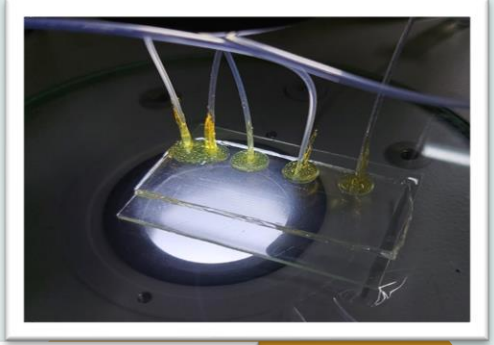
భారతీయ సాంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్
भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

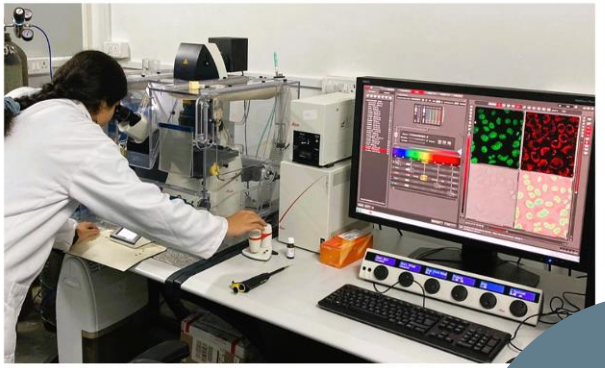
POLYMER & BIO - SYSTEMS ENGINEERING

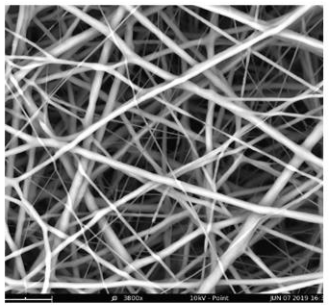
Brochure 2022-23

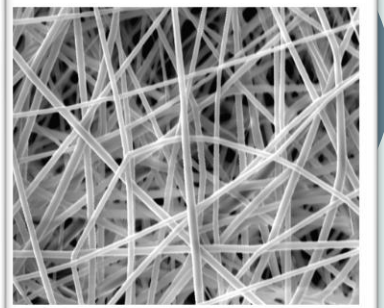
Message from PBS Coordinator.

- The Polymer and Biosystems (PBS) program is an interdisciplinary initiative at (IIT) Hyderabad aimed at training students in skilfully solving engineering problems in the emerging areas of **artificial intelligence(AI), polymer science, drug design and microfabrication .**
- Emphasis on advanced courses in Statistics, AI and Machine Learning(ML) allowing students to adapt and comprehend market needs.
- Hands-on training in research projects that have potential applications in healthcare and allied sectors.
- Industry experiences in the form of lectures and interactive sessions from prominent industry personnel (IBM, GeneTech, JMP, ANSYS & startups like Malai Biomaterial and E-Spin Nanotech).
- Establishing a long-term partnership with industries to work on problems of mutual interest to develop sustainable technologies for medical diagnostics.









OUR COURSES.

01

AI/ML And Computational Simulations

- ❑ Basics & Applications of AI/ML
- ❑ Data Visualization and Analysis in Research
- ❑ Statistical Hypothesis Testing
- ❑ Design of Experiments
- ❑ Programming in MATLAB & Python

02

Pharmaceuticals & Healthcare

- ❑ Transport Phenomena in Biological Systems
- ❑ Physical Biology
- ❑ Systems Biology
- ❑ Bio-Macromolecular Engineering
- ❑ Polymeric Biomaterials
- ❑ Characterization of Polymer & Bio Systems

03

Polymers/ Advanced Materials

- ❑ Inter-molecular & Surface Science
- ❑ Concept in Soft Matter Systems
- ❑ Advanced Fabrication
- ❑ Molecular Thermodynamics
- ❑ Polymer Processing and Rheology

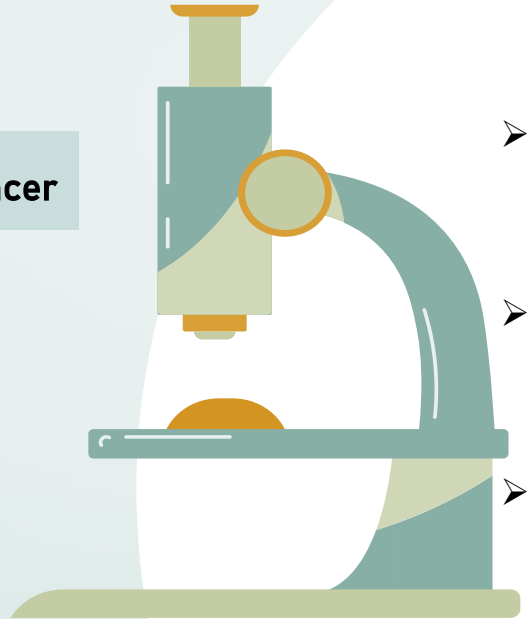
RESEARCH IN AI/ML {Healthcare and Materials}.

