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