



Saraswati Education Society

Saraswati college of Engineering, Kharghar

➤ Introduction

Teaching and Research are the main functions assigned to any institute. Teaching is a prime function and needs to be performed at the highest level of competence; that is possible only when the faculty is involved in the research activity. Research is an original contribution to the existing stock of knowledge making for its advancement. It is the pursuit of truth with the help of study, observation, comparison, experiment, collection of facts or data, analyzing the facts to reach certain conclusions either in the form of solution(s) towards the concerned problem or in certain generalizations for some theoretical formulation. In short, the search for knowledge through objective and systematic method of finding solution to a problem is research.

Research essentially nourishes the academic program and such engagement helps teachers to remain at the cutting edge, with advances in their own subject. It also sustains the interest in academic activities and widens the scope of learning. Importantly, it helps the institute to stand at the global level.

➤ R&D Cell

The R&D cell comprises of faculty members from various departments in the institute.

This committee oversees the smooth and efficient coordination of research and development activities in the institute, thus fostering overall growth. A senior faculty heads this cell in the capacity of Head R&D. Principal SCOE is the executive head and The Head R&D is functional head of the cell and advisory to R&D processes to be carried in the institution to Principal SCOE. The faculty members that constitute the R&D Cell are.

Sr. No.	Name of Faculty	Designation
1	Dr. Manjusha Deshmukh	Principal & Executive Head .
2	Dr. Suhas Sabnis	Head R&D
3	Dr. Bharati Joshi	Head of the department : Department of Computer Engineering department & Dean Academics

4	Prof.S.N.teli	Dean Administration
5	Dr. Fauzia Siddiqui	Head of the department : Department of Mechanical Engineering department
6	Prof. Roshani John	Head of the department : Department of Civil Engineering department
7	Prof. Vashali Jadhav	Head of the department : Department of Information technology department
8	Prof. Sheetal Bukkawar	Head of the department : Department of Electronic & telecommunication Engineering department
9	Prof. T.Z. Quazi	Head of the department : Department of Automobile Engineering department
10	Dr. Seema V. Lathkar	Head of the department : Department of Engineering Sciences & Humanities department
11	Dr. Bhavani Dubey	R&D Coordinator for Department of Electronic & telecommunication Engineering
12	Prof. Prashant Ingle	R&D Coordinator for Department of Automobile Engineering
13	Dr. Suman Rawat	R&D Coordinator for Department of Civil Engineering department
14	Dr. Priyanka Jadhav	R&D Coordinator for Department of Civil Engineering department
14	Dr. Sunita Pal	R&D Coordinator for Department of Engineering Sciences & Humanities department
15	Prof. Yogesh Jadhav	R&D Coordinator for Department of Information technology
16	Prof. Monali Deshmukh	R&D Coordinator for Department of Computer Engineering department
17	Prof. Vishal Bhise	R&D Coordinator for Department of Mechanical Engineering department

➤ **The role of each of the members can be summarized as,**

- To encourage and motivate faculty for externally funded research and development, interdisciplinary and multidisciplinary research, product design and development, publications in journals of high standing.
- To facilitate discussions and collaborations with researchers from other institutes, with the possibility of joint work in various thrust areas of national and international importance.
- To initiate and promote MOU with industries, Academic and R&D organizations; for consultancy, collaborative research, sponsored projects, industry institute interactions etc.
- To arrange talks and interactions by eminent personalities from industry, R&D organizations and institutions of repute; for the better understanding of research methodology and practices currently followed.
- To support faculty for delivering talks at different events and conducting workshops, training programs, seminars, conferences, symposiums, faculty development programs.
- To visit R&D organizations and disseminate information regarding the effective implementation of research projects in the institute.
- To suggest peer reviewed national and international journals for subscription in central library as well as department library.
- To formulate the R&D budget of department in close co-operation with the faculty and the Head.
- To keep everyone abreast of all announcements by various funding agencies like DST, DAE, DRDO, ISRO, CSIR, AICTE, UGC, UOSP, and the like.
- To motivate students for presenting papers in National and International conferences, and projects in competitions and exhibitions. B.E. projects can be considered as a mini research project. Interdepartmental / collaborative work to be encouraged positively.
- To attend and discuss the progress of R&D in the periodic meeting. The periodic meetings will be held bimonthly; on the last Friday, at 3.00 p.m. in the month of February, April, June, August, October and December.

