

A SUCCESS STORY

**UNIVERSITY OF THE
PUNJAB LAHORE PAKISTAN**
**DEPARTEMENT OF
POLYMER ENGINEERING
AND TECHNOLOGY**

**HIGHER EDUCATION
COMMISSION (HEC)**
**PROJECT OF
POLYMER RESEARCH
LABORATORIES**

**WELCOME TO THE WORLD OF POLYMER AND MATERIAL
ENGINEERING**

UP FRONT

MESSAGE FROM CHAIRMAN DEPARTMENT OF POLYMER ENGINEERING AND TECHNOLOGY



Prof. Dr. Tahir Jamil
Chairman

Department of
Polymer Engg. & Tech.
PU Lahore Pakistan

Department of Polymer Engineering and Technology has embarked upon a journey of unprecented growth. I have got four projects from Higher Education Commission and all of them are moving with complete success. With more opportunities than ever before I am pleased to introduce this news letter to keep you abreast of the most important happenings in Department of Polymer Engineering and Technology.

Together we are at the forefront of expanding scientific knowledge through research. Our workings impact local and international workings in the field of polymer and material science and engineering. This research news will help us prepare for the challenges of the future and let us share our successes for the common good. I invite you to feed back on our acedamic and research communications to pu.polymertech@hotmail.com , chairman.dpet.ceet@pu.edu.pk



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DEPARTEMENT OF POLYMER ENGINEERING AND TECHNOLOGY UNIVERSITY OF THE PUNJAB

IMPORTANCE OF POLYMER

Polymeric materials and their application have acquired a respectable place in all aspects of our daily life. The world today has much dependence on Plastics & polymers in extended territories of medical care, electronic device casings, packaging & storage, textiles & foams, liquid & gas transportation, beds & baths, furniture, automobiles and a lot more. At the helm of vast utilization, the domestic polymer industry is very much dependent on imported raw materials for their production of goods. So is the acute deficiency in the number of polymer technologists. Collectively, the situation is alarming. There is a need for persistent awareness in the masses over the issues of indigenous polymeric raw materials production, local synthesis of quality plastics, related environment problems (recycling and disposal) and an adoptable research and development.

The responsibility of such exercise lies obviously with polymer technologists and their work places. Universities, research laboratories and technological colleges have their constitutional role to provide a conducive environment for the activities mentioned. Training of selective youth by imparting polymer technological education on progressive tiers can develop a professional culture into the society. B.Sc., M. Sc., M.Phil., and PhD degree courses side by side with the short diploma programs will strengthen the growth of national industry on high standards acceptable to the international market .

FFP PROGRAMME AND ROLE OF HEC

A revolutionary scientist-minister revamped the Higher education commission with his pragmatic plan of strengthening the national science and technological universities. A wonderful concept, Foreign Faculty Program (FFP), was introduced to hire trained scientists and technologists working abroad and place them at the institutes where they could establish infra structure and deliver their competency. The task was to bring technology and the technologists both at the door step of engineering colleges and universities. The continuity of the program upgraded the laboratories, introduced splendid higher education programs and inculcated new disciplines. Within years, fruitful results started showing up. Institutes strengthened their faculties with higher level of qualification at the helm of modern well equipped laboratories.



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DEPARTMENT OF POLYMER ENGINEERING AND TECHNOLOGY HISTORY

University of the Punjab, the very prestigious seat of learning also accepted the ideological approach of HEC. Department of Polymer Engineering & Technology was established in 2004 as part of College of Engineering and Emerging Technologies (CEET) with two more departments of Department of Metallurgy and Material Engineering and Department of Electrical Engineering in college. Though the department of Polymer Engineering & Technology was notified in 2004, it remained inactive due to lack of necessary infrastructure. Hired from USA under the FFP program, Dr. Tahir Jamil started working on the establishment of necessary infrastructure for polymer and material research laboratories and academic programs. Supported by the financial muscle of HEC and logistical push of the Punjab University, today a state of the art facility is established in of Faculty of Engineering & Technology. About 100 million rupees were spent in gathering polymer synthesis, characterization, rheology and processing facilities under one roof.



