September 2017

PLAN DOCUMENT 2017 – 32

FOR

St. PETER'S INSTITUTE OF HIGHER EDUCATION AND RESEARCH

Registrar
St. Peter's Institute of Higher Education and Research
(Deemed to be University U/S 3 of the UGC Act, 1956)
Avadi, Chennai-600 054.

St. PETER'S
INSTITUTE OF
HIGHER EDUCATION
AND RESEARCH
IGNITE • INSPIRE • INNOVATE
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1. PREAMBLE

Higher education system has been undergoing continuous change to meet the demands of the aspiring needs of the stakeholders which includes students, the public as a whole and policy makers. The expanding system of higher education to meet larger population, the impact of technology on the educational delivery, the increasing private participation in higher education and the impact of globalization have necessitated marked changes in the Indian higher education system.

With increasing population, India is also a young country with half of the population being under age 25 which can be a strategic advantage. According to one study, India will have 25% of the world's work force by about 2015. The challenge is how the youth of India can be empowered with right type of knowledge and skill development to benefit themselves as well as the society. The Indian education system has been evolved over the years focussing on access to education at all levels and evolving curriculum and standards for improving the quality. Teachers and students now have access to multi-media teaching material and an electronic communication network has been created to enable sharing of academic resources. The need for promoting higher education in terms of quantity (Gross Enrolment Ratio, GER) and quality has been recognized and several initiatives have been taken at national level.

The higher education system has the mandate to contribute to national development, develop global competencies and inculcate values among students, absob the impact of technology, and have the quest for excellence. St. Peter's Institute of Higher Education and Research (SPIHER) is a relatively young deemed to be University having started in 2008. The main objective of the institute is to provide academic excellence and high quality research to aspiring students and become an Institute of Excellence at national and international level within a reasonable time period. Since inception, the institute has taken several initiatives and this document details the steps which are proposed to be initiated towards achieving the above broad objective.

2. VISION AND MISSION OF SPIHER

Vision

To transform St. Peter's Institute of Higher Education and Research into an internationally renowned and respected institute imparting high quality education and training based on the foundation of futuristic research and innovations.

Mission

To provide a conducive environment for academia and industry to work together in the joint development and integration of the technologies through identifying thrust areas of Engineering, Technology, Architecture, Management studies, Arts and Sciences, Medical sciences, Law, Dental sciences, Nursing Science, Pharmaceutical and Ayurvedic sciences, and Applied sciences maintaining a healthy environment between industry and academia.

Mandate

- To ensure coordinated development through proper planning and administration.
- To ensure continuous upgrading of the qualitative improvement of teaching, research and development as well as extension by strengthening the Internal Quality Assurance Cell (IQAC) of the institute.

3. INITIATIVES TAKEN SO FAR BY SPIHER

The following initiatives were taken by the institute to strengthen the academic and R&D systems.

- The institute was offering engineering, technology, architecture and management programmes in the beginning. Now undergraduate and post graduate programmes in science and humanities, and architecture are also beng offered.
- Improvement of teaching–learning process including pedagogies. Faculty development programmes conducted. Digital learning through Anna Edusat programmes and NPTEL lectures to augment class room teaching.
- Created digital library for digital learning including online as well as downloaded NPTEL lectures.
- Technical programmes including national and international seminars; Guest lectures by eminent experts and value added certificate courses to enhance the skills of students and faculty.
- Research programmes with effective monitoring. Research methodology workshop conducted every year for research scholars. Stipend for research scholars to a limited extent. Students project exhibition conducted to promote innovative research.
- Infrastructure strengthened for R&D. Sophisticated Analytical Instrumentation Facility (SAIF) and advanced manufacturing machines commissioned.
- Grants applied for research projects and technical programmes to various funding agencies.
- Created Centre for Staff Development to improve and motivate teaching and non-teaching staff to improve academic process and research contribution.
- Internal Quality Assessment Cell constituted and academic audit conducted.
- Created Centres for disaster maangement, advanced materials and nanotechnology for dissemination of knowledge and motivate students and faculty to work in these important areas.
- Created two incubators : Technology Business Incubator (sponsored by DST) and SPIHER – MSME Business Incubator (sponsored by Ministry of MSME). Ten technologies developed for commercialisation. Four patents filed.
- MoUs signed with industries including AIEMA, IMA and national research laboratories like CSIR Structural Engineering Research Centre and Central Leather Research Institute, and National Institute of Wind Energy for collaboration in academics and research.
- Two industry interaction meets conducted.
- Campus wide network under NKN for 2 Gbps internet connection. WiFi also available.
- Co-curricular, extra curricular and extension activities strengthened. Science and humanities association formed. NSS and YRC units formed. One village adopted.
- Conducted programmes for school students on disaster management, fire safety, project exhibition, sports events and competitions, and career counselling (*Vetri Nitchayam* along with *Daily Thanthi*)..

