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POLYMER SCIENCE AND RUBBER TECHNOLOGY
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An ISO 9001:2015
Certified Department

MESSAGE FROM HEAD OF THE DEPARTMENT

I am glad that the Dept. is able to bring out this Brochure on the occasion of Golden Jubilee year of the Department and the University. Ever since the inception the Department has strived to excel in its mandate to mould world-class polymer technologists to serve the nation. Over the years the Department has produced exceptional UG, PG and Doctoral talents who now adore key positions in leading industry and R & D laboratories in the country and abroad. The Department has successfully completed many international collaborations, industrial consultancy and academic research projects. Over the years the Department has strived tirelessly to upgrade the infrastructure and currently the laboratories are equipped with state of the art research facility. So far 121 students have completed Ph.D. and 35 students are pursuing their Doctoral degree. At this point the exemplary far sightedness and great vision of the former Professors who conceived the idea of a separate Department for Polymer Science and Rubber Technology and nurtured it to the present glory are gratefully acknowledged. Starting from the founder HoD, Prof. D. Joseph Francis, Prof. A. P. Kuriakose, Prof. K. E. George, Prof. Rani Joseph and Prof. Philip Kurian all have contributed immensely to the growth and reputation of the Department. Today the Department is a model centre of study in the campus with ISO certification and great acceptance among leading polymer industries in the country. Every year almost all eligible students are placed through campus selection process thanks to a very active placement cell. Many of the UG students clear the GATE examination with good score and opt for higher studies in national institutes like IITs or abroad. Overall the last fifty years have been very eventful and successful and I look forward to even more productive years ahead.

Dr. Sunil K. Narayanankutty

PS&RT

VISION AND MISSION

The Department of Polymer Science and Rubber Technology is committed to moulding world class polymer technologists and scientists; to do advanced research and development in the socially and economically relevant areas; to help polymer industry through consultancy and testing services; to serve the society through awareness programmes.

OBJECTIVES

To train and mould world class polymer technologists and scientists for the development of the polymer industry and research and developments institutions.

To establish and continuously improve state of the art infrastructure for carrying out advanced research on contemporary subjects.

To provide consultancy, testing and advisory services to the polymer based industries

To take up extension activities that will benefit the society in general and to spread awareness on polymers among the young generation.

QUALITY POLICY

The Department of Polymer Science and Rubber Technology is committed to maintain high standards in the teaching and learning process by establishing and continuously improving the state of art infrastructure, implementing technology-enabled pedagogical methods and updating curriculum and syllabus at definite intervals.

A BRIEF PROFILE

Instituted in 1971, the Department of Polymer Science and Rubber technology is as old as the university. The B.Tech (Polymer Science and Rubber Technology) programme was started in collaboration with the Rubber Research Institute of India in1972.The establishment of Research and Development wing in early 80's and introduction of M.Tech. (Polymer Technology) in 1985 were major milestones in the development of the Department. Both of these programmes have been approved by the AICTE. The Department believes in all-round quality and has been certified by ISO (ISO 9001 : 2015).

Well-qualified and competent faculty members and state-of-the-art facilities are the highlights of the Department. The faculty members trained in leading Universities in India and abroad with wide range of experience have published more than four hundred research publications in internationally reputed journals. So far 120 students have been awarded Ph.D. for their pioneering works in the field of polymer science and technology. Currently 35 students are pursuing their doctoral degree. The biennial international conference, Advances in Polymer Technology, organized by the Department gives the students an opportunity to interact with leading domestic and international polymer scientists, technologists and engineers. The Department is one of the five in the campus selected for the financial assistance under the MHO programme of the Netherlands.

The Department is being financially supported by FIST, SAP and DST PURSUE for undertaking major research and development works and for improving infrastructure facility. The other funding agencies who have supported major research projects of the Department include ISRO, DST, SERB, DBT, UGC, AICTE, BARC, NPOL, KSCSTE, and Volkswagen Foundation, Germany.

ACADEMICS

The Department offers B.Tech (Polymer Science and Engineering), M.Tech (Polymer Technology), Ph.D and Post-Doctoral Programmes.

