Lovely Professional University, Punjab

Course Code	Course Title	Lectures	Tutorials	Practicals	Credits	
CSE427	VIRTUALIZATION AND CLOUD COMPUTING LABORATORY	0	0	2	1	
Course Weightage	ATT: 5 CAP: 45 ETP: 50					

Course Outcomes :Through this course students should be able to

CO1 :: define key technologies and capabilities required for setting up IT virtualization and cloud computing infrastructure

CO2 :: enumerate the ultimate goal of assessing, measuring and planning for the deployment of cloud-based IT resources

CO3 :: understand the knowledge of cloud computing technology architectures based on Softwareas- a-Service (SaaS), Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS) delivery models.

CO4 :: observe the applications of tools used in Cloud environment.

CO5 :: articulate the IT resource optimization with cloud-based algorithms.

CO6 :: illustrate the usage of microservices and cloud-based resources.

	TextBooks (T)		
Sr No	**Title**	**Author**	**Publisher Name**
T-1	CLOUD COMPUTING: PRINCIPALS AND PARADIGMS	JAMES BROBERG, RAJKUMAR BUYYA	WILEY
T-2	VIRTUALIZATION ESSENTIALS	MATTHEW PORTNOY	WILEY

	Reference Books (R)		
Sr No	**Title**	**Author**	**Publisher Name**
R-1	CLOUD COMPUTING: PRINCIPLES AND PARADIGMS	RAJKUMAR BUYYA, JAMES BROBERG, ANDRZEJ GOSCINSKI	WILEY

Audio Visual Aids (AV)		
Sr No	**(AV aids) (only if relevant to the course)**	**Salient Features**
AV-1	https://www.youtube.com/watch?v=4eN5iiQSCBw	Cloning and template
AV-2	http://www.vmware.com/products/vsphere.html	vSphere and vSphere with Operations Management

Software/Equipments/Databases		
Sr No	**(S/E/D) (only if relevant to the course)**	**Salient Features**
SW-1	www.vmware.com/downloads	VMWare

Virtual Labs (VL)		
Sr No	**(VL) (only if relevant to the course)**	**Salient Features**
VL-1	http://labs.hol.vmware.com/HOL/catalogs/	Virtual lab for VMware vSphere

Detailed Plan For Practicals

Practical No	Broad topic	Subtopic	Other Readings	Learning Outcomes
Practical 1	Understanding virtualization	Virtualization and Cloud Computing		Understanding Virtualization Software Operation
	Understanding virtualization	Virtualizing servers		Understanding Virtualization Software Operation
	Understanding virtualization	Virtualizing desktops		Understanding Virtualization Software Operation
	Understanding virtualization	Virtualizing applications		Understanding Virtualization Software Operation
	Understanding virtualization	BIOS setting of Physical machine for virtualization technology		Understanding Virtualization Software Operation
Practical 2	Understanding hypervisors	Exploring the hypervisors		Student will learn how to create virtual machine and manage its resources
	Understanding hypervisors	Understanding type 1 hypervisor		Student will learn how to create virtual machine and manage its resources
	Understanding hypervisors	Understanding type 2 hypervisor		Student will learn how to create virtual machine and manage its resources
	Understanding hypervisors	Resource allocation		Student will learn how to create virtual machine and manage its resources
	Understanding virtual machines	Examining CPU’s in a virtual machine		Student will learn how to create virtual machine and manage its resources
	Understanding virtual machines	Examining memory in a virtual machine		Student will learn how to create virtual machine and manage its resources
	Understanding virtual machines	Examining network resources in a virtual machine		Student will learn how to create virtual machine and manage its resources
	Understanding virtual machines	Examining storage in a virtual machine		Student will learn how to create virtual machine and manage its resources
	Understanding virtual machines	Understanding how a virtual machine works		Student will learn how to create virtual machine and manage its resources
	Understanding virtual machines	Understanding virtual machine clones		Student will learn how to create virtual machine and manage its resources

