S.No.	Problem Title	Problem Statement	Faculty	Domain	Skills Required	Desired Qualification	Duration	Contact
1	ARMI: Autofluorescence-Raman Mapping Integration	Develop multimodal imaging + AI framework for prostate cancer stratification	Dr. Pooja Lahiri	Molecular Pathology Biochemistry Vibrational Spectroscopy Biophotonics	Essential: 1. Fluorescence Microscopy 2. Basic molecular biology wet lab 3. Basic ML understanding Desirable: 1. Molecular Pathology for Cancer 2. Handling of micro-spectroscopes (FTIR and RAMAN) 3. Biological Sample Preparation	M.Tech/MSc. Biomedical Engineering, Biomedical Science, Biotechnology, genetic engineering, biochemistry or allied disciplines MBBS students with one year of house internships	3–5 years	plahiri@atdc.iitkgp.ac.in
2	FTIR-based MASLD/NASH Diagnostics	Develop serum-based spectral biomarkers for MASLD stratification with explainable ML	Dr. Pooja Lahiri	Clinical Spectroscopy Biochemistry	Essential: 1. Hands-on experience in fluorescence and optical microscopy. Knowing confocal microscopy will be an advantage 2. Basic training in molecular biology wet lab techniques (sample handling, assays, etc.) 3. Foundational understanding of machine learning concepts (classification, feature extraction) Desirable: 1. Background in molecular pathology of metabolic diseases and cancer 2. Experience in handling micro-spectroscopy systems (FTIR and Raman) 3. Expertise in biological sample preparation (serum/tissue processing, storage protocols)	M.Tech/MSc. Biomedical Engineering, Biomedical Science, Biotechnology, genetic engineering, biochemistry or allied disciplines MBBS students with one year of house internships	3–5 years	plahiri@atdc.iitkgp.ac.in
3	ICMR Funded: 3D-Printed Dissolvable Microneedle Array with baselayer of Transparent, Wet-Adhesive HydrogelLens for Corneal Alkali Burn to prevent neovascularization, inflammation, scarring, microbial infection with corneal regeneration (3DmicroLens)	Microneedle for corneal regeneration	Dr, Nandita Dasgupta	Polymer Technology, Mechanical Engineering, Chemistry, Bioengineering	Essential: B.Tech/B.E./M.Tech./M.Sc./M. Pharm/MS in Polymer Technology, Mechanical Engineering, Chemistry, Biotechnology, Bioengineering, Biomedical Engineering, Pharmaceutical Engineering and allied streams AND GATE Qualified in relevent subject Desirable: Working experience in 3D Bioprinting, Designing, and Finite elemental analysis	B.Tech/B.E./M.Tech./M.Sc./M.Pharm/MS in Polymer Technology, Mechanical Engineering, Chemistry, Biotechnology, Bioengineering, Biomedical Engineering, Pharmaceutical Engineering and allied streams AND GATE Qualified in relevent subject	3-5 Years	nandita@atdc.iitkgp.ac.in
4	ANRF-ARG Grant: Modelling Drug-Induced Liver Injury (DILI) in High-Throughput Organ- on-chip device with integrated Electrochemical system	Microfluidics based organ-on-chip device with integrated electrochemical system	Dr, Nandita Dasgupta	Polymer Technology, Mechanical Engineering, Chemistry, Bioengineering	Essential: B.Tech/B.E./M.Tech./M.Sc./M. Pharm/MS in Polymer Technology, Mechanical Engineering, Chemistry, Biotechnology, Bioengineering, Biomedical Engineering, Pharmaceutical Engineering and allied streams AND GATE Qualified in relevent subject Desirable: Working experience in 3D Bioprinting, Designing, and Finite elemental analysis	B.Tech/B.E./M.Tech./M.Sc./M.Pharm/MS in Polymer Technology, Mechanical Engineering, Chemistry, Biotechnology, Bioengineering, Biomedical Engineering, Pharmaceutical Engineering and allied streams AND GATE Qualified in relevent subject	3-5 Years	nandita@atdc.iitkgp.ac.in