B.Tech. (Polymer Science and Engineering):

This is a 4-year course open to plus-two students. The admission is through an All India Entrance Test (CAT) conducted by the University every year in April/May for which the registration will be during December/January. This Government-aided course has a limited intake of 20 students per year and only a nominal tuition fee. The highlights of the course are one-semester long project work and training in the industry and very high prospects of placement through campus recruitment. Many of our students qualify for the GATE examination which make them eligible to pursue their higher education in national institutes like IITs and abroad.

M.Tech. (Polymer Technology):

This course instituted in 1985 with the assistance from UGC and AICTE admits 10 students per year. The selection is based on the GATE score / Departmental Admission Test (for non-GATE qualified students). Applications are invited during December/January every year. Classes commence by July. These students are well accepted by the leading polymer industries in India and research labs abroad.

Ph.D.:

The Department admits students for research in the frontier areas of polymer science and technology leading to Ph.D. A prospective candidate should have completed a postgraduate programme in the relevant discipline along with a valid GATE score and/or have qualified CSIR-UGC NET-JRF or other equivalent examinations.

Post-Doctoral Fellowship:

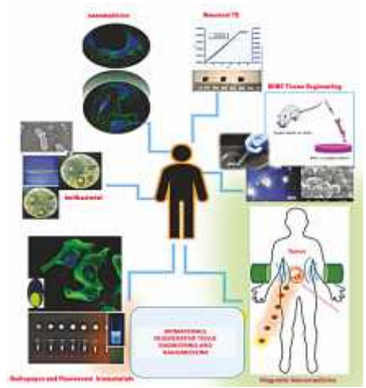
A few number of University Post-Doctoral fellowships are available every year to Doctoral Degree holders. Currently, five post-doctoral fellows are pursuing their research in the advanced research areas. Applications for this fellowship are processed twice a year. Prospective candidates can also apply for various national post-doctoral fellowship schemes such as National Post-Doctoral Fellowship (NPDF), D S Kothari Post-doctoral Fellowship - UGC, KSCSTE Post-doctoral fellowship etc. with one faculty member as scientist-mentor.

THRUST RESEARCH AREAS

- Polymer Synthesis and Processing.
- Polymer Blends and Composites.
- Nanomaterials and Nano Engineering.
- Energy Harvesting and Storage Devices.
- Adhesives and Surface Coatings.
- Shape Memory and Self-Healing Polymers.
- Tyre Compounds and Compounding Ingredients.
- Polymer Recycling and Waste Management.
- Integrated TENG powering LEDs and small portable lights

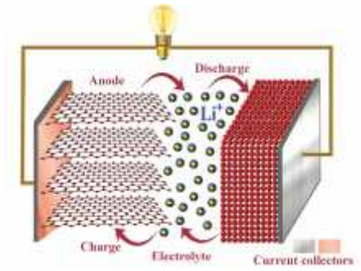
Biomaterials, Regenerative Tissue Engineering and Nanomedicine. .

Best performing innovative biomaterials/nanomedicine developed in the laboratory according to medical needs are protected with IPR and will be subjected to translational research.



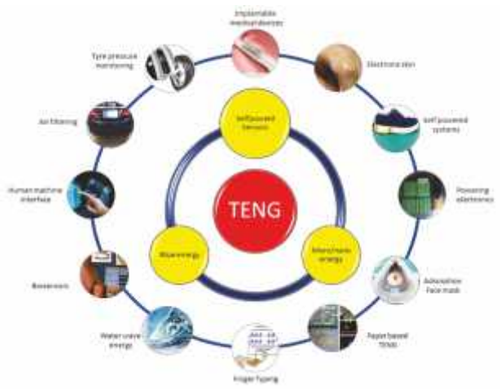
Batteries and Super capacitors.

Research on the development of batteries and super capacitors is on considering the importance of large scale energy storage. The team has been able to develop highly efficient electrolytes for the purpose.



Triboelectric Nanogenerators

Triboelectric nanogenerators (TENG) have been designed in the Department for utilizing irregular and wasted low frequency energy to produce useful electric power which include vibration, human motion, rotation, sliding, water waves etc.



