6G NETWORKS

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Overview

The course on "6G Networks" provides a comprehensive exploration of the next generation of mobile networks, focusing on emerging technologies, challenges, and opportunities. The course will lay the foundation of the state of art fundamentals of evolution of mobile communication technologies ranging from 1G to 5G.

With the emergence of Beyond 5G (B5G) technologies promising transformative changes, next phase aims to address the ever-growing demand for faster speeds, higher capacity, lower latency, and greater reliability. By embracing innovations such as terahertz communication, massive MIMO, mmWave technology, AI-driven networking, quantum communication, edge computing, and network slicing, B5G networks will usher in a new era of connectivity, powering the digital transformation of industries and societies worldwide.

The course will explore various dimensions from technological advancements to societal needs, regulatory frameworks, and market dynamics. Overall, "The Road for the Future Wireless Network" offers a comprehensive exploration of the forces driving wireless network development, equipping participants with the knowledge and insights needed to shape the future of connectivity in a rapidly evolving digital world.

On completion of course the participants will equip with knowledge and insights needed to navigate the evolving landscape of wireless communication and contribute to the advancement of next-generation connectivity. Practical aspects, challenges at various levels as well as innovative and transformative capabilities that can be achieved with the advancements will also be appreciated by the participants.

Additional communications, presentations skills workshops (both verbal and written), and interactive sessions are also key components.

Course Objectives

The course is intended for undergraduate and graduate students (B. Tech, M. Tech, MBA, M.Sc, PhD students) as well for faculty pursuing research. This course is for those who wish to explore their dream of becoming a scientist, inventor, innovator, researcher, technology incubators and engineering leaders in communication technology.

The key objectives for those who attend this course are as follows:

- Understand the evolution of mobile generations.
- Identify the key challenges and opportunities in future mobile communication technology.
- Explore potential applications and use cases enabled by 6G networks including IoT.
- Analyse the computational, security and economic challenges of 6G networks.
- Evaluate the role of advanced technologies.
- Discuss the ethical and privacy considerations of 6G.
- Gain insights into standardization of 6G and future roadmap.

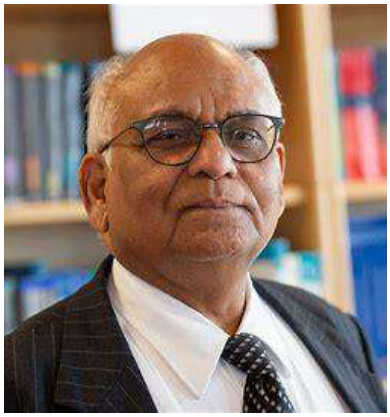
Course Information	**Duration : 28th March 2025 – 03rd April 2025** **Place : NIT Silchar , Assam , India** **Total Contact Hours : 18 hours (14 hours lectures and 4 hours tutorials)**
Modules and schedules	**A: <u>Day 1: 28-03-2025</u>** **Inauguration** Lecture 1 (1h): Introduction, Vision and goals of the course, State of the Art of Mobile generations. Lecture 2 (1h): A Glimpse of the Future Beyond 2020 - B5G, The Road for the Future Wireless networks. Lecture 3 (1h): Complex network challenges Lecture 4 (1h): Society 5.0 and SDGs, 6G Networks **B: <u>Day 2: 29-03-2025</u>**

	Lecture 5 (1h): 6G KPIs Lecture 6 (1h): Computational Challenges in 6G Networks Lecture 7 (1h): 6G Future Vision: Requirements, Design Issues, Applications Lecture 8 (1h): 6G System Architecture, 6G Security **C: Day 3: 31-03-2024** Lecture 9 (1h): 6G Use Cases Lecture 10 (1h): CONASENSE, Challenges, and Use Cases Beyond 2030 **D: Day 4: 01-04-2025** Lecture 11 (1h): 6G Standardization Lecture 12 (1h): 6G Terahertz Spectrum Band for 6G Lecture 13 (1h): 6G IoT, 6G AI, ML, and Quantum Computing Orchestration Lecture 14 (1h): 6G and Quantum Technologies, 6G Data Privacy and Ethics, Future Scope & Challenges **E: Day 5: 02-04-2025** Tutorial 1 (h): Economic Challenges for 6G Deployments, 6G and Green Business Model Innovation Tutorial 2 (1h): New Material Design for 6G Networks Tutorial 3 (1h): 6G-D2D implementation using SDR Tutorial 4 (1h): 6G IoT implementation **F: Day 6: 03-04-2025** **Examination on 6G Networks:** MCQ based examination **Valedictory**
Who can attend …	• Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories.

