

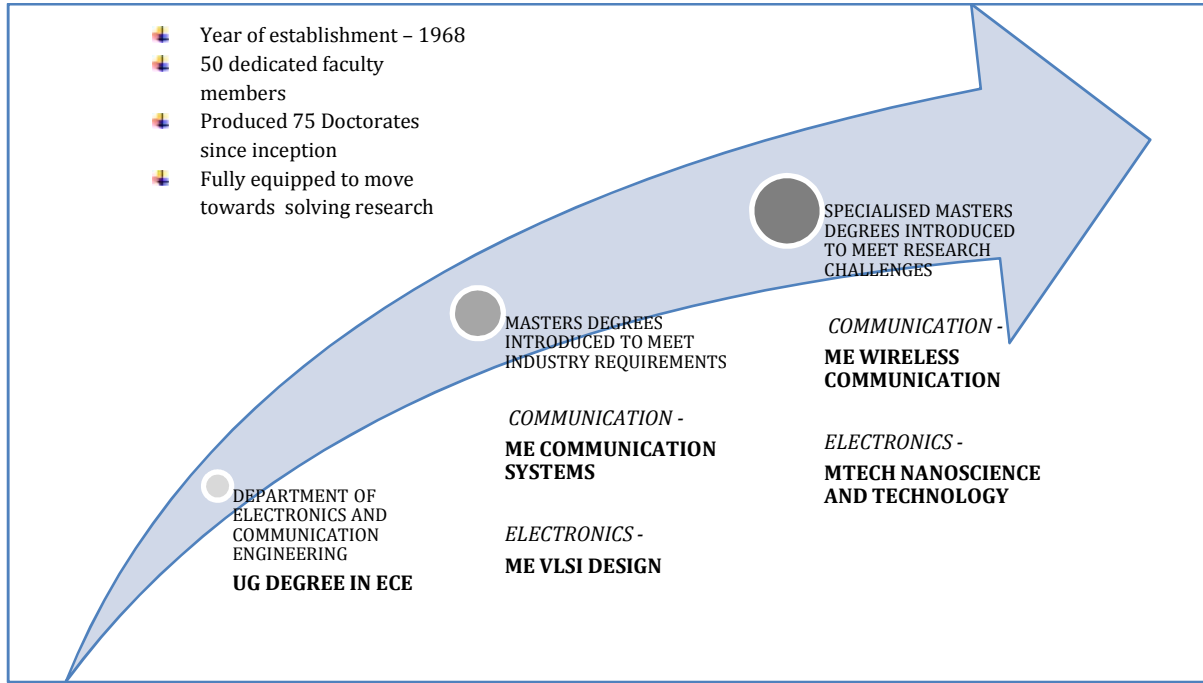


PSG COLLEGE OF TECHNOLOGY
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING

STRATEGY PLAN
2018 - 2023

PSG COLLEGE OF TECHNOLOGY, COIMBATORE
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

