R&D BROCHURE

BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL INSTITUTE OF TECHNOLOGY

Index

Preamble

At Bharatiya Vidya Bhavan's Sardar Patel Institute of Technology, Research is an integral part of the academic activity carried within various undergraduate and postgraduate programs. The Research and Development (R&D) center facilitates various research programs by channelizing various research projects and consultancy works in various departments of the Institute. The Research activities include Academic research and funded research projects and patent in the Faculty of Engineering and Technology. The students and Staff are encouraged to innovate through quality research in emerging areas.

The advancement of laboratory is a key role of the Research and Development center of the institute. Research and Development center acts as a liaison between funding agencies and the Institute to handle sponsored research projects and industrial consultancy assignments. The main objective is to maintain the quality and breadth of its research enterprise, and particularly for its openness to multidisciplinary research.

The research philosophy is to progress from inter-departmental collaboration, to inter-institutional partnerships at national and international levels. The scope and scale of research has substantially evolved from the era of student theses to funded projects to interdisciplinary research programs at state and national level. The Centre facilitates interaction with external agencies at national and international level.

By looking at changing requirements of industry, the objective of Research and Development Cell is to ensure that we hold on to our position at the cutting edge of innovation by encouraging interdisciplinary research.

Vision

"To encourage interdisciplinary research and innovation leading to collaborative projects with public and private sectors that offers applied research."

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

The office of the Dean for research and development is responsible for managing and developing all research activities at S.P.I.T. The main goal is to encourage and promote cutting-edge research based on the proven capabilities and expertise of our faculty and scholars. The primary role is to help facilitate strengthening of the Institute's research capabilities; proactively promote basic research and monitor quality of research work done. Research committee headed by a Dean has proposed the frame work for up-scaling and enhancing the research activities at the Institute.

It includes some of the following 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

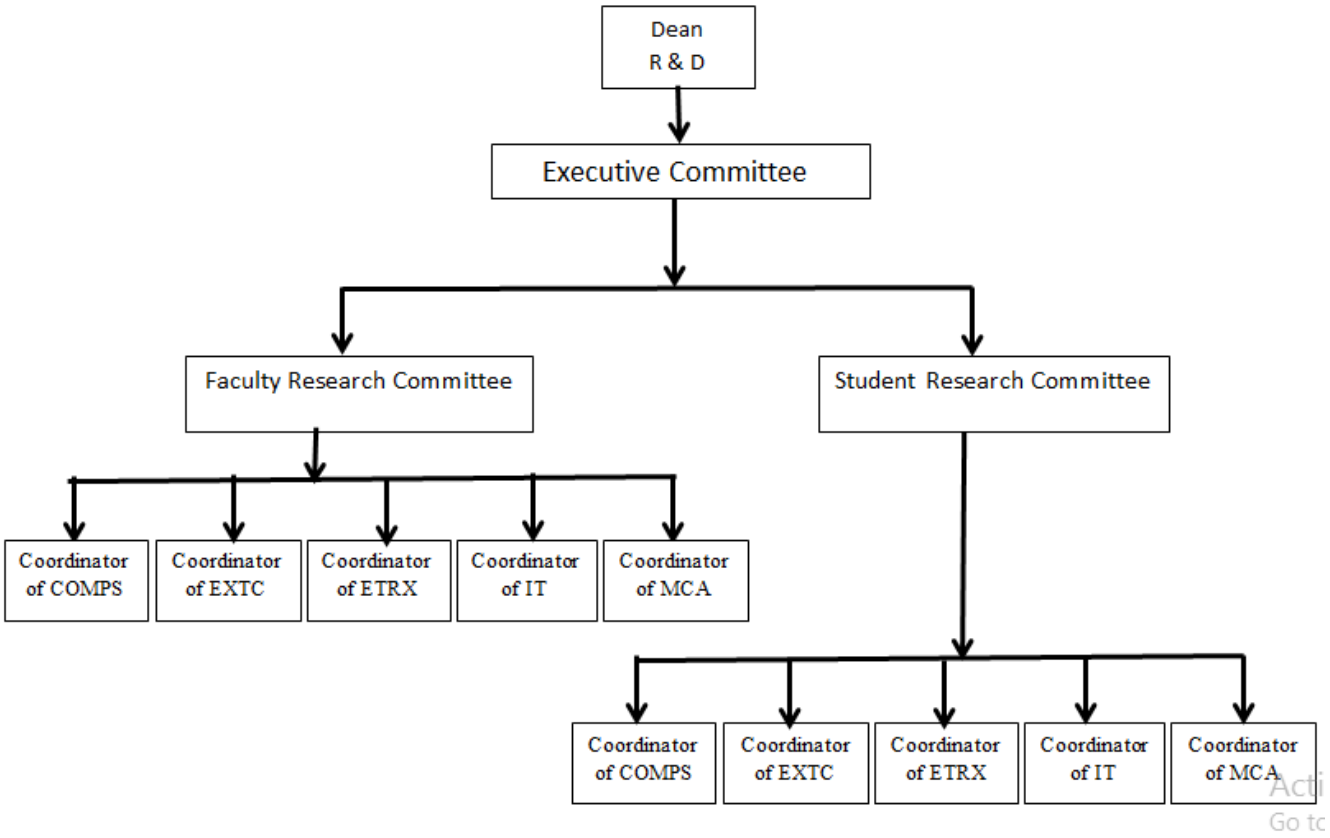
- Sending research proposals to funding agencies.
- Increase the quality of publication in standard journals.
- Conducting faculty and students development programs for cutting edge trends and Technologies

Long Term Goals

- Getting grants from national international funding agencies for research projects.
- Collaborating with agencies at national/ international levels for IPR and consultancy.
- Getting sponsorships for faculty and students development programs.

2. Structure of R&D

Research & Development centre 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 encompasses in executive committee, faculty research committee and student research committee.



2.1 Constitution of Committees

Dean R&D proposes three committees for R&D activities the constitution is as follows.

2.1.1 Executive Committee

1. Dean R and D (chair)
2. One senior faculty from all six departments (Internal Members)
3. One or two external domain experts nominated by HODs from all departments (External Members)

2.1.2 Faculty Research committee

1. Dean R and D
2. One senior faculty from all six departments (The internal members)

2.1.3 Student Research Committee

1. Dean R and D
2. One Internal member of Executive committee
3. One faculty from all six departments
4. One student from all six departments

2.2 Roles and Responsibilities of the Committees

A relevant roles and responsibilities as well as objectives are assigned as follows:

2.2.1 Role of Executive Committee

This committee provides impetus to the research and development activities and to provide guidance, directions to the faculty research committee. It has representation from all departments. The committee is a vibrant entity to discuss and propose R&D policy issues. The members highlight shortcomings in procedural matters and thus sharpen the performance of the Centre.

Identify promising areas for growth. Maintain vibrancy of areas that are currently strong.

1. Develop and maintain close ties with industry and government to promote technical exchange and collaboration on projects with significant potential for future growth and value.
2. Develop a sense of community in which faculty, staff, and students can work together productively and grow personally and professionally.
3. Maintain excellence and encourage multidisciplinary research amongst faculty, students
4. Provides Review for proposals and appoint review committee and scrutiny committee.
5. Promote, by maintaining highest standards of academic integrity, interdisciplinary research, faculty entrepreneurship and formulate related policies
6. Budget planning.

2.2.2 Role of Faculty Research Committee

1. Faculty Research committee selected by R&D Dean which represents R&D coordinator from every department, it specifically work for faculty of Institute and motivate the faculty of the Institute in achieving the objectives of R&D.
2. Prioritize R&D measurement and improvement goals
3. Balance Research and Development activities
4. Improve short- and long-term development objectives
5. Improve resource utilization
6. Promote faculty to write effective research proposals for funding agencies.
7. Guidance to research staff in order to raise the standard in academic and research activities
8. Promote faculty to organise and attend conference/STTP/workshops/ Seminars/Training/ FDP for faculty
9. Create awareness and promote faculty for publication, research contribution and patents
10. Execution of research initiatives planned by Dean R &D

2.2.3 Role of Student Research Committee

Student Research committee selected by R&D Dean which represents R&D coordinator from every department, it specifically work for students of Institute.

1. To acquaint the students about the booming technological innovations and the future prospects of their survival in the industry.
2. Conducting the events categorized into workshops, seminars, training, certification course work
3. Unfolding and paving way to the talents hidden among the students.
4. Promote and motivate students to organise and attend conference/workshops/ Seminars/Training
5. Helping faculty research committee in execution of research initiatives planned by Dean R&D

3. Departmental Research Cell and Major Thrust Areas

The quench of doing research drives researchers in our S.P.I.T. Departments.

