# EXPERIMENT-01

Aim: To understand Devops: principles practices and Devops Engineer Roles and responsibilities.

Theory:
DevOps can be best explained as people working together to conceive, build and deliver secure software at top speed. DevOps practices enable software development (dev) and operations (ops) teams to accelerate delivery through automation, collaboration, fast feedback, and iterative improvement.
DevOps is a combination of software development (dev) and operations (ops). It is defined as a software engineering methodology which aims to integrate the work of development teams and operations teams by facilitating a culture of collaboration and shared responsibility.
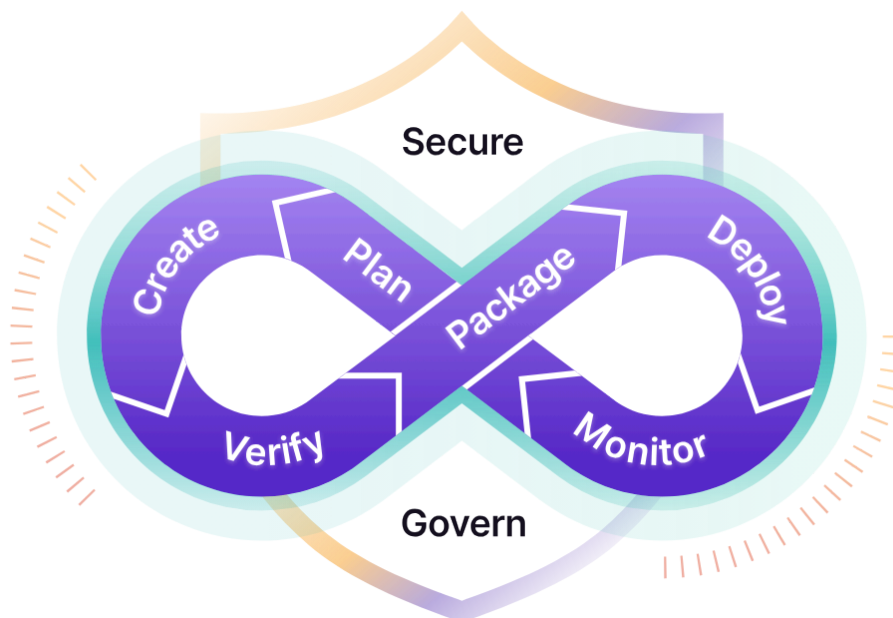
Core DevOps principles
The DevOps methodology comprises four key principles that guide the effectiveness and efficiency of application development and deployment. These principles, listed below, centre on the best aspects of modern software development.

Automation of the software development lifecycle. This includes automating testing, builds, releases, the provisioning of development environments, and other manual tasks that can slow down or introduce human error into the software delivery process.

Collaboration and communication. A good DevOps team has automation, but a great DevOps team also has effective collaboration and communication. **Continuous improvement and minimization of waste**. From automating repetitive tasks to watching performance metrics for ways to reduce release times or mean-time-to-recovery, high performing DevOps teams are regularly looking for areas that could be improved.
Hyperfocus on user needs with short feedback loops. Through automation, improved communication and collaboration, and continuous improvement, DevOps teams can take a moment and focus on what real users really want, and how to give it to them.

Roles and Responsibilities

A DevOps engineer's roles and responsibilities are a combination of technical and management roles. It is essential to have excellent communication and coordination skills to successfully integrate various functions in a coordinated manner and deliver the responsibilities to the customer's satisfaction.

The DevOps engineer's responsibilities are multi-prong - they need to be agile enough to wear a technical hat and manage operations simultaneously.

Some of the core responsibilities of DevOps Engineer include –

- Understanding customer requirements and project KPIs
- Implementing various development, testing, automation tools, and IT infrastructure
- Planning the team structure, activities, and involvement in project management activities.
- Managing stakeholders and external interfaces
- Setting up tools and required infrastructure
- Defining and setting development, test, release, update, and support processes for DevOps operation
- Have the technical skill to review, verify, and validate the software code developed in the project.
- Troubleshooting techniques and fixing the code bugs
- Monitoring the processes during the entire lifecycle for its adherence and updating or creating new processes for improvement and minimising the wastage
- Encouraging and building automated processes wherever possible

- Identifying and deploying cybersecurity measures by continuously performing vulnerability assessment and risk management
- Incidence management and root cause analysis
- Coordination and communication within the team and with customers
- Selecting and deploying appropriate CI/CD tools
- Strive for continuous improvement and build continuous integration, continuous development, and constant deployment pipeline (CI/CD Pipeline)
- Mentoring and guiding the team members
- Monitoring and measuring customer experience and KPIs
- Managing periodic reporting on the progress to the management and the customer

Conclusion:
DevOps is a transformative approach emphasising collaboration, automation, and continuous improvement in software development and IT operations. Key principles include collaboration, automation, and practices like Continuous Integration and Infrastructure as Code. DevOps engineers play a pivotal role in implementing and maintaining these practices, fostering a culture of efficiency and rapid response to change. Overall, DevOps represents a cultural shift, promoting collaboration and automation to deliver high-quality software efficiently.