PHOTOVOLTAIC TECHNOLOGY AND INNOVATION CENTRE (PoTIC)
and
NATIONAL CENTRE FOR PHOTOVOLTAIC RESEARCH AND EDUCATION

Continuing Education Program 4-Day Short-Term Course on

"Theory, Technology and Manufacturing of Silicon Solar Cells"

In the context of incentives for manufacturing of solar cells and modules in India, a large workforce with the knowledge of the technology and manufacturing is needed in the country. This course aim to impart the necessary knowledge in a short span of time. The course will cover the theory of solar cells, design of silicon solar cells, fabrication technology, characterisation of silicon wafers and partially and fully processed solar cells, and industrial manufacturing of TOPCon solar cells. The course will benefit practising engineers, students who aspire to work in this industry, and educators who are planning to train such students.

Course Contents:

- Introduction to the physics of semiconductor devices (band diagram, optical absorption, generation-recombination, charge carrier transport)
- Theory of silicon solar cells (equation governing the current voltage characteristics of solar cells, characteristics of silicon solar cells, design of silicon solar cells - optical design, junctions, passivation, impact of these parameters on solar cell characteristics)
- Production of silicon wafers starting with quartzite
- Unit Processes for Solar Cell Fabrication
- Introduction to TOPCon and HJT solar cell technologies and tandem solar cells.
- Characterisation of solar cells and wafers: Sheet resistance measurements, Electrochemical capacitance – voltage (ECV) measurements, ellipsometry, minority carrier lifetime, photoluminescence, dark IV, lighted IV and quantum efficiency, photoluminescence and electroluminescence imaging.
- Deep dive into TOPCon solar cell manufacturing **covered by an industry expert** - TOPCon Processes (Detailed introduction of each process step covering an overview of equipment, process and important aspects related to production), UV-induced degradation of TOPCon solar cells, application of LECO for contact formation, Ag-lean metallization pastes, and TOPCon patent analysis.

Lab visits: The course would include visits to NCPRE's silicon solar cell fabrication and characterisation facilities. You may also get an opportunity to visit our module characterization and fabrication facilities if there is a specific interest.

Course Coordinator: Prof. Anil Kottantharayil, Department of Electrical Engineering, and co-Principal Investigator of the National Centre for Photovoltaic Research and Education (NCPRE), IIT Bombay

Industry Resource Person: Dr. Mehul Raval, Deputy CTO, RCT Solutions GmbH, Germany

Date: July 1 - 4, 2026

Venue: IIT Bombay, Mumbai
The course fee per participant in INR are as follows:

PARTICIPANT CATEGORY	Fees (INR)
Indian Students	11800
International Students	35400
Government Employee/Academician	23600
Indian Corporate Employee	37760
International Corporate Employee	113280

* Fee is inclusive of 18% GST. The fee includes course material, lunch and refreshments.
**The fee for participants from SAARC countries is the same as that for Indian participants.

Limited accommodation is available on the IIT Campus, including hostels for students and a guesthouse for others, at rates determined by the hostel and guesthouse administrations. If you would like to avail accommodation on campus, please get in touch with Mrs. Ashwini Bangera at the details given below.

Registration Link:

Contact for more information:

Mrs. Ashwini Bangera
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