

## RESEARCH AFFILIATION AND RESEARCH FOCUS

Over the years, most of the departments of REC have been brought into research fold through affiliation with Anna University research center. Currently, Nine Departments of REC have been approved and recognized as Research Centers by Anna University to offer MS (by Research) and Ph.D. Programs. These are: Mechanical Engineering, Computer Science & Engineering, Electrical & Electronics Engineering, Biotechnology, Chemistry, Electronics & Communication Engineering, Mathematics, Information.

Technology and Bio-Medical Engineering. The college is recognized as a "Scientific and Industrial Research Organization"

(SIRO) by the Department of Science and Industrial Research (DSIR) of Government of India. The College has obtained "12B" status from University Grants Commission (UGC) in 2013. These recognitions have enabled the college to seek funding from government sponsoring agencies to conduct research and development that are of national relevance and importance. Following broad areas highlight research strength built-up over the years at REC.



- MEMS and Micro-fluidics
- Machine Vision Applied to Industrial Quality Control
- Computational Fluid Dynamics
- Applied Nano-Technology
- Composite Materials Technology
- Product Design and Development
- Bio-Medical Image Processing
- Environmental Biotechnology
- Clinical Research
- Big Data Analytics
- Computational Intelligence
- Business Intelligence & Computing
- Energy Systems
- Power Electronics and Drives
- Wireless Communication
- RF & Microwaves
- Embedded Systems
- Structural Engineering & Construction Materials

Active research is currently being pursued on these topics by faculty and research scholars at REC.

## CENTERS OF EXCELLENCE



Two Topics of major research and development perceived as exceptionally relevant in the present-day context have been developed as Centers of Excellence as listed below:

- Centre of Excellence in Machine Vision
- Centre of Excellence in MEMS and Micro-Fluidics

The machine vision activity is targeted towards developing image processing solutions to enhance Industrial productivity through objective quality measures. Machine Vision systems enable automated end-of-line inspection and quality control in manufacturing plants. The machine vision activity was started through seed funding under the DST TIFACCORE scheme. Several industrial inspection systems are currently operational using technology and solutions developed through this activity. This center is currently headed by Dr. Sundar, who has wide experience in both academics and Industry.

The MEMS activity with emphasis on micro-fluidic lab-on-chip systems is aimed at research towards development of low-cost measurement and diagnostic solutions for bio - medical and allied applications. The college is recognized as one of the National MEMS Development Centers (NMDC) supported through the national NPMASS program. Several MEMS devices such as Micro Tweezers, Accelerometer and Gyroscope have been designed and successfully implemented through the community chip fabrication program under NPMASS. The NMDC Centre is headed by Dr. L. Sujatha, who has several research scholars currently pursuing their doctoral research program under her guidance. This center now has the distinction of having an active DST-TSDP government sponsored project valued at Rs.1.24 Crores for research and development in processes for low-cost Micro-Fluidic device development. Facilities at this center include specialized thin-film deposition equipment, photo-lithography, high-resolution Digital Microscope, measuring equipment, De-Ionized Water Plant and accessories for in-house research and development in MEMS and Micro-Fluidics. Currently, the infrastructure for this center is being further augmented through internal funds to establish state-of-the-art Class-10000/ Class-1000 clean-rooms facilitating world-class research.

These centers of excellence have focused research and development activities with continual augmentation of facilities through internal funding as well as sponsored research project activities. Active research is also being carried-out in other engineering and science disciplines as well as inter-disciplinary topics. The College has over 94 faculty members holding a doctoral degree. Many of these faculty members are actively conducting research in their area of specialization and providing guidance to registered research scholars. Over 114 faculty members from various departments are pursuing part-time doctoral research program.

Currently, research infrastructure in the college is being expanded with additional laboratory spaces and conference rooms in a central research facility.

## SPONSORED RESEARCH AND DEVELOPMENT PROJECTS

Research and development infrastructure at REC was created through both internal funding as well as through external sponsored project funds to the tune of 10.5 Crores and more. Some of the major on-going sponsored research projects taken up by faculty members of the college are listed below.

01. Centre of Excellence in Machine Vision with Seed funding by DST TIFAC-CORE and subsequent internal funding for a total value of 5 Crores over the past six years—Currently headed by Dr. R. Sundar, Department of ECE.
2. Centre of Excellence in MEMS & Micro-Fluidics with internal funding to the tune of 60 Lakhs over the past two years and facilities created through sponsored projects – headed by Dr. L. Sujatha, Department of ECE.

03. Micro-fluidics Devices development - Funded by SSPL-DRDO- Value: 134.62 Lakhs. **INVESTIGATORS:** Dr. L. Sujatha and Dr. R. Sundar, Department of ECE..
04. Development of Analysis of Optimal Coating for HRG Components - Funded by RCI-DRDO - Value : 9.77 Lakhs. **INVESTIGATORS:** Dr. L. Sujatha and Dr. R. Sundar, Department of ECE.
05. Modelling & Analysis of Fused Quartz Pendulum type Accelerometer- Value: 9.45 Lakhs. **INVESTIGATORS:** Dr. R. Sundar and Dr. L. Sujatha, Department of ECE.
6. Development and Evaluation of Rotating Nozzle for Diesel Engine - Value: 17.67 Lakhs **INVESTIGATOR:** Dr. N M Sudharsan, Department of Mechanical Engineering.
07. Skill and Personality Development Program for SC/ ST students - Funded by AICTE-AQIS Value: 21.26 Lakhs. **COORDINATOR:** Dr. N. Hema, Department of Humanities & Sciences.
08. MODROB - Power Electronics Lab- Funded by AICTE-AQIS- Value: 10.5 Lakhs. **INVESTIGATOR :** Dr. K. Premkumar, Department of EEE.
09. Thermography as a tool to Detect Foetus Abnormality- Funded by ICMR – Value: 7 Lakhs – **INVESTIGATORS:** Dr. Natteri Sudarshan, Department of Mechanical Engineering and Dr. Md. Yacin Department of Bio-Medical Engineering
10. Centralised Versatile Secure Management System for Documents-Value: Rs. 3.50 Lakhs- **INVESTIGATORS:** Mrs. Priya Vijay (CSE) and Mr. K. Sibi (CSE)
11. Efficient Prediction and Monitoring Tool for Diabetic patients Using Data-Mining and Smart Phone System- Funded by AICTE - RPS – Value: 4.23 Lakhs **INVESTIGATOR:** Dr. S. Poonguzhali, Department of Information Technology
12. Polymer Micro-Molds using Soft Lithography - Funded by DRDO-ER & IPR – value: 21.68 Lakhs, **INVESTIGATOR:** Dr. L. Sujatha, Department of ECE
13. Nano-oxide based H<sub>2</sub>S Sensors for Nuclear Plants - Funded by AERB – value: 24.25 Lakhs, **INVESTIGATOR:** Dr. L. Sujatha, Department of ECE
14. Propolythioracil for Psoriatic Lesions—A Study -Funded by DST-SERB – value: 17.62 Lakhs, **INVESTIGATOR:** Dr. Haripriya, Department of Bio-Technology
15. Plant-based Nano-Gold for medical applications Funded by AICTE-RPS – value: 7.8 Lakhs, **INVESTIGATOR:** Dr. P. Rajasekar, Department of Bio-Technology
16. Centralised Versatile Secure Managemet System for documents- Value: 3.00 Lakhs -Funded by RESPOND-ISRO. **INVESTIGATORS:** Ms. Priya Vijay and Mr. K. Sibi, Department of Computer Science & Engineering