3.1 Research and Development Cell at Computer Engineering Department

Abstract - In the technology driven competitive world with ever increasing passion for advancement at a relentless speed, R&D has to play a key role. The Department of Computer Engineering is in a mission mode to increase the number of innovative and mostly multi-disciplinary research through untiring effort of faculty members and students. This results in nurturing research activities, procurement of equipment and development of state of the art research facilities. These projects address the requirements of real-life problems. More importantly, one of the major mandates of the Department of Computer Engineering is to participate in the international conferences and reputed Journals. The issue of concern society is also addressed by the faculty members and students through sponsored projects. The deliverables of the R&D endeavour are innovative affordable technology and products.

Objectives

1. To develop appropriate algorithms for incorporating security provisions and opportunistic networks design in different flavors of computing like Distributed, Mobile, Parallel, High Performance, Cloud and Internet of Things.
2. To develop system and applications programs by optimizing, analyzing and investigating the theoretical analysis of the algorithms.
3. To extract important insights through systematic computational analysis of data or statistics for designing intelligence systems.

Facilities

The department has three research domains namely, i) Networks and Security, ii) Computation & Algorithms and iii) Design, Intelligence and Analytics. The facilities available with the department are as follows.

Research Domains	Description	Facilities / Resources
Networks and Security	Internet of Things, Mobile Computing, Distributed Computing, Parallel Computing, High Performance Computing, Parallel and Distributed Systems, Cloud Computing, Information Security, Network Security, Cyber Security, Web Security, Cryptography and System Security, Digital Forensics, Cloud Security.	Networking Lab
Computation & Algorithms	Algorithm, Data Structures, Discrete Structures, Theoretical Computer Science, Computer Organisation and Architecture, Operating System, System Programming, Compiler Construction, Structured and Object Oriented Programming, Digital Signal Processing, Image Processing, Computer Graphics, Multimedia Systems and Applications.	Algorithm Lab
Design, Intelligence and Analytics	Machine Learning, AI, Neural Networks, Soft Computing, Databases, Software Engineering, Data Warehousing, Mining and Analytics, Human Computer Interaction, Digital Logic Design and Analysis, Service Oriented Architecture, Enterprise Resource Planning.	Post-Graduate Lab

3.2 Research and Development Cell at Electronics and Telecommunication Engineering Department

Abstract – The Electronics and Telecommunication department proposes with a vision and mission to pursue and promote Research and development activities in frontier technologies. An academic environment is created in the institution and necessary facilities are provided to encourage and carry out research.The focus is on the development of high-performance, energy-efficient, customizable solutions benefitting society at large. These laboratories will develop a new wave of ideas, technologies, networks, and systems that change the ways in which people (and devices) interact, communicate, collaborate, learn, teach, and discover. Simulation and Design, PCB Fabrication, Back-end Processing, and Characterization and Measurement will also be undertaken.

Objectives

1. To implement various algorithms and test beds in wireless networks, UWB systems, Optical networks, speech, audio and video processing, develop software tools for data analysis.
2. To develop appropriate algorithms that encompasses security and encryption solutions for seamless integration of various subsystems from the application to physical sub system.
3. To develop system and applications by optimizing solutions in emerging areas of antennas Embedded systems and VLSI.
4. To encourage students and faculty to publish in peer reviewed research journals and Patent their work.

Facilities

The department has three research domains namely

1. Modern digital signal processing.
2. Physical Systems
3. Cyber systems and security

The facilities available with the department are as follows.

Research Domains	Description	Facilities / Resources
Modern digital signal processing.	Wireless networks, UWB systems, Optical networks, speech, audio and video processing	Digital communication Research Lab
Cyber Physical Systems	Antennas, Embedded systems and VLSI	IoT Physical System Lab
Systems and security	Computer Networking, Encryption, Data compression, IOT, Cloud computing	Communication system Lab

3.3 Research and Development Cell at Electronics Department

Abstract - The department of electronics engineering has a vision to train the students and faculties to become competent researchers so as to realize product oriented innovative ideas with focus on enhancing the quality of research. In lieu to this it becomes mandatory to create an environment that shall motivate researchers to foster growth of scientific and technical knowledge for the betterment of mankind. Department has four research groups namely VLSI and Embedded Systems, Instrumentation & Control and Signal & Image Processing. All the faculty members of department are associated with these groups depending on their area of expertise. These group have published papers in peer reviewed journals and international conferences. Now department has a mission to publish patents and increase industry interaction.

Objectives

1. To investigate the issues in novel semiconductor technologies and propose the solutions.
2. To develop applications using latest technologies available in instrumentation, signal processing and power electronics.
3. To get research grants from various agencies for development of laboratories.
4. To increase number of publications in reputed journals and patents.

Facilities

State of the art laboratory infrastructure is available to support research activities. New facilities are also created in the department. R&D facilities in the domain of MEMS, Instrumentation, Biomedical, Image Processing and Power Electronics are updated with advanced technologies recently. Department has invested approximately Rs. 47 lakhs in academic year 2015-16. To further support research activities and development of laboratories, MoUs are signed with several companies. For example, department signed MoU with Eduvance, the educational arm of Vanmat Technologies Pvt. Ltd. under which department received technical support from Cypress Semiconductor Inc. and ARM university program. Department also signed MoU with companies like Starcom and Edgates technologies to provide recent Texas Instruments Technologies to department.

Research Domains	Description	Facilities / Resources
VLSI and Embedded System	primarily the research is carried out in Novel circuit Design, Device Simulation, Embedded Product Design and VLSI Communication Circuits.	VLSI LAB Visual TCAD, Vivaldo, TI MSP Board, Keil Embedded Software
Signal and Image Processing	primarily research is carried out in Biomedical Signal Processing, Machine Learning and Video Analytics	DSP LAB DSP Boards , Matlab Software
Instrumentation and Control	research is focussed in Simulation and design of instrumentation systems, Power Electronics System, Renewable energy and Biomedical systems	Instrumentation and Control LAB PSIM,C2000 Boards, Induction Motors, (3 phase), D C Motors, Labview, NI Elvis, T.I. PMLK boards, PLC(Allen Bradly)

3.4 Research and Development Cell at Information Technology Department

Abstract–Information Technology department of S.P.I.T. stride towards improving the technical education offered to engineering aspirants thereby equipping them for the ever-evolving technology domain. The key goal of the department is to provide a creative atmosphere in which higher studies and research thrive amongst the faculty and students. The department encourages the students and faculty to undertake the research in newly emerging frontier areas of Engineering, Technology, Science and multidisciplinary fields. The Department enhances the research capability by encouraging their participation in conferences, seminars, workshops and project competitions.

Objectives

1. To unify the research activities in data analytics from the perspective of both information systems and computer science.
2. To improve computing performance by harnessing the power of the graphics processing unit.
3. To illustrate concepts in image processing and analysis through actual processing of images.

Facilities

The department has three research domains namely, i) Data Analytics ii) Distributed System and iii) Image Processing. The facilities available with the department are as follows.

Research Domains	Description	Facilities / Resources
Data Analytics	To process and analysis a huge volume of data sets using Hadoop. Working with mining concept for large volume of data.	Database Lab
Distributed System	A private cloud was setup to understand benefits of virtualization Reusable application components for uses in cloud solutions. CUDA Lab for high performance computing using parallel processing.	Cloud Computing Lab, CUDA Lab, Networking Lab
Image Processing	To enhance and process images for various applications. Project are undertaken which focus on biometric applications.	Multimedia/ Image Processing Lab

3.5 Research and Development Cell at Master of Computer Application Department

Abstract - In today's world of trending technologies, there is high demand and competitive environment towards Research and Development. The Department of Master of Computer Application is in a mission to increase the number of innovative and applied research through untiring effort of faculty members and students. We aim to create zeal amongst students and faculty members towards research and innovation. More importantly, to work closely with the industrial needs that eventually will result in new or improved products, processes, systems or services that can increase the company's productivity. R&D cell thrives to establish collaboration with other universities, public and private sectors and identify R&D projects including consultancy services which could be undertaken at the department/ institution.

Objectives

1. To develop system and application to optimize, analyze and secure the solution using latest technologies.
2. To design, analyze and develop a system using intelligence and analytic techniques.

Facilities

The department has two research domains namely, i) Networks and Security, ii) Design, Intelligence and Analytics. The facilities available with the department are as follows.

