



Online refresher course on
ADVANCE OPTICAL COMMUNICATION FOR 6G AND BEYOND
June 15, 2026 – June 26, 2026 (MODE-ONLINE)
INDIAN INSTITUTE OF TECHNOLOGY (ISM) DHANBAD

Organizing Committee

Course Coordinator

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Venue

IIT(ISM) Dhanbad

Website:

<https://www.iitism.ac.in>

About The Refresher Course:

The main objective of this refresher course is to facilitate Faculty members from different regions of the country in gaining knowledge from Experts on recent developments in the domain, from universities, colleges, private academic institutions, and newly established institutes, to pursue quality research work. Optical communication serves as the fundamental backbone of both 5G and 6G networks by enabling the seamless transport of massive data with ultra-high capacity, low latency, and superior reliability. In 5G, optical fibre and free-space optical links primarily support the fronthaul and backhaul of ultra-dense small cells operating at mm-Wave frequencies. This ensures high-bandwidth, energy-efficient data transfer and end-to-end latency below 10 ms, which are essential for IoT, smart cities, connected vehicles, and mission-critical services. As we move into 6G, the role of optical communication expands further: it becomes the core infrastructure that interconnects heterogeneous access technologies, such as terahertz, LiFi, and satellite networks. With capabilities to deliver terabit-to-petabit data rates, sub-millisecond latency, and quantum-level security, optical systems enable futuristic applications, including holographic communication, digital twins, brain-machine interfaces, and the convergence of classical and quantum networks. Thus, while 5G relies on optical links for high-speed connectivity and efficient backhaul, 6G elevates optical communication to a more advanced, intelligent, and secure backbone, enabling the vision of truly immersive, global, and sustainable connectivity.

After attending the refresher course, the participants will independently and accurately be able -

- ✓ To understand the role of optical communication as the backbone of 6G and beyond, supporting ultra-high capacity, low latency, and secure connectivity.
- ✓ To evaluate photonic integration, silicon photonics, and energy-efficient transceivers for 6G infrastructure
- ✓ To apply advanced multiplexing (WDM, SDM, MDM) and optical wireless techniques (FSO, Li-Fi, VLC) to next-generation network design.
- ✓ To demonstrate the use of quantum-secured optical links (QKD) and optical satellite/ISL systems for global and secure communication

Participants: Eligibility Criteria:

- Faculty members working in universities and colleges that are included under Section 2(f) of the UGC Act. The teachers of colleges that do not yet come within the purview of Section 2(f), but have been affiliated with a university for at least three years, will be permitted to participate in the courses. These conditions are applicable only to residential training programmes/courses.
- For the Refresher course (RC), participation in the FIP is a prerequisite for admission. The teacher may opt for a refresher course after a one-year gap following FIP.

Application Procedure:

- The participants should first register at <https://mmc.ugc.ac.in/> and create an account.
- After logging in as a participant using User ID and Password, from the dashboard, click on “Apply for Guru Dakshta (FIP), Refresher Course and Short Term Programme/Faculty Development Programme”, next start filling the application form.
- In the application form, select “Apply for” as “Refresher Course”, next give details of your earlier participation in FIP, next select “Programme Name & Centre Name” as “Indian Institute of Technology (Indian School of Mines), Dhanbad”, later fill in the remaining items and submit the application form.
- Sample NOC is available on the website to download (or) click on the link https://mmc.ugc.ac.in/Document/MMTTP_Nomination%20Letter_Format.pdf to download the sample NOC.

Salient Features of the Course:

- The fulfilment of the requirements as laid down by UGC for the Career Advancement Scheme (CAS).
- Application/registration is free.
- The Course will be conducted in an online mode (Google Meet/Zoom/Microsoft Teams).
- No TA/DA will be given to the participants for attending the workshop. Travelling and other expenses should be borne solely by participants/sponsoring Higher Education Institutions (HEIs).
- A certificate of successful completion of the refresher course shall be issued to the eligible participants.

Important Dates

- Application deadline: **June 5, 2026**

Resource Persons

Eminent experts from premier institutes (IITs, NITs, and universities) will serve as resource persons.