FACULTY

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LABORATORY FACILITIES

The Department is equipped with state of the art research infrastructure for pursing research in frontiers areas of Polymer Science and Technology. Major facilities include Shimadzu Autograph Universal Testing Machines (50kN and 10kN), Alpha Technologies RPA2000 Rubber Process Analyzer, TA Dynamic Mechanic Analyzer Q800, TA DSC Q100, TA TGA Q50, UV-Visible, UV-vis Spectrophotometer Impact Tester, Atago Abbe Refractometer, Keithley 2182 Nano Voltmer, Waters515 HPLC, Brookfield Visvometer, Carl Zeiss Stereo Microscope, and thermo hake (rheomix) poly lab system.

FT Infrared Spectrophotometer
(Perkin Elmer- Spectrum Two).

Lyophilizer (Christ Alpha 2-4D Plus)

Gas Permeability Tester
(Systester GTR -7002)

Contact Angle Goniometer
(Rame - Hart 290)

Universal Testing Machine
(Shimadzu Autograph AGS -X)

Impedance Analyzer (Agilent)

Electrochemical Workstation
(CH Instruments 660 E)

ThermoHaake Rheomix (600 OS)

SELECTED AWARDS OF 2020-21 ACADEMIC YEAR

Prof. (Dr.) Prasanth Raghavan, KITES education Excellence Award, 2021.

Dr. Jabeen Fatima M.J, Kairali Gaveshaka Puraskaram,2020.

Dr. Sreeja S. National Postdoctoral Fellowship, 2020.

Divya Jose, Special Appreciation during the competition for 'Best thesis award', Golden Alumni Meeting, MG University, 2020.

Meera Sathyan, Best oral presentation, 32nd Kerala Science Congress, 2020.

Irthasa Aazem V. S., Best Paper Award – National Seminar, SH College, Thevara, 2020.

Deepthi Anna David, Best paper award, 33rd Kerala Science Congress, 2021.

PATENTS

The fruits of the research and development works of the Depart have been patented. Some of the recent works that have been awarded/ submitted for patents are:

- Insitu exfoliated magnetic layered double hydroxide (LDH) with enhanced magnetic hyperthermia potential for biomedical applications.
- Conducting polymer – dopant – polydimethylsiloxane composite and process for preparation thereof.
- Reduced graphene oxide-conducting polymer-polydimethylsiloxanecomposite, a process for preparation thereof, and energy harvester preparation thereof, and energy harvester.
- Long-lived photoluminescent PMMA silver terephthalate polymer composite films.
- Iron Oxide Assisted Rolling of Molybdenum Sulphide to One Dimensional Tubular Structures.

HOSTEL

The hostel facility is available to the students in the campus. We strive to make the transition from home to hostels as smooth as possible. Separate residential facility for international candidates within the campus is also offered. Free internet connectivity through a Wi-Fi system is provided. The life in the campus is made jovial by organizing cultural celebrations, events, sports events, debates and discussions.

LIBRARY

The Departmental library has an excellent collection of books on old issues of journals. The total number of titles available is well above 3500. This includes about 1800 textbooks and old issues of the journals, B.Tech, M.Tech. and Ph.D. theses and training reports. Additionally, the University Central Library houses pretty large collection of the books and journals in the polymer field. Many online journals are also subscribed.

CONSULTANCY

An active consultancy wing of the Department caters to the needs of the industry and R & D labs in the country and abroad. Apart from taking up full-fledged consultancy works the Department also caters to the testing and characterization requirements of the small-scaleindustries. Test samples can be submitted to the Department in person or by post/courier and the charges can be paid online. The results could be collected in person or could be sent to the client by email/post.

PLACEMENT CELL

A very active placement cell headed by a senior faculty assists the students in their placement drive. Every year quite many companies visit the campus for recruitments. Most of the eligible students are placed through this process. Some of the regular recruiters are Apollo Tyres, CEAT, MRF, Reliance Industries etc. Others 3M, GE, VSSC, DRDO, Saint Gobain, Mahindra, HLL, JK etc.