

<b>Title of the Course</b>	<b>Open Source Technologies for Engineering Applications</b>
<b>Operational Plan No</b>	<b>CSE-02 Contact Mode</b>
<b>Dates and Venue</b>	20 -24 July 2026, NITTTR, Chandigarh
<b>Course Contents</b>	<ul style="list-style-type: none"> <li>• Foundations of Open Source Technologies for Engineering Applications</li> <li>• Python Programming with Open Source Ecosystem for Engineering Applications</li> <li>• Docker and Containerization using Open Source Technologies</li> <li>• Data Analysis and Computational Workflows using R and RStudio</li> <li>• Reproducible Research and Scientific Publishing using Quarto</li> <li>• Data Visualization and Machine Learning using Open Source Tool Orange</li> <li>• Open Source DevOps Foundations and Core Toolchain</li> <li>• Open Source Tools for Data Analytics and Advanced Visualization</li> <li>• Open Source Frameworks for Computer Vision and Image Processing</li> <li>• Agentic AI and Open-Source Intelligent Tools for Autonomous Systems</li> <li>• Open Source Intelligence (OSINT) Tools and Techniques for Information Security</li> <li>• Automated Cyber Vulnerability Assessment using Open Source Tools</li> <li>• Open Source Technologies for Advanced Automation, CI/CD Pipelines, and Scaling</li> <li>• Federated Learning using Open Source Frameworks for Distributed Systems</li> </ul>
<b>Course Outcomes:</b>	<p><b>Participants will be able to:</b></p> <ul style="list-style-type: none"> <li>• Understand and evaluate the role of open source technologies, tools, and frameworks in engineering education, research, and industrial applications.</li> <li>• Develop engineering solutions using open source programming, data analysis, visualization, and machine learning tools such as Python, R, RStudio, and Orange.</li> <li>• Implement modern software engineering practices including containerization, DevOps, automation pipelines, and scalable deployment using open source technologies.</li> <li>• Apply open source AI, computer vision, cybersecurity, and OSINT tools to solve real-world engineering and information security challenges.</li> <li>• Design and deploy advanced intelligent systems using open source technologies for autonomous AI agents, federated learning, reproducible research, and distributed computing applications.</li> </ul>
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