➤ **PREAMBLE:**

History has shown that educational institutions across the globe have played an indispensable role in the phenomenal progress of humankind. In medicine or space, in technology

or economics, battle lines are being drawn. To remain as a vanguard of discovery, one should be inquisitive like a scientist, resourceful like an engineer and creative like an artist. To triumph one needs results; publishable and applicable results. Research and Development (R&D) flourishes where young minds and experienced faculty work synergistically. At Saraswati College of Engineering, R&D is pursued with the following objectives:

1. To acquire new scientific knowledge.
2. To design novel methodologies in all the fields of Engineering and Technology.
3. To develop new tools and techniques to expedite problem solving with special emphasis on rural and socially relevant issues.

The phrase "Research and Development" has a special significance apart from its conventional coupling of scientific research and technological development. As this process is usually associated with innovation as well, the synonym (R + D + I) can also be applicable. In general, R & D activities are conducted by specialized units or centres belonging to companies, academic institutions and state agencies. "Research and Development" normally refers to future-oriented, longer-term activities in science or technology, using techniques without predetermined outcomes and with broad forecasts of commercial yield.

At Saraswati College of Engineering, these are done to motivate the students and the faculty of the institution, to update the knowledge which leads to further investigation and progress and to give a hand to the industries in their product development. If such an effort does not exist, the growth of science or technology would be static. Knowing this, everyone is encouraged to do academic or industrial research, to involve in innovation or development and to use the knowledge for consultancy with the industries. Research, Development and Consultancy go hand in hand. All disciplines of the college are actively engaged on Research, Development and Consultancy activities. The R & D cell of this college would be active in registering for patents, copyrights, publications in conferences, organizing conferences, seminars and workshops.

All disciplines of the college would be engaged in R&D and consultancy activities. The R&D cell of this college would be active in registering for patents, copyrights, publications in conferences, organizing conferences, seminars and workshops. Faculty and students have been encouraged to be creative, since it is the creative aspect that induces newer thinking. Lectures and Demonstrations are made both for students and faculty to kindle their spirit of creativity both by our own faculty and from experts.

The management, knowing the importance of R&D has been magnanimous to sanction necessary funds for Research and Development. The college aims to have research centres in which faculty and students from various institutions outside the college besides the faculty and students from this college who are interested enhancing their qualifications register for their research degrees. The disciplines in which research centres have been proposed as a plan of further action are

1. Civil Engineering
2. Mechanical Engineering
3. Automobile Engineering
4. Electronics and Telecommunications Engineering
5. Computer Engineering
6. Information Technology
7. Physics
8. Chemistry
9. Mathematics
10. Communication skills/Humanities
11. Environmental Engineering /Sciences

To initiate contacts among researchers both in India and abroad, conferences would be mandatorily arranged. The faculty members and students would be encouraged to attend seminars and conferences conducted elsewhere. This would boost up the activities on research, in this institution.

➤ **AIMS:**

1. To create research awareness among the faculty and students
2. To enhance team work between researchers for interdisciplinary research
3. To establish links with different Industries, R&D organizations, which provide funding for research activities.
4. To involve the every faculty member in R&D activities, which lead to Ph.D. degree and research proposal writing.
5. To enhance the research awareness by conducting various national level and international level workshops and conferences and guest lectures.

6. To establish the fruitful collaboration and interaction with researchers working on interdisciplinary research

➤ **OBJECTIVES:**

The Research Promotion Scheme of SCOE aims to nurture research culture in the institute by promoting research in newly emerging and challenging areas of science and engineering. It encourages the Undergraduate and Post graduate candidates to undertake the research in newly emerging frontier areas of science and Engineering including multidisciplinary fields. This enhances the general research capability of budding technocrats by way of participating in conferences, seminars, workshops, project competition, etc.

➤ **R&D Activities**

The major R&D activities are as follows:

- External Funded Projects
- Publications in peer-reviewed Journals
- Faculty Development Programs, Conferences, Workshops, STTPs, Symposia etc. (attending and organizing)
- Procurement of high-end computational and laboratory equipments, and software for Research
- Deputation for Higher Studies
- Talks and Lectures by eminent researchers
- Industry Institute Interaction (Students and Faculty)
- Collaborations and MOUs with Industry, Academic and R&D Organizations.

