Title of the Course	**Open Source Technologies for Engineering Applications (National)**
Operational Plan No	**CSE-02 Contact Mode**
Dates and Venue	20 -24 July 2026, NITTTR, Chandigarh
Course Contents	• Foundations of Open Source Technologies for Engineering Applications • Python Programming with Open Source Ecosystem for Engineering Applications • Docker and Containerization using Open Source Technologies • Data Analysis and Computational Workflows using R and RStudio • Reproducible Research and Scientific Publishing using Quarto • Data Visualization and Machine Learning using Open Source Tool Orange • Open Source DevOps Foundations and Core Toolchain • Open Source Tools for Data Analytics and Advanced Visualization • Open Source Frameworks for Computer Vision and Image Processing • Agentic AI and Open-Source Intelligent Tools for Autonomous Systems • Open Source Intelligence (OSINT) Tools and Techniques for Information Security • Automated Cyber Vulnerability Assessment using Open Source Tools • Open Source Technologies for Advanced Automation, CI/CD Pipelines, and Scaling • Federated Learning using Open Source Frameworks for Distributed Systems
Course Outcomes:	**Participants will be able to:** • Understand and evaluate the role of open source technologies, tools, and frameworks in engineering education, research, and industrial applications. • Develop engineering solutions using open source programming, data analysis, visualization, and machine learning tools such as Python, R, RStudio, and Orange. • Implement modern software engineering practices including containerization, DevOps, automation pipelines, and scalable deployment using open source technologies. • Apply open source AI, computer vision, cybersecurity, and OSINT tools to solve real-world engineering and information security challenges. • Design and deploy advanced intelligent systems using open source. technologies for autonomous AI agents, federated learning, reproducible research, and distributed computing applications.
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