Research Domains	Description	Facilities / Resources
Security	Information Security, Network Security, Cyber Security, Cryptography and System Security.	Networking & Database Lab
Design, Intelligence and Analytics	Soft computing, Machine Learning, Data Mining, Big Data Analytics (Proposed), Service Oriented Architecture, Natural Language Processing.	Operating System & Programming Technology Lab

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

4.1 Promotion of Research and Innovation for Undergraduate Students (PRIUS) (Proposed)

To promote and support research and innovation based projects amongst undergraduate students; R&D Centre has proposed a new scheme through which it supports:

- undergraduate students in the research laboratories
- undergraduate students for international collaborative research projects, and
- encouraging projects leading to innovation

The scheme is applicable for undergraduate students enrolled at S.P.I.T. and a part of the PRIUS project must be carried out at S.P.I.T. For the implementation of this scheme, the student who wishes to pursue an undergraduate research project must identify a faculty supervisor from S.P.I.T. PRIUS undergraduate projects should typically run for a period of at least six months and it is to be understood that these projects will not in any way come in the way of the student's regular academic obligations and requirements for fulfilling the requirements for the award of degree. Undergraduate students identified to utilize this opportunity must finish their work before the end of final semester of the coursework. The proposed maximum funding per annum for a research proposal is Rs. 25,000/-

4.2 Innovation and Entrepreneurship Support Cell (IEDC)

Department of Science and Technology (DST), Government of India, funded Innovation and Entrepreneurship Development Centre (IEDC) has been setup at S.P.I.T. IEDC grant was sanctioned on 15th April 2010 for the establishment of IEDC at S.P.I.T. The total sanctioned amount was Rs 44,55,000/-- for a period of five years with the following mission and objectives.

Mission: Develop Institutional mechanism to create Entrepreneurial culture in academic Institutions to foster growth of innovation and entrepreneurship amongst the faculty and students.

Objectives:

- To act as an institutional mechanism for providing various services including information on all aspects of enterprise building to budding entrepreneurs.
- To create Entrepreneurial culture in the Parent Institution and other institutions in the region and to promote entrepreneurship including programmes related to women and weaker sections of the society.
- To inculcate a culture of innovation driven entrepreneurship through student projects
- To promote development of knowledge-based enterprises and employment opportunities in the innovative areas.
- To respond effectively to the emerging challenges and opportunities both at national and international level relating to SMEs and micro enterprises.

4.3 Center for Distance Engineering Education Programme (CDEEP)

S.P.I.T. has established center for distance engineering education on 7th March 2012 as a CDEEP, RC center of IIT-Bombay and also NPTEL local chapter of IIT-K on 25th Jan. 2017. Organized several continuing Education Programmes (CEPs) and Short Courses for students and faculty with IIT-Bombay. This will enable faculty and students to update their knowledge and skills, and also to train them in state-of-the-art facilities.

4.4 Intellectual Property Rights (IPR)

S.P.I.T. promotes innovations and facilitates protection of Intellectual Property (IP) of its faculty and students. While a formal framework to guide the implementation is an evolving process, S.P.I.T. has a IEDC cell to help the innovator for successful filling of the patent application. Parties engaged in creations of original and innovative work at S.P.I.T. include undergraduate and postgraduate students, and faculty members. Provision has been made for IPRs and Copy Rights in the budget.

4.5 Sponsored Research Projects

The research and development 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.

An important strategy to facilitate Research and development activities was the creation of a substantial reserve of research fund to facilitate research work of students. This fund enables the students to apply for resources to the Research committee by submitting a research proposal so as to reduce dependence on sponsored research.

Each research proposal received by the centre is sent for a blind review to a referee (a panel of senior and experienced researchers in the relevant field) who comments on the clarity and focus including rationale of the proposed study, logical flow of ideas, methodology, feasibility, originality and contribution to knowledge. The reviewer's comments are shared with the researcher to help strengthen the proposal.

4.6 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. The services at S.P.I.T. are categorized as Testing and Consultancy.

For obtaining expert services from S.P.I.T. in the concerned fields, contacts may be made with:

- Concerned faculty member directly, or
- Head of the Department of the department concerned, or
- Dean, Research & Development (especially, in case of interdisciplinary projects)
-

4.7 Conferences, Workshops and Seminars

S.P.I.T. has organized several conferences workshops and seminars 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. Research scholars gain much needed exposure through these events which are critical to their educational experience and preparing for the future research endeavours.

4.8 Memorandum of Understanding (MoU)

Research and Development (R & D) centre facilitates the signing of MoU related to research activities with different organizations on topics of mutual interests. S.P.I.T. has signed MoUs with the following organizations/universities/institutes for conducting training programs, availing R&D facilities etc.

Texas Instruments , Bangalore , 3DPLM 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, Erricsion India Pvt. Ltd, Haryana, Secure Matrix India , Pvt. Ltd, Mumbai, Visvasvaraya National Institute of Technology, Nagpur, Infosys, Pune, Wipro Technologies , Pune, IBM India Ltd., Tata Consultancy Services Ltd, Mumbai.

4.9 Research Scholars Colloquium and Awards

Research colloquium is the proposed activity conducted at S.P.I.T. The activity is proposed to be conducted annually. The presentations on ongoing research project at S.P.I.T. are given. The sponsored/funded projects are included in this activity. 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 in S.P.I.T. This event and promotes exchange of ideas. Research scholars gain much needed exposure through this event which required for educational experience and preparing for the future research endeavours. The award is given to the best presentation.

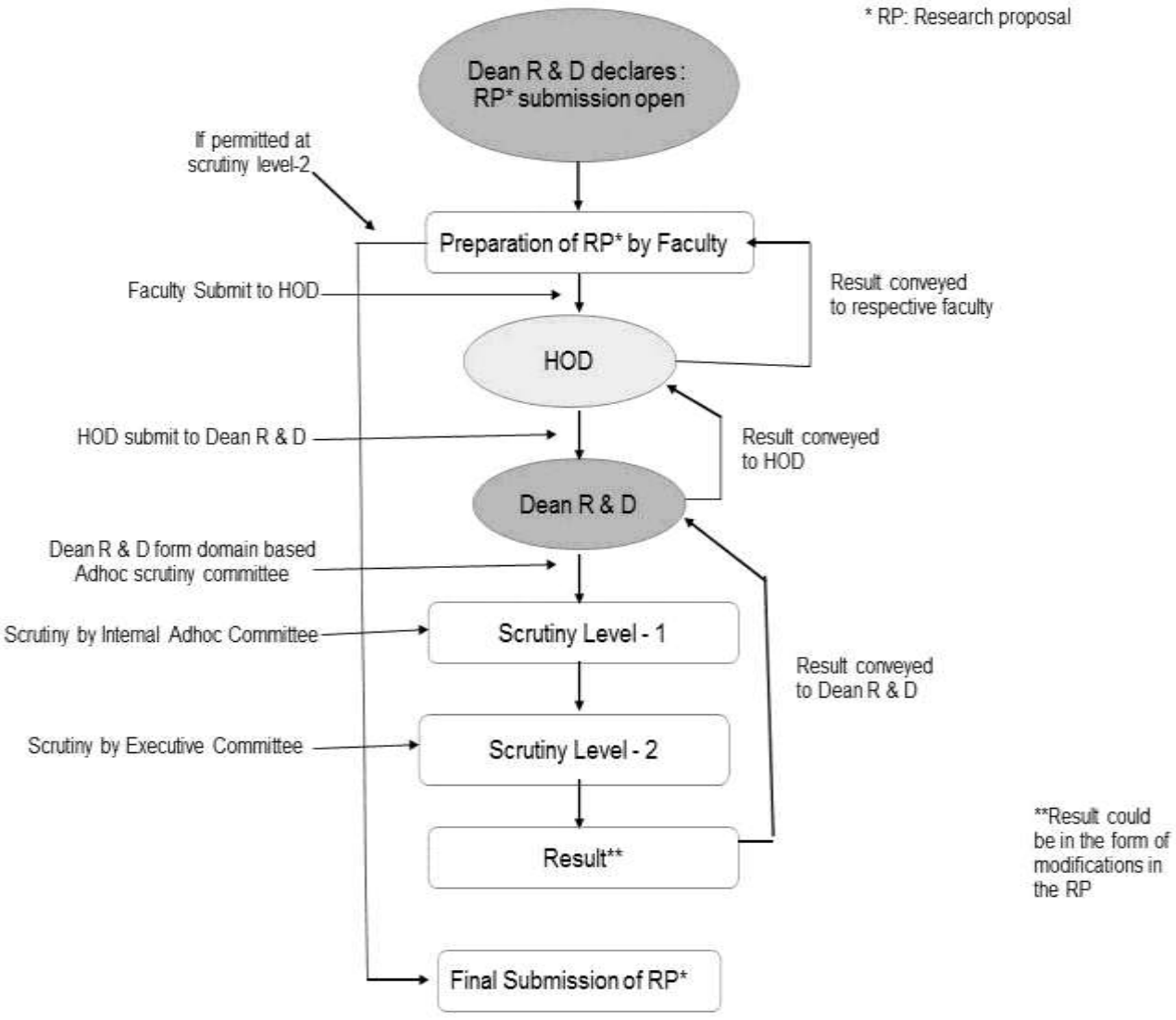
4.10 Faculty Award for Excellence in Research

