



AICTE Sponsored Short Term Course
On
Modeling and Simulation of Advanced Semiconductor Devices

July 17-22, 2017

Organized by

**Department of Electronics Engineering,
IIT(BHU), Varanasi-221005**



**Quality Improvement Program Center
Indian Institute of Technology (BHU)
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About the Course

The physics based modeling of the electrical and optical characteristics of various semiconductor devices is an important area of research for the growth and development of semiconductor science and technology. While analytical modeling gives the physical inside of the device characteristics, TCAD simulation can provide the first hand information of various advanced semiconductor devices without going through complex mathematical modeling and practical fabrication and experimentation. The basic objective of this short-term course is to introduce various modeling and simulation techniques used for the performance characterization of advanced semiconductor devices including nanoscale field effect transistors (FETs), flexible transistors, nanoelectronic and optoelectronic devices to the young faculty members and research scholars of various technical colleges and universities. While the major emphasis will be given on the modeling and simulation aspects of the advanced nanoscaled CMOS transistors, the modeling and simulation aspects of high performance organic semiconductor based transistors and semiconductor optoelectronic devices will also be discussed in this course. The participants will also be introduced to the use of different industry standard TCAD software (e.g. Silvaco-ATLAS, Synopsis-TCAD and Cogenda-Visual TCAD) for simulating various 2D and 3D semiconductor devices. In addition, various characterization techniques for device analysis will be covered. The course will include both the expert lectures and practical sessions.

Course Content

The tentative list of topics to be covered in this course are:

- ✓ Fundamentals of various Field Effect Transistors (FETs)
- ✓ Scaling of CMOS Devices: Issues and Challenges
- ✓ Advanced MOS Transistors: Tunnel-FETs (TFETs), Fin-FETs, Junctionless FETs, Ferroelectric-TFETs etc.
- ✓ Compact Device Modeling Techniques
- ✓ Flexible Electronics: Organic Field Effect Transistors
- ✓ Optoelectronic Devices: Source and Detectors
- ✓ Introduction to TCAD Device Simulators
- ✓ Hands-on training sessions on TCAD Device Simulators: Silvaco (ATLAS), Visual TCAD (Cogenda), and Synopsys (Sentaurus) TCAD

Course Coordinator

Prof. Satyabrata Jit
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List of Short Term Courses during 2017-18

S No	Department	Course Coordinator	Title of Short Term Course	Duration
1	Civil Engineering	Prof. K K Pathak	APRRAVSCE - 2017	May 29 - June 9, 2017
2	Chemical Engineering & Tech.	Prof. M K Mondal	Recent Advances in Wastewater Treatment	June 26-30, 2017
3	Bio-Chemical Engineering	Prof. Pradeep Srivastava	Advances in Bioprocess Engineering	June 19-25, 2017
4	Mathematical Sciences	Prof. S K Upadhyay	Algebra, Analysis & Application	July 03-09, 2017
5	Electrical Engineering	Prof. M K Verma	Power System Stability & Control in Smart Grid Architecture	July 03-08, 2017
6	Mechanical Engineering	Prof. A K Agarwal	Total Quality Management	July 10-15, 2017
7	Mathematical Sciences	Prof. T Som	Fixed Point Theory & Dynamical Systems	June 19 - July 01, 2017
8	Mining engineering	Prof S P Gupta	Advance Techniques of Project Management	July 10-15, 2017
9	Electronics Engineering	Prof. S Jit	Modelling & Simulation of Adv. Semiconductor Devices	July 17-22, 2017
10	Mining engineering	Prof. Arif Jamal	Coal Quality Management & Utilization	July 24-29, 2017
11	Electronics Engineering	Prof. Kishore P Sarawadekar	HDL for Signal, Image & Video Processing	August 21-26, 2017
12	Metallurgical Engineering	Dr. Jaysurya Basu	AMMDISMM - 2017	Sept. 11-16, 2017
13	Computer Science & Engg.	Prof. K K Shukla	Machine Learning, Trends, Perspective & Prospects	Sept. 18 - 25, 2017
14	Mechanical Engineering	Prof. S K Sharma	Engineering Economics	Sept. 18-23, 2017
15	Chemical Engineering & Tech.	Prof. P K Mishra	Recent Advances in Bio-Energy	October 02-06, 2017
16	Bio-Chemical Engineering	Prof. S Kundu	Bioprocess Instrumentation & Control in Bioreactor Design	Nov. 07-13, 2017
17	Chemistry	Prof. Y C Sharma	Advanced Treatment Processes for Industrial Effluents	Feb. 09-14, 2018
18	Material Sciences	Dr. A K Singh	Materials Characterization for Engineers	Feb. 05-10, 2018