	• Students at all levels (BTech/MSc/MTech/MBA/PhD). • Faculty from reputed academic and technical institutions. • Others who want to learn the basic and advanced concepts dealing with 6G Technology & its applications.
Fees	The participation fees for taking the course is as follows: a. Participants from abroad: USD 250 b. Participants from Industry/Research Organizations: Rs. 5000/- c. Participants from Academic Institutions: i. Faculty member: Rs. 2000/- ii. External Students: Rs. 500/- iii. Internal PG & PhD Students: Rs. 500/- iv. Internal UG Students: Nil The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hours free internet facility. The participants may be provided with accommodation on payment basis.

The Faculty (Experts)

Ramjee Prasad
Director: CTIF
Emeritus Professor,
Dep. of Business Development and Technology,
Aarhus University, Denmark.



Ramjee Prasad is an Emeritus Professor in the Department of Business Development and Technology at Aarhus University, Denmark. He is currently the Director of the Center for TeleInfrastruktur (CTIF) at Aarhus University, Denmark and Professor, Wireless Information Multimedia Communication Chair.

Ramjee Prasad is the Founding Chairman of the Global ICT Standardisation Forum for India (GISFI: www.gisfi.org) established in 2009. GISFI has the purpose of increasing of the collaboration between European, Indian, Japanese, North-American and other worldwide standardization activities in the area of Information and Communication Technology (ICT) and related application areas. He was the Founding Chairman of the HERMES Partnership – a network of leading independent European research centres established in 1997, of which he is now the Honorary Chair. He is also the founding editor-in-chief of the Springer International Journal on Wireless Personal Communications..

He is a member of the editorial board of other renowned international journals including those of River Publishers. Ramjee Prasad is a member of the Steering, Advisory, and Technical Program committees of many renowned annual international conferences including Wireless Personal Multimedia Communications Symposium (WPMC) and Wireless VITAE. He is a Fellow of the Institute of Electrical and Electronic Engineers (IEEE), USA, the Institution of Electronics and Telecommunications Engineers (IETE), India, the Institution of Engineering and Technology (IET), UK, and a member of the Netherlands Electronics and Radio Society (NERG), and the Danish Engineering Society (IDA). He is also a Knight ("Ridder") of the Order of Dannebrog (2010), a distinguished award by the Queen of Denmark..

Ramjee Prasad has published 1000+ journal and conference papers, authored 40 books, 10+ patents and supervised 100+ PhD candidates. His focus is on multi-business model innovation, sensing and virtual business models, and interdisciplinary network research.

Key Accomplishments:

- Author of several notable books and research papers.
- Founding chairman and member of some renowned research centers and forums.
- Fellow of various reputed recearch socities.
- Honarary Professor at many international premier universities.

Course Co-ordinators

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About Silchar

Silchar is the second largest town in the state of Assam. It was the kingdom of the Kachchari kings from 1755 to 1830. It was annexed to the British East India Company in 1833. The city has now attained a cosmopolitan status with inhabitants from all over India although Bengali speaking people constitute the majority. It is an educational and business hub in North East India next to Guwahati. Aesthetically the campus is very beautiful with greeneries and wet lands. During the month of March-April the weather in Silchar is pleasant with a temperature around 22-28°C.

How to reach NIT Silchar

The city is well connected by Road, Train and Air. There are direct flights from Kolkata and Guwahati and trains from New Delhi, Kolkata, Guwahati, and Agartala. Daily bus services are available from Agartala, Guwahati, Aizawl, and Imphal. The Institute is located around 35 kms from the Silchar airport, 10 kms from the Silchar railway station, 14 kms from ISBT Silchar, and 8 kms from the heart of the Silchar town. Prepaid taxi and auto services are available from Silchar.

Registration Guidelines (Step-by-Step):

1. Courses Registration for GIAN course may be done by paying the requisite fees as below through SBI collect.
   SBI Collect Name: GIAN COURSE NIT SILCHAR, 2512041, Ranjay Hazra.
   a. Participants from abroad: USD 250
   b. Participants from Industry/Research Organizations: Rs. 5000/-
   c. Participants from Academic Institutions:
   i. Faculty member: Rs. 2000/-
   ii. External Students: Rs. 500/-
   iii. Internal PG & PhD Students: Rs. 500/-
   iv. Internal UG Students: Nil

2. Fill out the Registration form given below, sign it. Send the scan copy of the filled in form with scanned copy of course fee transaction slip obtained by SBI collect to the course coordinator e-mail address (ranjay@ei.nits.ac.in, arun@ei.nits.ac.in). This is for the Course Coordinator's record. Now, await the Course Coordinator's confirmation.

NAME OF THE COURSE: 6G NETWORKS

(Course ID: 2512041)
Dates: -28 March-03 April, 2025
Department of Electronics and Instrumentation Engineering, NIT
Silchar, Assam, India

REGISTRATION FORM

GIAN Portal Application Number:

Full Name: Category (Industry/Academic/Student):

Organization:

Address:

Email Id:

Mobile Number:

Highest Academic qualification:

SBI Collect payment details:

Transaction Id/Ref No	Date	Amount

Accommodation Required: Yes/No (please tick in the applicable field)

Date:

Place:

Signature of Applicant