

# **Shri Sant Gajanan Maharaj College of Engineering, Shegaon**

## **RESEARCH AND DEVELOPMENT CELL**

### **Preamble:**

The future of any industry, college and university is dependent on innovation index and its linkages with providing the solutions to common problems in a society. With the advent of technologies online resources are available in abundance to each consumer, which make consumers more oriented towards their desired solutions and mounts the pressure on industry to provide more consumer-oriented solutions. So, it is inevitable to change our role from a typical solution provider and go much beyond the traditional problem-solving approach and provide personalized solutions. But the personalized solution comes with premium which consumers are reluctant to pay due several available options and competitors. There is a dire need to transform the solution development model.

### **Purposes**

This policy is developed in accordance with the Vision, Mission and the belief with the purpose to create a vibrant atmosphere to promote research among students, faculty and researchers. The research committee have highlighted the need of the research policy to improve the research profile of the institute.

### **Scope**

The research policy is applicable and mandatory for all faculty members, research scholars and students of all the departments of SSGMCE.

### **VISION:**

To nurture the research culture at SSGMCE by promoting research in emerging and challenging areas of Engineering, Technology, Science and Management.

### **MISSION:**

1. To develop and foster the Research Ecosystem at the institute
2. To develop a support system for researchers in terms of infrastructure, facilities and research funds
3. To collaborate with renown research organizations, leading industries and academic institutions of repute

4. To encourage and motivate the students and faculty members to undertake research projects in their areas of interest and improve the quality of academic research
5. To improve the quantity and quality of research publications, products and patents

### **Implementation Plan**

Students are the key partners for any innovation, research and entrepreneurial activities. Often, they are left out of innovation and research. The innovation and research mindset of the students need to be leveraged to build the culture of innovation, research and entrepreneurship at SSGMCE.

There is a need to motivate and engage all students in research activities.

The strategies for involving the students in academic research, innovation and entrepreneurship (IR & E) are as follows.

**Step 1:** Each department to identify the department level and interdisciplinary areas for IR & E. Each focus area should form the Similar Interest Groups (SIG)/Faculty Cluster around the activities to be carried out in that specific area. The SIG should include the members from faculty having research interest/skills in giving SIG, Students, Alumni, Industry Experts and relevant outside experts. Each SIG should present their activities to all the students in a common event two times every year inviting them to join the SIG. All SIGs should maintain the project definition format as per **Annexure: I, it will help them to enroll the students, monitor progress and given equivalence to academic activities e.g., Assignments, Projects or other academics.**

The successful SIGs should host Awareness and Information sharing sessions for end users, prospective SIG members and other relevant populations. Beside this department to host department level hackathons, project, and business plan competition in line with the collective focus of all department SIGs. (If required SGIRAC can help to identify the department specific challenges/projects).

**Time Frame:** To be carried out in First week of August and First week of February every year.

**Step 2:** Identified SIGs having potential projects for hackathons, publication, patents, grant application, start-up should be nurtured accordingly. Department level single point of contact from faculty and students should meet once in 15 days to discuss, monitor and manage the activities.

### **Step 3: Launch Event: Public Exhibition of the IR & E outcomes**

Organize an open to the public event where all the SIGs will exhibit their IR & E outcomes, it will help them to understand the needs of the solution, test the demand in actual market, secure funding/investment, technology transfer and make the end user aware.

SGIARC can help the potential projects in the following ways.

- i. Establish required collaboration
- ii. Identify the suitable funding/investment options
- iii. Acquiring necessary IPRs and Incubation of the business
- iv. Launch, Technology Transfer, Mentoring and Necessary Training of SIGs
- v. Maturing the project into a product or service as applicable.
- vi. Pilot scale implementation and test marketing
- vii. Completing legal and technical formalities for Spin-off
- viii. Spin-off launching

### **Step 4: Final Year Projects and Internship**

Each module of Section A of Annexure 1 can be offered as a project to final year UG/PG students, PhD Scholars or other relevant groups.

The all SIGs hosts a workshop for all 3<sup>rd</sup> year students every year to motivate them to take the predefined project of the SIGs, the cross-department teams should be encouraged to promote an interdisciplinary approach.

The outcome of the assigned module should be published in a reputed relevant journal, conference, technical event or obtain necessary IPR.