Note: For In-house R&D events, the following guidelines may be used with the approval of Principal SCOE & Head R&D.

- 50 % or 3000 Rs. whichever is less concession may be given in registration fee for Approved Faculty Members of host department.

- 50 % or 3000 Rs. whichever is less concession may be given in registration fee for Faculty of other departments, to a maximum two faculty, on recommendation of the concerned Head of the Department.
- The concession so granted shall be reimbursed on submitting the certificate of attendance/participation or presentation along with a detailed Report about the attended R&D activity of Participation. All the participants shall initially pay the full registration fee and claim for reimbursement only after fruitful completion of the program.

➤ **Patents**

Receiving patent of one's research work is one of the most important and influential factor to judge the quality of research. Full financial and legal assistance as per government Norms shall be provided to those who are interested in registering the patent. The patent shall irrevocably be registered in the name of Saraswati College of Engineering with the researcher's name prominently featuring as the inventor. The commercial aspects shall be mutually worked out between the institute and the researcher.

- Research and in-depth review papers shall be submitted to peer-reviewed journals for possible publication.
- Publication charges (if any) of the research papers published by faculty, shall not be reimbursed by the institute.
- One can apply to University of Mumbai and other agencies for publication charges of his/ her research papers.
- Funded projects can cover a part of the publication charges of research papers.

➤ **Conferences and Workshops**

The funds available to the Approved Faculty members to participate at conferences, workshops, STTPs, etc. shall be as tabulated below. Final call would be as per the decision of Hon Principal SCOE.

Sr. No.	Type	Financial Assistance
1	International Conference (Abroad)	up to Rs. 25,000
2	International Conference (India)	50 % or 3000 Rs. whichever is less
3	National Conference, Symposia, Workshop, STTP, etc	50 % or 3000 Rs. whichever is less

Note: The requisite amount within the limits mentioned shall be sanctioned by the Head of Institution, on recommendations of the respective Head of department and review by Head (R&D). This amount may be claimed from the department R&D budget sanctioned by the institution for the said financial year.

➤ **Funded Projects**

The depth of R&D culture, in any institution is judged by the number of grants approved and funds generated via various projects. A large number of new research projects are initiated every year with funding from various national and international governmental organizations and industries. The R&D cell keeps the faculty, abreast of all such announcements for R&D projects and encourages them to submit proposals for funding.

A select few national and international funding agencies are,

- ❖ Aeronautical Development Agency (ADA)
- ❖ Aeronautical Research & Development Board (ARDB)
- ❖ All India Council for Technical Education (AICTE)
- ❖ Council of Scientific & Industrial Research (CSIR)
- ❖ Department of Atomic Energy (DAE)
- ❖ Department of Biotechnology (DBT)
- ❖ Defence Research & Development Organization (DRDO)
- ❖ Department of Science & Technology (DST)
- ❖ Board of Research in nuclear sciences (BRNS)
- ❖ Indian Space Research Organization (ISRO)
- ❖ Institution of Engineers (India) (IE)
- ❖ Ministry of Agriculture and HRD
- ❖ Ministry of Communications and Information Technology
- ❖ Ministry of Non-Conventional Energy Sources
- ❖ University Grants Commission (UGC)
- ❖ University of Mumbai
- ❖ National Science Fund, U. S. (NSF)
- ❖ Industry - IBM, TCS, Infosys, TATA Motors, Honeywell, etc.

In addition to research projects, Government grants are received under the following Schemes:

- Funds for Improvement of Science and Technology Infrastructure (FIST)
- Fast Track Scheme for Young Scientists
- Swarnajayanti Award Projects
- Career Award for Young Teachers
- Better Opportunities for Young Scientists in Chosen Areas of Science and Technology (BOYSCAST)
- Modernization and Removal of Obsolescence (MODROBS)
- Thrust Area Program in Technical Education (TATE)
- Women Scientists Scheme
- Young Scientists Research Award

➤ **Important Guidelines**

All the faculty members who intend to apply for R&D projects and grants, and all those who have obtained approval for their projects from various apex bodies, industries and universities shall follow the work procedure given herewith.

