

Course Relevance

Computer networks form the backbone of modern communication, enabling seamless data exchange across global systems. This Internship cum Certification Program in Computer Networking provides a strong foundation in networking principles, protocols, and infrastructure. Covering essential topics such as the OSI model, routing, switching, network performance optimization, and wireless communication, the program ensures participants gain a deep understanding of how networks operate and interact. Participants will also gain hands-on experience with tools like Wireshark for network analysis and troubleshooting, along with practical exposure to network design and implementation. This program is ideal for those aspiring to build a career in network engineering, IT infrastructure management, and telecommunications, equipping them with the necessary skills to design, optimize, and manage robust network systems.

Course Objectives

- To provide a comprehensive understanding of networking concepts, protocols, and security across the OSI model.
- To explore the architecture of the Internet and various network types, along with their role in modern communication systems.
- To introduce key networking protocols such as DNS, HTTP, TCP/UDP, and their applications in data transmission.
- To showcase advanced networking techniques, including IP addressing, subnetting, routing protocols (RIP, OSPF, BGP), and mobility management.
- To examine wireless communication technologies such as Wi-Fi, cellular networks (3G, 4G, 5G), and their impact on mobility and connectivity.
- To highlight network security measures, including SSL, VPNs, IPsec, and OSI layer-specific protections, for safeguarding network infrastructure.



Topics to be Covered

This module provides a comprehensive understanding of networking concepts, protocols, and security across the OSI model. It covers the architecture of the Internet, various types of networks, and the functionality of each OSI layer. Learners will explore topics such as IP addressing, routing, wireless communication, and security measures implemented at different layers to protect network systems.

- Basics of Networking and the OSI Model – Understanding fundamental networking concepts, the role of different network components, and a detailed breakdown of the seven layers of the OSI model along with their functions.
- Communication Protocols and Internet Services – Exploration of DNS, HTTP/HTTPS, FTP, DHCP, and SMTP, detailing how these protocols support web browsing, file transfer, and email communication. Understanding peer-to-peer networks and their role in decentralized data sharing.
- Internet Architecture and Protocols (DNS, HTTP, TCP/UDP) – Analyzing the structure of the Internet and how key protocols (DNS, TCP, UDP) handle data flow and communication between devices.
- IP Addressing, Subnetting, and Routing Techniques – Learning about IPv4/IPv6 addressing, subnetting techniques for efficient IP allocation, and routing principles. Exploring static and dynamic routing and routing protocols such as RIP, OSPF, and BGP.
- Data Link Layer and Network Segmentation – Understanding framing, MAC protocols, error detection (CRC, parity checks), Ethernet, ARP, and VLANs, and their role in network efficiency and security.
- Transmission Media and Data Encoding – Studying wired vs. wireless transmission, signal encoding, modulation techniques, and the fundamentals of data transmission for reliable communication.
- Wireless Networks and Mobility Management – Exploring Wi-Fi, Bluetooth, 3G, 4G, and 5G technologies. Understanding mobility management, handoff strategies, roaming, and Mobile IP for uninterrupted connectivity.

Two-Weeks Short-Term Course

on

Foundation of Computer Networking: Core Concepts, Protocols & Infrastructure

Hybrid Mode
(Online and Offline)
19th - 30th May 2025



Patron:

Prof. K. Umamaheshwar Rao,
Director, NIT Rourkela

Chairman:

Prof. Bibhudatta Sahoo

Convener:

Prof. Arun Kumar

Co-Convener:

Prof. Suchismita Chinara

**DEPARTMENT OF COMPUTER
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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



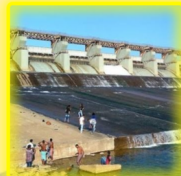
Pitamahal Dam



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 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/CSI> to know more about the department of CSE.

Important Dates

Registration Deadline	15th May 2025
Registration Confirmation	18th May 2025
Commencement of Course	19th May 2025
Max Offline Participanta (FCFS Basis)	50

Convener:

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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 cybersecurity.

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 facility can be availed on separate payment basis and based on availability.



scan for payment

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 scan or use below link for the google form:

<https://forms.gle/JciHAMGZoiCFB7EC7>



scan for registration

Contact and Queries:

Please send your queries directly to the student coordinator:

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