, Mumbai, Visvasvaraya National Institute of Technology, Nagpur, Infosys, Pune, Wipro Technologies , Pune, IBM India Ltd., TCS Ltd, Mumbai.
- **Research Scholars Colloquium and Awards:** Research colloquium activity is conducted at S.P.I.T. during the ICCICT conference. The activity is open to all faculty, students and research scholars. The goal is to make aware and facilitate interaction and sharing of the latest results and findings in faculty and interested students about on-going research projects.
- **Faculty Award for Excellence in Research:** Dean R & D initiates award of excellence for all departments of S.P.I.T. for best faculty (in R & D perspective) award. The motivated teachers deserve recognition and encouragement. R & D research centre appreciates excellent research activities conducted by faculty members by granting a faculty award.
- **Ph.D. Program:** Along with UG and PG programs, SP-IT is also offering Ph.D. program in the fields of Electronics, Telecommunication, Computer and MCA. The details are available at: <https://phd.spit.ac.in/>

Achievements and activities

A. Product Development Centre (SP-PDC):

Vision of PDC

To bring-out the overall development of students in the sphere of innovation, to instil a sense of creativity in sync with technical aspects to harness invention and innovation.

Mission of PDC

- To convert project to prototype for commercialization
- To develop and test hardware/Software products
- To provide technology support for creative product development
- To develop skills required for end-to-end and competitive product development.
- To provide infrastructure support and guidance for students group awarded by industry

About PDC

- It has been newly established on campus to support the industries to grow and develop their businesses through innovative products and services. The main industrial electronics, power electronics, automation and Communication. The services provided by this center to industries are as follows:
 - Technology support for new Marketable product development
 - To take outsourcing system-design jobs from the existing projects in industry and deliver them promptly related to above domains
 - To take up consultancy jobs to help industries in solving specific issues
 - To work on development of next generation products in the field of renewable, electric vehicles and IOT Applications
 - Mentorships for competitive product development
 - To offer a platform to Alumni, students and faculties for converting their ideas into marketable products
- **Infrastructure Funding:** A financial support of INR **15,00,000** has been provided for establishment of **PDC** by **SP-IT Alumni Network** with the aim at undertaking product development jointly with Alumni & industry experts. The center provides working space enabled with high speed computers and other software required for product development. We encourage students and faculty to develop various products by using this facility. Presently PDC is having almost INR 50 Lakhs worth projects from industry.
- **Ongoing Project under PDC**
 - a) **Starlyte:** Funded by TI-IIDC 2018-19
Product: Road Borne Light Powering System.
Description: Starlyte is a self-powering system that generates electricity using the movement of vehicles. This generated electricity will be stored in a storage unit that can be used to power nearby amenities.
 - b) **Industrial Signal Simulator:** Funded by TI-IIDC 2018-19
Product: Integrated Multifaceted Signal D3GS (Debugger, Controller, Calibrator,

Convertor, Generator, Simulator) using IoT for Industrial Usage.

Description: This device provides error detection, sensor calibration, generation of industrial standard signals, conversion of standard signals to the required industrial standard signal along with IoT features and DBMS associated with an Android App for the remote controlling and monitoring.

- c) **Aqua Care:** Funded by TI-IIDC 2018-19

Product: Aquaculture Monitoring and Feedback System.

Description: The system provides a complete solution to monitor all vital water parameters namely pH, turbidity and temperature in real time and gives the farmer immediate alerts in case of a problem

- d) **High Power Battery Charger:** Funded by General Auto Electric corporation

Product: 4.5kW Battery Charger for the Indian Railways

Description: GAEC is looking for the development of a Battery Charging Systems compatible with Railway's requirements and specifications. The proposed DC-DC converter is air cooled/naturally cooled, high conversion efficiency, safety, protection, temp, shock and vibration, as per standards (IEC/EN;UIC/AAR; and IS).

- e) **Universal Solar Pump Controller:** Funded by Sileaf Tech. Pvt Ltd, Pune

Product: Universal controller for powering any agrarian load from solar energy.

Description: Development of Universal Controller to work for water pump sets of capacities ranging from 3 HP to 10 HP and for other types of motors used in agriculture equipment.

- f) **Controller for Induction Casting Machine:** Funded by Riddhi-Heatron

Product: Controller for jewelry casting machine using induction heating

Description: The controller should provide auto-frequency tracking features with different coils and the prototype controller PCB must be tested successfully in the field at the Machine Capacity of 12kW with IGBT based High frequency Inverter.

- g) **Development of Software Applications to Maintain Service Calls:**

Funded by Suyog Telematics

Product: Application to monitor maintenance activities

Description: Mobile application for servicing maintenance calls, opening and closing of maintenance service tickets and keeping track with all the data-bases stored in cloud server to track history and record. This application also needs to develop a maintenance-website and two mobile applications linked to that one for service people and another for an administrator.

