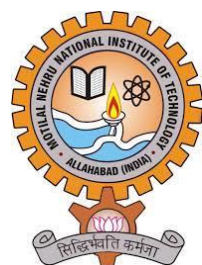




**Self-Financed
One-Week Short Term Course on
(in HYBRID mode)**

**Multi-Agent Systems and Distributed
Control
(MAS 2024)**

September 27 to October 1, 2024



Organized by

Department of Electrical Engineering

Motilal Nehru National Institute of Technology Allahabad, Prayagraj, India.

Organizing Committee

Patron Prof. Rama Shanker Verma

Director, MNNITA

Chairperson Prof. Richa Negi

Head, EED, MNNITA

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4. Prof. Paulson Samuel

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About the Course

The current decade has gradually augmented artificial and human intelligence, laying the foundation for "Industry 5.0 and beyond to Industry 6.0". Industry 6.0 envisions the integration of various technologies to enable industrial optimization and automation, such as IoT, AI, robotics, additive manufacturing, etc., towards sustainable development of the nation. Along with cloud computing, nanotechnology, and quantum computing, agent-based autonomy is at the sharp edge of Industry 6.0. A multi-agent system (MAS), comprising numerous autonomous agents/systems, performs collaboratively to accomplish a task. To successfully interact, MAS requires the ability to cooperate, coordinate and negotiate with each other and the environment without immediate human interventions. This makes artificial intelligence & machine learning essential factors for achieving agent-based autonomy.

The course aims to explore "**Sustainable AI for Self-Organizing Intelligent Systems**" and meeting the requirements of Industrial Revolution. The organization of the course has been divided into the following three phases to have better insight of its importance and applications:

[A] Networked Multi-Agent Systems

Discuss fundamental dynamics in interconnected network systems, encompassing consensus, synchronization, and networked control systems. This course will focus on graph theory, which provides critical concepts for modelling and designing MAS.

[B] Distributed algorithms in Multi-Agent Systems

The convergence of fields, such as distributed algorithms, parallel processing, control, and estimation, is vital for examining collective behaviours in multi-agent systems. This short-term course will concentrate on developing distributed algorithms for agents to make decisions and estimates using local information within networks like socio-cognitive networks.

[C] Leveraging AI and ML in Cyber-Physical Multi-Agent Systems

To develop a framework to boost resilience in cyber-physical multi-agent systems through automation that supports technical and human aspects. It will explore the crucial role of AI and ML in cyber-physical systems and address the challenges of interpreting and trusting AI systems.

This course has the following expected outcomes:

[i] Participants will be able to explore sustainable intelligent-based autonomy for robustifying self-organizing MASs.

[ii] Participants will be able to develop and apply distributed coordinated control using graph-theory-based frameworks.

[iii] Participants will be able to demonstrate/develop resilient cyber-tolerant control approaches for MASs employing advanced intelligent algorithms.

[iv] Participants will be able to explore superintelligence to achieve complete autonomy in line with industrial revolutions.

Eminent Speakers

❖ Prof. Ramkrishna Pasumarthy, IIT Madras

❖ Prof. Shubhendu Bhasin, IIT Delhi

❖ Dr. Abhilash Patel, IIT Kanpur

❖ Dr. Anoop Jain, IIT Jodhpur

❖ Dr. Sharad Kumar Singh, IIT Indore

❖ Dr. Arijit Sen, IISER Bhopal

❖ Dr. Roshni Maiti, IIST Shibpur

Who can apply/attend the course?

Faculty members/ research scholars/ students from academic institutes approved by the AICTE/ UGC/ MoE and Scientists/ Engineers working in Private/ Public/ Govt. organizations/ Industries can attend the course. As mentioned, the application should be made on the registration form by paying the fee.

About MNNIT Allahabad

Motilal Nehru National Institute of Technology Allahabad, Prayagraj (MNNITA) is an Institute with total commitment to quality and excellence in academic pursuits. It was established as the 17th Regional Engineering Colleges in India in the year 1961 as a joint enterprise of Government of India and Government of Uttar Pradesh, and was an associated college of University of Allahabad, which is the third oldest university in India. With over 45 years of experience and achievements in the field of technical education, on June 26, 2002 MNREC was transformed into NIT and Deemed University fully funded by Government of India. With the enactment of NIT Act-2007 (29 to 2007), the Institute has been granted the status of institution of national importance w.e.f. 15.08.2007. The first Master's Programme of the Institute was introduced by the Mechanical Engineering Department in the year 1966 and in all other Engineering Departments, were introduced in the 1970-71. To add a new dimension to itself the Institute established School of Management studies in 1996, which offers a two year/four semester post graduate degree programme in Management (MBA). The Institute has been recognized by the Government of India as one of the centers for the Quality Improvement Programme for M.Tech and Ph.D. The Institute has a very progressive policy towards extending all possible facilities to its faculty members to acquire higher degrees and receive advanced training. The Institute was selected as a lead institution in the Design theme under Indo-UK REC Project (1994-99). The Institute has been selected as a Lead Institution under World Bank funded Government of India Project on Technical Education Quality Improvement Programme (TEQIP) (2002-2007). It stands 49th place for its 'Engineering' category in the NIRF 2023 announced by MoE, GoI, and in top 10 NITs in the country.

Department of Electrical Engineering

The graduate course in Electrical Engineering was started in 1961. Subsequently post graduate programmes in Electrical Machine/Power System/Control System were introduced in the year 1970-71. The Department has well qualified and experienced faculty members in all the related fields of Electrical Engineering and well equipped laboratories. There is a widespread interaction between the Electrical Engineering Department and various other departments like Electronics and Communication Engineering, and Computer Science and Engineering etc. in the field of teaching and research. Ph.D. started in the year 1971, and established a Ph.D. program under QIP in 2002.

Registration fee payment details: Last Date of Registration: 25/09/2024

Course Registration Fee (including 18% GST)

[GST No.: 09AAAJM1116B2ZR]

Participants Category	Online mode (in INR)	Physical mode (in INR)
UG/PG/Research scholars	800/-	1,000/-
Faculty/Academicians	1,500/-	2,500/-
Industry personals	--	4,000/-
Account Name	SNFCE MNNIT Allahabad	
Account Number	10424975574	
IFSC Code	SBIN0002580	
Bank and Branch	SBI, MNNIT Allahabad	
Swift code	SBININBB828	

[Registration Link is appended below]

Note:

- ❖ **The registration fee is Non-refundable.**
- ❖ **The accommodation for offline participants may be provided in the Institute Guest House/Students' Hostels (based on the availability) on payment basis, as per the institute rules.**
- ❖ **Please mention "06/Self-Financed Short Term Course/EED/2024-25/SNFCE", as a remark while transferring the registration fee.**
- ❖ **Complete the registration by filling the Google Form Link: <https://forms.gle/cDE5yAFW5KPraG539>**