

Course Relevance:

The objectives of this workshop is to connect together both industry and academic professionals in the field of VLSI Design. The workshop will provide a platform to disseminate knowledge and share experiences, among participants and experts, highlighting open research problems for the next generation VLSI Design. Workshop participants will learn about the recent trends in digital and analog VLSI Design. They will also learn to apply the knowledge in practical circuits and systems and can enhance their fundamentals. Some hand-on session will give practical exposure to the application of VLSI system designs. It is necessary for Electronics and Communication engineers, students and researchers to understand the fundamentals of the emerging VLSI technologies. Aim of the course is to introduce the evolution of both analog and digital design flow and to provide overview of related CMOS and other recent technologies. This course would cover Fundamentals of VLSI Design, Design and modeling of basic analog modules, like Voltage Reference, Basic Amplifiers, OTA etc., Design of different digital logic gates, Reconfigurable system design using FPGA, Introduction to Embedded system design and Introduction to IOT system design for different industrial applications.

Course Objectives:

- To impart the fundamentals of both analog and digital VLSI design.
- To introduce different tools for ASIC full-custom and semi-custom design.
- To discuss the recent trends in VLSI technology with an emphasis on current research activities.
- To provide an opportunity for participants to interact with experts from both academics and industry.
- To provide the participants a platform to learn with practical hands-on lab exercises to get familiar about recent research trends and applications, in the field of Microelectronics and VLSI technology.

Topics to be Covered:

- The analog design flow in Cadence Analog Design Environment tool. Transistor level schematic design of single stage CMOS amplifiers. Learning, DC, AC and transient simulations of amplifiers. Creating symbol of basic amplifier circuits, and to use them hierarchically. Modelling of Two-stage operational trans-conductance amplifier (OTA) and circuit level design.
- Implementation of basic digital logic gates in Cadence. Implementation of different digital logic cells using Hardware Descriptive Language.
- To learn how to import the digital design on FPGA board.
- Introduction to Arduino Uno board for embedded system design for IOT applications.
- Introduction to system level applications of VLSI design.

Speakers:

- Dr. Roy P Paily, IIT Guwahati
- MEMS and VLSI System design
- Dr. Kailash Chandra Ray, IIT Patna
- VLSI Architectural design
- Dr. Bodhisatwa Majumdar, IIT Indore
- Cryptography
- Dr. Kishor Sawrbadekar, IIT BHU
- Image processing and digital VLSI design
- Dr. Debashis Mandal, IIT Kharagpur
- Data Converter Design
- Dr. Nijwm Wary, IIT Bhubaneswar
- Analog CMOS Circuit Design
- Dr. K K Mahapatra, NIT Rourkela
- Cyber Security in VLSI Design
- Dr. Debiprasad Acharya, NIT Rourkela
- Applications of VLSI Design in IOT
- Dr. Sougata Kumar Kar, NIT Rourkela
- MEMS based system design
- Dr. Samit Ari, NIT Rourkela
- Machine learning for VLSI Design



Ten-days Workshop on Analog and Digital VLSI Design Flow and Embedded System Design

Sponsored by Science and
Engineering Research Board
(SERB), India

04th - 13th July 2022



Chairman:

Dr. K. K. Mahapatra

Coordinators:

Dr. Santanu Sarkar

Dr. Sougata Kumar Kar

Department of Electronics and
Communication Engineering,
National Institute of Technology Rourkela
Rourkela-769008, Odisha, India

Technically Co-sponsored by:





About National Institute of Technology (NIT) Rourkela

National Institute of Technology (NIT), Rourkela was founded as Regional Engineering College, Rourkela in 1961. It is a prestigious institute with a reputation for excellence at both undergraduate and postgraduate levels, fostering the spirit of national integration among the students, a close interaction with industry and a strong emphasis on research, both basic and applied. The city of Rourkela is a bustling industrial city, cosmopolitan by nature and is well connected to all parts of the country by road and rail. The nearest airports are Ranchi, Kolkata and Bhubaneswar, which are well connected by trains. Please visit <https://www.nitrkl.ac.in/About.aspx> to know more about NIT Rourkela.

About Department of Electronics and Communication Engineering

The department was established with the vision to become a nationally acclaimed department of higher learning that will serve as a source of knowledge and expertise for the society. The department offers various UG and PG programmes with the mission to advance and spread knowledge in the areas of electronics, communication, instrumentation, signal processing and VLSI leading to creation of wealth and welfare of humanity. The department also offers M. Tech in Microwave and Radar Engineering and Ph. D. for regular as well as sponsored candidates. The faculties of EC department are handling several externally funded research projects. Please visit <https://www.nitrkl.ac.in/EC/> to know more about the Department of ECE.

Important Dates:

Registration Deadline	25 th June 2022
Confirmation to Participants by email	30 th June 2022
Commencement of Course	04 th July 2022 (Physical mode)

Target Participants:

The workshop on VLSI design provides an opportunity to learn different tools so it creates immense interest in PG students, research scholars/professionals, staff/faculty members and industry professionals working in the area of VLSI design. The M. Tech and PhD student participants from Electronics and Communication Engineering, Electrical Engineering and Computer Science and Engineering branches will be benefitted with this course.

Facilities:

Accommodation, food and travel allowance by train (as per GOI norms) will be provided to the selected participants.

Coordinators:

Dr. Santanu Sarkar

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Dr. Sougata Kumar Kar

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Registration Details:

The registration fee (after confirmation) for various participants for attending the Workshop is given below. The TA, accommodation and foods will be provided.

Registration Type	Fees
Student	INR 1000
Faculty Members	INR 1500
Scientist from R&D Organization/Industry Person	INR 2000

- The **students of NIT Rourkela** are exempted from the payment of registration fee.

Bank Account Details for Paying Registration Fee:

The registration fee is to be deposited in the following bank account:

Account Name	CONFERENCE, NIT ROURKELA
Account No.	36734418111
Bank	State Bank of India
Branch	NIT Campus Rourkela (02109)
IFS Code	SBIN0002109

Registration Form:

To complete online registration, the participants need to fill the following google form:

<https://forms.gle/FTMAMbRRe6YwLWBYA>

Certificates will be provided to the registered participants upon successfully completing the course.

Contact and Queries: Please send your queries directly to the course coordinators.