- Neuroscience
- AI/Machine Learning
- Data Science & Analysis

- **Neural Engineering:** AI/ML based data analysis and feature extraction from various images dataset using Convolutional Neural Networks (CNN) framework.
- **Live imaging and data analysis**: Investigation on the biophysical factors regulating the assembly and disassembly of stress granules in context of cancer.
- **Integrated framework for EEG data analytics using computation of microstates**: Towards development of mobile app.

RESEARCH IN ADVANCED MATERIALS.

- Metal-Sulphur Batteries
- Infectious Diseases and Cancer
- Microfluidics & Microfabrication



- Bacterial cellulose derived Carbon as Electrode and Interlayer for **Metal Sulfur Batteries.**
- **Engineering functionalized biomaterial matrices** for cancer immuno-therapeutics.
- **Microfluidics aided patterned nanofibrous materials** based on bacterial cellulose.
- Smartphone imaging integrated 3D printed microflow device for protein detection.

INDUSTRIAL LECTURES.

E-SPIN NANOTECH

IBM

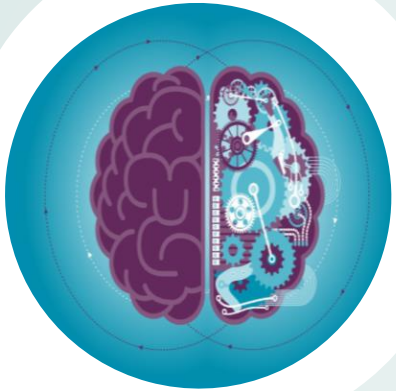
GeneTech

jmp
Statistical Discovery.™ From SAS.

ANSYS®

malai

FACULTY PROFILES.



Dr. Kishalay Mitra

- Machine Learning
- Bayesian Optimization
- Supply Chain optimization
- Optimization Under Uncertainty

Dr.Balaji Iyer

- Biomimetic Materials
- Structure-Function relationships
- Biophysics, Polymer Physics
- Multicomponent Simulations

Dr. Harish Nagaraj Dixit

- Interfacial flows
- Multiphase flows
- Hydrodynamic stability
- Electrohydrodynamics

Dr. Mudrika Khandelwal

- High performance green composites
- Liquid crystals and self-assembly
- Anti-fouling and anti-microbial materials
- Materials for tissue scaffolding

Dr. Chandra Shekhar Sharma

- Hierarchical Nanostructured Polymer
- Carbon based MEMS
- Bio-MEMS
- Bio-inspired functional surfaces
- Waste Management

FACULTY PROFILES.

Dr.Lopamudra Giri

- Neuroimaging
- Systems Biology
- Drug screening
- GPCR targeting drugs
- Data analysis

Dr. Suhanya Duraiswamy

- Microfluidics
- Microreaction engineering for nanochemistry
- Biodiagnostics
- Microparticles synthesis and manipulations

Dr. Ashish Mishra

- Cancer Genomics and Therapeutics
- Machine Learning
- Genome Editing
- Protein Engineering

Dr.Satyavrata Samavedi

- Polymer physics & characterization
- Electrospinning
- Biomaterials
- Drug delivery
- Inflammation

Dr. Debaprasad Shee

- Catalysis over supported metals and metal oxides
- Nanostructured catalysts
- Structure property correlations
- Fuels and chemicals from renewable sources
- Reaction Kinetics

Dr.Saptarshi Majumdar

- Multiscale Design of Polymeric Biomaterials
- Multiscale Simulations
- Industrial Process and Analysis

CURRENT PROSPECTS OF ALUMNI.

{PREVIOUS JOB OFFERS| HIGHER STUDIES}

DIPANJAN SEHANOBISH

Daftcraft, Japan
Role: AI Engineer

AVNIKA PANT

Washington University
St. Louis
Role: PhD

APURVA ANJAN

Waseda University, Japan
Selected for JICA Fellowship
Role: PhD

MUKUL CHOWDHURY

Centre for Health Care Entrepreneurship
Working on disclosure article
IIT, Hyderabad

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Student In-Charge

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Kindly register through our Office of Career Services (OCS) Portal.

For further information visit,

Website: https://ocs.iith.ac.in/