

## Resource People :

1. **Prof. Partha Pratim Sahu** (Senior Member, IEEE), Professor at Department of Electronics and Communication Engineering, Tezpur University, Assam, India
2. **Prof. Krishna Raj** (Member-IEEE), Professor & HoD at Department of Electronics Engineering, Harcourt Butler Technical University Kanpur, Uttar Pradesh, India
3. **Dr. N. B. Balamurugan** (Senior Member, IEEE), Associate Professor at Department of Electronics and Communication Engineering, Thiagarajar College of Engineering Madurai, Tamil Nadu, INDIA
4. **Dr. Rupam Goswami** (Member-IEEE), Assistant Professor at Department of Electronics and Communication Engineering, Tezpur University, Assam, India.
5. **Dr. Sunil Pandey** Analog Design Engineer, Intel Corporation, India.
6. **Dr. Rajesh Saha** (Senior Member, IEEE), Assistant Professor at Department of Electronics and Communication Engineering, MNIT Jaipur, Rajasthan, India.
7. **Dr. Kavindra Kandpal** (Senior Member, IEEE), Assistant Professor at the Electronics and Communication Engineering department of IIIT-Allahabad
8. **Dr. Suman Kumar Mitra** (Member-IEEE), Assistant Professor at Department of Electronics Engineering, Harcourt Butler Technical University Kanpur, Uttar Pradesh, India.

**No Registration Fee**

Note:

**Closing of registration: 04.06.2021 or 250 participants whichever is earlier.**

Preference: **Faculty/Industry person -> Research Scholar -> PG Student -> UG Student**

Registration Details: Participants can register using the following Google Form link:

<https://forms.gle/iwGzZvozHfj41FcQ6>

## Patron

**Prof. Samsher**

Hon'ble Vice Chancellor  
HBTU Kanpur

**Prof. S. K. Singhal**

Dean, School of Engineering  
H.B.T.U. Kanpur

## Convener & Chairperson

**Prof. Krishna Raj**

Head, Department of Electronics  
Engineering  
HBTU Kanpur

## Coordinators

**Dr. Suman Kumar Mitra**

Assistant professor (NPIU) &  
Faculty Counselor, HBTU IEEE Student  
Branch,

**Dr. Manish Kr. Singh**

Assistant Professor (NPIU)  
Department of Electronics Engineering  
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## Deputy Coordinator

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05-Day Online National Level  
Faculty Development Program  
(FDP) - cum - Short Term  
Training Programme (STTP)  
On

**“Simulation, Modelling, and  
Application of Advanced  
Semiconductor Devices”**

**July 05-09, 2021**

## Convener

**Prof. Krishna Raj**

## Coordinator

**Dr. Suman Kumar Mitra  
Dr. Manish Kumar Singh**

## Organised by

DEPARTMENT OF ELECTRONICS  
ENGINEERING  
SCHOOL OF ENGINEERING  
HARCOURT BUTLER  
TECHNICAL UNIVERSITY  
KANPUR-208002, UTTAR PRADESH

IN ASSOCIATION  
WITH  
HBTU IEEE STUDENT  
BRANCH

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### 3. Objectives of the FDP - cum – STTP:

- 1.To deliver a diverse training program on semiconductor devices for students, and young professionals.
- 2.To emphasize on modeling aspects, and non-conventional analyses of semiconductor devices.
- 3.To deliver training on industrial device simulators for creating an opportunity to work on more focused problems of research.
- 4.To create awareness on applications of semiconductor devices, and allied concepts.
- 5.To create an opportunity for exchange of knowledge through a common platform.

### 4. Topics to be covered:

1. Historical perspectives of semiconductor devices
2. Fundamental concepts in semiconductor devices
3. Tunnel Field Effect Transistors: theory and modeling
4. FinFETs: theory and modeling
5. Statistical analyses of FinFETs
6. Thin Film Transistors: theory and modeling
7. Interdisciplinary aspects of semiconductor devices
8. Applications of TFETs
9. Familiarization of Sentaurus TCAD by Snyopsys Inc.

### 5. Software Demonstration:

Synopsys TCAD simulation process for new generation semiconductor devices.

### 6. Who can participate:

Any interested Undergraduate/Post-graduate student, Research Scholar, Academician & Industry Person can join this program

### 7. Online platform:

Google MEET, Joining link will be provided in participants registered email ID.