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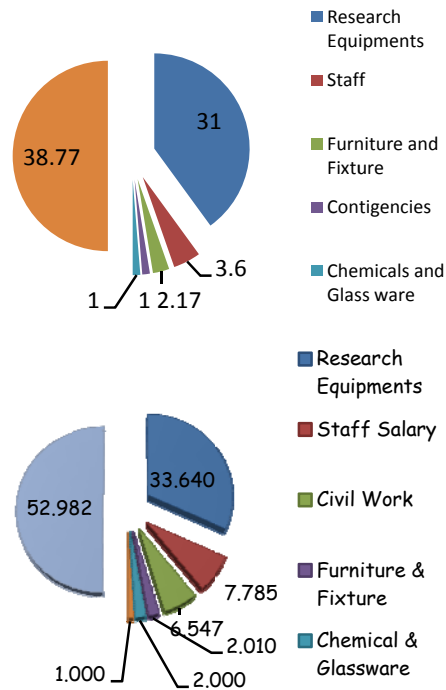
ENTITLED HEC PROJECTS AND THEIR SUCCESS

- In 2006 Prof. Dr. Tahir Jamil was given responsibilities to initiate a project for establishment of research group by funding from HEC. This project was a scientific project and was completed in consent of its scientific completions before its time period.
- In 2007 Prof. Dr. Tahir Jamil was awarded with a mega project of "Establishment of Research Laboratories for Polymers Synthesis, Chracterization, Rheology and Processing" by HEC. This Project was of worth 38.784 Mill Rs. This project is successfully completed and we have submitted PCIV for that project as well. Four high class research laboratories are established in this project with both facilities of synthesis and characterization.
- Project workings and completion itself indicate the success and workings of Polymer Team and intentions of Prof. Dr. Tahir Jamil for Establishments of Polymer Research Labs. Due to this Prof. Dr. Mujahid Kamran worthy Vice Chancellor University of the Punjab honoured Prof. Dr. Tahir Jamil to command Department of Polymer Engineering & Technology and he was selected to be the Chairman of the department.
- In 2009 in view of continual success and workings of Department of Polymer Engineering & Technology HEC awarded another mega project of 5.785 Mill Rs for "Establishment of Industrial Research labs for Polymer and Material Synthesis". This Project is still in process. More than 75% of project is completed in terms of establishment. Laboratories are constructed and all the instruments are purchased and installed.
- In 2010 HEC gave research project of Poly Urethane Membranes to Department. It is a joint project with HEC scholar. Department of Polymer also accommodated Ph.D scholar as assistant professor in department. This project is also running successfully.
- In 2011 University of the Punjab awarded research grant of Rs 0.025 Mill for a project based on membranes.

These entire projects are in progress and continually moving toward completion. Our whole team is dedicated and working for progress with every minute.



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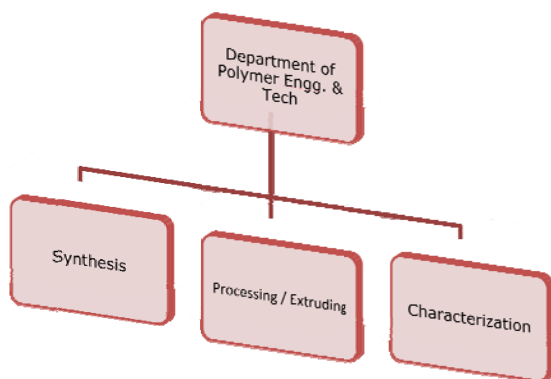
OUR CORE AND RESEARCH FACILITIES

HEC funded projects helped Department of Polymer Engineering & Technology to establish seven high class research laboratories. These laboratories are well equipped with synthesis, characterization and processing facilities. Characterization labs have state of the art equipments covering the fields of thermal, spectroscopy, paint, membrane, mechanical, chromatography, processing, visco elasticity and rheology.

Synthesis platform has facilities from lab scale synthesis to pilot plant scale production. And processing labs have industrial machines for polymer processing for guidance and training of students and man power. We are welcoming industries to make joint ventures with department for continue production which will be useful for revenue generation for the university and department. Worthy Vice Chancellor Prof. Dr. Mujahid Kamran has given approval for that as well.



