GANPAT UNIVERSITY

FACULTY OF COMPUTER APPLICATIONS

Programme	Master of Computer Applications	**Branch/ Spec.**	Computer Application
Semester	III	**Version**	1.0.0.0
Effective from Academic Year	2024-25	**Effective for the batch Admitted in**	June 2024
Subject Code	P13A3DOP	**Subject Name**	DevOps

Teaching scheme						**Examination scheme (Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	2	0	2	0	4	Theory	40	60	100
Hours	2	0	4	0	6	Practical	20	30	50

Objective:

- To design to drive business innovation and continuous process improvement.

Pre-requisites:

- Student should have experience in both software development and system administration

Course Outcomes :

- **1 = Slight (Low); 2 = Moderate (Medium); 3 = Substantial (High); "-" = No Correlation**

Name of CO	Description
CO1	Explain core DevOps concepts, its evolution, and compare SDLC models
CO2	Configure and automate continuous integration workflows using Jenkins
CO3	Deploy and manage applications using Docker
CO4	Automate configuration management and infrastructure provisioning using Ansible.

Mapping of CO and PO

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	1	0	0	0	2
CO2	2	1	3	3	1	0	0	1

CO3	2	1	3	3	1	0	0	1
CO4	2	1	3	3	2	1	0	1

Content:

Unit	SECTION-I	Hrs
1	**Introduction to Devops** What Is Devops, History of Devops, Devops definition, DevOps and Software Development Life Cycle, Waterfall Model, Agile Model, Continuous Integration & Deployment (Jenkins), Containers and Virtual Development (Docker, Vagrant), Configuration Management Tools (Ansible, Puppet, Chef)	7
2	**Continuous Integration - Jenkins** Introduction to Jenkins, Continuous Integration with Jenkins, Configure Jenkins, Jenkins Management, Scheduling build Jobs	8
	SECTION-II	
3	**Containers and Virtual Development - Docker** Docker Image, Docker Installation, Working with Docker Containers (What is Container, Docker Engine, Creating Containers with an Image, Working with Images), Docker Command Line Interphase, Docker Compose, Docker Hub, Docker Trusted Registry, Docker swarm, Docker attach, Docker File & Commands	7
4	**Configuration Management Tools - Ansible** Introduction to Ansible, Ansible Server Configuration, Infrastructure Management, SSH Connection in Ansible Master, YAML Scripts, Host Inventory (Hosts and Groups, Host Variables, Group Variables, Host and Group Specific Data), Ad-hoc Commands, Playbooks (Variables, Conditionals, Loops, Blocks, Handlers, Templates), Modules (Core Modules, Extra Modules), Ansible Roles	8

Practical Content:

List of programs specified by the subject teacher based on above mentioned topics.

Text Books:

1	Docker in practice by Ian Miell, Aidan Hobson Sayers, Manning Publications; 2nd edition (10 February 2019).
2	Ansible for Devops by Jeff Geerling, Midwestern Mac, LLC; 1st edition (10 October 2015).
3	Cloud Native Devops with Kubernetes by John Arundel, Justin Domingus, Oreilly pub 2019.
4	Jenkins Continuous Integration Cookbook by Alan Mark Berg, Ingram short title; 3rd edition (1 January 2017).

Reference Books:

1	Effective Devops by Jennifer Davis, Katherine Daniels, Oreilly publication 2016.
2	The Practice of System and Network Administration by Thomas A. LimonCelli, Strata R. Chalup, Christina J. Hogan, Pearson pub.
3	The Science of Lean Software and Devops Accelerate by Nicole Forsgren, Jez Humble, Gene Kim, Library of Congress Catalog-in-Publication

MOOC/Certification Courses:

1	https://www.mygreatlearning.com/academy/learn-for-free/courses/introduction-to-devops1
2	https://www.redhat.com/en/topics/devops
3.	https://intellipaat.com/jenkins-training-course/
4	https://kodekloud.com/courses/docker-for-the-absolute-beginner/
5.	https://in.coursera.org/projects/ansible-fundamentals

Question Paper Scheme:

University Examination Duration: 3 Hours
Note for Examiner: -
(I) Questions 1 and 4 are compulsory with no options.
(II) Internal options should be given in questions 2, 3, 5 and 6.
SECTION – I
Q.1 –8 Marks
Q.2 –11 Marks
Q.3 –11 Marks
SECTION - II
Q.4 –8 Marks
Q.5 –11 Marks
Q.6 –11 Marks