COURSE OBJECTIVE:

Field Programmable Gate Arrays (FPGAs) and Application Specific Integrated Circuits (ASICs) both implement VLSI logic but serve different roles. FPGAs are reconfigurable, making them ideal for research, prototyping, and low-volume production due to flexibility and quick time-to-market, though they have higher unit costs and lower performance. ASICs are custom chips optimized for specific tasks, offering high performance, low power, and cost efficiency in large volumes, but require complex, expensive design processes suited for stable, mature designs.

Part 1 of the workshop emphasizes digital design, Verilog coding, and FPGA implementation. With FPGAs increasingly used in space applications, the course addresses robustness and defect tolerance. It also introduces basic ASIC design using Tanner EDA tools.

Renowned experts from academia and industry will share their insights highlighting current trends and advancements on VLSI. This workshop includes informative talks by experts from ***IIT Kharagpur, IIT Bhubaneswar, IIT Bombay, NIT Rourkela, VJTI Mumbai***, and industry professionals from ***Qualcomm, Texas Instruments (TI) etc.*** to have a comprehensive idea on modern VLSI needs.

अनुसंधान नेशनल रिसर्च फाउंडेशन
Anusandhan National Research Foundation

COURSE HIGHLIGHTS:

- Foundational concepts in VLSI design.
- Recent advances in VLSI technologies.
- High-Performance Data Converters.
- Design of FPGAs using CLBs, LUTs, flip-flops and routing.
- VLSI designs for DSP applications.
- Introduction to fault tolerance and reliability.
- FPGAs in defect tolerant system design.
- Digital Design Using Verilog HDL and implementation in FPGAs.
- Analog Design Using Tanner EDA Tools.
- Layout using Microwind.

MAJOR TOPICS TO BE COVERED:

- Complete Modern VLSI Design Flow
- VLSI for Signal Processing
- ADC/ DAC Designs
- Architecture of FPGAs
- Defect Tolerance in FPGAs
- FPGAs in Healthcare
- HDL languages: Verilog in Vivado
- Hands-on in FPGA Boards
- Tanner Tools in ASIC Flow
- Microwind EDA for Layout

ANRF (erstwhile SERB) Sponsored

5 Days Faculty Development Program and Student Workshop on

FPGA to ASIC – A Complete VLSI Design Flow

(Part 1: FPGAs in Defect Tolerance)

06th January to 10th January 2026

in ONLINE MODE

Coordinators:

Dr. Atin Mukherjee
Dr. Santanu Sarkar

Co-coordinator:
Prof. Santanu K. Behera

Dept. of Electronics & Communication Engg.
National Institute of Technology Rourkela
Rourkela – 769 008, Odisha, India

Technically Co-sponsored by:

IEEE ROURKELA SUBSECTION

ABOUT NIT ROURKELA:

National Institute of Technology Rourkela 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.

34 NIRF Overall	13 NIRF Engineering	30 NIRF Research	281-290 QS Asia

ABOUT DEPARTMENT OF ECE:

There are two undergraduate, and five post graduate courses are running in the ECE department of NIT Rourkela. Faculty members of the department are involved with research work in various domains: VLSI Design & Embedded systems, Signal & Image Processing, RF and Microwave Systems, Communication & Networks, and Electronics & Instrumentation Engineering.

WHO CAN ATTEND:

This workshop is open to the Faculty members, UG/ PG Students, Research Scholars (RS), Post-doctoral Fellows, Laboratory Technicians, Industry and R&D Personnel etc. in all disciplines of Engineering and Sciences. Preference will be given to the faculty members.

Last Date of Registration:

28th December 2025 (Final)

FEES:

Registration Type	Fees (*Non Refundable*)
Faculty	***NIL***
Students(RS/PG/UG)	**₹ 295** (₹250 + GST)
R&D/Industry People	**₹ 885** (₹750 + GST)
Lab Staff & others	**₹ 590** (₹500 + GST)
NITR Staff/ Student	***NIL***

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REGISTRATION DETAILS

Complete Registration through (after payment):
https://forms.gle/uVfCAzgAJjk9ikfv5

MODE OF PAYMENT : (Online only)

Transfer the Fee amount using UPI or NEFT:
(mention in remarks as: **ANRF FPGA**)

UPI Details:

01389517841@sbi

NEFT Account details:

Acct. No.: **10138951784**
Name: **CONTINUING EDUCATION NIT ROURKELA**
Bank: State Bank of India
Branch: NIT Rourkela Campus
IFS Code: **SBIN0002109**

Mention payment remarks as: **ANRF FPGA**
Attach the payment receipt in the google form for registration (link/ QR mentioned above)

Certificates will be given only to those participants who attend all the sessions of the course.