To execute Final year undergraduate projects, the detailed plan of action and methodology to be followed is mentioned in **Annexure II**

### **Incentives**

The incentives to be offered as per the following criteria

<b>SN</b>	<b>Score as per Annexure III</b>	<b>Incentive</b>
1	Less than 20	No incentive
2	Between 21 to 30	Rs. 10,000/-
3	Between 31 to 45	Rs. 20,000/-
4	Between 46 to 60	Rs. 30,000/-
5	Between 61 to 75	Rs. 40,000/-
6	More than 76	Rs. 50,000/-

## **Objectives:**

- To inculcate a research culture at UG level and strengthen at PG level through credit courses in line with NEP 2020.
- To leverage the Choice Based Credit System to nurture Innovation
- To Leverage NEP 2020 provisions and create conducive environment across the departments to promote research and provide required support facility through research framework and guidelines.
- To organize seminars/conferences/workshops/training programs on cutting edge research/technology to acquire the necessary skill set/knowledge.
- To publish research/review/reports in high quality peer reviewed, indexed journals/books
- To fetch research grants from Govt. /Private Industries and consultancy projects to generate funds.
- To develop and strengthen research facilities within campuses.
- To establish partnership/collaboration with one of the top 100 global universities recognized for its academic and research excellence, Industries and SMEs.
- To develop a support system to help researchers to bring their research to society.
- Emerge as a Centre of excellence in creating knowledge.

## **Areas covered under the policy**

- PhD Research
- Joint Research Projects of Faculty and Students
- Publication by faculty and students
- Consultancy
- Proposal for Funding
- Thrust areas for research
- Procedure for
  - Collaboration
  - Organizing and attending the conference
  - Faculty training for research
  - Management of the research policy
- Non-Faculty Research Appointments
- Establishing Independent Laboratories and Research Centers

## **Seed Money**

- SSGMCE should have provision of research grants under the title “Self-Funded Minor Research Projects” for early-stage researchers. The objective of the grant is to provide financial support for pilot scale validation of the project and motivate the faculty members to take up research on priority basis.
- Further Research Cell shall guide respective faculty for submitting the pilot scale validation to suitable funding agencies for higher level funding.
- To promote and motivate faculty clusters for quality publications, Article Processing Charges/Conference Publication fees will be borne by the institute (Once in a year)

## **Collaborative research/Industry sponsored /Interdisciplinary research**

- Collaborations with reputed national and international universities, research organizations, government organizations, industries, NGOs, SMEs. etc. The Professor of all the schools shall take the initiatives and establish linkages with the appropriate organization pertaining to the focus areas of their respective departments, leading to consultancy, collaborative projects, faculty/student exchange and other appropriate activities. This will open new avenues for students and faculties to develop networking with researchers/scientists and industry experts. The collaborative projects and consultancy with industry shall aim at developing the solution/service for solving the industrial/societal problems. The interdisciplinary research focus is to be appreciated as it will develop multifaceted scientists.

## **Grant Management and IPR Cell need to be established**

- To prepare, interpret, negotiate, and accept agreements for funding projects. Liaising activities for Govt. and sponsored programs
- To evaluate the commercial potential of new technologies, determining patentability, prosecuting patents, registering copyrights, marketing and licensing patents, tangible material, and software, negotiating license agreements, and receiving and distributing royalties and other income to the inventors
- To file and manage IPR
- To manage financial conflict of interest
- Integrity, Quality and Ethics
- Data privacy and protection of identity
- Develop policy for exchange of material, research trials, publication and result sharing

## Non-Faculty Research Appointments

### Dedicated Appointment Researchers and Academic Staff - Research (AS-R):

Research Scientist, Professors, Research Engineer, Research Scholar or Professor of Practices (as envisioned in NEP 2020)

One research staff/teaching assistant “through earn and learn scheme” shall be appointed for each PI of potential project before the funding and as required/approved in the funding proposal after the funding. Their primary role is to assist the PI in attaining the goals of the PI's research projects. They may participate in the preparation of proposals, progress, and final reports, teaching activities and may be the co-author or sole author of research results, with the agreement of the PI. Although not usually engaged in formal classroom teaching, AS-R frequently assists in the guidance of researchers under respective PI, graduate and undergraduate students in the laboratory.

**Thrust Areas for 2022-2027** (Subjected to change as per recommendations of SIGs of SSGMCE)

Thrust areas are identified with the help of inputs received from research supervisors and faculty members of the institute.

