

Course Code	21CSE216P	Course Name	Linux and Container Technologies			Course Category	P	Industry Professional Elective											L	T	P	C										
																2	1	0	3													
Pre-requisite Courses	Nil		Co-requisite Courses	Nil			Progressive Courses	Nil																								
Course Department	Offering	School of Computing			Data Book / Codes/Standards		Nil																									
Course Learning Rationale (CLR):			The purpose of learning this course is to:				Program Outcomes (PO)																									
CLR-1	Introduce basic Linux system commands																		1	2	3	4	5	6	7	8	9	10	11	PROGRAM SPECIFIC OUTCOME		
CLR-2	Equip fundamental knowledge and skills to build, manage, and deploy containerized applications using Podman																		Engineering Knowledge	Problem Analysis	Design / Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and the world	Ethics	Individual & Collaborative Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO – 2	PSO – 3
CLR-3	Create and manage containers and its deployment																															
CLR-4	Implement best practices in container security, networking, and persistent storage																															
CLR-5	Foster the experience in using OpenShift, and Kubernetes																															
Course Outcomes (CO):			At the end of this course, learners will be able to:																													
CO-1	Use various tools to perform basic system operation in Linux						3	-	-	-	-	-	-	-	-	-	-	-	-	-												
CO-2	Explain the architecture, functionality, and usage of Podman for container management and development.						-	2	2	-	2	-	-	2	-	1	-	-	-	-												
CO-3	Develop the ability to create, customize, and optimize container images using Dockerfiles and registries.						-	2	3	-	2	-	-	2	-	-	-	-	-	-												
CO-4	Gain hands-on experience in running, networking, and troubleshooting containerized applications.						-	2	3	-	-	-	-	2	-	-	-	-	-	-												
CO-5	Demonstrate the deployment and management of applications on OpenShift, integrating Kubernetes principles						-	2	3	-	3	-	-	2	-	1	-	-	-	-												

Unit 1 – Basics of Linux (9 hours)																	
Introduction-to-Red-Hat-Enterprise-Linux, Understand and use essential tools (grep, ssh, tar, gzip, and bzip2, ugo/rwx permissions), File-System-Navigation, Working-with-Files-and-Directories, Configure local storage (List, create, delete partitions on MBR and GPT disks)-Manage users and groups																	
Unit 2 – Introduction to Containers and Podman (9 hours)																	
Overview of container technology, Introduction to Podman - features and advantages, Installing and setting up Podman on RHEL, Basic Podman commands: pulling images, running containers, and managing container lifecycles.																	
Unit 3 – Building and Managing Container Images (9 hours)																	
Understanding container images and their structure, Navigating container registries to find and manage container images, Creating custom container images using Dockerfiles, Best practices for writing efficient and secure Dockerfiles, Tagging, pushing, and pulling images to and from container registries.																	
Unit 4 – Advanced Container Usage (9 hours)																	
Persisting data in containers - managing volumes and bind mounts, Networking in containers: setting up container communication and exposing services, Debugging containers - analyzing logs and configuring remote debugging, Running multi-container applications using tools like Docker Compose.																	
Unit 5 – Introduction to OpenShift and Kubernetes (9 hours)																	
Overview of Kubernetes, Introduction to Red Hat OpenShift: features and architecture, Deploying containerized applications on OpenShift, Managing applications and resources in an OpenShift environment, Basic troubleshooting and best practices for OpenShift deployments, Multi-pod Applications																	

Learning Resources	<ol style="list-style-type: none"> Christopher Negus, Linux@ BIBLE, John Wiley & Sons, Inc., Indianapolis, Indiana, Canada, 2020, 10th edition. Brian Ward, How Linux Works: What Every Superuser Should Know, No Starch Press, 2021 Michael Kerrisk, The Linux Programming Interface, No Starch Press, 2010. Aurélien Géron, Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, O'Reilly, 2022. 	<ol style="list-style-type: none"> SUSE LLC, SUSE Linux Enterprise server 12 SPA5 Administration Guide, 2025. Nigel Poulton, Docker Deep Dive, Packt Publishing, 2020. Kelsey Hightower, Brendan Burns, Joe Beda, Kubernetes Up & Running, O'Reilly, 2017.
--------------------	---	---

Learning Assessment									
Bloom'sLevel of Thinking		Continuous Learning Assessment (CLA)						Final Examination (0% weightage)	
		CLA-1 Average of Unit test (20%)		CLA-2 Project Based Learning (60%)		Report and Viva Voce (20% Weightage)			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	30%	-	--	20%	-	10%	-	-
Level 2	Understand	30%	-	-	20%	-	10%	-	-
Level 3	Apply	20%	-	-	20%	-	10%	-	-
Level 4	Analyze	20%	-	-	20%	-	10%	-	-
Level 5	Evaluate	-	-	-	10%	-	30%	-	-
Level 6	Create	-	-	-	10%	-	30%	-	-
Total		100 %		100 %		100 %		-	

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
1. Shri Ranjit Sengupta, Managing Director, Vectra Technosoft Pvt Ltd 2. Mr. Sidharth Pattanaik, AMIE(ECE)MBA, Business Development Manager, Vectra Technosoft Pvt Ltd (Advantage Pro)	1. Dr. P Shanthi Bala, Professor, Pondicherry University	1. Dr.M Vimaladevi, AP/CINTEL, SoC, SRMIST 2. Dr.Salomi Samsudeen, AP/CINTEL, SoC, SRMIST