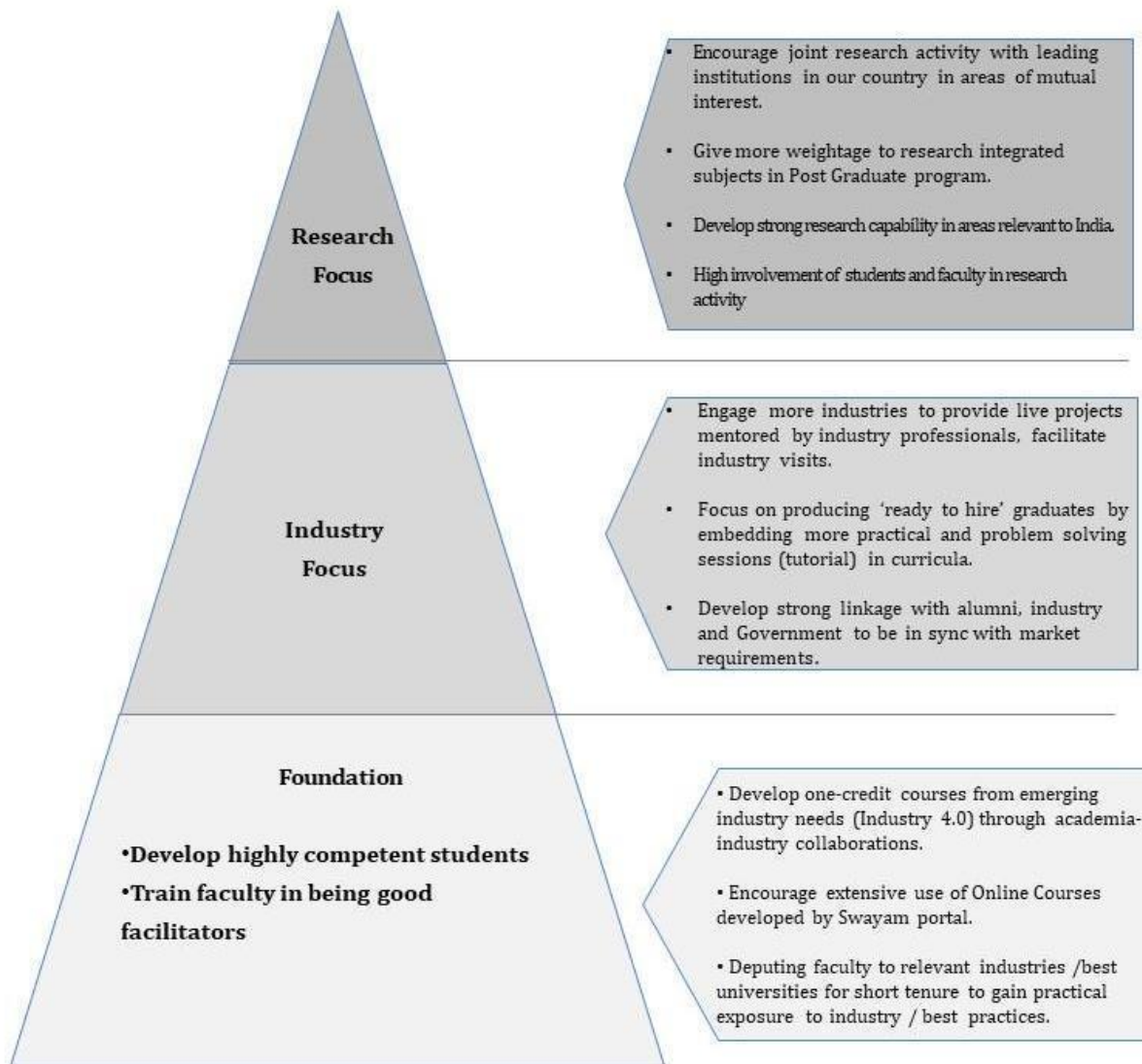
STRATEGIC PLAN: 2018 – 2023



FACTORS CONSIDERED FOR FORMULATING THE STRATEGIC FIVE YEAR PLAN

- ✓ **Global Megatrends that will drive Digital Business in the next decade -**
 According to Gartner Inc - the World’s leading research and advisory company, as provided in *Annexure 1*, the emerging technologies for the next 5 years include 5G, IoT platforms, Connected Homes, Commercial UAVs.
- ✓ **Opportunities in India in Communication domain-**
 - Telecommunication and Telecommunication Infrastructure is the backbone of ‘Digital India’, as well as Industry 4.0
 - The ongoing Digital India program including Smart City and Make in India initiatives are likely to help telecom sector create 11 to 12 million job opportunities in the next five years, primarily in the services segment, according to the Telecom Sector Skill Council.
- ✓ **Opportunities in India in Electronics Domain -**
 - Government of India has envisioned a policy to substitute the import of electronic products by 2020. Between 2015 and 2020, automotive electronics and industrial electronics are estimated to be high growth segments.
 - Government infrastructure projects such as smart cities, modernisation of railways and increasing automation in industries as well as investments by Electronic manufacturing companies, especially in the mobile phone segment, to serve the Indian domestic market are giving impetus to growth of the Indian electronics segment.

Overall Strategy for Inclusive Growth in the Department–

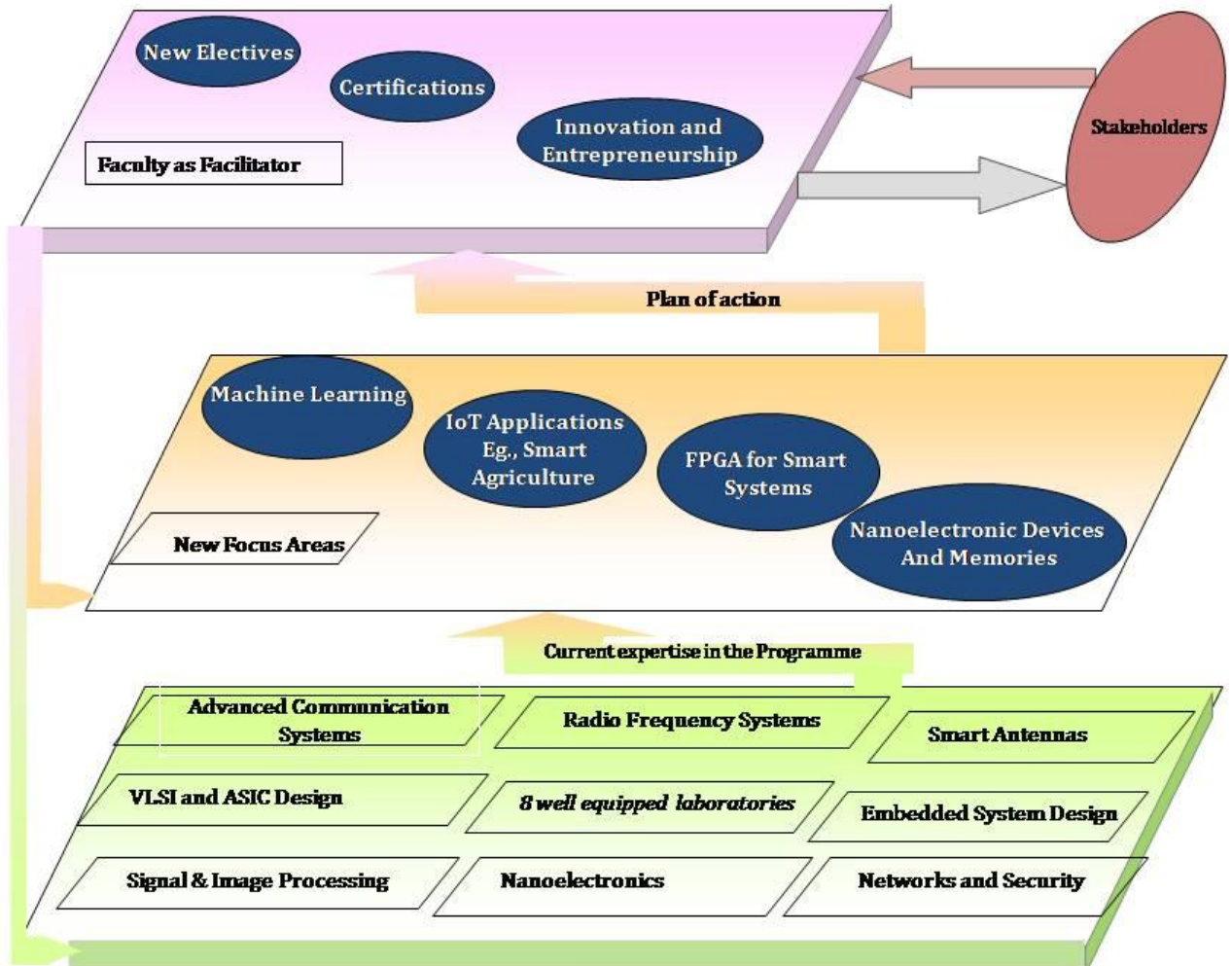


Specific Targets –

- Collaboration with IIT Madras for research, patents, product development and curriculum development.
- To Collaborate with industry and introduce 2 to 5 One-Credit courses / advanced high impact electives in Curriculum of each programme per year and also offer advanced One Year Diploma Certificate programs for engineers.
- Engaging with the Alumni network for mentoring students and improving their placement prospects; with the average salary level of students to increase by 25% over a period of 2 years.
- To increase the number of faculty members involved in patents, publications and research funding in department from 50% to 75%
- Establish infrastructure to cater to intellectual and manpower needs of the country through corporate funding and schemes announced by Government under Smart City, Digital India and Make in India initiatives through Ministry of Electronics and Information Technology, Dept. of Telecommunications, DRDO, DST and ISRO.