## 1. About H.B.T.U., Kanpur

Harcourt Butler Technical University, Kanpur came into existence on September 01, 2016 by U.P. Govt. Act. No. – 11, 2016 as a result of the up-gradation of Harcourt Butler Technological Institute which was established in 1921 as a 'Government Technological Institute' by Sir Spencer Harcourt Butler, the first Governor of United Provinces (now Uttar Pradesh) and was renamed as HBTU in 1926. It has entered in the centenary year by its tradition of excellence in technology & engineering education, research and innovations. I

On academic front, the University is running four Schools: School of Engineering, School of Chemical Technology, School of Basic & Applied Sciences, School of Humanities & Social Sciences with thirteen Undergraduate Programmes in Chemical Engineering, Civil Engineering, Computer Science & Engineering, Electrical Engineering, Electronics Engineering, Information Technology, Leather Technology, Mechanical Engineering, Biochemical Engineering, Food Technology, Oil Technology, Paint Technology and Plastic Technology along with M.C.A, full time & part time M.Tech. programmes in various disciplines and full time and part time Ph.D. programmes in number of disciplines as part of Quality Improvement Programme of MHRD and TEQIP-III. The University is being operated in two campuses, the east campus has an area of 77 acres while the west campus has an area of 250 acres which are situated 3 km apart.

## 2. About the Department of Electronics Engineering

The Department of Electronics Engineering was established in 1990. It offers B. Tech. in Electronics Engineering with intake of 78 students and M. Tech. in Electronics and Communication Engineering with intake of 21 students. The Department has successfully implemented many sponsored projects funded by World Bank and Swiss Govt, AICTE, DST, DRDO and TEQIP.

The Department is having well equipped labs and software for Semiconductor device simulator, Optical device simulator, Virtual Instrumentation, VLSI Design, PCB Design, Signal Processing, Optical Networks etc.. Various extracurricular activities are regularly organized by the students under the aegis of HBTU IEEE Student Branch, IETE HBTU ISF & Association of Electronics Engineers for their overall development.

The Faculty of the Department is well qualified and associated with Institutes of repute like IITs, IISc, NITs and has published several papers in referred Journals and Conferences of National and International repute. Several National Level Seminars, Conferences, Faculty Development Programmes,

## Day 1 | 05.07.2021

**11.00 a.m.-11.30 a.m.** Inauguration

**11.30 a.m.-1.30p.m.**

**Lec 1:** Evolution and fundamentals of semiconductor devices

**2.30 p.m.- 4.30 p.m.**

**Lec 2:** Tunnel-FET & FinFET: needs, performance aspects and statistical analysis

## Day 2 | 06.07.2021

**10.00 a.m.- 11.00 a.m.**

**Lec 3:** Modelling Strategies in FinFET

**11.00 a.m.- 12.00 p.m.**

**Lec 4:** Emerging FETs for Analog/RF Circuit Applications

**2.00 p.m.-3.00 p.m.**

**Lec 5:** Modelling Approaches in TFET

**3.00 p.m.-4.00 p.m.**

**Hands-on/Demonstration 1:** Familiarization of Synopsys TCAD Tool

## Day 3 | 07.07.2021

**10.00 a.m.-12.00 p.m.**

**Lec 6:** TFT: theory and modelling approaches

**2.00 p.m. -4.00 p.m.**

**Hands-on/Demonstration 2:** Working on Sentaurus Structure Editor

## Day 4 | 08.07.2021

**10.00 a.m.-12.00 p.m.**

**Lec 7:** Interdisciplinary aspects of Semiconductor Devices

**2.00 p.m.-3.00 p.m.:**

**Lec 8:** Biosensors in Food Technology

**3.00 p.m.-4.00 p.m.:**

**Hands-on/Demonstration 3:** Simulation & Visualization process in Synopsys TCAD

## Day 5 | 09.07.2021

**10.00 a.m.-12.00 p.m.**

**Lec 9:** TFET as Biosensors: theory and modelling approaches

**2.00 p.m.-3.00 p.m.:**

**Hands-on/Demonstration 4:** Simulation and visualization of Advanced MOS Devices

**3.00 p.m.- 3.30 p.m.** Valedictory session