<p><b>Engineering</b></p> <ul style="list-style-type: none"> <li>• Big Data Analytics</li> <li>• Artificial Intelligence</li> <li>• Sensor Technology</li> <li>• Smart Technologies</li> <li>• Branch Specific Areas identified by the department</li> </ul>	<p><b>Management</b></p> <ul style="list-style-type: none"> <li>• Human Resources Management</li> <li>• Finance Management</li> <li>• E-commerce</li> <li>• Corporate Social Responsibility</li> <li>• Digital Marketing and Social Media Promotion</li> <li>• Areas identified by the department</li> </ul>
<p><b>Interdisciplinary</b></p>	
<ul style="list-style-type: none"> <li>• Mother and Child Health</li> <li>• Water Sanitization and Hygiene</li> <li>• Epidemics and Infectious Disease</li> <li>• Tackling AMR</li> <li>• Vaccines and medicines for the communicable and non-communicable diseases</li> </ul>	<ul style="list-style-type: none"> <li>• ICT in Healthcare</li> <li>• ICT in Management</li> <li>• Wearable Technology to Care Delivery</li> <li>• Disease Surveillance Using Technology</li> <li>• Smart Supply Chain Solutions</li> <li>• Biomedical Engineering</li> </ul>

## **RESPONSIBILITIES:**

1. To prepare policies, procedures and guidelines relating to research and development activities
2. To prepare R&D budget for the institute that majorly includes publication, training, travel and creating new facility for research.
3. To identify the potential areas of research in various disciplines of engineering, science and management and form the faculty clusters based on their specialization.
4. To help faculties to prepare and submit proposals to various funding agencies like AICTE, UGC, DST etc. to obtain grants for projects (In coordination with the Bureau of Proposals)
5. To coordinate the matters related to Ph.D. including administration and evaluation of Ph.D. students
6. To encourage and motivate the faculties to register for Ph.D.
7. To encourage faculties to publish their research work in reputed journals having good impact factor and indexing
8. To encourage and motivate students and faculties to attend/publish papers in various National/International Conferences
9. To arrange/organize the FDP/STTP/workshops related to research and development activities
10. To support faculties and students to enhance their knowledge about Intellectual Property Rights (IPR), Patents and copyrights
11. To encourage departments to undertake more MoUs with leading industries and reputed organizations for upskilling of students and faculties and collaborative research
12. To ensure the effective and optimal use of resources by providing a platform for sharing available research facilities
13. Preserve code of ethics while publishing papers / thesis
14. To form the student research teams at the department/institute level and enhancing the culture of interdisciplinary research
15. To identify potential projects/ideas that can be transformed into a product/patent
16. To motivate faculty, staff and students for taking up startups as per innovation and entrepreneurship policy.

### **ROLE OF COORDINATORS:**

1. To identify thrust/emerging areas of research in consultation with members of the department and form the clusters of faculties with respect to their area of specialization/interest.
2. To prepare departmental R and D budget.
3. To identify a students research coordinator from each class.
4. To encourage and support faculty, staff and students for preparation of proposals and submit to the funding agencies.
5. To motivate and mentor faculty, staff and students to publish papers in reputed conferences and journals having good impact factor and indexing
6. To ensure proper execution of PhD related activities (Coursework and Evaluation)
7. To make students aware about the expertise, facilities and research activities of the department.
8. To identify and prepare a list of students eligible for incentives related to research activities as per the academic incentive scheme.
9. To verify and submit applications of faculties eligible for incentives for research activities to the Chief Coordinator.
10. To take a monthly review of research activities at the department level.

### **ROLE OF CHIEF COORDINATOR**

1. To prepare R and D budget of the institute and submit to the Head of Institute/Principal for the approval.
2. To prepare/revise the guidelines and policies for research activities and submit to Head of Institute/Principal for the approval
3. To arrange the STTP/FDP/Workshops related to research activities at institutional level.
4. To perform administrative responsibilities related to PhD
5. To organize orientation workshops twice in a year. (February and August, where SIG head will present their ongoing research activity and invite interdisciplinary collaborations)
6. To approve and submit a list of students eligible for incentives related to research activities



7. To approve and submit a list of faculties eligible for incentives related to research activities
8. To take review of research activities at institutional level in the last week of every month.

### **IMPORTANT GUIDELINES FOR RESEARCH AND DEVELOPMENT ACTIVITIES**

1. All the faculty, staff and students should be the part of a SIG/faculty cluster of their interest with information to R and D Coordinator.
2. SIG/faculty cluster should decide their research focus in the mutual consent of all the members once in a year.
3. Each SIG should work in close coordination and submit at least one funding proposal.
4. Ph.D. supervisor with the assistance of their PhD scholars shall write and submit a Research Proposal to various funding agencies for financial grant/support.
5. It is mandatory for the department of Applied Science and Humanities and Business Management to submit one research proposal per year for a minimum of Rs 5,00,000
6. It is mandatory for all the Engineering departments to submit one research proposal per year for a minimum of Rs 10,00,000
7. It is mandatory for all the faculties to publish at least one paper per year in ICI/SCOPUS indexed Journal/Conference
8. All R&D coordinators and HODs to motivate and encourage their faculty members to publish research articles in SCI/WOS indexed journals
9. All R&D coordinators and HODs to motivate and encourage their faculty members to publish books/book chapters
10. It is mandatory for all the faculties and ME/PhD scholars of the SSGMCE to maintain plagiarism level 15% or as per the guidelines of the respective publishers.
11. It is mandatory for all the faculties to attend at least one research training per year.
12. The Member should not be allowed to change SIG as they are expected to spend sufficient time on their area of interest.