BE DEGREE PROGRAMME IN ECE

Strategy -

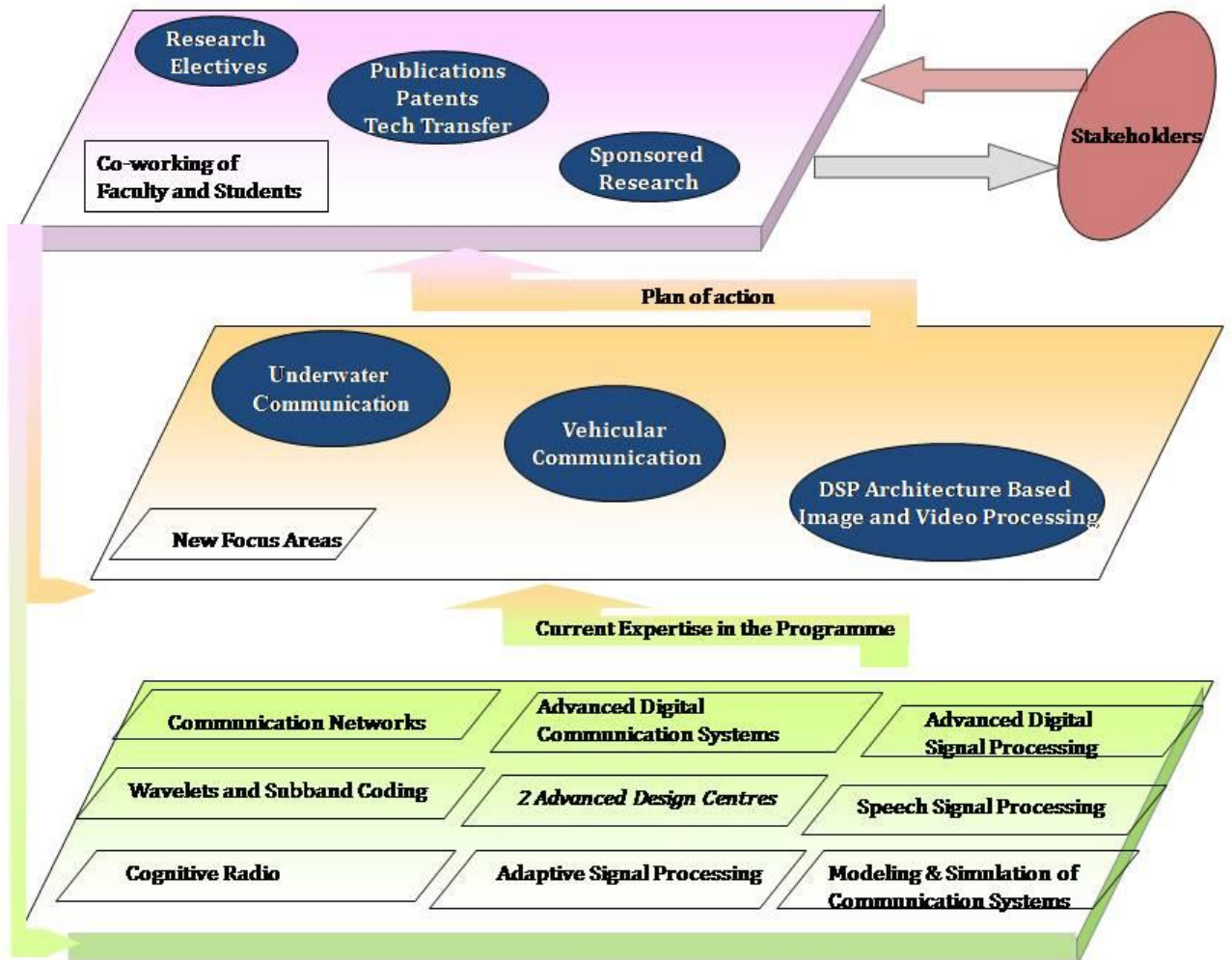


Specific Targets -

- To discuss with stakeholders (Industry, Alumni, Government) and design curriculum and pedagogy to improve functional skills and soft skills of students as per emerging global and national megatrends.
- To increase the number of students who take up online certification courses that are recognized by the industry.
- To increase the number of industry driven student projects from 75% to 100%.
- To encourage student participation in Innovation Contests and encourage idea-to-product pre-incubation involving students and faculty.
- Every faculty member to be engaged with any one industry at any given point of time.

