

## **Institutional Distinctiveness**

University has put forth many of its resources in building the Center of Excellences in collaboration with universities of International repute. The food security Center of Excellence is established with Tel Aviv University, Israel and Punjab Agricultural University, Punjab. The center works closely with the farmers and villagers. Under this university has established Digital Villages, they develop and provide digital solutions to the farmers. The center also works in the area of enhanced treatment of wastewater without energy investment and biofuel production. Another major area of work under this center is development of biosensor platforms and development of affordable processing technologies for mitigation of post-harvest losses. The following projects are undergoing at the center: Digital Villages: A Data-Driven Approach to Precision Agriculture in Small Farms, Post harvesting – Biosensor Platforms and Development of affordable Processing Technologies for mitigation of Post-Harvest losses in tropical fruits (GUAVA), Enhanced treatment of wastewater using a synergy of microalgae and microorganisms - without energy investment and biofuel production, and Developing delivery system of CAS9/gRNA to a tissue culture of wheat and barley for genome editing of agronomic traits.

The Center of Excellence in Emerging Materials is established with Virginia Tech, USA. The major areas of work in the center are Coal derived graphene, Bio X, Composites, Others, including U2R (unintended and unencumbered research) projects. The researchers involved are working tirelessly to design and develop products, publish their results in the journals of international repute and share their experiences through conferences and workshops. The research projects are executed by various outstanding faculty members of Thapar University. Post-doctoral researchers, PhD scholars, PG and UG students are involved in the project. This gives a unique opportunity to our PG and UG students to choose a research-intensive path as their future careers. 14 projects out of a total of 34 projects submitted were selected through a thorough review process for funding. Fourteen projects under high risk, high reward category selected at exploratory funding levels. “Coal to Graphene” recipe successfully adapted from Virginia Tech, USA. Graphene oxide successfully synthesized at the center and coal derived quantum dots are synthesized. Graphene coated epoxy smart coatings on steel found to stop corrosion at a time scale of a factor of more than 10 viz a viz plain steel bars (e.g. compared to 10-15 years, life expectancy goes above a century). The center is planning to file a patent. We are developing Nano-Coated Antimicrobial Composite System to Resist Water Borne Infection.