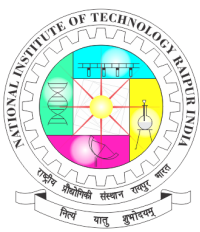




शिक्षा मंत्रालय  
MINISTRY OF  
EDUCATION



# 45 Days Certificate Course on Foundations of Cyber Physical System

Organized by

Department of Computer Science & Engineering

National Institute of Technology Raipur

6<sup>th</sup> January— 7<sup>th</sup> March, 2025



## ABOUT THE COURSE

The course allows one to upscale and pursue a career in the challenging, adventurous and rewarding field of **cyber-physical systems** and its automation through AI along with hands-on experience. The proposed program is an instructor-led program that covers essential training on cyber-physical systems principles and automation techniques. The course provides knowledge of real-world scenarios with hands-on experience on case studies to develop cyber-physical systems configuration. The course delves into the concepts of computation platform of CPS, real-time sensing and communication of CPS, attack detection and mitigation, security framework design, state estimation of CPS, automata-based modeling of CPS, Neural Network-based modeling of CPS, Industrial IoT (IIoT) concepts, implementation of CPS in IIoT etc., that are essential to become a proficient cyber-physical system analyst. The proposed program is designed to equip students and professionals aspiring to start a technical career in cyber-physical systems.

## ABOUT NIT RAIPUR

National Institute of Technology Raipur (An Autonomous institute of National Importance) fully funded by the Govt. of India. NIT Raipur is located in Raipur, the Capital City of Chhattisgarh State and spread over an area of approx. 100 acres. The institute is 5 km from Raipur railway station and 14 km from airport on NH-6, the Great Eastern Road. NIT Raipur has proven to be “avant-grade” in the field of science and technology over the past few decades in this region. NIT Raipur is ranked 70<sup>th</sup> in engineering category in India by the NIRF, and it is the highest ranked engineering college in Chhattisgarh. Presently NIT Raipur offers 12 undergraduate, 14 Postgraduate (including M.Sc., M.C.A and M.Tech. in Applied Geology) and 18 Ph.D. programs. The institute offers facilities for research and also undertakes R & D activities, provides testing, consultancy and other extension services including continuing education to the industry through the Industry Institute Interaction cell and the placement of the student through the Department of Training & Placement. The students have brought laurels to the institute and are very well placed in Government organization, Public and Private Sectors, Multinational Companies, Universities, research organizations in India and abroad. More details about NIT Raipur are at: <http://www.nitr.ac.in>

## OUTCOMES OF THE COURSE

- ✓ Understand basic concepts of Cyber-physical world
- ✓ Demonstrate the Cyber-physical devices working principles
- ✓ Real-time sensing and communication for CPS
- ✓ Ability to identify the challenges in the cyber-physical systems implementation
- ✓ Developing skill set for entry-level positions as Cyber-physical System Analyst
- ✓ Case studies on Industrial IoT (IIoT) using automated

## ELIGIBILITY CRITERIA FOR PARTICIPATION

- ✓ UG/PG graduated/pursuing students
- ✓ Ph.D. Scholars from higher education institutions
- ✓ Faculties / Staffs / Lab Instructors from technical and academic institutions
- ✓ Govt. Employees or Industry/working professionals seeking cyber physical system skills

## REGISTRATION DETAILS

Registration Link:

<https://forms.gle/owEBt6hC8P4CiUGi8>

OR

Scan QR for Submitting Registration Form



## COURSE CONTENTS

- Basics of Cyber Physical System (CPS)
- Computational Platforms for CPS
- Communication Platforms for CPS
- Real-time Sensing Techniques
- Attacks Detection and Mitigation
- Security perimeter concepts and design methodologies
- State estimation criteria and techniques
- Automation of CPS using Automata theory
- Automation of CPS using AI techniques
- Industrial IoT (IIoT) concepts
- Implementation of CPS in IIoT
- Digital Twin
- Cyber Security
- Multi-agent Systems

## COURSE TIMELINE

Session Days:	<b>Monday to Friday</b>
Session Duration:	<b>1 Hr. 30 Min. (90 Min.)</b>
Session Time:	<b>05:30 PM to 07:00 PM</b>
Mode of Instruction:	<b>Hybrid Mode</b> (Online and Offline both)

## COURSE TIMELINE & REGISTRATION

Registration Last Date:	<b>30<sup>th</sup> November, 2024</b>
Course Start Date:	<b>6<sup>th</sup> January, 2025</b>
Course End Date:	<b>7<sup>th</sup> March, 2025</b>



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## CHIEF PATRON

Prof. N.V. Ramana Rao, Director, NITRR

## PATRON

Dr. Prabhat Diwan, Dean (R&C), NITRR

## CHAIRMAN

Dr. Pradeep Singh, HoD, Department of CSE

## ADVISORY COMMITTEE

Prof. Naresh K Nagwani, Department of CSE  
Dr. Pradeep Singh, Department of CSE

## CO-ORDINATORS CONTACT DETAILS

1. **Dr. Manu Vardhan**, Department of CSE,  
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3. **Dr. Madhukrishna Priyadarsini**, Department of CSE,  
Email: mpriyadarsini.cse@nitrr.ac.in

## SPEAKERS

Subject experts of Cyber Physical System may be from IIT, NIT, and IIITs.

## NUMBER OF PARTICIPANTS

The number of participants in the course is limited. Preference will be given to the participants on first come basis.

## CERTIFICATE

Certificate will be provided to all the participants at the end of certificate course.



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## FEE STRUCTURE

S. No.	Particulars	NITRR Students	External Students / NITRR Staff	Industry/Faculties and Staff from Education Institution/Govt. Employees
1	Course Fee	INR 3000/- + 18% GST (INR 3540/-)	INR 4000/- + 18%GST (INR 4720/-)	INR 5000 + 18% GST (INR 5900/-)
2	Accommodation Unavailable	No TA/DA will be provided for attending the course.		

## REGISTRATION PROCESS

Submit the online registration form  
<https://forms.gle/jpH9j9JTW6eCmX818>

1. Fill the required basic details including the details of the Fee payment
2. Upload soft copy of payment receipt
3. Submit the form.

Nomination

A confirmation email will be sent to the registered participants after confirmation.

## ACCOUNT DETAILS

Account Name: **National Institute of Technology, Raipur**  
Account No.: **38027633250**  
Bank Name: **State Bank of India**  
Bank Branch: **NIT Branch**  
IFSC Code: **SBIN0002852**