Electronics & ICT Academy IIT Roorkee

An Initiative of
Ministry of Electronics & Information Technology (MeitY)
Government of India

A Faculty Development Program
on
Federated Learning for User Privacy and Data Confidentiality

In association with
National Institute of Technology, Delhi

July 28th – Aug 01st , 2025

Timings: 09:30 AM – 6:00 PM

Register Before: July 26th , 2025

Venue: Hybrid Mode at National Institute of Technology, Delhi

Objectives of the Course

- To introduce the core concepts and architecture of Federated Learning.
- To enable participants to understand privacy and security challenges in distributed ML.
- To explore cryptographic methods used to protect data during federated model training.
- To provide exposure to real-world use cases and industry adoption of FL.
- To build proficiency in tools and frameworks for implementing federated systems.
- To foster research interest in privacy-aware AI aligned with legal and ethical norms.
- To empower educators to integrate FL concepts into academic curricula and research.

Why this course ?

In an era of growing data privacy concerns, Federated Learning (FL) offers a secure alternative to traditional centralized machine learning by enabling decentralized model training without sharing raw data. This course equips participants with essential knowledge of privacy-preserving AI, legal compliance (e.g., GDPR), and hands-on experience using FL tools. It prepares educators, researchers, and professionals to adopt and implement FL in real-world applications, fostering responsible AI development and curriculum integration in alignment with emerging technological and ethical standards.

Prerequisites

No experience is required, but fundamental knowledge of any programming language would be helpful.

Experts from Academia/Industry

Who Should Register?

Any Interested Faculty/PhD-Scholars UG/PG/ & Industry Persons can register

Registration Fee

Fees: ₹ 250/- Faculty/Research Scholar/ Students
₹ 500/- Industry/Others
Note: Refund will be done in case of course cancellation only, with in 20 working days

FDP Kits & Refreshment will be provided

How to make Payment

Please make the payment first using the below link upload the payment receipt when filling out the Google registration form

https://eict.iitr.ac.in/instruction-for-payment/

EICT Course Code: EICTIITR-FDP-5H6-06

Registration Link

https://forms.gle/v61AZci4nSftEicn8

Scan QR for registration
Register before: July 26th , 2025

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Course Outcomes

- Participants will understand the principles and components of Federated Learning.
- Ability to implement privacy-preserving machine learning solutions.
- Knowledge of secure communication and data handling in decentralized environments.
- Hands-on skills in deploying FL models using tools like TensorFlow Federated.
- Awareness of regulatory frameworks (GDPR, HIPAA) and ethical considerations.
- Preparedness to guide academic and student research in privacy-focused AI.
- Capability to develop course content and lab modules on FL for institutional programs.
- Enhanced ability to evaluate, compare, and optimize FL strategies for different application domains.

Focus Areas

- Fundamentals of Federated Learning (FL) architecture and workflows.
- Privacy-preserving machine learning techniques (e.g., differential privacy, secure aggregation).
- Communication-efficient algorithms and distributed model training.
- Data confidentiality protocols and encryption techniques in FL.
- Applications of FL in healthcare, finance, IoT, and smart devices.
- Hands-on practice with open-source FL frameworks like TensorFlow Federated and PySyft.
- Ethical, legal, and regulatory considerations in decentralized AI systems.

Course Features

- 40 Hours of Lectures, hands-on, and Pedagogy/Industry sessions.
- Lectures from Expert Speakers, Hands-on from industry/Academia experts.
- Access to learning material and video lectures
- Certificate by E&ICT Academy IIT Roorkee

Who may benifits

- Academic Faculty and Students(UG/PG)
- Government Officials.
- Working Professionals in the Industry and Startups.
- Research Scientists and Technical Staff.

This certificate can be considered in alignment with other Quality Improvement Programs (QIP) as well as NBA and NAAC for recognition/credit.

Principal Investigator

Prof. Sanjeev Manhas
ECE Department, IIT Roorkee

Course Coordinators

- Prof. Sanjeev Manhas, IIT Roorkee
- Dr. Karan Verma , NIT Delhi
- Dr. Gyanendra Sheoran, NIT Delhi

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