Dean R & D initiates award of excellence for all departments of S.P.I.T. for best faculty (R & D perspective) award. The motivated teachers deserve recognition and encouragement. R & D research centre appreciates an excellent research activities conducted by faculty members by granting a faculty award. This appreciation will be measured against specific criteria such as publications in national and international journals, conferences and transactions including book chapter; patent applications; organizing value added courses; external recognitions for carrying research activity; consultancy and including other criteria which has national or international level significance. Such criteria are measured to quantitative as well as qualitative analysis.

5. Processes

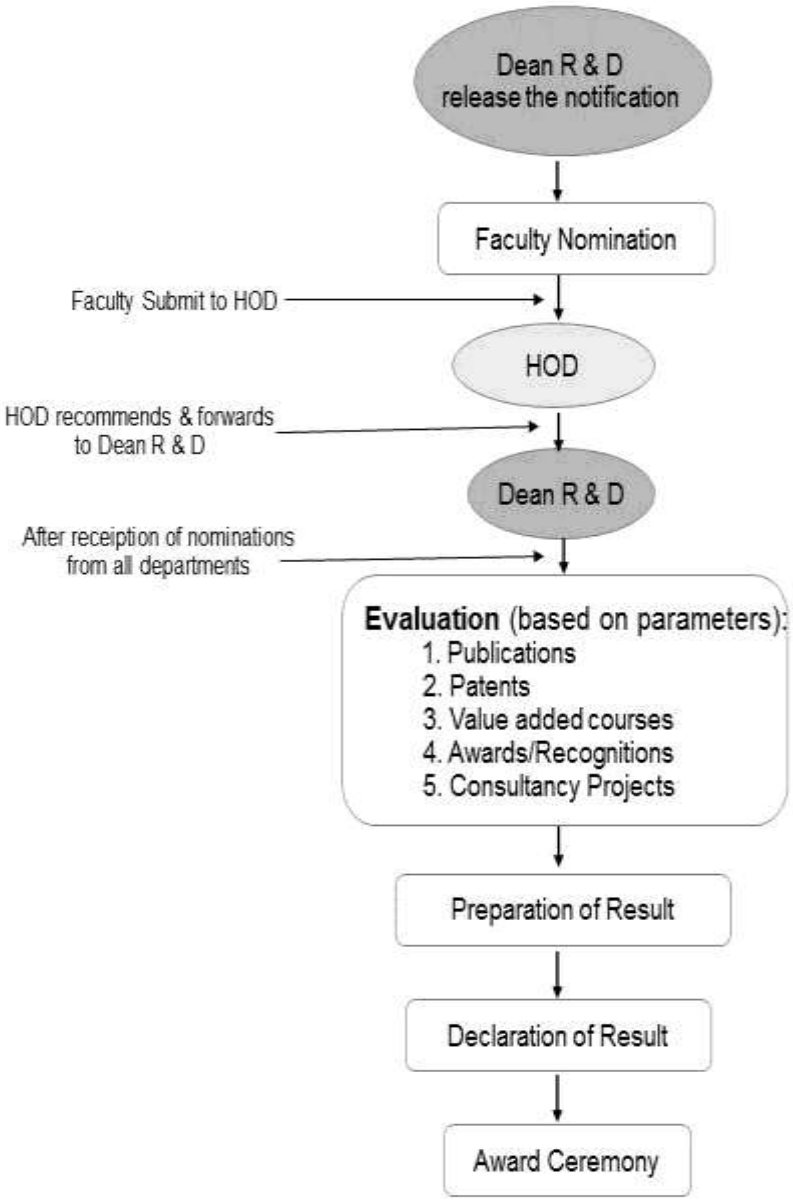
5.1 Process for RPS

The process starts with the initiation of RPS, through Dean R&D. The faculty of all departments submit the research proposals through respective HOD to R&D center. The scrutiny committee accepts or reject the proposals with the feedback. The selected research proposals are sent to the funding agencies.



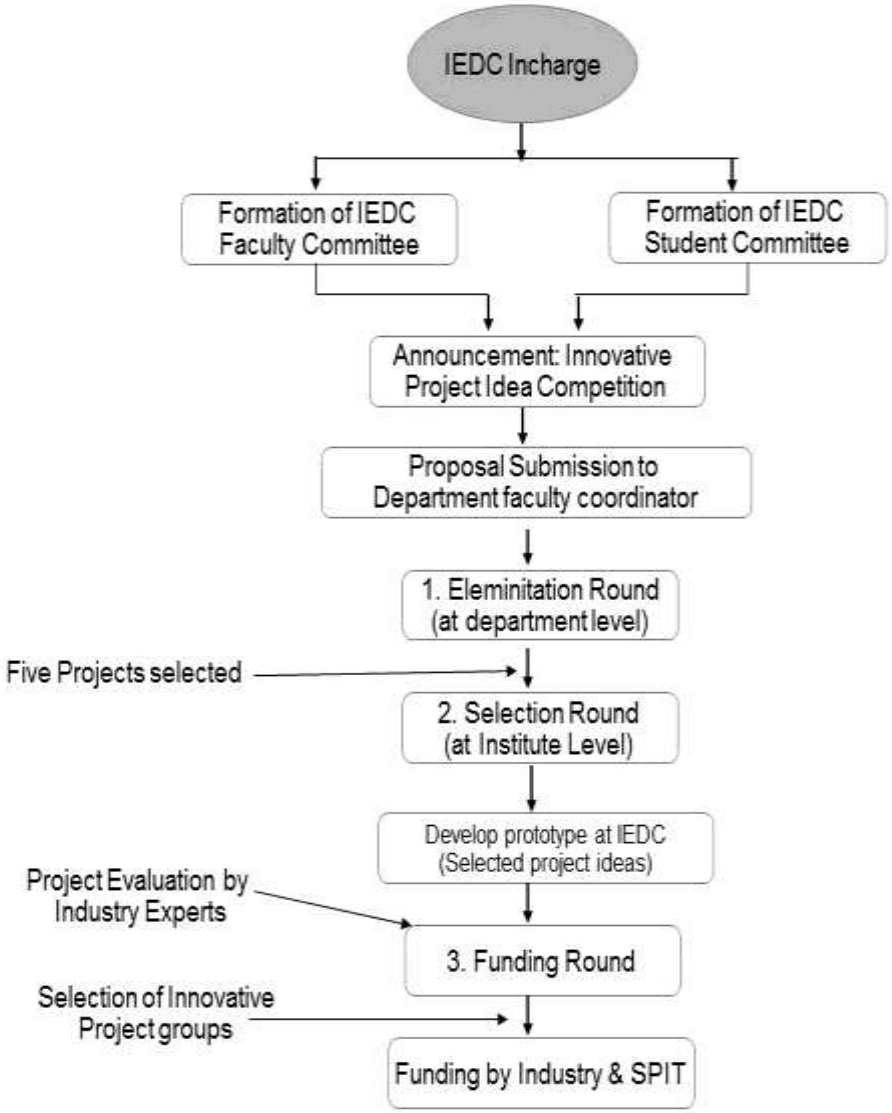
5.2 Process for Award for Excellence

Dean R & D initiates award of excellence for all departments of S.P.I.T. for best faculty (R & D Perspective) award. It will be measured against specific criteria such as publications in national and international journals, conferences and transactions including book chapter; patent applications; organizing value added courses; external recognitions for carrying research activity; consultancy and including other criteria which has national or international level significance. Such criteria are measured to quantitative as well as qualitative analysis.