- h) **Student Attendance report:**

The S.P.I.T. The app aims to help students by providing an easy way to view and keep a track of attendance and also stay updated with all the updates or announcements regarding results, events, seminars/talks and urgent notices and also timetables. Parents can stay in loop with their ward's attendance and performance in college.

- i) **Student Research Paper Evaluation:**

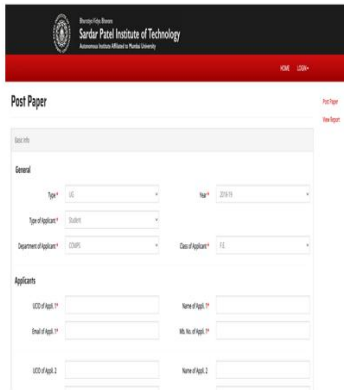
This is an online website which stores publication details of students, research scholars and faculty. This is a common repository of all publication data. Reports from this website helps to understand student wise, department wise faculty wise, conference wise, journal wise publication details.

- j) **Student performance evaluation:**

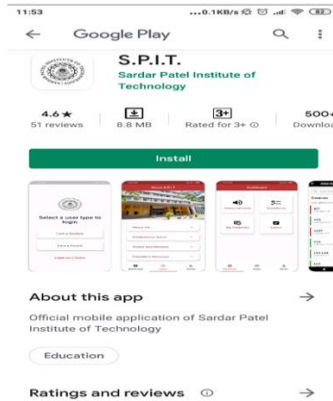
This is a framework based dynamic website developed to decide best student of the year. Students who wish to apply for the best student will apply giving all their information such as academic, research publication, project publication, extra-curricular activities. Based on

the submission admin will give marks as per the information. Reports generated will rank the student based on their performance

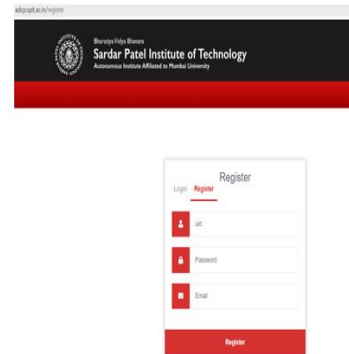
Some photos of Software Products:



PDC 1 : Portal for reimbursement of paper publication



PDC 2 : S.P.I.T Mobile App for attendance



PDC3 : portal for Student Performance

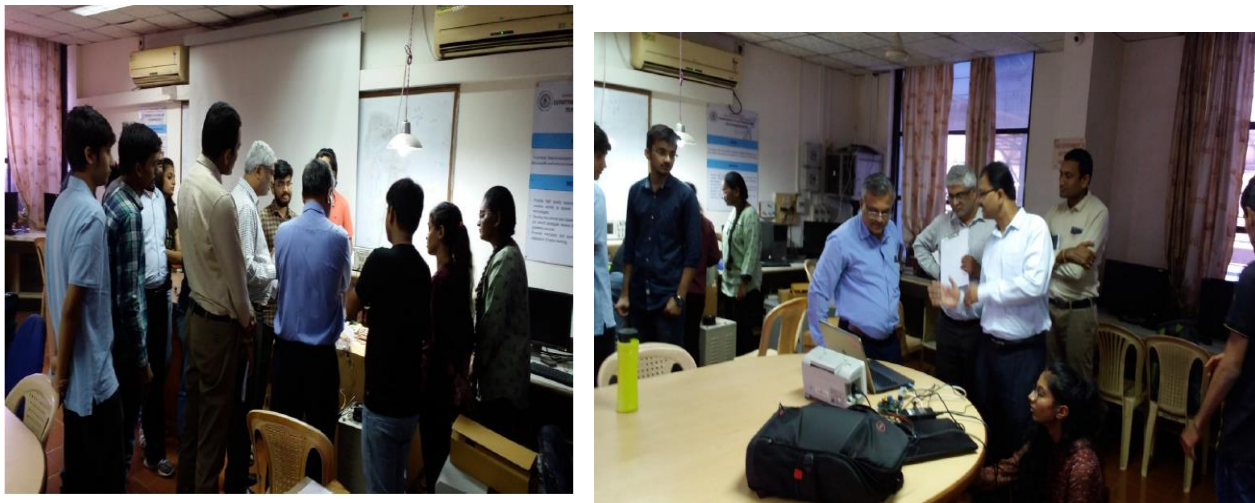
Some photos of Hardware Products:



