Course Relevance

Wireless communication is the foundation of modern connectivity, enabling seamless interaction across mobile, IoT, and intelligent systems. This short-term course in AI-Enabled Wireless Networks provides a strong foundation in wireless communication principles, network evolution (2G-6G), and AI techniques for intelligent network management.

Covering key topics such as machine learning, deep learning, traffic prediction, resource allocation, 5G/6G technologies, Massive MIMO, edge computing, and SDN, the program ensures a comprehensive understanding of next-generation wireless systems. Participants will also gain practical exposure through case studies and a mini project on AI-driven network analysis.

This program is ideal for those aspiring to build careers in wireless communications, telecommunications, and AI-driven network optimization, equipping them with the skills to design, analyze, and manage intelligent network systems.

Course Objectives

- To provide a strong foundation in wireless communication concepts, including network architecture, standards, and evolution from 2G to 6G.
- To introduce the fundamentals of Artificial Intelligence, Machine Learning, and Deep Learning for intelligent system design.
- To explore the integration of AI techniques in wireless networks for traffic prediction, network optimization, and efficient resource allocation.
- To demonstrate the use of reinforcement learning for adaptive and autonomous network management.
- To examine next-generation wireless technologies such as 5G/6G, Massive MIMO, millimeter-wave communication, edge computing, and Software-Defined Networking (SDN).
- To highlight real-world applications in smart cities, autonomous vehicles, and IoT, along with hands-on experience through case studies and a mini project on AI-enabled wireless network analysis.

Topics to be Covered

- Fundamentals of wireless communication systems.
- Evolution of wireless networks from 2G to 6G.
- Wireless network architecture and communication standards.
- Challenges in wireless networking and performance issues.
- Introduction to Artificial Intelligence and Machine Learning.
- Supervised and Unsupervised learning techniques.
- Basics of Deep Learning and AI tools.
- AI-based network management and optimization.
- Traffic prediction and intelligent network control.
- Resource allocation and spectrum management using AI.
- Reinforcement learning for adaptive wireless networks.
- Overview of 5G and emerging 6G technologies.
- Massive MIMO and millimeter-wave communication.
- Edge computing and intelligent networking.
- Software-Defined Networking (SDN) in wireless systems.
- Applications in smart cities, autonomous vehicles, and IoT.
- Case studies in AI-enabled wireless networks.
- Mini project on intelligent wireless network analysis.

Keynote Speakers

- Prof. Peter Han Joo Chong, AUT, Auckland, New Zealand
- Prof. G. G. Md. Nawaz Ali, Bradley University, Peoria, Illinois, United States of America (USA)
- Prof. William Liu, AUT, Auckland, New Zealand
- Prof. Saroj Kumar Meher, ISI, Bangalore
- Prof. Chiranjeev Kumar, IIT (ISM) Dhanbad, Jharkhand
- Prof. Bidyut Kumar Patra, IIT (BHU) Varanasi, Uttar Pradesh
- Prof. Manju Khari, JNU, New Delhi
- Prof. Pushpendra Singh, JNU, New Delhi
- Prof. Anupam Kumar, NIT Patna, Bihar
- Prof. Sudhakar Pandey, NIT Raipur, Chhattisgarh
- Prof. Suvendu Rup, NIT Raipur, Chhattisgarh
- Prof. Puneet Kumar Jain, Dr B R Ambedkar NIT Jalandhar, Punjab
- Prof. Alekha Kumar Mishra, NIT Jamshedpur, Jharkhand
- Prof. Lopamudra Hota, BIT Mesra, Ranchi, Jharkhand
- Prof. Ashok Kumar Turuk, NIT Rourkela, Odisha
- Prof. Bibhudatta Sahoo, NIT Rourkela, Odisha
- Prof. Panthadeep Bhattacharjee, NIT Rourkela, Odisha
- Prof. Arun Kumar, NIT Rourkela, Odisha

One Week short-Term Course

on

Artificial Intelligence and Next-Gen Wireless Networks

Hybrid Mode
(Online and Offline)
18th - 22nd May 2026

Patron:

Prof. K. Umamaheshwar Rao, Director, NIT Rourkela

Chairman:

Prof. Bibhudatta Sahoo

Convener:

Prof. Arun Kumar
Prof. Bibhudatta Sahoo

Department of Computer Science and Engineering
National Institute of Technology, Rourkela,
Odisha-769008
http://www.nitrkl.ac.in

About NIT Rourkela

National Institute of Technology (NIT) Rourkela is an institution of national importance funded by the Ministry of Education. NIT Rourkela was established as Regional Engineering College (REC) on August 15, 1961. NIT Rourkela was ranked 601-800 in the world by the Times Higher Education World University Rankings of 2018 and 126th in Asia. In India, it was ranked 16 among engineering colleges by the National Institutional Ranking Framework (NIRF) in 2023. For details about the institute please visit us at www.nitrkl.ac.in.

Tourist Places Nearby


Khandadhar Waterfall


Pitamahal Dam


Hanuman Vatika


Vedvyas Temple


Mandira Dam

About Department of Computer Science and Engineering

The department was established with the vision to prepare its students for professional employment and graduate education through study and implementation of the fundamental principles of theory, abstraction, and software design, while at the same time presenting the ethical and social issues associated with computer science.
The department offers various UG and PG programmes with the mission to o provide high-quality education that prepares the graduates for success in their professional practice and advanced studies. The department also offers M. Tech in Computer Science, Information Security, and Software Engineering; and Ph. D. for regular as well as sponsored candidates. Please visit https://website.nitrkl.ac.in/CS/ to know more about the department of CSE.

Important Dates	
Registration Deadline	10th May 2026
Registration Confirmation	12th May 2026
Commencement of Course	18th May 2026
Max Offline Participanta (FCFS Basis)	50

Coordinator:
Prof. Arun Kumar
Assistant Professor
Department of CSE, NIT Rourkela
Email: kumararun@nitrkl.ac.in
Mobile no.: +91 9971867785

Contact and Queries:
Please send your queries directly to the student coordinator:
Ms. Prangya Priyadarshini, Mr. Putcha Sai Kiran
Email: stc.itssc.2023@gmail.com, putchasaikiran@gmail.com
Mobile no: +91-9337860838; +91-7077876261

Target Participants

The short-term course is of immense interest for UG/ PG students, research scholars/professionals, staff/ faculty members, and industry professionals working in the area of networking and IoT.

Registration Details

Registration Details (Fees Non-Refundable)	
Registration Type	**Fees**
Students	**INR 2360(Online) INR 3540 (Offline)**
Faculty from Academic Institutions	**INR 3540**
Scientist from R &D Organization/Industry Persons	**INR 4720**

Registration fees include Registration Kit, Refreshment, Tea, and Snacks, and 18% GST. Lodging, boarding, lunch, and dinner facilities can be availed on a separate payment basis and based on availability.

Bank Account Details for Registration

Account Name	**CONTINUING EDUCATION NIT ROURKELA**
Account No.	**10138951784**
Bank	**State Bank of India**
Branch	**NIT Campus Rourkela (02109)**
IFS Code	**SBIN0002109**

To complete the online registration, the participants need to use the below link for the google form:
https://forms.gle/ging4WuxLvSxUUKX6