

# INT332:DEVOPS VIRTUALIZATION AND CONFIGURATION MANAGEMENT

L:2 T:0 P:2 Credits:3

**Course Outcomes:** Through this course students should be able to

- CO1 :: Understand the concept of virtualization and containerization.
- CO2 :: Understand the implementation and operation of Docker and microservices.
- CO3 :: Understand and implement the concept of Docker swarm.
- CO4 :: Understand the concept of continuous integration.
- CO5 :: Apply the concept of CI/CD using Jenkins.
- CO6 :: Design of software using CI/CD concept.

## Unit I

**Introduction to Docker.** : Introduction to Docker hub, Docker Architecture, Docker life cycle, Concept of Hyper-V

**Installation of Docker.** : Installing Docker on Windows/Linux, Concept of Hyper-V, Basic Docker commands.

## Unit II

**Basic Docker operations.** : Create a Docker-hub account, Pushing the Docker to container-hub, Saving changes to a Docker container.

**Introduction to docker file** : Creating a Docker file

**Docker storage** : Types of Docker storage, Linking docker container

## Unit III

**Microservices** : Introduction to microservices

**Introduction to docker compose** : Docker compose installation, Introduction to YAML files, Writing a Docker Compose file, Deploying wordpress using docker compose.

## Unit IV

**Container orchestration** : Introduction to container orchestration

**Docker swarm cluster** : Creating a Docker swarm cluster, Initializing Docker Swarm create a service in a Docker Swarm

## Unit V

**Docker networks** : Introduction to Docker networks, Creating a service

**Continuous integration** : Introduction to continuous integration.

## Unit VI

**Jenkins** : Jenkins Architecture, Installing Jenkins

**Node Management** : Managing nodes on Jenkins

**Jenkins Integration** : Jenkins Integration with devops tools

**CI / CD Pipelines** : Understanding CI / CD Pipelines, Creating CI / CD Pipelines

## List of Practicals / Experiments:

### List of practical.

- Installing Docker on Windows/Linux, Concept of Hyper-V, Basic Docker commands.
- Create a Docker-hub account, Pushing the Docker to container-hub, Saving changes to a Docker container.
- Creating a Docker file
- Types of Docker storage, Linking docker container
- Introduction to micro services

- Docker compose installation, Introduction to YAML files, Writing a Docker Compose file, deploying WordPress using docker compose.
- Introduction to container orchestration
- Creating a Docker swarm cluster, Initializing Docker Swarm create a service in a Docker Swarm.
- Introduction to Docker networks, Creating a service.
- Introduction to continuous integration.
- Jenkins Architecture, Installing Jenkins.
- Managing nodes on Jenkins.
- Understanding CI / CD Pipelines, Creating CI / CD Pipelines.

**Text Books:**

1. DOCKER DEEP DIVE by NIGEL POULTON, SHROFF/O'REILLY

**References:**

1. JENKINS CONTINUOUS INTEGRATION COOKBOOK by ALAN MARK BERG, O'REILLY
2. JENKINS 2 UP AND RUNNING by BRENT LASTER, O'REILLY
3. DOCKER: UP AND RUNNING by KARL MATTHIAS, SEAN P. KANE, O'REILLY