KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY

Deemed to be University U/S 3 of the UGC Act, 1956

SCHOOL OF ELECTRONICS ENGINEERING

SUMMER TRAINING PROGRAM 2025

FABRICATION & CHARACTERIZATION OF SEMICONDUCTING DEVICES FOR SENSING APPLICATIONS

Research-driven and Industry-oriented Curriculum in Electronics and Computing

COURSE OBJECTIVE

The objective of this course is to provide students with comprehensive knowledge and hands-on experience in the design, fabrication, and characterization of semiconducting devices tailored for sensing applications. The course aims to equip learners with an understanding of semiconductor materials, micro/nanofabrication techniques, and analytical methods used to evaluate device performance, with a focus on their integration into chemical, biological, and environmental sensors.

COURSE OUTCOMES

- **Understand Semiconductor Materials and Device Physics:** Students will be able to explain the fundamental properties of semiconductor materials and their relevance in designing sensing devices.
- **Apply Fabrication Techniques for Sensor Development:** Students will gain practical skills in micro/nanofabrication processes such as photolithography, thin-film deposition, and etching for constructing semiconducting sensors.
- **Characterize and Evaluate Sensor Performance:** Students will be able to perform electrical and structural characterization of semiconducting devices and interpret data to assess sensing efficiency, sensitivity, and reliability.

COURSE DURATION:	40 + Project (20)
COURSE FEE:	• KIIT Affiliation: Rs. 4000/-* • Other Affiliation: Rs 5000/-* *(Exclusive of Fooding & Lodging)
TEACHING LEARNING MODE:	Hybrid Mode
COURSE INSTRUCTORS:	• Dr.(Prof.). U. P. Singh • Dr. Arindam Basak
COURSE EVALUATION:	Continuous Evaluation
COURSE CERTIFICATE:	After successful completion of the course.

MODULE
DESCRIPTOR FOR THE COURSE

MODULE 1

SYNTHESIS AND FABRICATION TOOLS:

- Thermal and Co-evaporation
- DC/RF sputtering
- Chemical Bath Deposition
- Dip Coating
- RTPs

SIMULATION TOOL:

- SCAPS 1D introduction

MODULE 2

SPECTROSCOPIC ANALYSIS:

- UV-VIS-NIR Spectrophotometry

SIMULATION TOOL:

- Device parameter variation and result optimization using SCAPS 1D simulation

MODULE 3

STRUCTURAL ANALYSIS:

- X-Ray Diffraction (XRD)
- EDXRF

MODULE 4

ELECTRICAL CHARACTERIZATION:

- Hall Effect
- I-V and C-V measurement
- Device parameter measurement and validation with SCAPS 1D

CONTACT US

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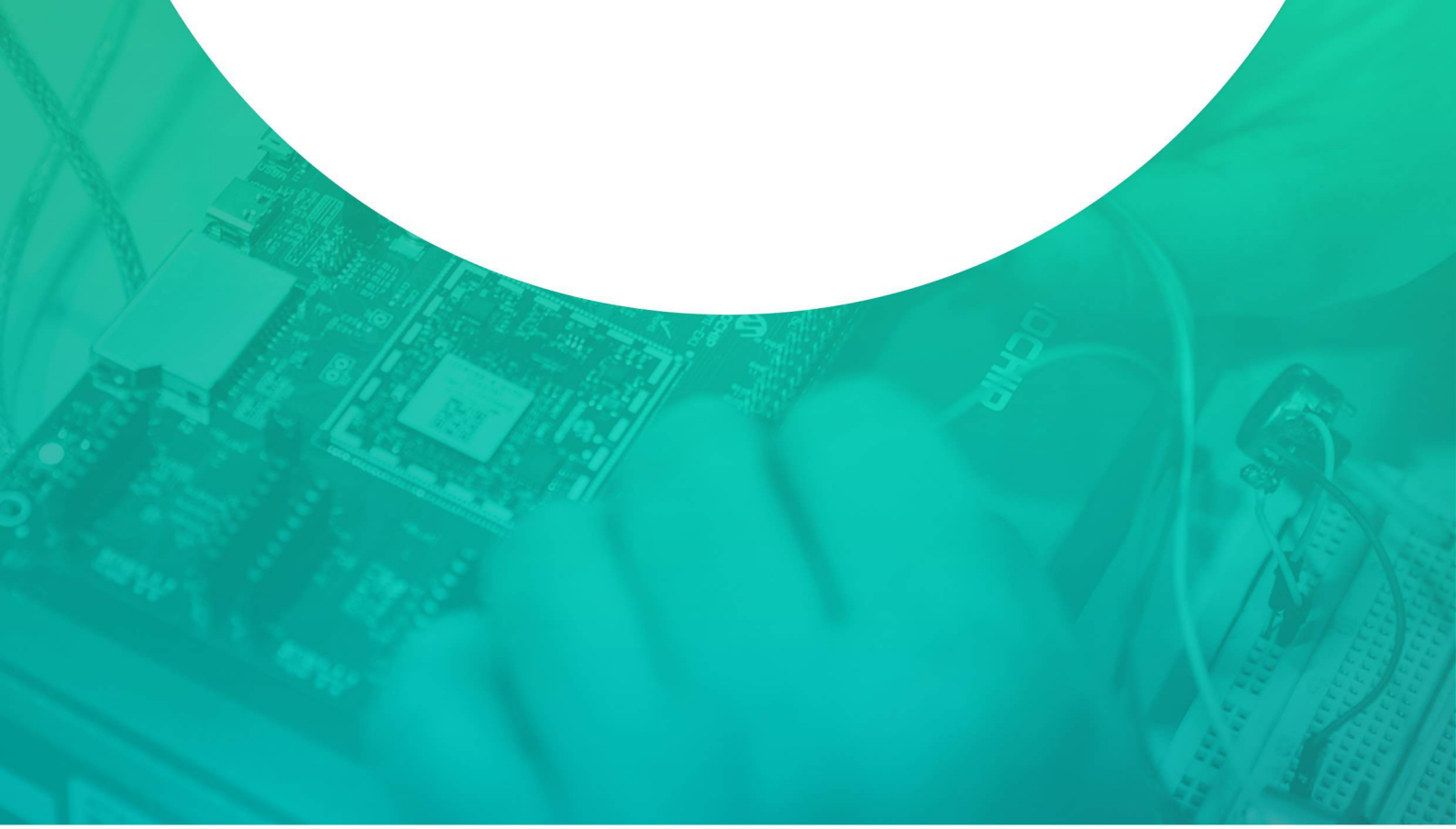

DEPARTMENT OF ELECTRONICS ENGINEERING

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