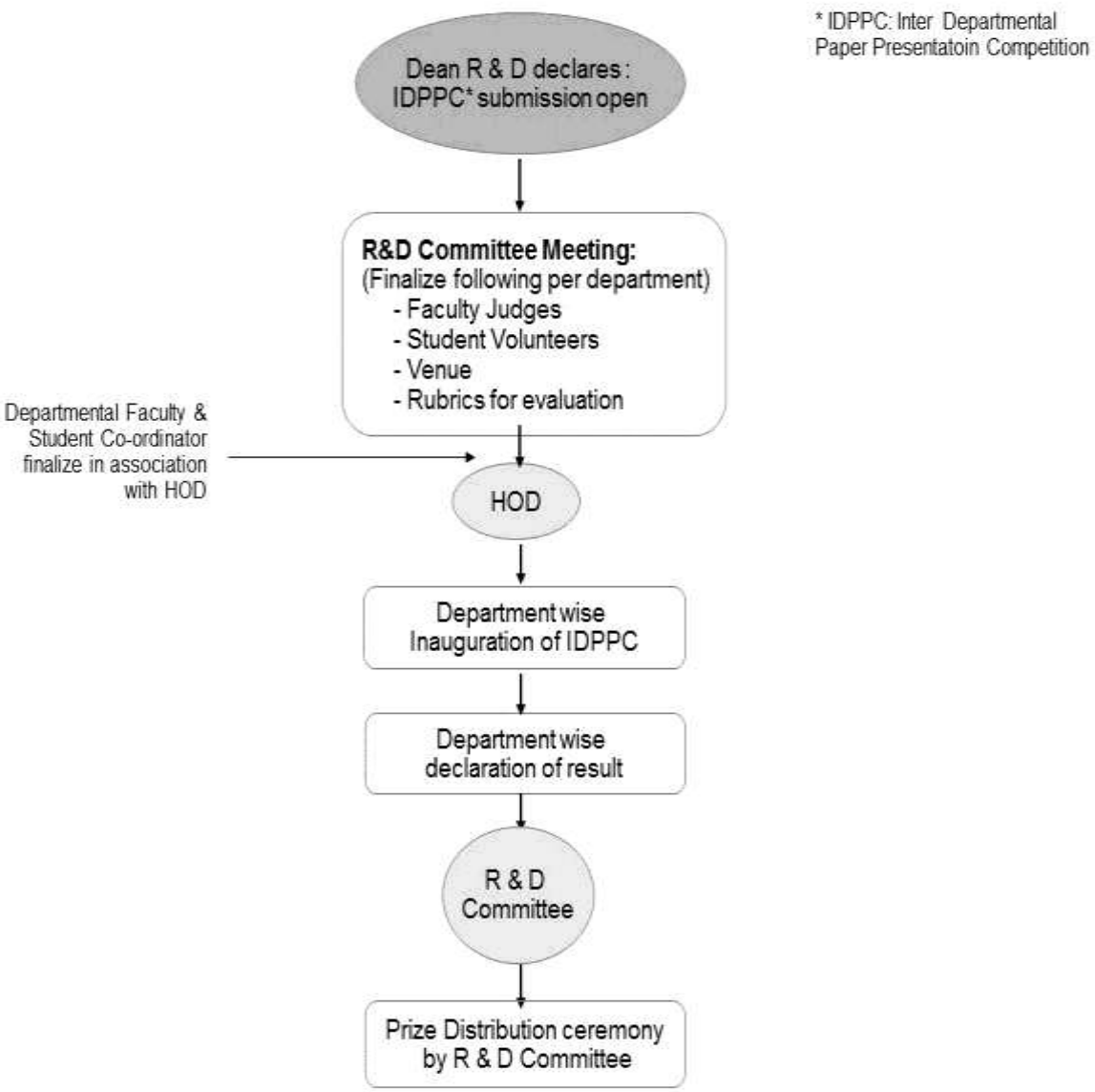
5.3 Process for IEDC projects

Dean R&D announces Innovative Project Idea Competition. There are three rounds of selection1) Elimination Round 2) Selection Round and 3) Funding Round. Students groups submit proposal to Faculty coordinator of their respective department. Students group funded by Industry and SPIT, develop prototype, Prepares Business Plan and forms a Virtual Company. Successfully completed project team draft patent and register their patent at Indian Patent Office.



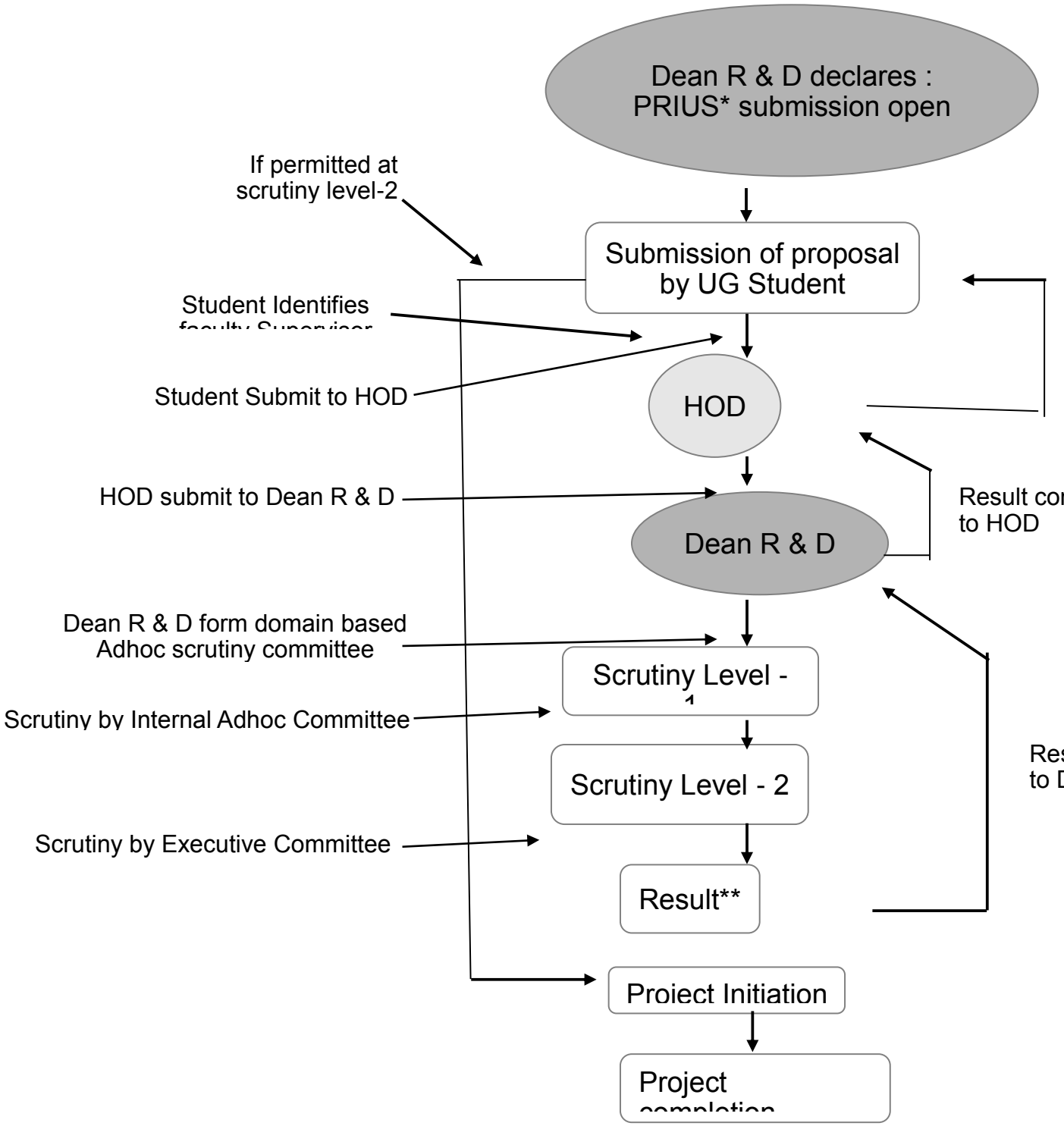
5.4 Process for Students Paper Presentation

This competition is conducted for final year students of EXTC, ETRX, COMP, IT and MCA. Student writes a research paper based on their final year project under the guidance of their mentor. Department wise papers are evaluated based on the paper presentation skill and paper writing skill. Inter departmental faculty (judge) will select best 3 papers as winners using rubrics of evaluation.