ME DEGREE PROGRAMME IN COMMUNICATION SYSTEMS

Strategy -

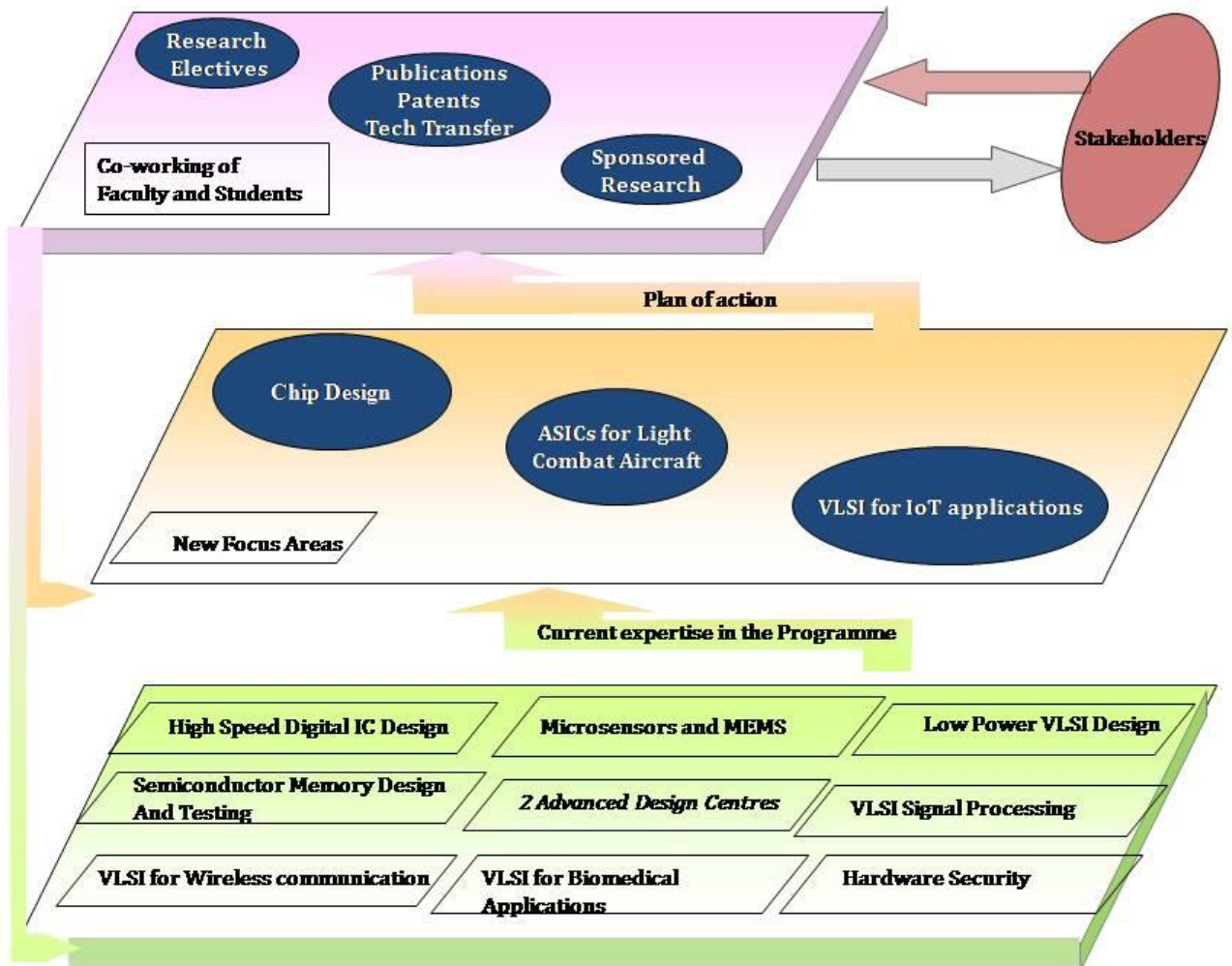


Specific Targets –

- To leverage the strengths in Signal Processing and Communication towards product development that are of societal value and cater to industry requirements, for instance the Development of Wireless EEG (Disposable) Cap that was successfully developed and technology transferred to Industry.
- Faculty and students to be jointly involved in research activity in new focus areas of industry with IoT, Defense, Connected Vehicles, Connected Homes and Consumer Electronics being priority areas.
- To establish a Defense Incubation Centre.
- To take up sponsored research in IoT based Air Pollution Monitoring in collaboration with IIT Madras.
- To bring the number of industry sponsored projects research/live projects to 100%.
- To publish large fraction of papers in top journals where the peers in top 100 institutions publish their papers.
- To achieve a Ph.D graduation rate of 0.25% per year per faculty member.