**Application Form for
QIP SHORT TERM COURSE**

on

**Modeling and Simulation of Advanced
Semiconductor Devices**

July 17-22, 2017

1. Name (block letters):

2. Designation & pay scale:

3. Organization:

4. Address for communication with pin code:

Mobile No.:

E-mail:

5. Highest Academic Qualification:

6. Specialization:

7. Experience (in years):

(a) Teaching: (b) Industrial:

8. Amount of TA for to-and-fro III AC railway fare (only for the AICTE approved college teachers):

9. Whether Accommodation (to be provided strictly on sharing basis) is required:

Please register me for the course on “**Modeling and Simulation of Advanced Semiconductor Devices**” to be held at IIT (BHU) Varanasi during **July 17-22, 2017**.

Place:

Date:

Signature of the applicant

SPONSORSHIP

Prof./Dr./Mr./Ms./Mrs./_____ is an employee of our AICTE approved institute and his/her application is hereby sponsored. The applicant will be permitted to attend the short-term course on **Modeling and Simulation of Advanced Semiconductor Devices** at IIT (BHU) Varanasi during **July 17-22, 2017** of the Short Term Course, if selected.

Date:

Signature of Sponsoring Authority

Designation:

(Official Seal)

Refundable Security Deposit Details:

*DD No.:

Date:

Bank:

Amount: **₹ 2000/-**

Signature of the Applicant

*DD should be drawn in favor of the **Registrar, IIT(BHU), Varanasi-221005** payable at the **SBI, IT Branch (Code:11445), BHU, Varanasi**.

Participation Certificate

Certificate of participation will be issued to all the participants only after completion of the course.

Important Dates

Last date for receiving application

June 25, 2017

Confirmation of Participation

June 27, 2017

Contact Details

Prof. Satyabrata Jit

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ABOUT THE DEPARTMENT



Department of Electronics Engineering came into existence as an offshoot of Electrical Engineering Department in the year 1971 (when Banaras Engineering College, College of Mining and Metallurgy and College of Technology had been amalgamated to form the Institute of Technology in its present form). The intake every year of the Department is 79 in the B.Tech. level and 47 in the M.Tech. level. Besides teaching students of our own discipline (Electronics Engineering), we also offer the basic courses in Electronics Engineering to almost all the Departments of the Institute, we also teach advanced-level courses to the students of Electrical Engineering and Computer Engineering Departments. We have a training and placement section in the Institute through which most of our students are professionally placed in various jobs.

Our current priority areas of specialization are (i) Communication Systems Engineering (ii) Digital Techniques & Instrumentation (iii) Microwave Engineering and (iv) Microelectronics. We are also running a doctoral program in these thrust areas. A mention may be made about the external Ph.D. Registration Scheme of the Institute under which at a time there would be on an average 4-5 Scientists of National Laboratories registered for their Ph.D. degree.

HOW TO REACH

Varanasi Railway Station is well connected to almost all parts of the India. The Lal Bahadur Shastri International Airport, Babatpur, Varanasi is also well connected via Air to Delhi, Mumbai, Kolkata, Hyderabad, and Bengaluru. There are frequent flight services from New Delhi. The Institute is located in the extreme south of the Varanasi city and about 7 km away from Varanasi Railway Station and 30 km from the Babatpur (Varanasi) airport. Pre-paid Taxis and Auto-Rickshaw can be hired from the airport and rail way stations.