13. All the Doctorate faculties shall help and support colleagues to pursue their doctoral research.
14. Faculties conducting research shall guide and utilize the SIG effectively.
15. The student research coordinator shall encourage their classmates to actively participate in the SIG research activities.
16. Inter departmental interaction of faculties and student research teams shall be encouraged to enhance multi-disciplinary research/projects
17. Ph.D. supervisors and scholar shall acquire the membership of professional societies like IEEE, IE, ASME ISTE etc.

## **RESEARCH AND DEVELOPMENT POLICIES**

To foster the culture of research amongst the faculty members and students some motivational measures are proposed which herein after referred as **Best Practices for Research and Publications**

### **BEST PRACTICES FOR RESEARCH AND PUBLICATIONS**

#### **A. PUBLICATION IN JOURNAL**

1. The papers published in journals indexed by ICI/SCOPUS/SCI(WOS) /ESCI /SCIE/ SCImago shall only be considered for Article processing charges (APC) reimbursement
2. In case of multiple authors, all authors shall be affiliated to SSGMCE
3. APC for the publication up to Rs 5000/- for the paper published in ICI/SCOPUS/SCI(WOS)/ESCI/SCIE/ SCImago indexed journal (Once in a year) shall be borne by institute
4. In no other case the publication charges shall be paid by the institute

#### **B. PUBLICATION IN CONFERENCES IN INDIA**

1. The papers published in the proceedings of conferences organized/ sponsored by IEEE, IET, SPRINGER, ELSEVIER etc. shall only be considered for reimbursement
2. Faculties of SSGMCE shall be eligible for the sponsorship in the form of registration fees, travel and dearness allowance, and duty leave
3. In case of multiple authors, all authors shall be affiliated to SSGMCE and only one author shall be eligible for 100% reimbursement of registration fees for the presentation

4. Ph.D. scholars who are IEEE student members (Or Branch Specific Professional Bodies that sponsors/hosts conference) shall only be eligible for registration fees reimbursement
5. The sponsorship for the individual faculty/PhD scholar shall be given maximum for one conference paper per year

### **C. PUBLICATION IN CONFERENCES OUTSIDE INDIA**

1. Faculties of SSGMCE shall be eligible for the reimbursement for publication/ presentation of research paper in a conference outside India
2. Faculties of SSGMCE shall be eligible for the sponsorship of 50% registration fees, duty leave as per norms, travelling allowance (Train/Bus TO and FRO) from Shegaon to the city of embarkment (Viz. Mumbai, Delhi, etc.) and one-way airfare from the city of embarkment to conference destination.
3. It is mandatory for the faculty applying for sponsorship for presentation abroad to submit a travel grant proposal to AICTE, UGC, SERB etc.
4. In case of multiple authors, only one author shall be eligible for the sponsorship
5. Sponsorship for presentation in abroad conference shall be applicable to only that paper where the affiliation of authors is SSGMCE
6. An individual faculty from SSGMCE can apply for the sponsorship for presentation of a paper in abroad once in three years
7. Faculty applying for sponsorship have to submit a detailed travel plan and necessary documents to the Principal for sanction at least one month in advance. The sanction of the same shall be subjected to the approval of the Management

### **D. PUBLICATION OF PATENT**

1. Faculties of SSGMCE shall be eligible for the reimbursement for the publication fees of patents
2. Reimbursement is applicable to only those patents which are filed jointly with SSGMCE subjected to approval from Management.
3. No SSGMCE faculty /student can apply for patent personally /individually if the project is sponsored by SSGMCE/SGIARC even after leaving SSGMCE.