- Every research proposal shall pass through a multi-tier review, where the proposal shall first be reviewed by the PI/ Co-PI themselves, then by the concerned Head/ experts in the department, followed by other eminent researchers in the field. The proposal shall then be vetted by the research review committee (RRC) before submission to the funding agency.
- It is advisable to have a faculty working in the same field, as Co-Investigator; for every proposal submitted for funding to external agencies. The faculty proposed as Co-Investigator, shall preferably be from the same department as the Principal Investigator.
- All applications related with R&D shall be routed through the Head (R&D) along With one hard copy for R&D records. A soft copy shall also be emailed to the Head R&D; and the department representative in R&D cell as well as the HOD shall be copied on the email.
- Separate dead stock registers shall be maintained for all R&D as well as externally funded projects in every department.
- Purchase of instruments, software, etc. and the audit report made for the same shall follow the SES Accounts Department guidelines.

- Principal Investigator and Co-Investigator shall ensure that the instruments, software, etc. purchased are secured in the laboratory/ department.
- The entire sanctioned amount shall be utilized as per the guidelines of the funding agency.
- In case the Principal Investigator leaves the institute; all the items, instruments, software, etc. purchased shall remain as an asset of the institute.
- All HODs must regularly and diligently update the R&D information and achievements of their departments in the R&D page on the institute website through Head R&D.

➤ **Policy for Procurement and Maintenance**

- The purchase committee for any research project shall comprise of, The Principal, Head (R&D), concerned HOD and PI/ Co-PI. Their role is to streamline the purchase requests and gauge its utility; in completion of the project. The said committee shall also look into the recruitment of JRF/ SRF, if any.
- The accounts department shall submit a photocopy of, the sanctioned letter and cheque/ DD to the concerned Principal Investigator (PI) of the research project.
- The P.I. shall immediately plan and apply in writing to the Principal, through Head (R&D) for releasing the funds (towards, travel, contingency, consumables, books, technical assistance, hiring charges, etc. i.e. excluding the equipment cost and salary, if any). The Accounts Department shall immediately release the amount on receiving the sanction from the Principal. The PI shall settle the accounts, for the released amount on or before 31st of March every year.
- The PI shall also plan for purchase of equipments as per the existing purchase procedure of the institute. A minimum of two quotations are necessary for the equipments to be purchased. The only exception to this shall be proprietary items, where the PI has to submit a justification. The entire purchase of equipments for the research project shall be completed, positively within one month of receiving the grant for the same from the management or the funding agencies.
- It is advisable; though not mandatory to procure high end equipments from reputed manufacturers with a proven track record.
- All the sanctioned funds shall be spent as per the guidelines of the concerned funding agency.
- All the equipments purchased, shall first be registered in the Stores and then in the DSR of the R&D in the department. This will help to have a uniform procedure and smooth

functioning of purchase procedure under R&D. The total expenditure under R&D can then be easily identified.

- In case PI leaves the institute, the Co-PI shall be fully responsible to complete the project as per the guidelines of the concerned apex bodies.
- If the PI is not in a position to continue the project, the PI shall utilize all the funds received as on date and submit the utilization certificate and progress report to the R&D Cell. He shall only then be relieved from his duties.
- The PI/ Co PI shall complete the project by all means within the stipulated period and submit the audited statement of expenditure, utilization certificate and progress report to the concerned funding agency. A copy of all such documents shall also be marked to Head (R&D) for records.

➤ **Seed Money**

Seed money for R&D project shall be distributed by the following procedure:

- Submission of proposal/s to funding agency
- Application for seed money through the respective HOD
- Scrutiny by R&D cell on sanction of the submitted project
- 25 % of the sanctioned project cost shall be given as seed money from the department R&D budget to start the procurement which will be recovered at a later stage after receiving the grant.

➤ **Research Review Committee (RRC)**

This committee (RRC) is formulated to specifically oversee the research proposals by faculty and Post Graduate dissertations. The RRC shall comprise of,

- Principal
- Head (R&D)
- Head of Department (concerned Dept.)
- P. G. Coordinator (only in case of M. E. Projects)
- Project Guide & Co-Guide (only in case of M. E. Projects)
- Subject Expert/s

All the prospective Principal Investigators should ensure that the research proposal is presented before the RRC well in advance prior to the submission. The HOD should ensure that the project work of PG students is presented before the RRC at least 90 days prior to the submission.