Practical 2	Understanding virtual machines	Understanding templates		Student will learn how to create virtual machine and manage its resources
	Understanding virtual machines	Understanding snapshots		Student will learn how to create virtual machine and manage its resources
	Understanding virtual machines	Understanding OVF		Student will learn how to create virtual machine and manage its resources
Practical 3	Installing a guest OS	Installing windows on a virtual machine		Student will get familiarised with various performance variations that may happen in virtualized environment
	Installing a guest OS	Loading windows into a virtual machine		Student will get familiarised with various performance variations that may happen in virtualized environment
	Installing a guest OS	Installing vmware tools		Student will get familiarised with various performance variations that may happen in virtualized environment
	Installing a guest OS	Understanding configuration options		Student will get familiarised with various performance variations that may happen in virtualized environment
	Installing a guest OS	Optimizing a new virtual machine		Student will get familiarised with various performance variations that may happen in virtualized environment
	Installing a guest OS	Installing linux on a virtual machine		lab practical 1 will be conducted
Practical 4	Creating a virtual machine	Full and Linked Clone in VMware Workstation		Student will learn about templates, creation of virtual machine clones and snapshots
	Creating a virtual machine	VM configuration		Student will learn about templates, creation of virtual machine clones and snapshots
	Creating a virtual machine	Exploring VMware Workstation		Student will learn about templates, creation of virtual machine clones and snapshots
	Creating a virtual machine	Installation of VMware Workstation		Student will learn about templates, creation of virtual machine clones and snapshots
Practical 5	Protecting virtual machine	Cloning a virtual machine	SW-1 AV-1	Student will understand the cloning of a virtual machine and its relevant properties.
	Protecting virtual machine	Saving a virtual machine state	SW-1 AV-1	Student will understand the cloning of a virtual machine and its relevant properties.
	Protecting virtual machine	Creating a snapshot	SW-1 AV-1	Student will understand the cloning of a virtual machine and its relevant properties.
Practical 6	Management With vCenter Server	Tagging and Search to find objects quickly		Lab Practical 2 will be conducted
	Management With vCenter Server	Monitoring events and creating alarms		Lab Practical 2 will be conducted
	Management With vCenter Server	Migrating VMs with VMware vMotion		Lab Practical 2 will be conducted

Practical 7	Management With vCenter Server	vCenter 6 Overview	SW-1 AV-1	Student will learn hypervisor 2 and its working
	Management With vCenter Server	Creating a Virtual Machine in HOL	SW-1 AV-1	Student will learn hypervisor 2 and its working
Practical 8	Introduction to vSphere Network and Security	Understanding Single Sign On		Student will learn Roles creation and Single Sign On facility in HOL environment
Practical 9	Management With vCenter Server	Cloning VMs and using Templates	SW-1 AV-1	Lab practical 3 will be conducted Students will learn management of templates in hypervisor-1
Practical 10	Management With vCenter Server	vSphere Monitoring and Performance	AV-2 VL-1	Students will understand functioning of fault tolerance and monitoring performance
Practical 11	Simulation using cloudsim	Installation of cloudsim	DK-1 DK-3	Students will work on cloudsim tol
	Simulation using cloudsim	Setup of cloudsim	DK-1 DK-3	Students will work on cloudsim tol
Practical 12	Simulation using cloudsim	Working with Cloudsim core package	DK-1 DK-3	Students will work on cloudsim tol
	Simulation using cloudsim	Understanding Entity Classes	DK-1 DK-3	Lab practical 4 will be conducted
Practical 13	Simulation using cloudsim	Simulate a cloud scenario using CloudSim and run a scheduling algorithm	DK-2	Students will work on cloudsim tol
Practical 14	Container technology	installation		Student will learn about Container Technology in HOL environment
	Container technology	Working with containers		Student will learn about Container Technology in HOL environment
	Container technology	Configuring containers		Student will learn about Container Technology in HOL environment
	SPILL OVER			
Practical 15	Spill Over			