Faculty Development Program on

Photonics Communications and Its Applications

Under the banner of

Electronics and ICT academy, NIT Patna

9th - 13th July, 2019

Patron

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

Coordinator
Dr. Rakesh Ranjan, ECE Department
NIT Patna

Sponsored by

MeitY (Govt. of India)

Organized by

Deptt. of Electronics & Comunication Engg.
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 MHRD, Govt. of India after rechristening the erstwhile Bihar College of Engineering Patna on 28th Jan. 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. NIT Patna has been declared as an institute of National Importance and has been granted a fully Autonomous Status by MHRD, Govt. of India. The institute is situated on the south bank of holy river Ganges. The Institute imparts high level education training, research and development in science, engineering technology and humanities along with high quality education and values at U.G., P.G. and Ph.D. levels. At present, the institute offers courses in six major technical disciplines, viz. *Architecture*, *Civil*, *Computer Science*, *Electrical*, *Electronics & Communication*, and *Mechanical* along with of *Physics*, *Chemistry*, *Mathematics*, etc.

Electronics and ICT Academy

Ministry of Electronics and Information Technology, Govt. of India has instituted seven Electronics and Information & Communications Technology (E&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

Photonics is the domain of science and engineering associating the physical phenomena and technologies for the generation, transmission, detection, and utilization of light-wave. In comparison with conventional communication schemes, Photonics Communication offers a large numbers of advantages. For the exponentially increasing demand of data transmission capacity and security, Photonics/Optical Fiber Communication and related devices/sensors are highly capable to accommodate these requirements with high degree of measurements and accuracies. Moreover, the Multicore fiber technology, is one of the promising approach to address the increasing demand of internet data traffic, which uses the space division multiplexing concept by accommodating more than one core in the same cladding region. Even in 5G wireless technology, the guided photonics communication has a big role to provide the backhaul data communication support. The course aims at explaining various kinds of photonics/optical communications, photonics devices and sensors including the CMOS compatible nano-scaled waveguides/devices – hybrid Plasmonic waveguide/devices, fabrication aspects of some specialty fiber, role of photonics communication in 5G back haul support and various challenges in Photonics communications. The course also provide the practical experiences with several hardware/equipment and software platform of Photonics Communications.

Objective and Scope

- Primary objective of this program is to provide an exposure of recent trends in Photonics Communications and applications.
- During this program our focus is to develop the state-of-the-art in basics of Photonics communications, Photonic Crystal fibers, CMOS compatible waveguides/sensors/ devices, fabrication aspects of specialty fibers, along with the role of Photonics in 5G communication backhaul and to develop skills to utilize equipment, software, etc. for better understanding of different phenomena and challenges of photonics technology through the interaction with experts/faculties/scientist from IITs/NITs/CSIR Lab. (CGCRI Kolkata), including the host institution.
- This program can serve as an excellent platform to get the concepts of both basics and recent developments in photonics technologies, to the teaching and research community associated with the departments of Electronics and Electrical technology, Physics, Computer Science, etc.

Finally, this program will provide a unique opportunity to identify and to discuss potential collaborations among young researchers, faculties, scientists, etc.

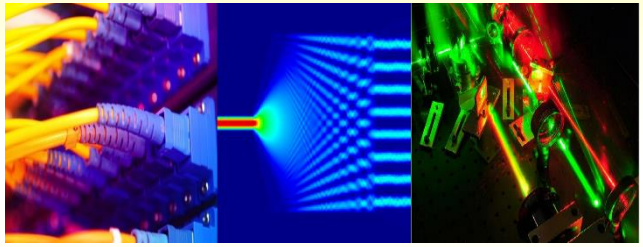
Course Content

- Fundamentals of Photonics Communications
- Types of Optical Waveguides
- Optical Communications (Coherent)
- Photonic Devices
- Multicore Fiber Technology and their Applications
- Photonic Crystal Fibers and their Applications

- Materials & Techniques for Fabrication of Fibers
- High Power Laser Applications
- Plasmonics
- Hybrid Plasmonic Waveguides and their Applications
- Role of Fiber Optic Technology in 5G Communications
- Optical OFDM: Modulation approach

Outcomes

- By the end of the program, the participants should be able understand the concepts of Photonics Communications and devices, fiber fabrication, photonics technology for 5G backhaul, etc.
- They will be able to handle optical instruments/ measurements and get motivated for further studies and research in this research area.



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 PG/UG students; priority will be given to the faculty members and Ph.D. students.

Resource Persons:

- Prof. D. Mitra, Professor, ECE, IIT-ISM Dhanbad
- Prof. D.K. Singh, Director, BIT Sindri, & Prof., ECE, NIT Patna (on Lien)
- Dr. Sumanta Gupta, Assoc. Prof., EE, IIT Patna
- Dr. Anirban Dhar, Scientist, CGCRI, Kolkata
- Dr. Bharat Gupta, Asstt. Prof., ECE , NIT Patna
- Dr. Neeraj Shukla, Asstt. Prof., Physics, NIT Patna
- Dr. Rakesh Ranjan, Asstt. Prof., ECE , 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. **The Certificate will be given by Electronics & ICT Academy NIT Patna.**

Registration Process

1. Scanned copy of the filled application form duly endorsed by the forwarding authority and the demand draft are to be mailed at (**rr@nitp.ac.in**). The demand draft as applicable, should be drawn in favour of "**Director, NIT Patna**" payable at **Patna**.
2. 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**
3. Selection will be made purely on *First-Come-First-Serve basis* (subject to fulfilling the eligibility criteria).
4. Maximum fifty (50) participants will be accommodated in the FDP.
5. The brochure and the registration form may be downloaded from the Institute website www.nitp.ac.in & http://www.nitp.ac.in/ict/
6. No travelling allowance will be paid by the Academy.

Last date of submission of application: 2nd July, 2019.

Address for Correspondence

Enquiry should be addressed to:

Dr. Rakesh Ranjan,
Assistant Professor,
Dept. of ECE Engineering, NIT Patna
Mob. No.: 9334385016
Email: rr@nitp.ac.in

Venue

E & ICT Academy Conference Room, ECE Department, NIT Patna.

Accommodation

Accommodations will be provided in the Hostel(s) of NIT Patna as per the availability on additional payment basis.

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REGISTRATION FORM

1. Name (block letter): ……..

(a) Gender ☐ Male ☐ Female

(b) Category ☐ Gen ☐ OBC ☐ SC ☐ ST

2. Designation ……..

3. Organization: ……..

4. Highest Academic Qualification: ……

5. Experience (in years):

(a) Teaching: …… (b) Industrial…….....

6. Address for communication: ……

……

Pin code: ……Ph. No.: ……..…....

Fax No.: ……..……..

E-mail: ……..……....

7. Mode of Payment Through DD ☐

Through NEFT ☐ CASH ☐

8. DD No./NEFT Trn Ref no. : ……...……...

Date: …….. Bank Name:……..……

Amount: ……

9. 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