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Department of Polymer Engineering & Technology

- Synthesis
 - Lab Scale
 - High Pressure Reactor
 - Pilot Plant
 - Dipped Good
- Processing
 - Extruders
 - Blow Moulding
 - Pipe Extruder
 - Injection Moulding
 - Film Extruder
 - Lab Scale Extruder
- Characterization
 - Thermal Analysis
 - Spectroscopy
 - Chromatography
 - Mechanical
 - Paint
 - Membrane
 - Viscosity
 - Rheology



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INAUGURATION OF POLYMER RESEARCH LABORATORIES

Worthy Vice Chancellor inaugurated Polymer Research Laboratories Department of Polymer Engineering & Technology on 26th December 2011. Prof. Dr. Tahir Jamil in his opening remarks thanked all the guests for coming at the ceremony. He especially thanked Worthy Vice Chancellor and Punjab University staff for their coordination and help in every possible matter. Worthy Vice Chancellor praised the working of Prof. Dr. Tahir Jamil and regarded these projects amongst the most successful projects of Punjab University which are not only completed in time but they are also running successfully. He also ensured about his complete coordination in future for progress and workings. Worthy Vice Chancellor inaugurated the newly constructed building of Department comprised of three labs and offices. He and all the respected guests visited all the existing and new facilities.



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HIGHER EDUCATION COMMISSION (HEC) DIRECTOR VISIT

Mr. Javed Hashmi from HEC visited Department of Polymer Engineering & Technology on 27th February 2012. Mr. Hashmi met Prof. Dr. Mujahid Kamran the Worthy Vice Chancellor University of University of the Punjab Lahore with Prof. Dr. Tahir Jamil in Vice Chancellor Office. Engr. Tariq Majid Qureshi Director Planning and Development University of the Punjab also accompanied him. Later Mr. Hashmi visited the Department of Polymer Engineering & Technology with Engr. Tariq Majeed Qureshi. Prof. Dr. Tahir Jamil showed them all the laboratories and facilities which are generated by HEC funded projects. Later on Mr. Hashmi met other officials of College of Engineering and Emerging Technologies (CEET).

Mr. Hashmi expressed his interest and praised Prof. Dr. Tahir Jamil for his hard work and success for establishing these projects. He also said that by seeing these facilities we can say that HEC money is utilized in a right manner.



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NEWS ABOUT OUR ACHIEVEMENTS WHICH REFLECTS YOUR INTEREST

Department of Polymer Engineering & Technology and Polymer Research Laboratories have completed more than 50 research thesis of M.Sc/M.Phil Chemistry, M.Sc Chemical Engineering and B.Sc Chemical Engineering students.

Department of Polymer Engineering & Technology and Polymer Research Laboratories is working on a number of research projects which are of interest of industry and researchers including

- Bio Composite Materials
- Gas Separation Membranes
- Liquid Separation Membranes
- Polymer Recycling
- Paint Manufacturing
- Polymer Composites
- Polymer Synthesis
- Conducting Polymers
- Synthetic Resin Manufacturing
- Rubber
- Dipped Goods
- Pervaporation
- Adhesives
-



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ACADEMIC PROGRAMMES

With the industry and interuniversity collaboration, a two year M.Phil polymer technology program is introduced and the first session 2011-2013 is successfully launched. This multidiscipline program has 34 students from the field of Chemistry, Physics, Chemical Engineering, Metallurgy and Material Engineering disciplines. With the extensive courses and laboratory work and a thesis, this program focuses on all aspects of evolving polymer fields from synthesis and characterization to engineering and physics. It's again a fortunate coincidence that both chemical and polymer engineering are components of the faculty of Engineering & Technology at University of the Punjab that have lot of knowledge and teaching faculty to share in favour of students. There is strong intent that our faculty and students will participate extensively in collaborative research program with other universities, industries, and national laboratories. Department started M.Phil Polymer Technology Program and the first session 2011-2013 is successfully launched. This multidiscipline program has 34 students from the field of Chemistry, Physics, Chemical Engineering, Metallurgy and Material Engineering disciplines. The next intake will also include professionals from the field of Civil Engineering, Mechanical Engineering, Petroleum Engineering and Environmental Sciences as well. So we have planned to bring different professionals of sciences and engineering at one platform not only to teach them but to train them for professional national and international market. Along with theoretical concepts of Polymer and Material Engineering our strong emphasis is on Practical working on Machines and Research Projects. The degree program in the polymeric technology is a fresh and high-potential avenue for the educating youngsters. As polymers find an ever increasing use in manufactured products, polymer technology has a globally sustainable future. The national polymer industry asks for addressing of it's everyday issues: non-availability of qualified polymer engineers, poorly trained plant technicians, lack of research and development activity at their plants and joint ventures with academia. University of the Punjab in close association with the Higher Education Commission seems to be determined to patronize the dissemination of polymeric studies as part of the national responsibility. The newly established department of polymer Engineering & Technology at University of the Punjab can play a strong professional role in this regard with all the solid infra structure of laboratories and the study programs to be conducted.