It may kindly be noted that, the research proposal of faculty shall be submitted to the funding agency only after presentation to RRC. Similarly, the project work of every PG student shall be submitted to the university, only after the approval by RRC.

In addition to this, the RRC shall also look into,

- Collaboration with research organizations
- MoU with industries and overseas universities
- Training and Consultancy
- Continuing Education (including Add on Modules)
- Industry Sponsored Projects

➤ **R&D Incentives**

The institute follows a unique point based incentive scheme to reward the research work carried out by faculty in the respective year. This is a one of its kind scheme initiated with the patronage of Hon. Principal SCOE and serves as an effective motivation for faculty, to undertake research in their chosen areas of interest. The various points considered for R&D incentives are tabulated below,

Sl. No.	Nature of Activity	API : Self-Appraisal Score	Verified API Score
		Total Score	
III. A	Other research Publications (books, chapters in books , other than referred journal articles)		
	i. Text or reference books published by International Publishers with an establishment peer review system		
		Sole Author (50 per publication)	
		Sole Editor (30 per publication)	
		Chapter in edited Book (10 per publication).	
	ii. Text or reference books by National level publishers/State and central Govt. Publications with ISBN/ISSN numbers		
		Sole Author (30 per publication)	
		Sole Editor (20 per publication)	
		Chapter in edited Book (10 per publication).	
	iii. Text or reference books by other local publishers		
		Sole Author (15 per publication)	
		Sole Editor (10 per publication)	
	Chapter in edited Book (5 per publication).		
III. B	RESEARCH PROJECTS		
	i.	Completed /Ongoing Sponsored Projects.(In case of Co-PI points are to be shared in 60:40 ratio)	

	ii.			
		Major Project with Grant >Rs 15 Lakhs for Sciences and Rs 5 Lakhs for others (20 per project)		
		Major Project with Grant >Rs 5 Lakhs for Sciences and Rs 3 Lakhs for others (15 per project)		
		Minor Project with Grants >Rs 40,000 for Sciences and Rs 25000 for others (10 per project)		
	ii. Completed /Ongoing Consultancy Projects			
		Grant >Rs 10 Lakhs for Sciences and Rs 2 Lakhs for others (10 per project).In case Jt.venture points are to be shared in 60:40 ratio.		
III. C	RESEARCH GUIDANCE (In case of joint supervision points are to be shared in 70:30 ratio)			
		Ph .D (10 per candidate)		
III. D	PARTICIPATION IN TRAINING COURSES /CONFERENCES /SEMINAR /WORKSHOP			
	i. Industry training/Interdisciplinary project			
		Duration two weeks or more (10 per course/workshop).		
		Duration one week (5 per course/workshop)		
	ii.Participation and presentation of research papers (oral/poster) in conferences/Journal			
		a)Reputed International conference(15 per participation/ presentation) Faculty publication with ME students (30:70 ratio)[30% for faculty]		
		b) International Conference (10 per participation/ presentation) Faculty publication with ME students (30:70 ratio)[30% for faculty]		
	iii. Invited lectures or presentation for conferences /Seminar /Training Course /Refresher Course/Orientation Course			
		a) National Level (5 per lecture)		
		b) Local-University / College Level (2 per lecture)		
III. E	TRAINING COURSES/CONFERENCE /SEMINAR/WORKSHOP ORGANISED			
	i. Refresher courses. Methodology workshops, Industrial training courses ,STTPs, summer /winter School/Teaching –learning –evaluation Technology Programmes, Soft-Skills development Programmes, Faculty Development Programmes.			
		Duration 2 weeks or more (30 per course).In case of Co-coordinator points are to be shared in 70:30 ratio. [30% coordinator & 70% for reset		