ME DEGREE PROGRAMME IN VLSI DESIGN

Strategy –

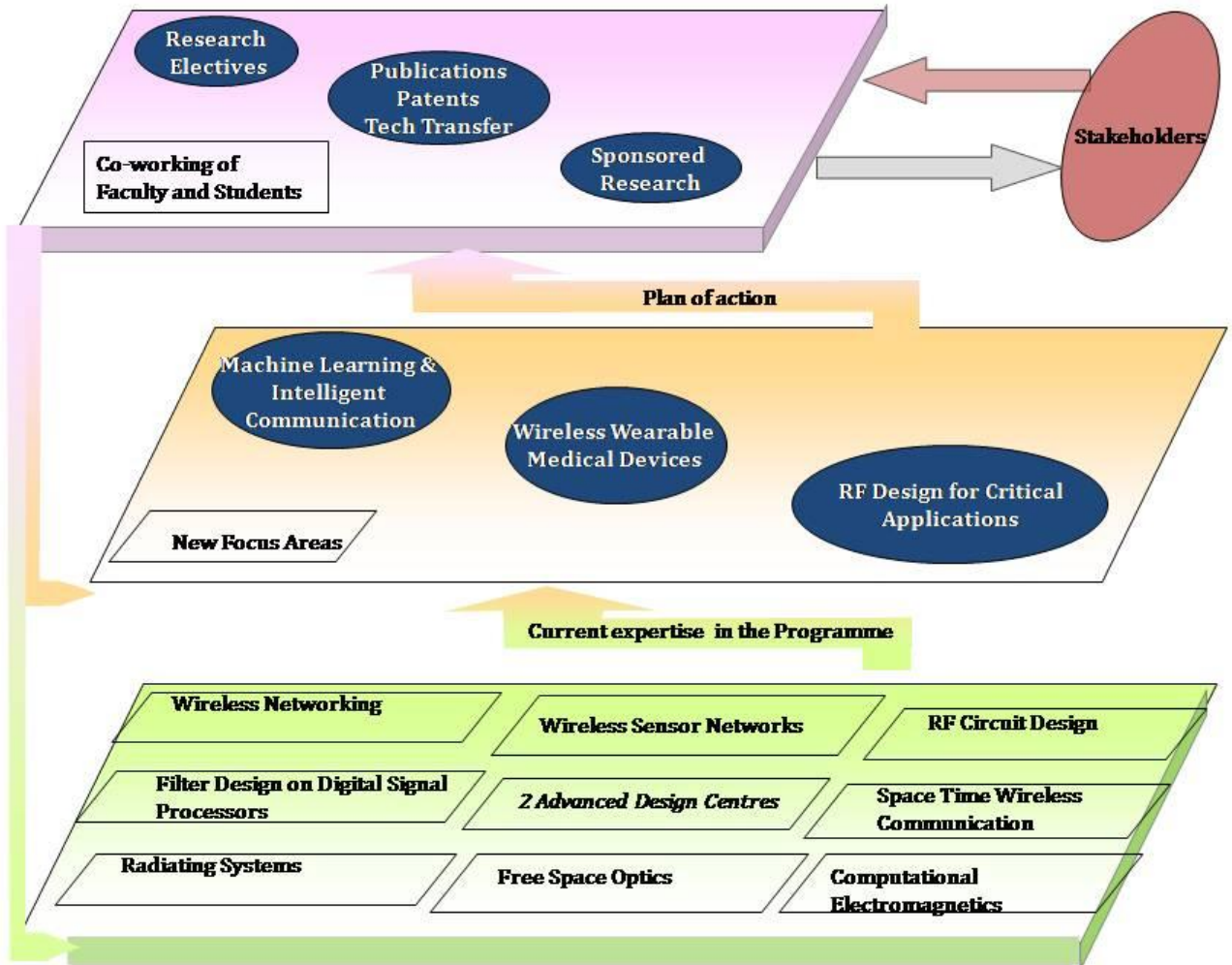


Specific Targets –

- To leverage the facilities available under the Special Manpower Development Programme for Chip to System Design, by Department of Electronics and Information Technology, GoI and assign student projects focused on societal applications and industrial electronics.
- To develop atleast 2 new elective courses by collaborating with industries including Intel, Xilinx, AMD and others based on EDA tools such as Xilinx, Cadence, Synopsys and Mentor Graphics available in department.
- To collaborate with Semiconductor Research Work Laboratory, Department of Space, GoI and IISc., Bangalore for joint research and publication.
- To establish a Defense Incubation Centre .
- To bring the number of industry sponsored projects research / live projects of students to 100%.
- To publish large fraction of papers in top journals where the peers in top 100 institutions publish their papers.
- To achieve a Ph.D graduation rate of 0.25% per year per faculty member.

ME DEGREE PROGRAMME IN WIRELESS COMMUNICATION

Strategy –

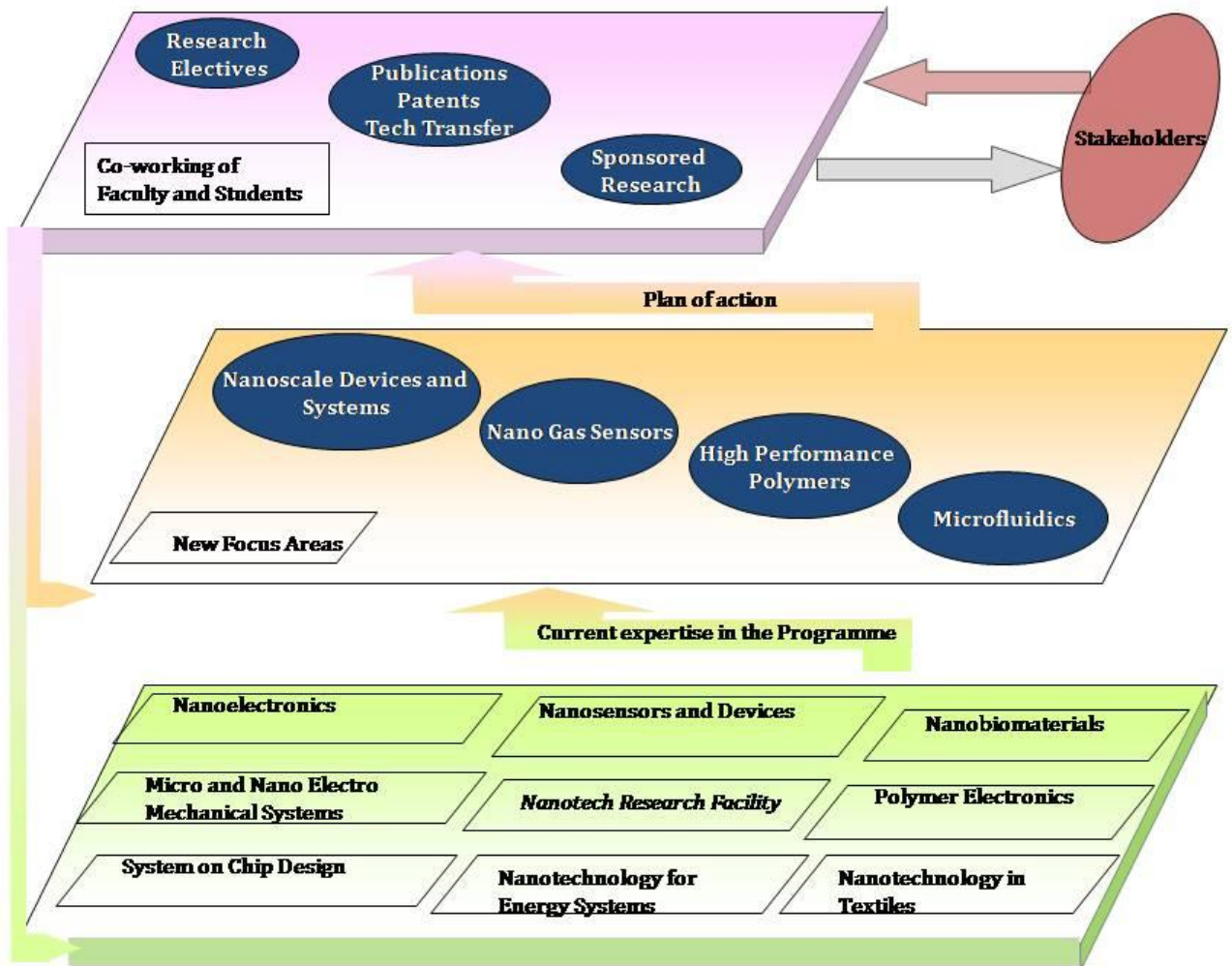


Specific Targets -

- To leverage the facilities in Centre of Excellence in Advanced Wireless Technology and Advanced Communication Systems to take up industry driven research and joint publications.
- To develop atleast 2 new elective courses by collaborating with the industry partner Keysight Technologies.
- To focus on product development in Healthcare domain following the success of ‘Wireless EEG (Disposable) Cap Based recorder’ and ‘Development of RF Coil for 1.5 Tesla MRI’ developed with funding from DST, GoI.
- Effective utilization of the testing facilities available in PSG-Qualsys Centre for EMI/EMC and RF Testing for research, product development, consultancy and plan for atleast 2 technology transfer in next 2 years.
- To establish a Centre of Excellence in Wearable Medical Devices capable of design, development & testing.
- To bring the number of industry sponsored research / live projects of students to 100%.
- To publish large fraction of papers in top journals where the peers in top 100 institutions publish their papers.
- To achieve a Ph.D graduation rate of 0.25% per year per faculty member.