Name	Affiliated Department and Institute (with full address)
Prof. Deepa Venkatesh	Department of Electrical Engineering, IIT Madras, Chennai-600036, India
Prof. Balaji Srinivas	Department of Electrical Engineering, IIT Madras, Chennai-600036, India
Prof. Bijoy Krishna Das	Department of Electrical Engineering, IIT Madras, Chennai-600036, India.
Prof Shivnandu	Department of Electrical Engineering, IIT Madras, Chennai-600036, India
Prof. Shankar Kumar Selvaraja	Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India.
Prof. T. Srinivas	Electrical Communication Engineering, Division of ECE (EECS), IISc Bangalore
Prof. Supradeepa V. R	Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India.
Prof. Partha Roy Chaudhuri	Department of Physics, Indian Institute of Technology Kharagpur, Kharagpur 721302, West Bengal, India
Prof. Samudra Roy	Department of Physics, Indian Institute of Technology Kharagpur, West Bengal, India
Prof. Shailendra Kumar Varshney	Department of E & E C Engr, Indian Institute of Technology Kharagpur, West Bengal, India
Prof. Raja Dutta	Department of E & E C Eng, Indian Institute of Technology Kharagpur, (W.B)
Prof. Joseph John	Department of Electrical Engineering, IIT Bombay, Powai, Mumbai 400 076, Maharashtra, India.
Prof. Tapan Gandhi	Department of Electrical Engineering, IIT Delhi, New Delhi-110016, India
Prof. Samresh Das	Centre for Applied Research in Electronics, IIT Delhi, New Delhi-110016, India
Prof. Anuj Dhawan	Department of Electrical Engineering, IIT Delhi Hauz Khas, New Delhi-110016, India
Dr. Santanu Manna	Department of Electrical Engineering, IIT Delhi, Hauz Khas, New Delhi. India
Prof. Vivek Venkataraman	Dept. of Electrical Engineering, IIT Delhi, Hauz Khas, New Delhi. India
Prof. Devi Chadha	Optoelectronics & Optical Communication / EE, Hauz Khas, New Delhi. India
Prof. Joyee Ghosh	Department of Physics, IIT Delhi, Hauz Khas, New Delhi-110016, India
Prof. R. K. Varshney	Department of Physics, IIT Delhi, Hauz Khas, New Delhi-110016, India
Prof. Saurabh Mani Tripathi	Optics & Photonics Centre / Physics, IIT Delhi, New Delhi-110016, India
Prof. Subrat Kar	Department of Electrical Engineering, IIT Delhi, New Delhi-110016, India
Prof. Rituraj	Department of Electrical Engineering, IIT Kanpur, Uttar Pradesh, India

Prof. Pradeep Kumar	Department of Electrical Engineering, IIT Kanpur, Uttar Pradesh, India
Name	Affiliated Department and Institute (with full address)
Prof. R Vijaya	Department of Physics, IIT Kanpur, Uttar Pradesh, India
Prof Shilpi Gupta	Department of Electrical Engineering IIT Kanpur, Uttar Pradesh, India
Prof. Ramesh Kumar Sonkar	Department of Electronics & Electrical Engineering, IIT Guwahati, Assam — PIN 781039, India.
Prof. Amritanshu Pandey	Department of Electronics Engineering, IIT BHU, Varanasi – 221005, Uttar Pradesh, India
Prof. Parthasarathi Chakrabarti	Department of Electronics Engineering, IIT BHU, Varanasi – 221005, Uttar Pradesh, India
Prof. Sumanta Gupta	Department of Electrical Engineering, IIT Patna, Bihta, Patna, Bihar 801106, India
Prof. Anshul Jaiswal	Department of ECE, IIT Roorkee, Uttarakhand, India
Prof. Sachin Kumar Srivastav	Department of Physics, IIT Roorkee, Uttarakhand, India
Prof. Anirban Mitra	Department of Physics, IIT Roorkee, Uttarakhand, India
Prof. Vipul Rastogi	Department of Physics, IIT Roorkee, Uttarakhand, India
Prof. Mukesh Kumar	Optoelectronic Nanodevice Research Laboratory, Department of Electrical Engineering, Indian Institute of Technology Indore, Madhya Pradesh, India.
Prof. Sunil K. Kiwanian	Department of Physics, Indian Institute of Technology Jodhpur, Jodhpur-342030, Rajasthan, India
Prof. Nitin Bhatia	Department of Electrical Engineering, Indian Institute of Technology Jodhpur, Jodhpur-342030, Rajasthan, India.
Prof. Yogendra Kumar Prajapati	Department of ECE, Motilal Nehru National Institute of Technology, Allahabad, Prayagraj - 211004, Uttar Pradesh, India
Prof. G. Thavasi Raja	Department of Electrical Engineering, National Institute of Technology, Tiruchirappalli 620015, India.
Prof. Nishit Malviya	Department of Electrical Engineering, Indian Institute of Information Technology, Ranchi 834010, India.
Prof. Jitendra Kumar Mishra	Assistant Professor — Department of Electrical Engineering, Indian Institute of Information Technology, Ranchi 834010, India
Prof. Rituraj Singh	Department of Electronics & Communication Engineering, NSUT, New Delhi – 110078, India
Prof. Liam Barry	School of Electronic Engineering, Dublin City University, Glasnevin Campus, Dublin, Ireland