4. All patents shall be filed through the IP cell of SGIARC/SSGMCE wherein the first applicant and hence the owner is SSGMCE. However, the co-applicant may be inventors
5. All the commercial rights of the patent shall be with SGIARC/SSGMCE
6. The fees for filling patent shall be paid by SSGMCE
7. The revenue generated after commercialization of the patent shall be shared between SSGMCE/SGIARC and the inventors however the percentage of sharing will be mutually decided by the SSGMCE/SGIARC and the inventor as per the policies

## **INCENTIVES FOR SPONSORED RESEARCH, CONSULTANCY**

### **A. SPONSORED RESEARCH**

1. It is mandatory for all the departments to submit a research proposal to the funding agencies (AICTE, UGC, DST, etc.) every year
2. A research proposal accepted by the funding agencies (AICTE/UGC/DST etc.) shall be regarded as sponsored research
3. Faculties of SSGMCE are eligible for the incentives for sponsored research
4. Incentive of 1% of the total fund sanctioned OR Rs 10000/- (whichever is minimum) shall be applicable to PI
5. In case of multiple applicant/investigators the incentive shall be shared between PI and Co-PI
6. Incentives shall be applicable only when all the formalities/documentation with funding agency are completed in all respects and due time

### **B. CONSULTANCY POLICY**

In the following area Institute employees should undertake consultancy work & execute the same as per the stipulated norms.

- 1) Computer base program - Latest highly demanded courses to be introduced.
- 2) Technical consultancy- From various Govt. / Private Organizations regular job orders to be undertaken.
- 3) Management consultancy- Counseling & problem related to routine dealing with the organization.
- 4) Through MBA/Management expert in all relevant area- Counseling & problem related to routine dealing with the organization.

- 5) Seminars/Symposia/Workshops/Conferences  
National/International. Seminar/Symposia/Workshop/Conference in the field of workshop/ Technology Management/IT for the Institute of repute – Formulated yearly calendar & organize programmes from time to time. Especially need & tailor made strategy to be followed.
- 6) Industry Institute interface- Maintain present track & necessary liaising with industries.
- 7) Consultancy in R & D Cell should identify the area.
- 8) General consultancy – Other than these areas which have not been covered in the point no.1 to 7

Nature	MODE OF PAYMENT	
	Institute	Individual
A) General rule	50%	50%
B) Without overhead	40%	60%
C) Deputed in the interest of Institute	60%	40%
D) Individual development	70%	30%

*\*Subjected to revision in the annual review meeting.*

#### **Norms of the Institute for Consultancy:**

- In the premises of the Institute no question of leave.
- If deputed in the interest of the Institute permitted with full pay duty leave (DL).
- Leave should be granted without any limitation of period if deputed outstation by the Institute.
- If for the sake of on duty prior approval from the competent authority is essential and one has to avail leave as per procedure.
- Type A: Individual consultancy – By single person
- Type B: Group consultancy – Dept. or inter-department too.
- If the incumbent is keen to undertake any job for extra income he/she must contribute to institute to the extent of 40% of the total earnings (Profit of consultancy) for the year.

## **General Guidelines for Consultancy**

The institution should actively encourage and support the faculty in taking up consultancy (and testing) works. They are advised to liaise actively with society and industry to attract projects, particularly those, which have elements of industrial problem solving, student involvement and educative value.

There is not any limit on the quantum on the consultancy work taken up or the remunerator earned by a faculty so long as this is done with the concurrence of the competent authority and without prejudice to the other duties and responsibilities of the teacher or to the interest of the institution and the students.

### **Area of Consultancy:**

- (i) Consultancy and Testing Services.
- (ii) To take up necessary and apt projects for development of industry and society needs.
- (iii) Enhance the potential of manufacturing & development center
- (iv) Begin part-time courses
- (v) Visiting lectures from the in-house faculties.

### **Type of Projects:**

**Type I** - Those projects, which involve the participation of a faculty or group of faculties who use Institutional infra-structural facilities such as workshops, Laboratories, computers, etc. for the work.

**Type II**- Those projects, which involve the participation of a faculty or group of faculties  
Without using any institutional infrastructure.

### **Consultancy Service Charges:**

A pattern adopted for the sharing of the net revenue from consultancy work is as given below. Initially, the expenses towards exhaustible items like – printing papers, stationary; cartridge/ink, drawing sheets, etc. should be met with and the remaining amount should be distributed as per followings.

### **For Consultancy Projects of Type I**


- (a) 50% to the development fund of the institution
- (b) 50% to be shared by the team involved with the work including supporting staff

### **For Consultancy Projects; of Type II**


- (c) 40% to the development fund of the institution
- (d) 60% to be shared by the team involved with the work including supporting staff.

### **RECOGNITION OF FACULTY RESEARCHER**

1. In order to recognize the research contribution of the faculty members **“Faculty Researcher of the Year Award”** shall be presented to deserving faculty member
2. To promote and motivate the research culture an honor list of faculty members having research acumen shall be prepared and published every year

  
**Dr S S Jadhao**  
Chief Coordinator, R&D



  
**Dr S B Somani**  
Principal