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- Separate Bank and ATM within the campus for the benefit of students and staff members.

4. THE WAY FORWARD

In order to further move towards the objectives of achieving eminence in academic and research, a well thought out short term and long term plan is required which can be implemented in stages. The direction for academics and research is more often motivated by the trends and emergence of disciplines of science and technology at national and international levels. This is briefly discussed below.

4.1 Academics and Research Topics

The following courses are very relevant for today's rquirement of the industry.

Engineering and Technology

- Nanotechnology
- Smart materials and technologies
- Sustainable or Green energy
- Environment management
- Bioenergy

- Remote sensing and GIS
- Sustainable construction materials and technologies
- Damage and failure analysis
- Predictive analysis
- Life cycle assessment techniques
- Waste management
- Disaster mitigation and management
- Smart cities technologies
- Intelligent transportation

- Embedded technology for communication
- Micro electromechanical systems
- Aqua communication systems
- 5G wireless technology
- Artificial intelligence for speech recognition
- Anatomy and working of search engines
- IoT
- Big data
- Cloud computing
- Software automation
- Cyber security
- LiFi technology
- Embedded Linux

- Nuclear energy
- Project management
- Data analysis and management
- Lean manufacturing

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- Green manufacturing
- Six sigma
- Supply chain management
- NDT
- Mechatronics
- Industrial automation
- Robotics
- Nano robotics
- Biomas gasifier for thermal and electrical applications
- Patient friendly bioimplants
- Non-invasive diagnostics

Sciences

- Biomaterials
- Applied crystallography
- Graphene and semiconductors
- Climate science
- Medical physics/electronics
- Business analytics
- Nano materials and science
- Fuel cells
- Astrophysics
- Geophysics and Geoinformatics
- Space physics
- Green chemistry
- Renewable energy

More topics can be included. The list is not exhaustive.

4.2 Teaching – Learning Systems

The following systems need special attention for implementation.

- Improving analytical and creative skills of students.
- More importance for practicals in science, engineering and technology courses.
- Compulsory internship for students of engineering and technology.
- Smart class rooms
- Smart campus, clean campus and digital campus
- Digital learning introduced by MHRD including SWAYAM courses, National Digital Library, National Academic Depository, e-Shodh Sindu, Virtual Labs, e-Yantra, Free and Open Source Software (FOSS) for education and e-Vidwan.
- Implement Outcome Based Education (OBE) with Choice Based Credit System (CBCS)
- Implementation of credit transfer to enable students to study subjects (not offered in SPIHER) in other reputed institutions at national and international level through academic collaboration..
- Appoint more faculty with Ph.D. qualification to improve the academic quality. Increase the ratio of Ph.D faculty gradually over the next five years.

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- Create Chair Professors in niche areas for academics with sponsorship by industry under CSR.
- Centre for Higher Studies to enable/guide students for higher studies/research programmes after graduation.
- Centre for Foreign Languages for foreign studies/transnational employment of students.
- Coaching center for competitive exams.
- Unnadh Bharath : extension and mentoring to nearby schools, colleges and communities.

4.3 Research and Development

R&D should benefit the society and industry to improve our living standards, indiginisation of technologies and national economy. The projects should be of societal and national relevance and include the following.

- Leveraging science, technology and innovation to meet the needs of the country.
- Creating cutting edge knowledge base for value generation.
- Enhancing S&T led entrepreneurship for socio-ecenomic development.
- Suggested action plan:
  - Innovative research projects by students, faculty and research scholars.
  - Importance for inter-disciplinary research projects.
  - Increase research income. Identify and work in niche areas where funding is possible.
  - Appoint more faculty with Ph.D. qualification for research with fixed salary and incentive from grant. They can also guide Ph.D. scholars.
  - Creating seed money and stipend scheme for research work.
  - Networking with national and international universities and research institutions for research collaboration and exchange visits by experts.
  - Create Chair Professors with sponsorship from industry under CSR.
  - Conduct Guest Lectures by eminent researchers on latest topics to motivate students and faculty.
  - Improve quality of publications (impact factor and H-index).
  - Increase patent filing.

4.4 Students Quality and Strength

Being a self-financing institution with limited financial resources, new initiatives may be taken to increase awareness and publicity for SPIHER among the stake holders. This may in turn attract good quality students which will in turn produce good graduates and good placement. Some suggestions are given below.

- Public Relations Officer for improving publicity for various programmes and achievements of SPIHER.
- Receptionist for providing information and guidance to visitors.
- Branding SPIHER through our own website, media, alumni, open days, inter-institution science, sports and cultural programmes etc.
- Display boards within the campus highlighting achievements, daily programmes, placement etc.
- Linkage with schools and colleges through career counselling and empowerment programmes.
- Social awareness programmes.