5.5 Process for PRUIS

The student who wishes to pursue an undergraduate research project must identify a faculty supervisor from S.P.I.T. PRIUS undergraduate projects should typically run for a period of at least six months and it is to be understood that these projects will not in any way come in the way of the student's regular academic obligations and requirements for fulfilling the requirements for the award of degree. Undergraduate students identified to utilize this opportunity must finish their work before the end of final semester of the coursework.



6. Budget

R&D financial heads, sanctioned and proposed budget

6.1 Sanctioned Budget for Financial Year 2016-17

Sr. No	Activities	Amount Budgeted
1	Faculty Development Program	7,00,000
	a) IIT PG credit Courses / Online certificate courses like Coursera can also be considered if certificate is obtained	
	b) IIT/NIT DEP Summer/Winter Courses	
2	Faculty Publications	5,50,000
3	Patents & Copyrights	
	a) Patents	2,00,000
	b) Copy rights	1,00,000
4	Short term courses/workshops	1,50,000
5	Skill Development (Non teaching and Teaching)	1,50,000
6	Students Publications & R&D	2,00,000

6.2 Proposed budget for financial year 2017-18

Sr. No	Activities	Amount Budgeted
1	Faculty Development Program	7,00,000
	c) IIT PG credit Courses / Online certificate courses like Coursera can also be considered if certificate is obtained	
	d) IIT/NIT DEP Summer/Winter Courses	
2	Faculty Publications	5,50,000
3	Patents & Copyrights	
	c) Patents	2,00,000
	d) Copy rights	1,00,000
4	Short term courses/workshops	1,50,000
5	Skill Development (Non teaching and Teaching)	1,50,000
6	Students Publications & R&D	2,00,000
7	Promotion of Research and Innovation for Undergraduate Students (PRIUS)	3,00,000
8	R&D center activities: Expert committee expenditure,	2,50,000

	Awards, Colloquium, Visits	
9	National & International Collaborative research	5,00,000

7. Outcomes

Following are the outcomes of R &D initiatives.

7.1 Annual Report

Executive committee will prepare the annual report at the end of Academic Year based on R&D activities conducted the year. Activity report for measurable outcomes

7.2 Faculty Contribution

Faculty Research committee will prepare the contribution report along with assessment and analysis at the end of Academic Year based on faculty contribution done in the year.

7.3 Students Contribution

Students Research committee will prepare the contribution report along with assessment and analysis at the end of Academic Year based on faculty contribution done in the year.

7.4 Publications

Executive committee in association with Faculty Research committee and Students Research committee will prepare the list of publication at the end of Academic Year based on faculty contribution and student's contribution done in the year.
The list will be given to Library for display on website.

7.5 Revenue Generation

Generating the revenue through software and hardware development, patents and value added courses.

(Soft and hard copies will be maintained)

8. R & D Calendar

Month	Week	R & D Activity
ODD Semester begins		
July	2	Meeting: Executive Committee
July	4	Meeting: overall R&D committee
August	2	PRIUS Proposal Initiation
August	3	Meeting: R&D faculty co-ordinators and R&D student co-ordinators
August	4	IEDC Project Proposals submission
October	3	Assessment/Settlement of IPR Submissions
November	2	Meeting: R&D faculty co-ordinators and R&D student co-ordinators
November	4	Settlement of Publication Expenses
December	2	PRIUS Assessment
December	3	Notification: AICTE AQIS
EVEN semester begins		
January	2	Submission: AICTE AQIS proposals
January	3	Submission of IPR Proposals
January	4	Meeting: R&D faculty co-ordinators and R&D student co-ordinators
February	1	PRIUS funding settlement
February	2	IEDC Project Presentations
February	3	Meeting: overall R&D committee
March	1	Submission of Publication expenses
March	2	Budget Preparation
March	4	Proposed Budget
April	3	Paper Presentations
April	4	R & D week
May	1	Faculty Qualification Improvement Proposals
May	2	Meeting:

		R&D faculty co-ordinators and R&D student co-ordinators
May	4	Audit of Sponsored Research
June	1	Meeting: overall R&D committee
June	2	Re-Formation of R & D committee

Committee Members

Research & Development Committee of Sardar Patel Institute of Technology.

Faculty Research committee

i. Dr. Preetida Vinayakray-Jani, EXTC, (coordinator)
ii. Prof. Anand Godbole, COMP
iii. Dr. Pooja Raundale, MCA
iv. Prof. Rupali Sawant, IT
v. Prof. Narendra Bhagat, ETRX

Students Research committee

vi. Dr. Amol Deshpande, EXTC, (coordinator)
vii. Prof. Arti Karande, MCA
viii. Prof. Abhijeet Salunke, COMP
ix. Prof. Sheetal Chaudhari, IT
x. Prof. Govind Haldankar, ETRX

9. R&D Policies and Regulations at S.P.I.T.

9.1 Consultancy Projects

Requests for consultancy services come to the Institute due to a variety of factors, such as (i) the professional status, reputation, and, expertise in niche areas, associated with specific individual faculty members (ii) and the Institutional reputation. The *roles* of the individual and the Institution are complementary and most often value addition arises from this. The individual provides the intellectual inputs and skills and harnesses his expertise and experience towards meeting the client's requirements. The Institution, on the other hand, provides a diverse range of infrastructural facilities and services which facilitate consultancy and related activities. The effective costs of such facilities and services, reckoned in terms of major initial investments, periodic up gradation etc. cannot be underestimated.

More importantly, the Institutional reputation for excellence, expertise and ethical practices plays a substantial role in attracting consultancy opportunities. Although the roles of the individuals and the institution are closely intertwined, it needs to be emphasized that the Institution adds substantially to the stature of the individuals.

Finally, as all consultancy activity is to be channelled through the Institution and the Institution assumes some indirect responsibility for completion of the assignments to the satisfaction of the clients. Consequently the Institution has to necessarily look forward to a reasonable share of the revenues.

At S.P.I.T. we envisage following categories of consultancy projects:

- Category I :
- A consultancy is requested by an agency (client) from a particular Professor
- The assignment to be carried out at client site
- No infrastructural requirement from institute for the assignment
- Consultant professor will be allowed to visit client site for completion of assignment for 52 days in a year not more than one day per week during running semester.
- Category II

e) A consultancy is requested by an agency (client) from a particular Professor
f) The assignment to be carried out at Institute
g) Institute infrastructural required for the assignment

- Category III

e) Consultancy is requested by an agency (client) from Institute
f) Institute assigns a consultant to complete the assignment
h) Institute infrastructural required for the assignment

- Consultant team will be allowed to visit client site for completion of assignment for 52 days in a year not more than one day per week during running semester.

Income Sharing Proposal

(All the payment to be made to Institute and institute manages the sharing)

Category I

Total Income Less Service Tax = A

Less Other expenditure with prior approval maximum up 10% of A = B

Institute Share = 30% of B

Consultant's Share = 70% of B

Category II

Total Income Less Service Tax = A

Overhead to Institute = 20% of A
less other expenditure with prior approval maximum up to 10% of A = B
Institute Share = 50% of B
Consultant's Share = 50% of B
Category III
Total Income Less Service Tax = A
Overhead to Institute = 20% of A
less other expenditure with prior approval maximum up to 10% of A = B
Institute Share = 70% of B
Consultant's Share = 30% of B

9.2 Policy for Qualification Improvement of the Faculty

1. Sponsored study leave under all categories (including QIP) for M.E. / Ph.D. has been discontinued from the year 2013-2014. However, faculty can avail study leave of six months during their M.E. / Ph.D. period subject to signing of the bond prescribed for the same.
2. For motivating faculty to pursue PhD would be taken up with the new Board of Governance (BoG) under autonomy.

9.3 Policy for Training Program/Seminar/Workshops/FDP

Proposed Scheme for disbursement of revenue generated by training programme/ short term courses.
Training Programs

1. Faculty members can conduct value added training program within the institute or at client site
2. All such training programms will be conducted before / after the institute working hours
3. Trainer team will be allowed to visit client site for completion of assignment for 52 days in a year not more than one day per week during running semester.

Income Sharing Proposal
Total Income Less Service Tax = A
Less other expenditure with prior approval maximum up to 10% of A = B
Institute Share = 50% of B
Trainer's Team share= 50% of B = C
Training Team Share :

Sr. No.	Team Member Title	% Share
1	Coordinator	10% of C
	Trainer	70 % of C
2	Lab Assistant	7 % of C
3	Class IV	3 % of C
4	Accounts	5 % of C
5	Principal	5 % of C

9.4 Policy regarding sponsorship for International Conferences

Recognizing the significance and importance of research work and its publication in peer reviewed journals both, at international and national levels, norms sponsorship for attending conferences abroad are being amended as under. The faculty member seeking sponsorship should also make efforts to get

sponsorship from other bodies which offer sponsorship eg. UGC, AICTE etc.