MTech DEGREE PROGRAMME IN NANOSCIENCE AND TECHNOLOGY

Strategy -



Specific Targets –

- To leverage the facilities in the Nanotechnology Research and Development facility at PSG Tech for development of products that are of societal value.
- To develop new elective courses based on each faculty research areas namely Polymer Nanocomposites, Biomedical Nanotechnology, Sensors and Biosensing in Nanotechnology.
- Focus on product development in Healthcare domain and Nanosensors.
- Establish a Centre of Excellence in Wearable Medical Devices.
- To bring the number of industry sponsored projects research / live projects to 100%.
- To publish large fraction of papers in top journals where the peers in top 100 institutions publish their papers.
- To increase the funding through sponsored research from DST Nano Mission, DST and others in areas of Sensors, Nanobiomaterials, MEMS, Nanocomposites and Nanoelectronics, from 1 -2 crores to 5 crores.
- To achieve a Ph.D graduation rate of 0.25% per year per faculty member.

WE DRAW OUR MOTIVATION TO REACH NEW HEIGHTS FROM OUR ALUMNI

FEW OF OUR ECE ALUMNI IN NEWS – YEAR 2016 - 2017



Our BE ECE 2004 alumnus Dr Sharath Sriram was awarded "3M Eureka 2016 Prize for Emerging Leader in Science". He has mimicked the way the human brain processes information with the development of an electronic long-term, multi-state memory cell. He is Associate Professor in Royal Melbourne Institute of Technology, Australia.

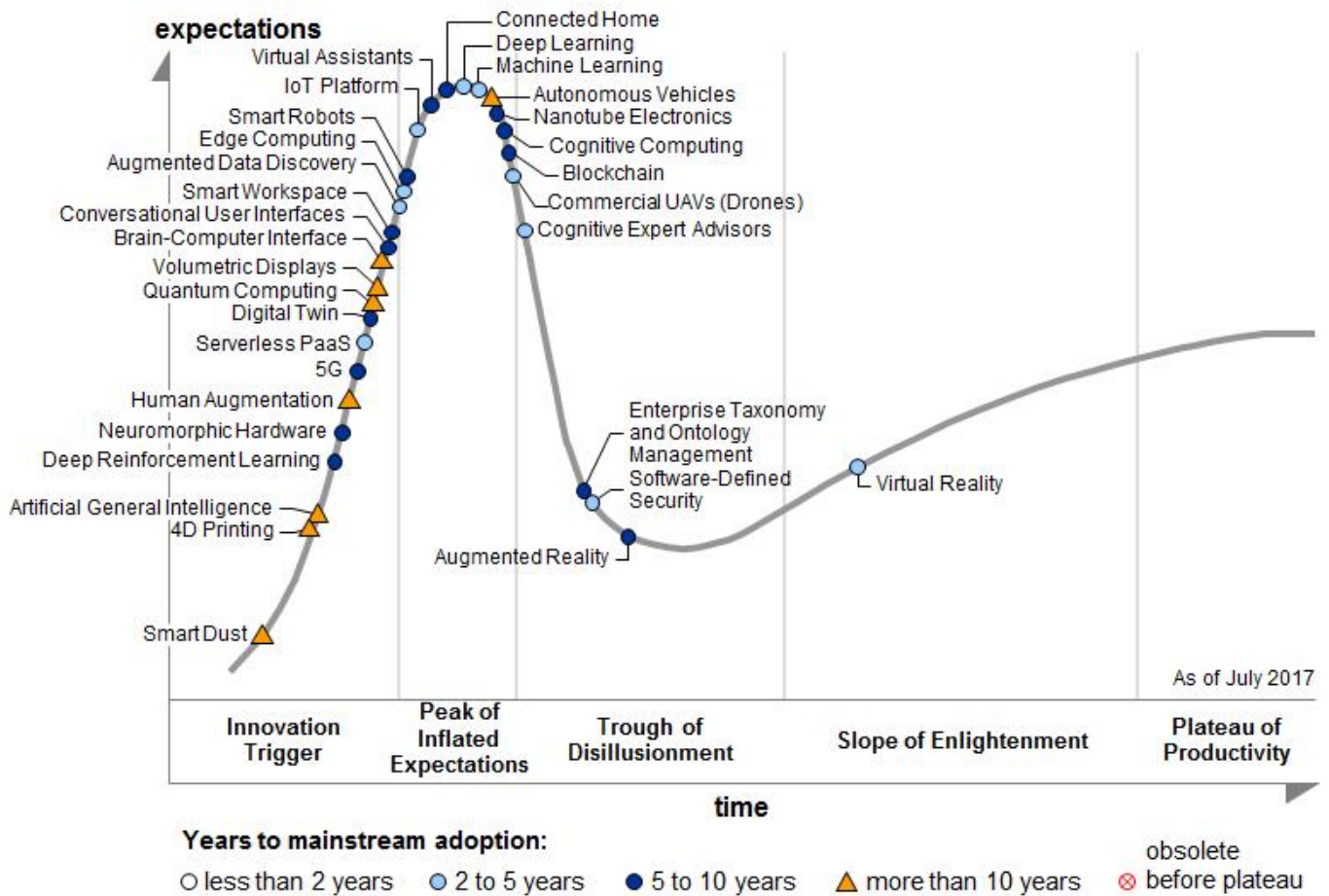
Our BE ECE 1984 Batch Alumnus Dr Raj Rajkumar, Professor of Electrical & Computer Engg. at Carnegie Mellon University in USA. His General Motors - Carnegie Mellon Autonomous Driving Collaborative Research Lab is about to release Autonomous Car.



Our BE ECE 1994 alumnus Vanitha Kumar, Vice President - Software Engineering at Qualcomm in USA, is selected as one of the top ten powerful women in the world of technology.

Gartner Inc.

Hype Cycle for Emerging Technologies, 2017 – Guide for Investment decisions



PSG COLLEGE OF TECHNOLOGY, COIMBATORE
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

STRATEGY PLAN – Brief Report

1. Curricular Aspects –

New Initiatives:

- Academic Matters -

To identify ‘**Professors of Practice**’ – experts from the industry with suitable academic qualification and industry experience to teach 25% of all the skill based elective courses in the UG as well as PG curriculum.

- Administrative matters –
 - ✓ To broadly have **two groups of students** in each class where the first group would consist of more potential students and second group will consist of students who require close monitoring and attention over their academic progress; and to **appoint two tutors for each class** where the tutors would take up a mentor/facilitator role and guide their respective students in the true spirit for which the class division has been made. **This would also improve the attendance and pass percentage.**
- ***Curriculum Structure and Revision of Regulation***
 - ✓ New electives and One credit courses for **UG** are planned to prepare the students for Industry 4.0.
 - ✓ The new electives planned for **PG** are designed to be offered in the respective CoE / Programme Specific Laboratory to improve the students’ familiarity and utilization of equipment/software in the CoE. This would lead to better project work / research outcomes.
 - ✓ We strongly recommend **flexible / suitable credit system** so that students have opportunity to improve their skillsets for upcoming new jobs in the industry (Figure 1). It is suggested to create a common pool of subjects required for Industry 4.0 and permit students to choose 20% of their courses from this common basket.