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- Attracting students for PG and research programmes at national and international levels.
- Students participation in competitions at national and international levels (Hackathon, SAE-BAGHA, etc.). Many Government organisations pose problems for solution.
- Utilise strength of our alumni for spreading awareness about SPIHER through programmes within and outside the country.
- Participation in national and international ranking systems (NIRF, Atal Ranking, QS).
- Develop proper linkages for improving employability of students.

4.5 Vision 2032 : Desired Targets

Research excellence:

- One research centre / Centre of excellence in each department.
- Six research papers in SCOPUS/Web of Science indexed journals with impact factor per faculty per year.
- Research income 20% of overall income.
- 50 patents.

Industry interaction

- 100% placement for all eligible students.
- 50 incubatee start ups.

Faculty excellence

- 75% Ph.D. faculty
- Network for 50 industry faculty
- Faculty internship - 30
- Digital learning (MOOCS/SWAYAM/NPTEL) – One in a year by each faculty.

Programmes

- Start new programmes – 2 every 3 years in UG and 2 in PG.
- Syllabus diversification
- Students NPTEL/SWAYAM – 4 during the programme by every student.
- 6 technical programmes in every department in a year including one international conference.
- IQAC to conduct minimum 6 programmes every year.
- Four EDPs in a year.
- Three hackathons every year.
- Four outreach programmes every year.

Globalisation

- MoUs with 10 select universities in the world for academics and research collaboration.
- 10% students intake to be international students.
- 5% of students to undergo student exchange programmes.
- 10% of faculty to undergo faculty exchange.
- 15% international co-authored publication.

Students intake

- 6,000 intake - 5,000 in UG, 500 in PG, 300 in M.Phil., and 200 in Ph.D.
- Competitive selection.

Infrastructure

- Separate Library Building for all programmes including digital library for 150 users.
- Separate Administrative block with offices for VC, Registrar, CoE and Research department.
- Students amenities centre.
- Setting up 3 offshore campuses.
- Strengthen IT system and implement ERP.
- Sports complex with indoor stadium.
- Green campus

5. PLAN DETAILS

The above targets will be achieved in stages. Hence detailed plan for 3 years, 7 years and 15 years is given below.

Sl. No.	Activity and Overall target	3 year Plan 2017-20	7 year Plan 2017-24	15 year Plan 2017-32
	Research excellence:			
	• One research centre / Centre of excellence in each department.	1 in 50%	1 in 75%	One in all.
	• Six research papers in SCOPUS/WoS indexed journals with impact factor per faculty per year.	2	4	6
	• Research income 20% of overall income.	5%	10%	20%
	• 50 patents.	15	30	50
	Industry interaction			
	• 100% placement for all eligible students.	75%	100%	100%
	• 50 incubatee start ups.	15	30	50
	Faculty excellence			
	• 75% Ph.D. faculty	30%	50%	75%
	• Network for 50 industry faculty	15	25	50
	• Faculty internship - 30	15	30	30
	• Digital learning (MOOCS/SWAYAM/ NPTEL) – 2 in a year by each faculty.	1	2	2
	Programmes			
	• Start new programmes – 2 every 3 years in UG and 2 in PG.	100%	100%	100%
	• Syllabus diversification -50% of course	20%	30%	50%
	• Students NPTEL/SWAYAM – 4 during the programme by every student.	4	4	4
	• 6 technical programmes in every	3	6	6

	department in a year including one international conference. • IQAC to conduct minimum 6 programmes every year. • Four EDPs in a year. • Three hackathons every year. • Four outreach programmes every year.	 4 2 2 2	 6 4 3 4	 6 4 3 4
	Globalisation • MoUs with 10 select universities in the world for academics and research collaboration. • 10% students intake to be international students. • 5% of students to undergo student exchange programmes. • 10% of faculty to undergo faculty exchange. • 15% international co-authored publication.	 2 - - - -	 5 5 3% 5% 5%	 10 10 5% 5% 15%
	Students intake • 6,000 intake - 5,000 in UG, 500 in PG, 300 in M.Phil., and 200 in Ph.D. • Competitive selection.	 2,000	 4,000 √	 6,000 √
	Infrastructure • Separate Library Building for all programmes including digital library for 150 users. • Separate Administrative block with offices for VC, Registrar, CoE and Research department. • Students amenities centre. • Setting up 3 offshore campuses. • Strengthen IT system and implement ERP. • Sports complex with indoor stadium. • Green campus	 50 1 √ 50%	 150 √ √ 2 √ √ 75%	 √ √ 3 100%

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