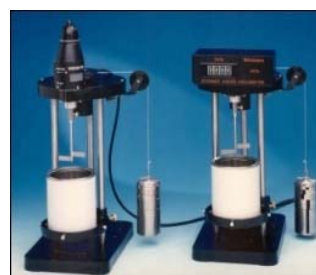
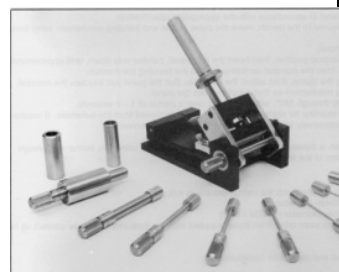


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RESEARCH PAPERS

Over 20 papers have been published in the past 3 years in national and international journals by independent or joint working of department of Polymer Engineering & Technology. This indicates the success and working of our researchers for the field of research and development. List of published research papers is as under

- Effect of additives on the properties and performance of cellulose acetate derivative membranes in the separation of isopropanol/water mixtures; **Desalination** (Article in Press, DES 11100, No. of pages 7,)
- Our researcher presented Paper In 4th Symposium On Engineering Sciences on Pervaporation ICET PU LHR and won **Best Presenter Award** in March 01, 2011
- [Synthesis of polypyrrole/zinc oxide composites and study of their structural, thermal and electrical properties](#). Aisha Batool, Farah Kanwal, Muhammad Imran, Tahir Jamil, Saadat Anwar Siddiqi. *Synthetic Metals* 161(23–24), 2753 (2012).
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- [Modification of cellulosic fabric using polyvinyl alcohol, Part-II: Colorfastness Properties](#). Mohammad Zuber, Khalid Mahmood Zia, Ijaz Ahmad Bhatti, Tahir Jamil, Fazal-ur-Rehman, Ali Rizwan. *Carbohydrate Polymers*, 87(4, 1), 2439(2012).
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- [Modification of cellulosic fiber with polyurethane acrylate copolymers. Part I: Physicochemical properties](#). Misbah Sultan, Khalid Mahmood Zia, Haq Nawaz Bhatti, Tahir Jamil, Rizwan



Hussain, Mohammad Zuber. *Carbohydrate Polymers*, 87(1-4), 397(2012).

- [Cytotoxicity and mechanical behavior evaluation of chitin-bentonite clay based polyurethane bio-nanocomposites](#). Khalid Mahmood Zia, Mohammad Zuber, Mehdi Barikani, Rizwan Hussain, Tahir Jamil, Sohail Anjum *International Journal of Biological Macromolecules*, 49 (5-1), 1131(2011).
- [Preparation of rich handles soft cellulosic fabric using amino silicone based softener, part II: Colorfastness properties](#). Mohammad Zuber, Khalid Mahmood Zia, Shazia Tabassum, Tahir Jamil, Syed Barkaat-ul-Hasin, Muhammad Kaleem Khosa, *International Journal of Biological Macromolecules*, 49 (1), 1(2011).
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- Synthesis And Characterization Of Polyacrylonitrile Copolymers (JPICHE) Vol. XXXVII, ISSN 1813-4092, pg 61-67; 2009
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DEPARTEMENT OF POLYMER ENGINEERING AND TECHNOLOGY UNIVERSITY OF THE PUNJAB