2. Teaching – Learning & Evaluation

- ***Faculty training and Development Initiatives***

We plan to make Faculty Development and Training Programs mandatory and create a systematic approach for the same. A **Hub and Spoke Model** is planned to be adopted where potential Knowledge Hubs are identified. Faculty members whose research and training requirements match with each Hub are assigned to respective Hub and they would participate in the faculty development and exchange activities happening in the hub.

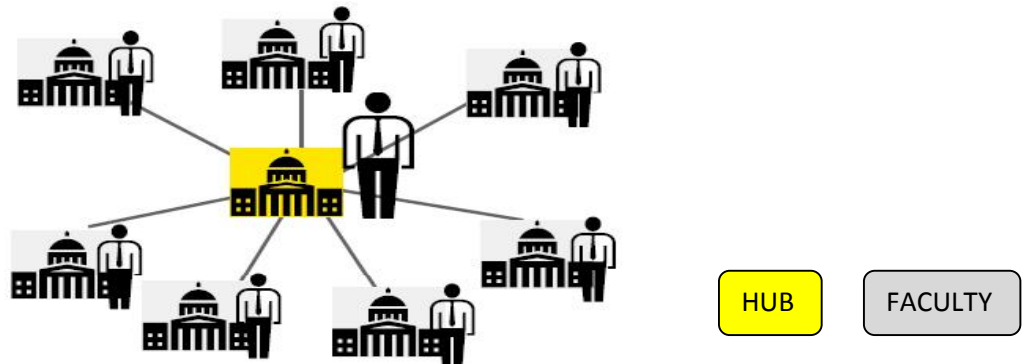


Figure 2: Hub and Spoke Model

Few Hubs identified include IIT Madras, Naval Base-Cochin, Semi-conductor Laboratory in Chandigarh, IIIT-Hyderabad, etc.

3. Research, Innovations and Extension –

Specific and realisable targets are planned for each research component as follows:

- To increase the number of faculty members involved in patents, publications and research funding in department from 50% to 75% and also improve the research ambience through providing RA & TA.
- To publish large fraction of papers in top journals where the peers in top 100 institutions publish their papers.
- To achieve a Ph.D graduation rate of 0.25% per year per faculty member.
- To Collaborate with industry and introduce 2 to 5 One-Credit courses / advanced high impact electives in Curriculum of each programme per year and also offer advanced One Year Diploma Certificate programs for engineers.
- To increase the number of students who take up online certification courses that are recognized by the industry.
- Engaging with the Alumni network for mentoring students and improving their placement prospects; with the average salary level of students to increase by 25% over a period of 2 years.

It is planned to bring in sponsored research from Government as well as Industry by utilizing the following opportunities:

- Telecommunication and Telecommunication Infrastructure is the backbone of 'Digital India', as well as Industry 4.0
- Government of India has envisioned a policy to substitute the import of electronic products by 2020. Between 2015 and 2020, automotive electronics and industrial electronics are estimated to be high growth segments.
- Government infrastructure projects such as smart cities, modernisation of railways and increasing automation in industries as well as investments by Electronic manufacturing companies, especially in the mobile phone segment, to serve the Indian domestic market are giving impetus to growth of the Indian electronics segment.

4. Infrastructure and Learning Resources

• *Planned Infrastructure facilities in the department –*

1. *Centre of Excellence in Signal Processing* in collaboration with Texas Instruments (TI) Bangalore and STEPS Knowledge Services Pvt. Ltd., Coimbatore, funded by AICTE (MODROB), Texas Instruments, Bangalore and TEQIP III. The following are the primary objectives:

- ✓ Training for UG students (part of curriculum).
- ✓ Training for PG students using advanced digital signal processors.
- ✓ Training for Faculty (Internal & External) on research activities through workshops, training programs and FDP's.
- ✓ Establishing a Design and Testing Consultancy Centre for Industry projects.
- ✓ Providing a research platform for the faculty and research scholars from various departments.

The following activities are also planned as part of the Centre's outcomes:

- ✓ DST Funded Project Titled 'Wireless Patient Monitoring system'
- ✓ DRDO Funded project titled 'Design of a Passive FM Radar'
- ✓ DRDO Funded project titled ' Biometric Authentication system for Defence Applications
- ✓ 5G summit - 2 days
- ✓ Industry Consultancy Projects related to Signal Processing and Communication
- ✓ Executive Development program for Industry Professionals

2. **VLSI Design Centre** sponsored by Ministry of Electronics and Information Technology (MEITY), PSG Management, INTEL, Enixs and TEQIP. The broad objectives of the centre include:
 - ✓ To develop ASIC catered to societal applications similar to ASIC used in Light Combat Aircraft.
 - ✓ To develop projects catering to industry and societal requirements.
 - ✓ To develop new electives and assign student projects leading to chip development.
 3. **PSG – Qualsys Centre for EMI / EMC and RF Testing** in collaboration with M/s Qualsys Consultants (India) Pvt. Ltd., Ahmedabad, PSG-STEP and M/s Sinetec Technologies. The following are the broad objectives:
 - ✓ Pre-compliance Testing Services regarding EMI/EMC, RF and related disciplines.
 - ✓ Offering EMI/EMC training and certification programs.
- **Computerisation of administration in department**

The following computerization is planned in the department:

- ✓ Development of **Infrastructure Database** to ensure the utilization of infrastructure in teaching as well as research laboratories. The upgradation plan will be based on the database.
 - ✓ **Faculty and Student Database for internal record maintenance and reference.** This would be highly useful for activities like Accreditation, Harbinger/Tech day report preparation, etc
 - ✓
- 5. Student Support and Progression**

India is poised to be the major supplier of manpower to the rest of the world by 2030. Hence we plan to identify the megatrends that drive innovation and technology at a global level through our Alumni who are spread out in several parts of the world. The Department plans to identify alumni and give them title of ‘**Career Coach**’ and arrange for regular interactive sessions with students as well as faculty on new subjects and skills requirements; also on existing job requirements in market.

