

Short Term Course/FDP  
on  
**"Artificial Intelligence: Devices  
to Circuits"**

*Under the aegis of*

**SPARC Scheme**

*Coordinated by*

**Electronics & ICT Academy,  
IEEE EDS Student Chapter  
IIT Roorkee**



Jan 9, 2020 – Jan 13, 2020

**Experts from Academia/Industry**

Prof. M.M De Souza and  
Prof. Eleni Vasilaki, University of Sheffield, UK  
Prof. Debanjan Bhowmik, IIT Delhi  
Prof. Kaushik Roy, Purdue University  
Dr. Vivek De, Intel Corporation

Ministry of Electronics & Information Technology  
Government of India, SPARC MHRD Govt of India

**Venue**  
IIT Roorkee

**Why Artificial Intelligence?**

Artificial Intelligence (AI) builds smart machines that imitate the human behavior. This course aims to discuss neuromorphic computing based on promising spin electronics technologies for AI applications. Recently, neuromorphic computing has demonstrated huge potential for information processing at low power that leads to highly energy efficient systems. This course will help participant gain knowledge about design of AI systems from device to system level. Implementation of such systems with emerging devices will also be dealt.

**Focus Areas**

- Introduction to Artificially Intelligent Systems
- Neural Network and Neuromorphic Systems
- Energy Efficient Computing in Nanoscale CMOS
- Role of Non-Volatile Memories
- Spintronic Devices for Neuromorphic computing
- Beyond traditional ionic memristors
- Sparse Reservoir Computing
- Learning in Brain Circuits

**Benefits and Outcomes of the Course**

- Participants will understand state-of-the-art AI systems, neural network and hardware implementation of neuromorphic systems
- The participants will learn in-memory computation and usage of emerging devices for computation
- The participants will learn computational models aiming to advance our understanding of the brain learning mechanisms

**Objective of the Course**

- ✓ To provide an overview of key concepts and technologies required for implementation of neuromorphic computing.
- ✓ To present the usage of emerging devices for neuromorphic computing systems
- ✓ To understand various applications of neuromorphic computing for AI
- ✓ To understand the principles governing the learning and memory of the neuronal connections

**Program Features**

- ✓ The program is split into lectures and tutorials.
- ✓ Interaction & learning with experts from academia and industry.
- ✓ Hands-on experience on implementation of neuromorphic computing.
- ✓ Certificates to the participants by E&ICT Academy IITR.

**Coordinators**

Dr. Sanjeev Manhas (PI, SPARC E&ICT Acad., ECE Dept.)  
Dr. Brajesh Kumar Kaushik (PI, SPARC, ECE Dept.)  
Dr. Sudeb Dasgupta (Co-PI, SPARC, ECE Dept.)



## Who Can Attend ?

Program is open to faculty members/research scholars/PG students from colleges/universities, and industry personnel working in the concerned/allied discipline.

## Registration Fee

Faculty members: Rs. 1500/-  
Research scholars: Rs. 2,000/-  
Persons from Industry: Rs. 2,500/-

## How to make Payment

Offline: DD in favor of "Dean SRIC IIT Roorkee" payable at Roorkee "OR"

Online: (

<https://www.onlinesbi.com/prelogin/icollecthome.htm?corpID=365641>) Read the instruction for payment before filling the online registration form.

## How to Apply

Step 1: Make Payment

Step 2: Participants may fill registration form through Academy website (<http://eict.iitr.ac.in>).

OR

Step 2: Send a duly filled-in registration form along with Demand Draft to Academy address.

Mr. Prateek Sharma, EICT Academy, ECE Department, IIT Roorkee-247667

## Important Dates

Last Date For Registration:

Jan 3, 2020

## EICT Academy IITR

Electronics and ICT Academy (E&ICT) at IIT Roorkee (funded by Ministry of Electronics and Information Technology) aims to enrich and upgrade teaching and research competences of engineering faculties of institutes/colleges by conducting courses and workshops in fundamentals as well as emerging areas of E&ICT and enabled areas. The programs are conducted by well-known industry partners, resource persons from leading academia and experts from renowned R&D organizations.



## Activities of the Academy

- Specialized training on basic and advanced level topics with hands-on experience in the emerging areas of Electronics & ICT.
- Setup the activity centers to conduct FDPs locally at institutes/colleges.
- Curriculum development for the industry. Continuing Education Programme for students/working professionals.
- Design, develop and delivery of specialized modules for specific research areas in industry.

## One Week Short Course/FDP

on

## " Artificial Intelligence: Devices to Circuits"

Jan 9, 2020 – Jan 13, 2020

## REGISTRATION FORM

Applicant Name \_\_\_\_\_

Gender: \_\_\_\_\_

Category (GEN/OBC/SC/ST): \_\_\_\_\_

Designation: \_\_\_\_\_

Name and Address of the  
Organizatio/Institute: \_\_\_\_\_

City/Town: \_\_\_\_\_

Email: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Do you need Accommodation?  
(Yes/No): \_\_\_\_\_

DD Number: \_\_\_\_\_

Date: \_\_\_\_\_

Issuing Bank: \_\_\_\_\_

Payable at: \_\_\_\_\_

Signature of the Applicant

## Contact us

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