1. In view of the above three slots have been defined as under.

Slot 1. Once a faculty member publishes a paper in a peer reviewed international journal, he/she will be eligible for slot as defined below. He/She may utilize the sponsorship within a period of two years from the date of publication of the international journal paper.

Sponsorship will be under following heads:-

- Registration Fees
- Visa fee
- Conveyance - Economy fare by air
- Conveyance form residence to airport, int'l airport to hotel and similarly return journey.
- Up to US $ 80 per day (towards lodging and boarding - on days of the conference only) to be reimbursed on actuals.
- The paper should be presented at an International conference organized by a Professional body.
- The research work should not reflect the work leading to M.E., Ph. D. for which the faculty member were sponsored.
- The work may reflect research work for which the faculty member was guiding ME, Ph.D. dissertation work.
- The total expenses reimbursable would be **restricted to Rs.1,10,000** which would be inclusive of grants from other sources.

Slot 2. Once a faculty member publishes a paper in a peer reviewed national journal, he/she will be eligible for Sponsorship to the extent of 75% of the total expenses under the following heads. He/She may utilize the sponsorship within a period of two years from the date of publication of the journal paper (national level).

- Registration Fees
- Visa fee
- Conveyance - Economy fare by air
- Conveyance from residence to airport int'l airport to hotel and on journey on return.
- Expensed toward stay up to US $ 80 per day (towards lodging and boarding) to be reimbursed on actuals.
- The paper should be presented at an International conference organized by a Professional body.
- The research work should not reflect the work leading to ME, Ph.D for which the faculty member was sponsored.
- The work may reflect research work for which the faculty member was guiding ME, Ph.D. dissertation work.
- The total expenses reimbursable would be **restricted to Rs.75,000** which would be inclusive of grants from other sources.

Slot 3. If a faculty member does not qualify in slot 1 or 2 he/she may utilize sponsorship under this slot. The sponsorship may be utilized once in two years. Sponsorship will be under the following heads.

- Registration Fees
- Visa fee
- Conveyance - Economy fare by air
- Conveyance form residence to airport int'l airport to hotel and on journey on return.
- Expensed towards stay up to US $ 80 per day (towards lodging and boarding) to be reimbursed on actuals.
- The paper should be presented at an International conference organized by a Professional body.
- The research work should not reflect the work leading to ME, Ph.D for which the faculty member

was sponsored.

- The work may reflect research work for which the faculty member was guiding ME, Ph.D. dissertation work.
- The total expenses reimbursable would be **restricted to Rs.55,000 (or Rs.28000 per year)** which would be inclusive of grants from other sources.

2. The faculty member should after returning from the conference give a presentation on his/her topic and about the visit in a faculty meeting.

3. In addition to the above mentioned sponsorship a faculty member is entitled for reimbursement for a national conference conducted by a professional body as per govt. norms every year.

4. A faculty member would also be entitled for sponsorship to a seminar/program of special interest to the department / college once in two years. The maximum reimbursement on different heads would be restricted to Rs.10,000.(or Rs.5,000 per year)

5. To get sponsorship for international conferences faculty member should also apply to other funding agencies like AICTE/UGC/DST before seeking sponsorship from college.

6. The faculty member should, before proceeding to the conference give a complete schedule of stay abroad, clearly indicating dates of the conference travel plan etc.

7. A committee will review the status of conference where the faculty is sponsored, relevance to the subject etc.

10. Terminology, Regulations for Research & Development R&D

1. Scope

These regulations shall be called "R&D Regulation" hereafter & shall be applicable to all activities stated therein. These rules supersede all existing R&D rules.

2. Terminology

2.1 Sponsored Research Project: Time and cost bound projects sponsored by Government, public, private, national / international agencies and autonomous bodies. The project cost including cost towards contractual manpower, deputed manpower, equipment, consumables and supporting services of the Institute are borne by the sponsor.

2.2 Sponsor: The organization that Sponsored the Project to the Institute and gives necessary financial support for successful completion of the project in time.

2.3 Principal Investigator / Investigator in charge (PI): A faculty member of the Institute with necessary expertise and competence to conduct a Sponsored Research / Industrial Consultancy work. Normally, the faculty member who submits the project proposal and discusses / negotiates it with the sponsor and is instrumental in getting the project is the Principal Investigator. For administrative reasons, the Principal Investigator of some projects may be appointed by the Dean (R&D) in consultation with concerned HoD if the original Principal Investigator leaves or his/her service are not available to the project for any other reason.

2.4 Co-Investigator (Co-PI): A faculty member co-opted by the Principal Investigator to work jointly with him. If the PI leaves the Institute or goes on leaves, a Co-Investigator assumes the power of the PI with the approval of the Dean (R&D).

2.5 Consultancy Project: Time bound specific problem solving projects sponsored by funding agencies with payment of consultancy fee / honorarium to the Investigator(s) in addition to all other expenses.

2.6 Individual Research and Development Grant Fellowship: Research and Development grants-in-aid offered to individual faculty, research fellows from the sponsors and executed using Institute facilities with financial support from the granting agencies towards equipment, contingency, overhead, fellowship etc.

2.7 Dean R&D: The Dean (R&D) has full responsibility for project administration including

(i) acceptance of sponsored research and consultancy projects from the sponsor on behalf of the Institute;

(ii) the recruitment, extension, assessment, termination and invoking disciplinary procedure against project staff and

(iii) the full financial power related to all projects covered under the R&D Regulations.

3. Manpower:

3.1 All project appointments will be contractual and on the basis of consolidated monthly emoluments.

3.2 Automatic transfer from one project to another either on completion or midway shall not normally be permitted. However, in special cases such requests with justification by the PI may be approved by the Dean.

3.3 The tenure of contractual appointment of a project staff will be for the duration of the project and less than five years.

3.4 The total period of continuous contractual employment in the project(s) and must be less than five years.

3.5 A project employee shall execute a contract Agreement on non-judicial stamp paper of value at least

Rs. 100/- at the time of joining with the explicit provision that contract may be terminate by either side (Staff or R&D Unit)by giving one month's notice or one month's consolidated emoluments in lieu of the notice.

3.6 Selection of JRF / SRF / RA shall normally be made as per the guidelines provided by the sponsoring agency and with the approval of the Dean (R&D).

3.7 All appointment letters shall be issued under signature of Assistant Registrar (R&D).

3.8 The PIs shall consider prevailing emoluments package, general qualifications and experience for staff while preparing project proposal.

3.9 The Selection Committee for the recruitment of project staff for each project will be constituted as follows:

(a) The short listing of the applications of project staff is to be done by the PI and sent to Dean (R&D) for approval.

(b) Selection Committee for Project staff recruitment:

i) Dean (R&D) or his nominee - Chairman

ii) Head of the Department - Member

iii) Principal Investigator (PI) - Member

iv) Two experts (to be nominated by the PI) - Member

The Committee is to be approved by the Dean (R&D). The Dean (R&D) shall fix, on the recommendations of the selection committee, the monthly consolidated emolument and the duration of the contractual appointment. The contract is to be renewed every year on recommendation of the PI.

3.10 On completion of each year of service during the contract period, extension in tenure and suitable enhancement of monthly emoluments, if applicable may be considered by the Dean (R&D) on recommendations of the PI of the concerned School. Application may be made in the prescribed format for approval of the Dean.

3.11 In case of urgent requirement, on recommendation of the PI short term job contracts for 89 days may be considered by the Dean (R&D).

3.12 All project staff shall work for the project only unless agreed to otherwise by the Dean (R&D).

3.13 PIs shall be the sanctioning and controlling authority for all types of leaves with respect to contractual project staff.

3.14 Conduct Rules: project employees shall

a) Follow general code of conduct as approved by Dean (R&D).

b) Maintain secrecy of the research findings / technical information and shall not get involved in unauthorized communication of any official document or information.

3.15 Dean (R&D) may, at his discretion, constitute committee(s) to conduct disciplinary proceedings, if necessary against project employees. On the basis of the report, suitable disciplinary action may be initiated and punishment will be imposed by the Dean (R&D).

3.16 Project employees may be allowed to register for ME/Ph.D programme if he / she fulfil all the requirements prescribed by the University and Institute.

4. Finance and accounts:

4.1 A separate book of accounts shall be maintained for each project. R&D Unit shall be responsible for submission of statement of accounts as and when required by the sponsors. Govt. audited statement of accounts at the end of each financial year shall be provided, if required by the sponsor.

