



BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE (A)
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
BR25 M.TECH CSE COURSE STRUCTURE AND SYLLABUS

II Semester	DEVOPS (D252BAB1) (PROFESSIONAL ELECTIVE-IV)	L	T	P	C
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Course Objectives: The main objectives of this course are to:

1. Describe the agile relationship between development and IT operations.
2. Understand the skill sets and high-functioning teams involved in DevOps and related methods to reach a continuous delivery capability.
3. Implement automated system update and DevOps life cycle.

Course Outcomes: At the end of the course, student will be able to (Four to Six)

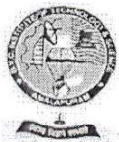
		Knowledge Level(K)#
CO1	Explain DevOps Life cycle process	K2
CO2	Demonstrate the concept of Code coverage	K3
CO3	Explain Jenkins, Jenkins work flow, Jenkins master slave architecture, Jenkins Pipelines	K2
CO4	Discuss the concept of Dockers Command and running containers	K2

Based on suggested Revised BTL

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1		2	2	3	
CO2			2	3	3	
CO3			2	3	3	
CO4			2	2	3	

Dr.N.Rama Krishnaiah, Professor of CSE,UCEK & Control of Examination JNTUK, Kakinada.	Dr.C.Krishna Mohan, Professor of CSE,IIT, Kandi, Hyderabad.	Dr.P.Radha Krishna, Professor of CWQSE,NI T, Warangal	Mr.Rajesh Bobburi Chief Operating Officer, HighQ Labs Private Limited, Rajahmundry	Dr.Lakshmi Haritha Medida, Associate Professor, R.M.K.Engineering College,Kavaripattai,Tamilnadu	Dr.K.Srinivas, Professor & HoD Department of CSE, B.V.C.I.T.S, Batlapalem
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(Please fill the above with Levels of Correlation, viz., L, M, H)

UNIT	CONTENTS	Contact Hours
UNIT-1	Introduction to DevOps: Introduction to SDLC, Agile Model. Introduction to DevOps. DevOps Features, DevOps Architecture, DevOps Life cycle, Understanding Work flow and principles, Introduction to DevOps tools, Build Automation, Delivery Automation, Understanding Code Quality, Automation of CI/CD. Release management, Scrum, Kanban, delivery pipe line, bottle necks, examples	10Hrs
UNIT-2	Source Code Management (GIT): The need for source code control, The history of source code management, Roles and code, source code management system and migrations. What is Version Control and GIT, GIT Installation, GIT features, GIT workflow, working with remote repository, GIT commands, GIT branching, GIT staging and collaboration. UNIT TESTING-CODE COVERAGE: Junit, n Unit& Code Coverage with Sonar Qube, Sonar Qube-Code Quality Analysis.	12Hrs
UNIT-3	Build Automation - Continuous Integration (CI): Build Automation, What is CI Why CI is Required, CI tools, Introduction to Jenkins (With Architecture), jenkins workflow, jenkins master slave architecture, Jenkins Pipelines, PIPELINE BASICS - Jenkins Master, Node, Agent, and Executor Freestyle Projects& Pipelines, Jenkins for Continuous Integration, Create and Manage Builds, User Management in Jenkins Schedule Builds, Launch Builds on Slave Nodes.	12Hrs

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UNIT-4	Continuous Delivery: Importance of Continuous Delivery, CONTINUOUS DEPLOYMENT CD Flow, Containerization with Docker: Introduction to Docker, Docker installation, Docker commands, Images & Containers, Docker File, running containers, working with containers and publish to Docker Hub. Testing Tools: Introduction to Selenium and its features, JavaScript testing	12Hrs
UNIT-5	Configuration Management - ANSIBLE: Introduction to Ansible, Ansible tasks Roles, Jinja2 templating, Vaults, Deployments using Ansible. CONTAINERIZATION USING KUBERNETES (OPENSHIFT): Introduction to Kubernetes Name space & Resources, CI/CD - On OCP, BC, DC & Config Maps, Deploying Apps on Open shift Container Pods. Introduction to Puppet master and Chef	12Hrs
Total		58Hrs

*Note:

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 Git Hub. Experiment with the source code written 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.

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8. Integrate Kubernetes and Docker
9. Automate the process of running containerized application developed in exercise 7 using Kubernetes.
10. Install and Explore Selenium for automated testing.
11. Write a simple program in Java Script and perform testing using Selenium.
12. Develop test cases for the above containerized application using selenium.

Text Books

1. Joyner, Joseph., DevOps for Beginners: DevOps Software Development Method Guide for Software Developers and IT Professionals, 1st Edition Mihails Konoplow, 2015.
2. Alisson Machado de Menezes., Hands-on DevOps with Linux, 1st Edition, BPB Publications, India, 2021.

Reference Books

1. Len Bass, Ingo Weber, Liming Zhu. DevOps: A Software Architect's Perspective. Addison Wesley; ISBN-10
2. Gene Kim, Je Humble, Patrick Debois, John Willis. The DevOps Handbook, 1st Edition, IT Revolution Press, 2016.
3. Verona, Joakim Practical DevOps, 1st Edition, Packt Publishing, 2016.
4. Joakim Verona. Practical DevOps, Second Edition. Ingram short title; 2nd edition (2018). ISBN10: 1788392574
5. Deepak Gaikwad, Viral Thakkar. DevOps Tools from Practitioner's View point. Wiley publications. ISBN: 9788126579952

Web Resources:

4. <https://archive.nptel.ac.in/courses/106/104/106104220/>
5. <https://www.tutorialspoint.com/blockchain/index.htm>

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