INFORMATION ABOUT OUR RESEARCH SUPPORT OR COLLABORATIONS

Department is providing testing services to industries for testing of their products. We are working with industries for development of new projects and also enhancement of their product quality. Also Polymer Research Laboratories is giving services for testing of samples of universities and research organizations for completion of thesis of students and completion of research projects. Organizations that are in collaborations with Department of Polymer Engineering & Technology are:

UNIVERSITIES

- Department of Chemistry PU Lahore
- Government College University (GCU) Lahore
- Government College University (GCU) Faisalabad
- National University of Sciences and Technology (NUST) Islamabad
- Plastic Technology Center (PTC) Karachi
- Quaid-e-Azam University Islamabad
- Center for Solid State physics PU Lahore.
- Demont Morrency College of Dentistry Lahore
- Bahaudin Zakria University (BZU) Bahawalpur
- University of Engineering & Technology (UET) Lahore

INDUSTRIES

- Reliance Polymer Industries Lahore
- Power Chemicals Faisalabad
- Anwar Khawaja Industries Sialkot
- Shafi ResoChem Industries Lahore
- UniFoam Lahore
- Wah Nobel Gp of Industries Wah Cantt

FACULTY HIRING AND TRAINING OF MAN POWER

Department of Polymer Engineering in collaboration with HEC projects has a team of Researchers (Chemists/ Engineers) and Research Technicians. These projects gave training to researchers and technicians who are now performing in projects and also giving services in different sectors of Polymer and Material Engineering across country in national and multi nationals groups as well as in abroad. Currently two Researchers and one Research Technician are working on HEC project. Six Researchers and four Research Technicians have worked on HEC projects. Currently department have two lecturers and one lab supervisor on adhoc basis.



DEPARTEMENT OF POLYMER ENGINEERING AND TECHNOLOGY UNIVERSITY OF THE PUNJAB

FUTURE GOALS

- Society of polymer and material engineering (SPME)
- Polymer Club
- B.Sc Polymer Engineering
- Ph.D Polymer Engineering
- International Accreditation of labs
- Revenue generation
- Industrial Research Project
- Research papers publications on national and international high impact journals



HEC NEWS LETTER

NEWS & VIEWS

Higher Education Commission, Pakistan

June 2012



VCs' Forum on Higher Education in the Islamic World

P - 2

6 Pakistani Universities among Top 300 Asian Universities

P - 5



HEC, Universities Participate in Education Expo

P - 4

Department of Polymer Engineering and Technology Inaugurated at University of the Punjab

A new Department of Polymer Engineering and Technology has been established at University of the Punjab, Lahore. Dr. Mujahid Kamran, Vice Chancellor of the University recently inaugurated the Department.

Polymeric materials and their application have acquired a respectable place in all aspects of our daily life. The world today has much dependence on plastics and polymers in extended territories of medical care, electronic device casings, packaging and storage, textiles and foams, liquid and gas transportation, beds and baths, furniture, automobiles and a lot more.

Though the Department of Polymer Engineering and Technology was notified in 2004, it remained inactive due to lack of necessary infrastructure. Hired from USA under HEC's Foreign Faculty Programme, Dr. Tahir Jamil started working on the establishment of necessary infrastructure for polymer and material research laboratories and academic programmes.

Through HEC's financial support and logistical push of the University, the state-of-the-art facility has been established in Faculty of Engineering and Technology.



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With the industry and interuniversity collaboration, a two year MPhil polymer technology programme has been introduced and the first session 2011-2013 has successfully started.

The multidiscipline programme has 34 students from the field of Chemistry, Physics, Chemical Engineering, Metallurgy and Material Engineering disciplines. With the extensive courses and laboratory work and a thesis, the programme focuses on all aspects of

evolving polymer fields from synthesis and characterization to engineering and physics.

The Department has been working on a number of research projects which are of interest to industry as well as researchers.

The Department is looking forward to advance various activities and projects like Society of Polymer and Material Engineering (SPME), Polymer Club, BSc Polymer Engineering, PhD Polymer Engineering, International Accreditation of labs, Revenue generation, Industrial Research Project as well as research paper publications on national and international high impact journals.