

All other auxiliary functions are taken care of by Deans/ Head of the Departments/ Section Heads/ Committees/ Coordinators/ Other in-charges in a transparent and democratic way.

## 7.2 Best Practices

### 7.2.1 Describe at least two institutional best practices (as per NAAC Format)

#### Response:

#### Best Practices in the institute

#### Title of the Practice: *Research ecosystem in the institute*

#### Objective of the practice:

1. To engage the young minds in research and innovation activities and there by awarding masters and doctoral degrees in engineering and technology.
2. To involve UG, PG and Ph.D. students doing research work in specific areas of engineering discipline and creating research groups for intended outcome.
3. To carryout meaningful research which will result into patents, products and services to the society/community.

The concept of this practice is to form research groups consisting of UG, PG and Ph.D. scholars to carryout focused work. All these students form a subgroup in which senior and junior students work in a team in a specific research area for their mutual benefits. In a department there are few subgroups working in different specialized research areas as per the expertise of faculty. For accomplishment of the work Ph.D. students guide PG scholars. PG scholars guide UG students for their project in the areas. Thus, a synergic bond is established among the group and supervising faculty.

#### The context:

The research work was focused in identified areas. The issues of industry, society and farmers are addressed so that, the research outcome will provide a solution to the existing problems.

Following are few challenges which will be addressed through the research ecosystem.

- To design and develop functionally graded material suitable to resist wear in automobiles.
- To design and fabricate solar operated blanching system for turmeric processing.
- To solve the problem of wrinkles formation in metallic parts.
- Design of second order sliding mode controller for process control applications in industries.
- Development of Intelligent Controllers for Autonomous Underwater Vehicle
- Biomedical applications like Retinal Image Registration, Glaucoma Diagnosis, Hemorrhage Detection and Laser Scar Detection, etc.
- Few important research areas, in which useful work is undertaken are listed below:
  - Signal and Image processing
  - Use of solar energy for solving industry and agriculture problems.

- Biomedical engineering
- Composite materials

**The practice:** It involves running Ph.D. programmes funded by several central agencies through selection of research scholars and guiding through expert faculty. Further research groups are formed in the department to carry focused research in identified areas. The progress of the research is monitored through research symposium organized every six months. Facilities like laboratories established by the support of industries/government agencies are used to conduct experimental work.

**Ph D programs:** Institute offers Ph.D. program under Swami Ramanand Teerth Marathwada University, Nanded and is also selected as research center for faculty under QIP of Ministry of HRD, Government of India, New Delhi. The Institute has state-of-art equipment and machinery for teaching, research, consultancy and extension services. It has received substantial financial assistance for laboratory development and research from various funding agencies like AICTE, DST, BARC, NRB, etc. apart from funding received under the three phases of world bank assisted TEQIP and from Government of Maharashtra. Institute has established DST-FIST sponsored laboratories. Faculty research abilities and efforts have culminated into establishment of a “Center of Excellence” in the area of Signal and Image Processing under TEQIP. In addition, the institute has established center of excellence in VLSI, and Solar Energy.

**Research guides/faculty:** The research programme (Ph.D.) in the institute is supported by approved research guides from all the departments. Many departments run PG programme which strengthens the UG programmes as well as the Ph.D. programme being an interface between the two.

**Research groups:** Research groups are active in the departments where in research scholar, M. Tech scholar and final year B. Tech students work together in respective areas to achieve their goals. The synergy effects due to working in a team benefits to the group

**Research Symposium:** The quality research is achieved through research symposiums which is held twice in a year. The research scholars have to present their progress in front of the expert panel which consists of expert faculties from premier institutes. The institute has conducted eight research symposiums till date. The research scholars receive useful comments/remarks/suggestion from experts to improve the quality of work.

**Collaborations:** The Institute has collaborations with a number of premier institutes (including foreign universities) and industries through which substantial opportunities like internships, credit transfers and industry relevant projects. Recently institute has signed MoUs for academic collaboration with Foreign Universities like CUNY CREST and Civil Engineering Department, The City University of New York, USA, Oakland University Michigan, USA, SAI Technologies, USA and University Technology Petronas, Malaysia.

**Laboratories established by industries:** The institute has established the industry supported laboratories like E-PASS laboratory sponsored by Emerson Automation Solution, Mumbai, Center for VLSI Design and Verification by Mentor Graphics, USA and NVIDIA GPU Education Center, Pune giving fillip to the research and skill development activities. The research culture of the institute has been proven through publication in peer reviewed journals and reputed international conferences. (Instru laboratories to be added-Endress Houser)

**Evidence of success:** The successful outcomes of the best practice are listed below

- Ph.D. Successfully completed - 249
- Research Publications - 1300+
- Citations - 8000+
- Patents filed - 25+
- Awarded Patents - 02
- Fully functional Innovation Laboratory
- Selection in all TEQIP I, II and III phases for funding.
- The Centre of excellence in 'digital signal and image processing' established through TEQIP funding under national competitive process. Institute received funds worth 8 Crore Rupees.
- Best project award to UG students.
- Participation in SAE automotive competitions like BAJA and SUPRA.
- MoU with industries.
- Royal Society of London Fellowship, Young Scientist Award and Best Teacher Award to faculty.
- Recognition of research by faculty through photo publication on cover page of international journal.
- Successful organization of national level STTP, workshops, seminars.
- Institute hosted three prestigious international conferences recently in collaboration with national and international premier institutes.