Some photos of PDC Infrastructure

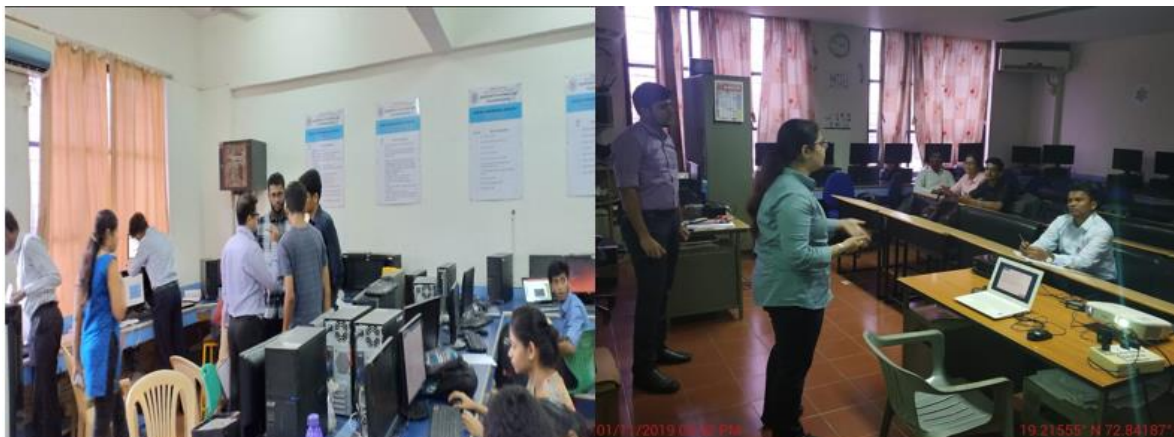


Some photos of Exhibition and Feedback from Industry:



B. Technical Research Paper Presentation and Project Exhibition

To encourage a research aptitude and provide a competitive environment, the R&D Cell Conducts Technical Paper Presentation and Project Exhibition competitions every year for final year students of the college. The Technical Paper Presentation competition evaluates the research paper writing skills and paper presentation skills of students using a set of specialized rubrics for evaluation. The purpose of this competition is to help students to actually engage in writing quality research papers and thus publish in various conferences and journals. The project exhibition competition allows students to demonstrate their projects and are generally evaluated by industry experts like Quantiphi, Capgemini, Zeuva (SP-TBI Start up), RGM Technologies Pvt. Ltd, Bitgenie Pvt. Ltd., Liminal Pvt. Ltd, etc. This gives student valuable insights to help them think and conceptualize their idea from a product based point of view.



Glimpses Technical Paper Presentation and Project Exhibition Competitions

C. Reimbursement Policy

The R&D Cell provides a reimbursement of up to INR 5000 per title to encourage students for paper publication. In the last 3 years, our students and faculty have published close to 500 papers in various reputed conferences and journals. Research patents are drafted and filed on a yearly basis by SP-IT students and faculty through the IEDC cell. Some of these patents are converted into business models, some of them converted to products.

D. Participation in Events

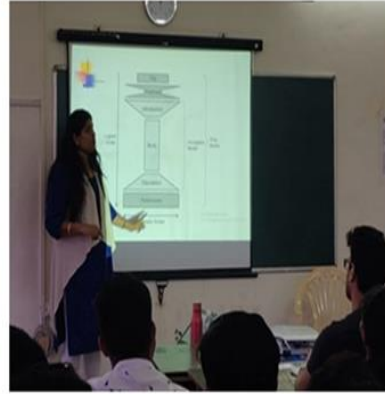
SP-IT encourage students to participate in various research oriented events like hackathons and other projects for exposure to real-world problems in a competitive world. Every year, about 15-20 groups consistently participate in very reputed and recognized competitions like Texas Instruments, E-Yantra, Smart India Hackathon. Our students have done us proud and have been winning prizes at several such competitions over the years.

E. Funded projects

SP-IT faculty members work on funded projects and collaborate with industry for consultancy opportunities every year. Every department has professional forums who organize and assist several activities within the department and institute.

F. Workshop

Several workshops/talks based on research related activities like paper writing, patent drafting are arranged and organized by the R&D Cell on a regular basis. Such workshops help with improving the overall research environment and creating opportunities for publishing research papers, articles in conferences and journals and drafting patents.



G. Grant (DST / SICOM/SP-TBI)

- With continuous follow up with DST and by showcasing our suitable environment we were able to get support from DST for setting up a full-fledged TBI and received grant for Recurring/Non recurring expenditure to the tune of 4-17CR for period 5 years 2015/2016.
- The setting up infrastructure and sharing of progress report of TBI resulted in getting approval of SEED FUND of INR 10CR towards NIDHI Fund for encouraging start up for which the first installment of 2CR has been received
- Due to SP-IT great interaction and consistent follow up SPIT were able to get CSR support from SICOM for INR 50 Lakhs.

H. Industry Awards

- The industry has been awarding top performer students towards Academics/ Project / Best Innovative ideas every year.