

Faculty Development Program On RFIC Design: Challenges and Opportunities for 5G communication

Under the banner of
Electronics and ICT academy, NIT Patna

20th - 24th May, 2019



Patron

Prof. P.K. Jain
Director, NIT, Patna

Coordinators (NIT Patna)

Dr. Sangeeta Singh
Dr. Rajeev Kumar Arya

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Organized by

**Department of Electronics and Communication
Engineering,
National Institute of Technology, Patna-800005**

Technical Program Coordinator (NIT, Patna)

Dr. Ram Gopal

About NIT Patna

National Institute of Technology Patna is the 18th National Institute of Technology created by the Ministry of H.R.D. Government of India after rechristening the erstwhile Bihar College of Engineering Patna on 28.01.2004. NIT Patna marked its humble beginning in 1886 with the establishment of pleaders survey training school which was subsequently promoted to Bihar College of Engineering Patna in 1924. This made this institute the 6th oldest Engineering Institute of India. The Institute is situated on the south bank of holy river Ganges behind Gandhi Ghat (where the ash of father of the Nation, Mahatma Gandhi was offered in the river Ganges). The campus has a picturesque river view with historic building presenting a spectacle of architecture delight and natural beauty. The Institute imparts high level education training, research and development in science, engineering technology and humanities along with high quality education and values at UG, PG and Ph.D. level. At present the Institute offers courses in six major technical disciplines viz. Architecture, Civil Engineering, Computer Science & Engg., Electrical Engg., Electronics & Communication Engg. and Mechanical Engg. It also consists of well-established departments of Physics, Chemistry, Mathematics and Humanities and Social Sciences.

Electronics and ICT Academy

Ministry of Electronics and Information Technology, Government of India has instituted seven Electronics and Information & Communications Technology (ICT) Academies of which, the academy of NIT Patna is one. The Academy at NIT Patna aims to design and organize basic as well as specialized training programs in niche areas of electronics and ICT for the development of required knowledge base, skills and tools to equip the teaching community with better knowledge and understanding.

Overview

Today is an era of exponential growth in wireless communication industries, it opens up new market opportunities in designing integrates circuits (ICs) required in this field. The extensive progress of CMOS technology has enabled its application in microwave and millimeter wave technologies. Presently, the CMOS technology has become one of the most attractive choices in implementing

transceiver due to its low cost and high level of integration. In spite of the advantages of CMOS technology, the design of CMOS transceiver in millimeter wave applications exhibits several challenges and difficulties that the designers must overcome. As a result, there is a need to explore these aspects of CMOS ICs designing challenges. This program would focus on the basic concept of RF and analog IC design, basic designing challenges involved.

Objective and Scope

- Primary objective of this program is to provide an exposure of recent trends in RFIC Designing and their circuit applications.
- During this program our focus will be on developing the state-of-the-art in basic RFIC fabrication, physics, and practical designing challenges through interaction with experts from academic CFTI institutions such as IITs/NITs/IIITs including host institution.
- This program can serve as an excellent platform to get the concepts of both basics and recent advances in 5G RFIC designing technologies to the teaching and research community associated with the Departments of Electronics, Electrical and Computer Science etc.

Finally, it will provide a unique opportunity to identify and to discuss potential collaborations among young researchers and faculty. One of the key features of this course is that, along with discussing the advanced research topics and cutting edge technologies, it will encompass fundamental aspects of RFIC designing for 5G communication circuits..

Course Contents

- RF, High Speed and Power Semiconductor Devices
- VLSI circuit design and Modelling (Device to circuit interfacing)
- Low cost Energy efficient system for Agriculture & Health Sector
- Low power and high gain CMOS LNA for UWB applications
- Operational Transconductance Amplifier for Low Frequency Application
- Design IC implementations of RF functional blocks (such as low-noise amplifiers, mixers and

oscillators) based on foundry models and design rules to meet specifications for a wireless communications system;

Discuss monolithic synthesizer architectures and their performance.

Outcomes

By the end of the program, the participants should be able to understand the basics as well as recent research opportunities in CMOS and Beyond CMOS devices.

They will be able to simulate the some basic devices, using both virtual fabrication process flow as well as the device and circuit designing aspect.

Who Can Participate

Industry personals, Faculty members of UGC/AICTE recognized Universities and Engineering colleges all over India, Research scholars, M. Tech. students, However there are very limited number of seats for Ph.D. /PG/UG students; priority will be given to the faculty members and Ph.D. students.

Resource Persons

Dr. Saurabh Kumar Pandey, IIT Patna
Dr. Sandeep Kumar, ECE, NIT Surathkal
Dr. Suneel Pandey, Intel Corporation, Bangalore
Dr. Priyanka Mondal, NIT Patna
Dr. Jayanta Ghosh, NIT Patna

Registration Fee

Faculty Member: Rs 1000/-
Ph.D/PG Students : Rs 500/-
Industry Personnel: Rs 2000/-

Registration fee includes Registration kit, Tea, Snacks, Lunch and a Course Completion Certificate. **Certificate will be given by Electronics & ICT Academy NIT Patna.**

Registration Process

- Scanned copy of the filled application form duly endorsed by the forwarding authority and the demand draft are to be mailed at (sangeeta.singh@nitp.ac.in). No travelling Allowance will be paid by the Academy. The

demand draft as applicable, should be drawn in favour of "Director, NIT Patna" payable at Patna.

- Registration fee can also be paid by the online mode, the account details for this purpose is
Account Name: NIT Patna
Account No.: 50380476798
IFSC Code: ALLA0212286
- Selection will be made purely on First-Come-First- Serve basis (Subject to fulfilling the eligibility criteria).
- Maximum fifty (50) participants will be accommodated in this FDP.
- The brochure and the registration form may be downloaded from the Institute website www.nitp.ac.in.

The registration fee can also be deposited in cash.

Last date of submission of application: 15th May, 2019.

Address for Correspondence

Enquiry should be addressed to:

Dr. Sangeeta Singh
Assistant Professor,
Dept. of ECE Engineering, NIT Patna
Mob. No.: 09479646111
Email: sangeeta.singh@nitp.ac.in

Venue

Microelectronics and VLSI Lab,
2nd Floor,
Dept. of ECE Engineering, NIT Patna

Advisory Committee

Prof. P.K. Jain, Director, NIT Patna
Dr. B.C. Sahana, HOD (ECE), NIT Patna
Dr. Barat Gupta, CI-E&ICT Academy, NIT Patna

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REGISTRATION FORM

- Name (block letter):
(a) Gender Male Female
(b) Category Gen OBC SC ST
- Designation
- Organization:
- Highest Academic Qualification:
- Experience (in years):
(a) Teaching: (b) Industrial.....
- Address for communication:
.....
Pin code: Ph. No.:
Fax No.:
- E-mail:
- Mode of Payment Through DD
Through NEFT CASH
- DD No./NEFT Trn Ref no. :
- Date:Bank Name:.....
- Amount:
- Endorsement from the forwarding authority:
Name:
Designation:.....
Seal:

DECLARATION

I do hereby agree to abide by the rules and regulations of the FDP.

Place:
Date:.....

Signature of the applicant