**Problem encountered and resources required:**

**Problems encountered**

- Identification of motivated research scholars.
- Inadequate faculty strength in the department.
- Need of sophisticated and high-end machines/equipment required for research work in emerging areas.
- Need to convert research work in to products/ new processes/ patents.
- Lack of utilization of expertise of senior faculty members.

**Resources required:**

- Adequate scholarly faculty members recruitment is essential.
- Industry involvement in the research program of the institute.
- Non availability of consultants for IPR work.
- Adequate funding to purchase state of art equipment/machines.

Details of the research programmes and relevant information is available on <https://onlinesggs.org/phd/Research/index.php>.

**Title of the practice: 'PRAGYA' - A national level technical event**

**Objectives of the practice:** Pragyaa is an Annual technical event of SGGS Institute of Engineering and Technology, managed and organized completely by students. Pragyaa in Hindi means intelligence.

- It is a national level technical extravaganza which invites intelligent, creative minds of young India

to showcase their talents in the fields ranging from Technology, Science, Business, Art and entertainment.

- This event every year is graced by presence of experts from various fields who enlighten students with their vast treasure of knowledge.
- PRAGYAA inculcates in students a thirst of knowledge and the ability to think differently and there-by produce holistic and intellectual development amongst the students.
- Today's Engineers and Managers have to be global in their perspective and must be able to withstand pressures of competitive era which may need downsizing, expansion, mergers, acquisitions or restructuring.
- This Institute values that and shapes the all-round personality of the students and promotes all those events and experiments to nurture student's all-round personality.
- This is an event, which started in 2005 as a state level event, now has gained importance at national level. Around 3500 Students from Engineering colleges from Maharashtra and adjoining states participate every year.

#### **The context:**

- To develop the overall personality of the students co-curricular, extra-curricular activities are very much important and the institute accordingly organizes a national level technical event to showcase talent and potential of students.
- The event is organized in the month of February/March every year and is managed by students only.
- The event attracts participation of students from engineering colleges across the country.
- The event provides a platform for school students through project exhibition.
- Participation in the event prepares the students for organizing and management skills.
- Local farmers also participate in special program called 'Krushi Pragyaa', where some rural exhibitors showcase their products.

#### **The practice:**

- Pragyaa is organized every year to provide a platform to students to show their excellence in techno-social competitions. Each year it has a constructive theme working for the welfare of society & contribute towards technical development. Students come in huge numbers to participate in the multitude of events ranging from the brainstorming junior scientist, to the bewildering robotics & get a chance to delve into a wide variety of exhibits. The aim of event is focusing on excellence of technology for human welfare & add a new dimension to success of our extravaganza every year so that it will reach the height of its glory.
- Pragyaa organizes around 50 events with different technical and non-technical themes. Some of the events are,
  - Junior Scientist
  - Speedester
  - Robosoccer
  - RoboSumo
  - Drone Racing
  - Pick n follow
  - Codestier Code in Less Blind C
  - Megatron Train Your Tool

- Cad War
- Krishi Pragyaa
  
- The event budget for the Pragyaa is around 10 to 20 lakhs per year. The event is sponsored by many industries and organizations. Some of the sponsors for the event are,
  
- Cognizant Technology solutions, Pune
- Tata Consultancy Services, Pune
- Bharat forge Limited, Pune
- Vinodrai industries, MIDC Jalna

**Evidence of success:**

- National level participation of students in large number, on an average 500.
- Involvements of industries.
- Involvement of farmers and school children
- Sponsorship from many organizations.
- Expert lectures and special sessions are organized where eminent personalities guide the student and faculty.
- Successful organization of the event since 2006
- Wide publicity in electronic and print media

**Problems encountered:**

- Events like paper presentation, project competition are held at many places throughout the year
- Only few faculty members are involved in the event
- Low quality of projects exhibited in the event
- Sponsorship issue as the event is held every year
- Accommodation and food problems in the campus for large number of participants
- Students treat event duration as holidays and go home

**Resources required:**

- Encourage maximum faculty participation in various events
- Proper scrutiny of papers and projects in the event to ensure quality
- Creation of accommodation facility to outside participants
- Government/affiliated University may provide grants to this event

File Description	Document	
Any additional information	<a href="#">View Document</a>	
Link for Additional Information	<a href="#">View Document</a>	

**7.3 Institutional Distinctiveness**