



MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

COURSE CONTENT

DEVOPS LABORATORY								
V Semester : CSM								
VII Semester : CSE								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
24X0585	Core	L	T	P	C	CIA	SEE	Total
		0	0	2	1	40	60	100
Contact Classes : Nil	Tutorial Classes: Nil	Practical Classes: 30			Total Classes: 30			
Prerequisites: Problem Solving with C and C++, Object oriented Programming with JAVA								

Course Overview:

This course provides a comprehensive foundation in C programming, focusing on problem-solving, structured program design, and efficient implementation of algorithms. Students will develop logical thinking skills and gain hands-on experience in designing, implementing, and testing programs using core features of the C language.

Course Objectives:

1. To introduce students to fundamental DevOps practices such as version control, continuous integration, continuous deployment, and automation.
2. To enable learners to explore and apply modern tools like Git, GitHub, Jenkins, Docker, Kubernetes, and Selenium in real-world scenarios.
3. To develop the ability to design and manage containerized applications, ensuring scalability, efficiency, and reliability.
4. To provide hands-on experience in automating software development workflows, from source code management to deployment and testing.
5. To cultivate problem-solving and analytical skills by integrating DevOps tools for building, deploying, and testing applications in a collaborative environment.

Course Outcomes: After Completion of the Course, Students should be able to

1. Apply version control tools (Git and GitHub) to manage, track, and collaborate on source code effectively.
2. Configure Continuous Integration/Continuous Deployment (CI/CD) pipelines using Jenkins, ensuring automated builds and deployments.
3. Develop, containerize, and deploy applications using Docker and Kubernetes, achieving scalability and automation in application management.
4. Perform automated testing of applications using Selenium, integrating it with CI/CD workflows for quality assurance.
5. Design and execute an end-to-end DevOps workflow, from code development and version control to containerization, deployment, and testing of applications.

List of Experiments:

1. Write code for a simple user registration form for an event.
2. Explore Git and GitHub commands.
3. Practice Source code management on GitHub. Experiment with the source code in exercise 1.
4. Jenkins installation and setup, explore the environment.
5. Demonstrate continuous integration and development using Jenkins.
6. Explore Docker commands for content management.
7. Develop a simple containerized application using Docker.
8. Integrate Kubernetes and Docker
9. Automate the process of running containerized application for exercise 7 using Kubernetes.
10. Install and Explore Selenium for automated testing.
11. Write a simple program in JavaScript and perform testing using Selenium.
12. Develop test cases for the above containerized application using selenium.
13. Develop Package and deploy the multi-service registration app to Kubernetes using Helmcharts and expose it viaIngress.
14. Convert the single registration app into a small multi-service system and orchestrate locally with Docker Compose.

TEXTBOOKS:

1. JoakimVerona.,PracticalDevOps,PacktPublishing,2016.

REFERENCEBOOKS:

1. Deepak Gaiwad,ViralThakkar.DevOpsToolsfromPractitioner'sViewpoint.Wiley publications.
2. Len Bass,IngoWeber,LimingZhu.DevOps:ASoftwareArchitect'sPerspective.Addison Wesley.

ELECTRONICRESOURCES:

1. <https://www.scribd.com/document/761249265/DEVOPS-LAB-MANUAL-R22>
2. <https://docs.docker.com/compose/>
3. <https://www.jenkins.io/doc/book/pipeline>
4. <https://education.github.com/git-cheat-sheet-education.pdf>

MATERIALSONLINE:

1. Open-ended experiments
2. Lab Manual