4.2 In general, for sponsored research projects, 20% of the total project cost shall be charged towards Institutional charges (overheads) for utilizing the infrastructural and other facilities of the Institute. However, depending on the norms of the funding agency and project budget, verification can be allowed by the Dean in consultation with the PI.

4.3 In the event, any project utilize Institute's manpower and other supporting facilities beyond office hours, the expenses towards the same shall be charged to the respective project. For this purpose, on the recommendations of the PI, the Dean (R&D) may approve suitable honorarium for the supporting staff of the Institute.

4.4 PIs shall arrange to maintain Procurement-cum-purchase Registers and Stock / Asset. These shall be verified by Govt. Auditors and R&D Unit as and when required. All purchase proposals in line with the purchase procedures of the Institute, shall be processed by the R&D Unit.

4.5 Accounts for sponsored projects shall be maintained under five broad budget heads. They are: Salary, Equipment, Contingency & Consumables, Travel and Institutional Charges (Overhead). Minor adjustment in approved budget heads may be permitted by the Dean (R&D) without violating the norms of funding agency significantly.

4.6 Cash advance shall be drawn in the name of PI/ Co-PI of the project.

4.7 All expenditures shall normally be made within the proposed date of completion of the project. Exception may be permitted with the consent of the sponsor.

4.8 PIs shall normally be allowed to draw another advance only after adjusting the previous one taken by them unless otherwise agreed by the Dean (R&D).

4.9 In the event of non-availability of fund in a project, excess expenditure (if any) due to unforeseen reasons, the Sponsoring Agency will be approached to sanction additional fund or to permit the expenditure from another project of the same sponsor.

4.10 TA and DA Rules: The Government of India TA & DA rules will be applicable to the PIs and project employees for all sponsored research / consultancy projects. However, there could be some relaxation in the TA & DA rules for the PIs and project staff, subject to the availability of fund and with prior approval of the Dean (R&D).

5 Intellectual Property Rights:

5.1 Unless otherwise agreed with the Sponsor in the project agreement, Intellectual property Rights for any discovery or invention originating from the Sponsored Research and Consultancy Project shall jointly rest with the Institute, Investigator (s) and the Sponsoring Agency unless the Sponsoring Agency authorizes the Institute in writing to have the exclusive right. Patent / copyright application before the Registrar / Controller of Patents shall be filed by the R&D Unit on the basis of the recommendations made by the patent / Copyright Committee.

5.2 For the effective protection of IPR, it is necessary that the PIs should maintain a register that gives the details of the work done and salient findings on daily / weekly basis. This register should be signed by the PI and by at least one other faculty / project employee as witness to the result.

5.3 For the copyright protection of software / technology, registration of the software at the Department level shall be made and properly documented. The list shall be centrally made available to the R&D Unit.

6. Technology transfer:

The PIs shall not independently transfer technology either on exclusive or non-exclusive basis to any party without the consent of the IPR owners. The terms and conditions for each of such technology transfer shall be worked out on a case to case basis with approval of the Dean (R&D)/ Principal.

7. Retainership (Proposed):

With the permission of the Dean (R&D) / Director, the faculty members of the Institute can accept retainership of the reputed organizations. The fees thus earned shall be shared by the Institute and the Individual in the ratio of 3: 7 only after payment of service tax, etc as applicable. For this purpose, the faculty concerned may utilize one day per week of four days in a month during an academic year with the specific approval of the Dean (R&D) provided alternate arrangements for classes and other commitments are made by faculty member. This applies to research and consultancy projects too.

8. Software marketing (Proposed):

All software duly copyrighted may be marketed and the sale proceeds thus accrued shall be shared between the Institute and the software consultant(s) as per Industrial Consultancy rules for the first copy and in the ratio (3:7) for the subsequent copies after payment of applicable taxes like service tax. If the subsequent copies sales involve training and their supporting services, the rules of consultancy (with no contribution towards use of Institute computing facilities) shall be applicable. If the marketing rights are transferred, the terms and conditions shall be determined as per Technology Transfer Rules.

9. Duties and responsibilities of the Principal Investigators (PIs):

9.1 Sponsored Research and Consultancy projects shall be undertaken only with the prior approval of the Dean (R&D). All research project proposals are to be submitted to the R&D Unit for endorsement of the Dean (R&D) before onward transmission to the funding agency. In case of on-line submission, the PI needs to submit copy of the proposal to the R&D Unit for endorsement of the Dean before on-line submission.

9.2 It shall be the responsibility of the PI to get the project work completed satisfactorily within the sanctioned grant and duration.

9.3 The PI shall ensure that the head-wise expenditure does not exceed the budgetary allocation. For effective control, periodic (or as and when required) expenditure details shall be made available to PIs by R&D Unit.

9.4 The PI shall maintain the details of equipment purchase out of project funds separately for each project. He / She shall send a copy of it to Dean (R&D) for placing the same before the Govt. Audit for verification.

9.5 The PIs shall be responsible for submission of periodical and / or final technical report (s) of the project work as may be required by the sponsoring agency. He / She shall also send a copy of the final technical report to Dean (R&D).

9.6 The PI shall write to the sponsor for timely release of fund with a copy to the Dean (R&D) for follow up. R&D Unit will provide the un-audited /audited statement of accounts to PIs for forwarding the same to the sponsor.

9.7 The PIs shall sanction / control the leaves due to the contractual employees working in their projects under intimation to R&D Unit.

10. Financial benefits to PIs / Co-PIs and project staff:

10.1 Within the framework of a sponsored project, PIs shall be permitted to have consultancy fee / honorarium, if the sponsor so approves. The consultancy fee / honorarium thus received shall be shared between the PIs and the Institute in the ratio approved by the Institute.

10.2 PIs shall be allowed to work full time during the vacation in the projects and get suitable honorarium as approved by the Institute (in lieu of vacation) for such period, provided the funds under salary provided by the funding agency so permits.

10.3 Depending on availability of funds under Travel head and with the approval of the Dean (R&D), expenses (TA, DA, Registration Fee, etc.) for presenting papers in National Conferences in fields relevant to the project, shall be given to PIs/ Co-PIs from the project fund provided such visits are approved by the Dean.

10.4 On recommendations of PIs, contractual project staff and students working in projects may be permitted with approval of the Dean (R&D) to present papers in national Conferences with TA, DA and Registration Fee support provided the funds are available under Travel head of the project.

10.5 The PIs shall prepare project proposals keeping

(i) the prevailing scholarship/ consolidated salary,

(ii) General qualifications and experience for staff required,

(iii) rules of the R&D in mind. All such proposal requires approval by the Dean (R&D).

11. Exception clause:

These R&D Regulations shall normally be applicable to all research projects, consultancies, testing services retainership, software marketing, technology transfer, intellectual property rights. Any exception / deviation to these rules may be considered by the Principal / Competent Authority for approval depending on the merits of the case.

12. Faculty Development Fund (FDF) & Department Development Fund (DDF) (Proposed):

A portion of the Institutional overhead taken from the research and consultancy projects will be available to the PIs as Faculty Development Fund (FDF) and to the Departments/ Centers as Dept. Development Fund (DDF) to meet the expenses related to professional development as given below:

a) 10% of the Overhead charges is to be kept under the Faculty Development Fund (FDF) for the Project Investigator (PI) and the Co-project Investigator (Co-PIs). The percent distribution among the PI and Co-PI(s) will be approved by the Dean on the recommendation of the PI.

b) 15% of the Overhead charges is to be kept under the Department Development Fund (DDF).

The PI/ Co-PI is allowed to use the FDF for procurement of Laptop, Mobile Phone and Computer Accessories etc. Besides the PI/ Co-PI may also meet the expenses of official foreign travel partially from this fund, if R&D budget is inadequate and for other similar purposes.

13. Procurement Procedures:

All the purchases related to sponsored projects should be made as per the approved purchase guidelines of the Institute. However, some deviation in the purchase rules of the Institute could be made, to make the R&D related purchases faster and flexible, with the approval of the competent authority.

14. Prescribed formats:

Forms related to various activities of the R&D will be available with the R&D unit and in the designated website.

15. Management of Centres of Excellence:

The Centres of excellence funded by various funding agencies will operate as independent R&D cells in the institute. The Chairmen/ Heads of the centres, appointed by the competent authority will have financial and academic administration responsibility as approved by the competent authority. However, financial management of these centres will be the responsibility of the R&D Unit.