

# AICTE –Teaching and Learning (ATAL) Academy

The main objectives of the ATAL Academy are:

- To plan and help in imparting quality technical education in the country.
- To support technical institutions in fostering research, innovation, and entrepreneurship through training in various emerging areas.
- To stress upon empowering technical teachers using Information and Communication Technology.
- To utilize SWAYAM platform and other resource for the delivery of trainings.
- To provide a variety of opportunities for training and exchange of experiences such as workshops, Orientations, learning communities, peer mentoring and other faculty development programmes.
- To support policy makers in incorporating trainings as per requirements.



## ABOUT THE PROGRAMME

The MOSFET device performance can be increased by reducing the channel length. But, the traditional planar design introduces performance limitations when device dimensions shrink. As transistor sizes continue to shrink, 3-D MOSFET architectures present a viable path forward, enabling continued performance improvements while addressing the limitations of traditional planar designs.

This faculty development programme (FDP) is intended to discuss recent advancements in the field of 3D MOSFETs. It will cover different device structures of 3D MOSFETs, Materials for 3D MOSFETs, and Fabrication Technologies for 3D MOSFETs. It will also highlight the challenges in 3D MOSFET scaling, device performance and reliability. Besides, Device Modeling and TCAD Simulation for 3D MOSFETs will be highlighted. The Impact of 3D MOSFETs on circuit design and integration will be discussed.

This FDP will provide a platform for the participants to interact and discuss recent developments in 3D MOSFETs and challenges in device scaling.

## ABOUT THE RESOURCE PERSONS

Academics from premier institutions such as IITs and experts from the semiconductor industry, specializing in MOSFET devices, are invited to serve as resource persons for this program.



*AICTE Training and Learning  
(ATAL) Academy Sponsored  
Faculty Development Programme  
(Online) on*

**“ADVANCES IN 3D MOSFET ARCHITECTURES:  
PAVING THE WAY FOR NEXT-GENERATION  
SEMICONDUCTOR SCALING”**

Organized by

**DEPARTMENT OF ELECTRONICS  
AND COMMUNICATION  
ENGINEERING**

JANUARY 06 -11, 2025



**Engineering A Better Tomorrow**

[www.mvjce.edu.in](http://www.mvjce.edu.in)

## ABOUT MVJ COLLEGE OF ENGINEERING

MVJ College of Engineering was established in 1982 as the flagship institution of Venkatesha Education Society, to impart education in Engineering, Management and beyond. MVJCE offers 15 UG Programs and 8 PG Programs and has 9 Research Centres across various disciplines. The college is accredited by NAAC.

## ABOUT THE DEPARTMENT

The Department of Electronics and Communication Engineering, established in the year 1982, is affiliated to Visvesvaraya Technological University, Belagavi, approved by AICTE, New Delhi. The department has various Centres of Excellence which includes Robotics & Industrial Automation and National Instruments LabVIEW Academy. The department is recognized as Research Centre by VTU to offer Phd Programme.

## OBJECTIVES OF THE FDP

- To enhance participants' technical knowledge in 3D MOSFETs, including understanding semiconductor materials and device physics
- To outline the processing steps involved in the fabrication of 3D MOSFETs and highlight the technical challenges involved in realizing 3D MOSFETs
- To impart the device concepts involved in achieving 3D MOSFET scaling
- To bring out the challenges involved in the realization of 3D MOSFETs
- To highlight the importance of simulation and modeling of 3D MOSFETs
- To discuss the impact of 3D MOSFETs on circuit design and integration

## TOPICS COVERED

Future directions and trends in 3D MOSFETs

The impact of 3D MOSFETs on circuit design and integration

Power and energy efficiency in 3D MOSFETs

Challenges in 3D MOSFET realizations

## REGISTRATION AND OTHER DETAILS

For registration, please use the link given below.  
<https://atalacademy.aicte-india.org/signup>

ATAL FDPs are free, and No fee will be charged from any participant attending ATAL FDP.

Candidates are requested to register at the earliest, as the number of seats is limited.

The FDP will be held in ONLINE mode.

The certificates shall be issued by ATAL academy to those participants who have attended the program with minimum 80 % attendance and scored minimum 70 % marks in the test conducted at the end of the FDP.

COORDINATOR

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CO-COORDINATOR

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# PROGRAMME SCHEDULE

DAY 1 06-01-2025	DAY 2 07-01-2025	DAY 3 08-01-2025	DAY 4 09-01-2025	DAY 5 10-01-2025	DAY 6 11-01-2025
06:00 PM to 06:30 PM <b>Inauguration</b>	06:00 PM – 07:30 PM Session 3 <b>Future directions and trends in 3D MOSFETs-1</b>  <b>Dr. Harshit Agarwal,</b> Associate Professor, IIT, Jodhpur	06:00 PM – 07:30 PM Session 5 <b>Device modeling and TCAD simulation for 3D MOSFETs</b>  <b>Dr. Satyabrata Jit,</b> Professor, IIT(BHU), Varanasi	06:00 PM – 07:30 PM Session 7 <b>Parasitic capacitance and resistance in 3D transistors</b>  <b>Dr. Satyabrata Jit,</b> Professor, IIT(BHU), Varanasi	06:00 PM – 07:30 PM Session 9 <b>ML driven modelling of semiconductor devices (3D MOSFETs)</b>  <b>Dr. Harshit Agarwal,</b> Associate Professor, IIT, Jodhpur	02:00 PM – 03:30 PM Session 11 <b>3D MOSFETs in Post-Moore's Law Era</b>  <b>Mr. Baranidharan Vadivelu,</b> Application Engineer, Siemens EDA, Bangalore
06:30 PM – 08:00 PM Session 1 <b>Bottom-up approaches in CMOS</b>  <b>Dr. V. Ramgopal Rao,</b> (Former Director, IIT Delhi), Vice-Chancellor, Birla Institute of Technology & Science, Pilani	07:30 PM - 09:00 PM Session 4 <b>The impact of 3D MOSFETs on circuit design and integration-2</b>  <b>Mr. Sudhakar Reddy</b> Amireddy, Sr. Manager, Intel Corporation, Bangalore	07:30 PM – 09:00 PM Session 6 <b>Future directions and trends in 3D MOSFETs-2</b>  <b>Dr. Anish Kumar,</b> Sr. Staff Engineer, Intel Corporation, Arizona, USA	07:30 PM – 09:00 PM Session 8 <b>3D MOSFET applications</b>  <b>Dr. Roy Paily</b> Palathinkal, Professor, IIT, Guwahati	07:30 PM – 09:00 PM Session 10 <b>Power and energy efficiency in 3D MOSFETs</b>  <b>Dr. Roy Paily</b> Palathinkal, Professor, IIT, Guwahati	03:30 PM – 05:00 PM Session 12 <b>Fabrication technologies for 3D MOSFETs &amp; the impact of 3D MOSFETs on circuit design-3</b>  <b>Mr. Chandrasekhar Kypa,</b> Vice President & Business Leader, Quest Global, Bangalore
08:00 PM – 09:30 PM Session 2 <b>3D MOSFET architectures &amp; the impact of 3D MOSFETs on circuit design-1</b>  <b>Mr. Chandrasekhar Kypa,</b> Vice President & Business Leader, Quest Global, Bangalore					05:00 PM – 06:30 PM Session 13 <b>Challenges in 3D MOSFET realizations</b>  <b>Dr. Girish Pahwa,</b> Assistant Professor, National Yang Ming Chiao Tung University, Taiwan
					06:30 PM to 07:30 PM <b>Online test &amp; feedback</b>
					07:30 PM to 08:00 PM <b>Valedictory Session</b>