		of the organizing team]		
		Duration 1 week (20 per course). In case of Co-coordinator points are to be shared in 70:30 ratios. . [30% coordinator & 70% for reset of the organizing team]		
		ii) Seminar (one day) organised .In case of Co-convener /Jt. Organizing Secretary points are to be shared in 70:30 ratios. [30% Co-convener /Jt. Organizing Secretary & 70% for reset of the organizing team]		
		International(20 per event)		
		National (10 per event)		
III.	F	AWARDS/HONOURS/RECOGNITIONS		
		International level honour/recognition/ award (30 per award)		
		National level honour/ recognition/award (25 per award)		
		State level honour/ recognition/award (25 per award)		
		College level honour/ recognition/award (10 pts)		
III.	G	PEER REVIEWING OF PAPERS/PROJECT PROPOSAL/EVALUATION OF PROJECT COMPLETION REPORT		
		For Referred Journal(7 per paper)		
		For non referred but recognized and reputable journals and periodicals, having ISBN/ISSN numbers (4 per paper)		
		Conference proceeding as full paper etc.(3 per paper)		
		Evaluation of project Completion Report (10 per report for major project and 5 for minor project)		
		Evaluation of project Proposals (5 per report for major project and 3 for minor project)		
		TOTAL API SCORE		

IMPORTANT NOTE

THE FACULTY MEMBER HAS TO CONTRIBUTE FROM

(MINIMUM) 1 CRITERION IN CATEGORY 1 AND 1 CRITERION IN CATEGORY 2

TO BE ELIGIBLE FOR R&D INCENTIVE

Incentive Criteria

The points to be considered for recommending R&D incentives are tabulated herewith;

R&D Incentive	Points \geq for		
	Assistant Prof.	Associate Prof.	Professor
1	50	100	100
2	100	200	200
3	150	300	300
4	200	400	400

Note: The period of consideration shall be from 1st July to 30th June

All such faculty eligible for R&D incentives shall submit the report with supporting documents to the HOD, through the Research Coordinator of the department by 20th of June every year. The HOD along with some senior faculty members shall then carry out a rigorous scrutiny at the department level; and ensure that their recommendations reach the R&D cell, latest by 25th of June, every year.

Mode of Execution

The R&D Incentive scheme shall follow a transparent, multi-tier process with the following authorities;

Evaluating Authority: Head of Department

Reviewing Authority: Head (R&D)

Recommending Authority: Principal SCOE

Approving Authority: Hon. Secretary SES

➤ **R&D Budget**

The HODs shall formulate the yearly R&D budget, in close co-operation with the senior faculty members in the department. The same shall be forwarded to, The Principal through Head (R&D).

The HODs shall ensure the inclusion of, appropriate amount of seed money required, based on the number of proposals submitted to external funding agencies. This budget may also include certain high-end equipments required exclusively for research, in the thrust areas identified by the department.

All HODs shall submit a report on the amount spent on R&D for the prevailing financial year by 10th of April. The R&D expenses shall invariably include:

- External Funded Projects
- Faculty Development Programs, Conferences, Workshops, STTPs, Symposia etc.
(organized and attended by faculty)
- Specific Procurement for Research
- Deputation for Higher Studies
- Honorarium paid for talks and lectures by eminent researchers
- Industry Institute Interaction (Students and Faculty)
- Collaboration and MoU with Industry and R&D Organization

Important Links

- <http://www.dst.gov.in> (DST)
- <http://www.dae.gov.in> (DAE)
- <http://www.drdo.gov.in> (DRDO)
- <http://www.isro.org> (ISRO)
- <http://www.csir.res.in> (CSIR)
- <http://www.aicte-india.org> (AICTE)
- <http://www.ugc.ac.in> (UGC)
- <http://www.unipune.ac.in> (UoP)
- <http://www.dbtindia.nic.in> (DBT)
- <http://www.nbhm.dae.gov.in> (NBHM)
- <http://www.tifr.res.in> (TIFR)
- <http://www.barc.ernet.in> (BARC)
- <http://www.wipo.org>
- <http://www.indianpatents.org.in> (INDIAN PATENTS)
- <http://www.jpo.go.jp> (JAPAN PATENT OFFICE)
- <http://www.uspto.gov> (U. S. PATENTS & TRADEMARKS)
- <http://www.espacenet.com> (EUROPE's PATENT DATABASE)

Dr.Manjusha Deshmukh
Principal SCOE