PMRF-ISSS Teaching Programme

Prime Minister Research Fellowship students' teaching requirement facilitated by the Institute of Smart Structures and Systems

Module PMRF-ISSS021/2025

Material and Optical Characterization Techniques

Name of the PMRF student

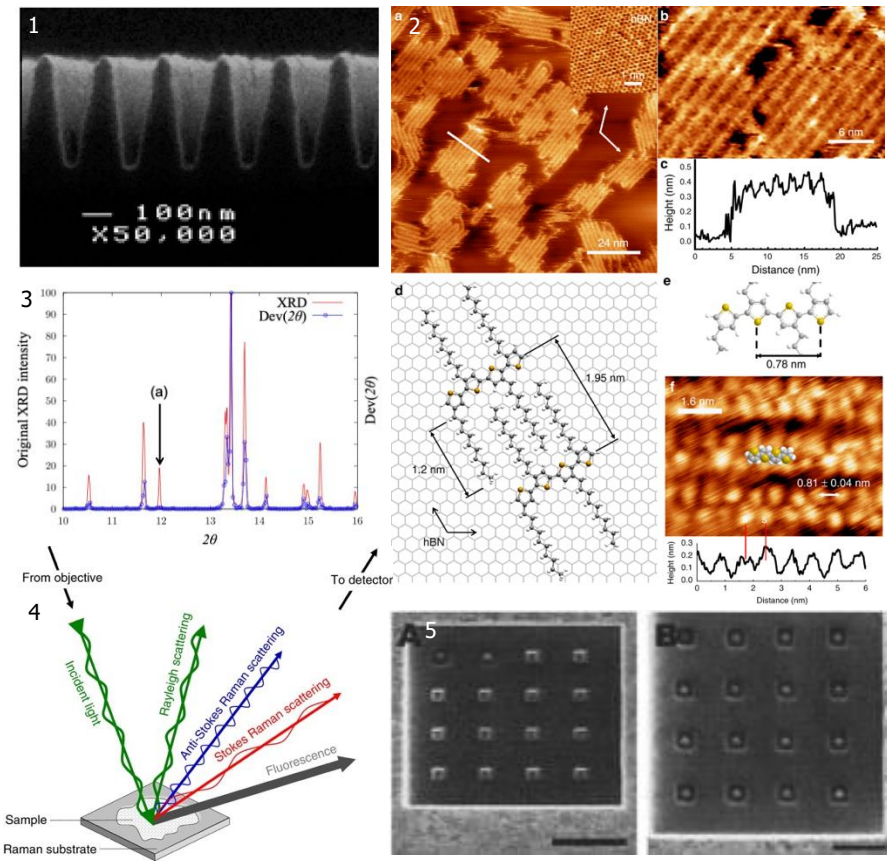
Wridheeman Bhattacharya

Required background of the students taught

Final Year UG and PG students in Electrical and Electronics Engineering, Physics, material science, Metallurgical Engineering, and other disciplines.

Online Session Coordinator

Will be chosen from the list of final registrants.



1. https://pubs.acs.org/doi/full/10.1021/jp911355q
2. https://doi.org/10.1038/s41467-019-09571-6
3. https://doi.org/10.1002/adts.202200613
4. https://doi.org/10.1038/nprot.2016.036
5. https://doi.org/10.1116/1.3013329

Details of the content of the module

Course Outline:

Material Characterization

1. Scanning Electron Microscope (SEM)
2. Transmission Electron Microscope (TEM)
3. Atomic Force Microscopy
4. X-Ray Diffraction
5. Focused ion beam machining
6. Energy-Dispersive X-ray Spectroscopy (EDS)
7. Thin Film and Stress Measurement

Optical Characterization

1. Optical Microscopy
2. Ellipsometry
3. Optical Profilometry
4. Raman Spectroscopy
5. UV-Visible Spectroscopy
6. Fourier Transform Infrared (FTIR) Spectroscopy
7. X-ray Photoelectron Spectroscopy (XPS)

Other Additional methods

1. Dynamic Light Scattering
2. Film Stress Measurement
3. Hall measurement
4. Minority Carrier Characterization
5. Reflectometry
6. Resistivity with 2- probe, 4- probe and van der Pauw technique

Schedule of the module

Start Date – 8th March, 2025

Lecture Schedule – Two recorded lectures of 1.5 hrs duration will be uploaded every Saturday; 20 lectures

End Date – 10th May, 2025

Contact:
eez238344@ee.iitd.ac.in/wridheeman@gmail.com

Meeting link : Will be shared later

Link

Contact email ID: isss.forum@gmail.com

Registration link:
https://forms.gle/vYKFYaa5q7hgQrHP8