- ✓ The ECE Association would be conducting GATE coaching classes with our GATE qualified department faculty as resource persons.
- ✓ It is decided that **PCD** in I year, **Innovation Lab** in Third year and Project Work would be innovation driven and max. need to be based on real life challenges.
- ✓ The skills based courses in curriculum would be identified and atleast **one CO in the subject be related to Innovation.** The pedagogy used to impart this outcome can be of experiential learning model.
- ✓ The innovation pipeline would identify student ideas at early stage through appropriate means (eg., competition), validated, supported and mentored to develop PoC followed by prototype validation. Encourage **Student Start-ups.**

6. Governance, Leadership and Management

Vision and Mission of the department

Vision

To be recognized as a premier department worldwide for moulding skilled, talented and well disciplined engineers.

Mission

The mission of the ECE department is to facilitate young Engineers to acquire technical exposure in the areas of Electronics and Communication Engineering, nurture career improvement and develop human, social and intellectual qualities necessary for successful practice of the profession.

Corpus Fund for Chair / Scholarships

It is requested that the funds generated during the Alumni Reunion be routed to the concerned departments for formation of Chair in the suitable titles.

Quality Improvement Strategies

The following strategy (Figure 6) is planned for inclusive growth in the department:

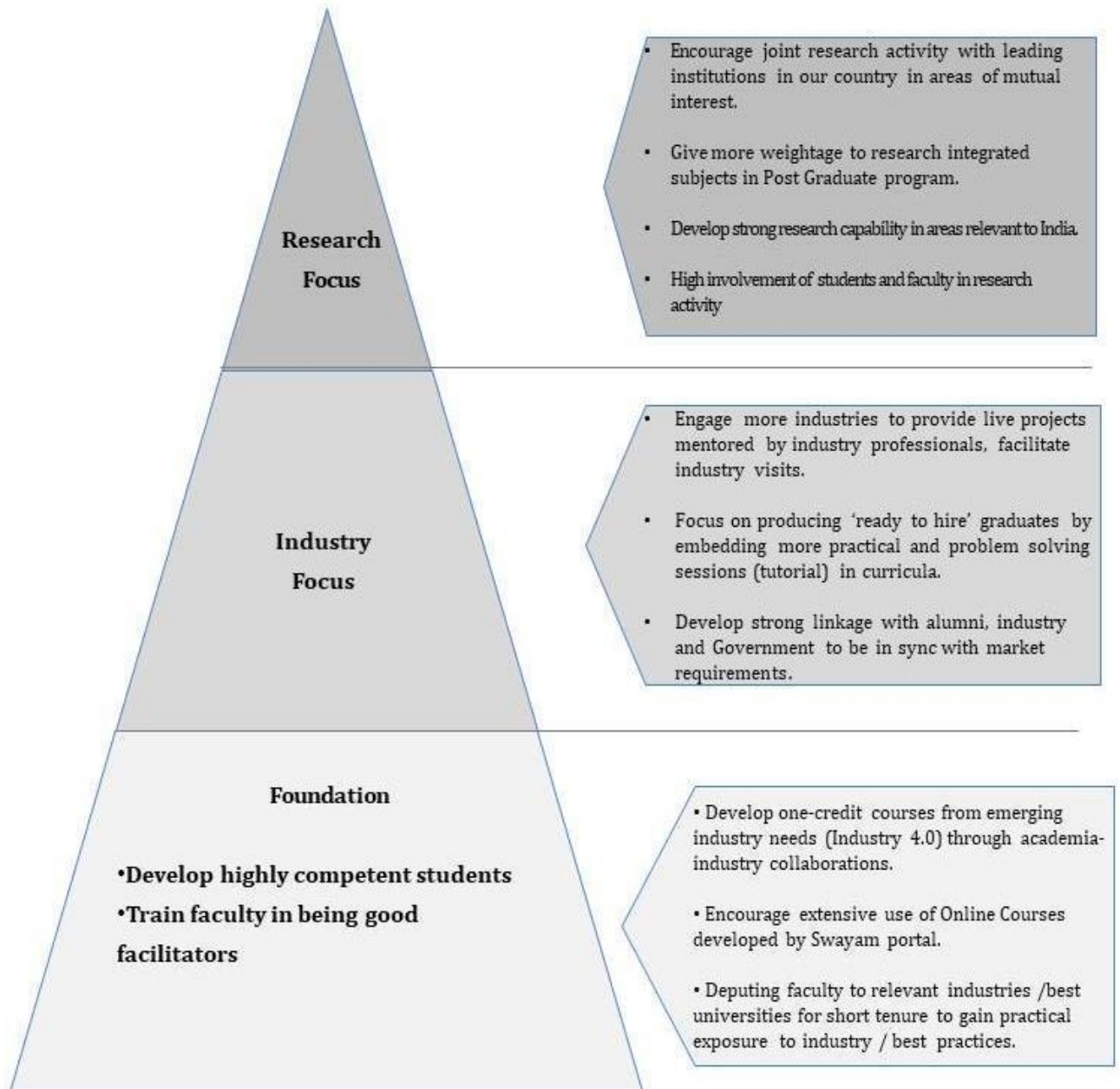


Figure 6: Strategy for Quality Improvement

7. Institutional Values and Best Practices

Best Practices

- ✓ Conduct of Project Exhibition in department
- ✓ Every faculty member associated with Industry and Interaction sustained through on-site reviews
- ✓ Toppers in Examinations are honored through ECE Association
- ✓ Recognition of teachers in Research
- ✓ Good research ambiance through excellent infrastructure
- ✓ Encouragement of senior as well as young alumni to visit their alma mater and involve in department activities.

SWOT Analysis

Strengths:

- ✓ Faculty
- ✓ Best students in the region are admitted to the programmes
- ✓ High Quality Research and maximum number of research guides and PhDs ongoing/completed
- ✓ Infrastructure

Weakness:

- ✓ Consultancy and Testing

Opportunities:

- ✓ Several Govt. initiatives have Telecommunication infrastructure as the backbone which is an opportunity to work with Government as a stakeholder in research.
- ✓ Industry 4.0 requires Smart Factories which depend on Machine to Machine Communication thus improving placement prospects for ECE students.

Threats:

- ✓ Declining student motivation to take up challenging tasks in academia.
- ✓ To sustain the quality of admissions to post graduate programmes.