

# Lovely Professional University, Punjab

Course Code	Course Title	Course Planner	Lectures	Tutorials	Practicals	Credits
CSE427	VIRTUALIZATION AND CLOUD COMPUTING LABORATORY	21137::Manmohan Sharma	0	0	2	1
Course Weightage	ATT: 5   CAP: 45   ETP: 50	Exam Category: X6: Mid Term Exam: Not Applicable – End Term Exam: Practical				
Course Orientation	SKILL ENHANCEMENT, SOFTWARE SKILL					

	Reference Books ( R )		
Sr No	Title	Author	Publisher Name
R-1	CLOUD COMPUTING: PRINCIPALS AND PARADIGMS	JAMES BROBERG, RAJKUMAR BUYYA	WILEY
R-2	CLOUD COMPUTING BIBLE	BARRIE SOSINSKY	WILEY
R-3	VIRTUALIZATION ESSENTIALS	MATTHEW PORTNOY	WILEY

Relevant Websites ( RW )		
Sr No	(Web address) (only if relevant to the course)	Salient Features
RW-1	<a href="https://www.vmware.com/in/solutions/virtualization.html">https://www.vmware.com/in/solutions/virtualization.html</a>	Virtualization basics
RW-2	<a href="https://pubs.vmware.com/vsphere-4-esx-vcenter/index.jsp?topic=/com.vmware.vsphere.vmadmin.doc_41/vsp_vm_guide/deploy_vms_from_templates_and_clones/c_working_with_templates_and_clones.html">https://pubs.vmware.com/vsphere-4-esx-vcenter/index.jsp?topic=/com.vmware.vsphere.vmadmin.doc_41/vsp_vm_guide/deploy_vms_from_templates_and_clones/c_working_with_templates_and_clones.html</a>	Clones and templates
RW-3	<a href="https://pubs.vmware.com/vsphere-4-esx-vcenter/index.jsp#com.vmware.vsphere.vmadmin.doc_41/vsp_vm_guide/working_with_ovf_templates/c_importing_and_exporting_virtual_appliances.html">https://pubs.vmware.com/vsphere-4-esx-vcenter/index.jsp#com.vmware.vsphere.vmadmin.doc_41/vsp_vm_guide/working_with_ovf_templates/c_importing_and_exporting_virtual_appliances.html</a>	Understanding OVF
RW-4	<a href="https://cloudacademy.com/blog/public-cloud-war-aws-vs-azure-vs-google/">https://cloudacademy.com/blog/public-cloud-war-aws-vs-azure-vs-google/</a>	Aws vs Azure vs Google Cloud

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

Software/Equipments/Databases		
Sr No	(S/E/D) (only if relevant to the course)	Salient Features
SW-1	<a href="http://www.vmware.com/downloads">www.vmware.com/downloads</a>	VMWare
SW-2	<a href="https://www.virtualbox.org/wiki/Downloads">https://www.virtualbox.org/wiki/Downloads</a>	Virtual box

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

**\*Each experiment of the lab will be evaluated using following relative scheme:**

Component	Weightage (%)
Performance/Job evaluation/conduct/skill execution/demonstration	50
Viva	50

### Detailed Plan For Practicals

Practical No	Broad topic	Subtopic	Other Readings	Learning Outcomes
Practical 1	Understanding virtualization	Microsoft windows drives server growth		Understanding Virtualization Software Operation
	Understanding virtualization	Virtualization and Cloud Computing	RW-1	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
	Understanding hypervisors	Exploring the hypervisors		Understanding Virtualization Software Operation
Practical 2	Understanding hypervisors	Understanding type 1 hypervisor	RW-3 SW-1	Student will learn how to create virtual machine and manage its resources
	Understanding hypervisors	Understanding type 2 hypervisor	RW-3 SW-1	Student will learn how to create virtual machine and manage its resources
	Understanding hypervisors	Vmware ESX	RW-3 SW-1	Student will learn how to create virtual machine and manage its resources
	Understanding virtual machines	Examining CPU's in a virtual machine	RW-3 SW-1	Student will learn how to create virtual machine and manage its resources
	Understanding virtual machines	Understanding how a virtual machine works	RW-3 SW-1	Student will learn how to create virtual machine and manage its resources

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Practical 2	Understanding virtual machines	Understanding OVF	RW-3 SW-1	Student will learn how to create virtual machine and manage its resources
	Understanding virtual machines	Understanding containers	RW-3 SW-1	Student will learn how to create virtual machine and manage its resources
	Creating a virtual machine	Loading vmware workstation player	RW-3 SW-1	Student will learn how to create virtual machine and manage its resources
	Creating a virtual machine	Exploring vmware player	RW-3 SW-1	Student will learn how to create virtual machine and manage its resources
	Creating a virtual machine	Building a new virtual machine	RW-3 SW-1	Student will learn how to create virtual machine and manage its resources
	Creating a virtual machine	Resource Allocation	RW-3 SW-1	Student will learn how to create virtual machine and manage its resources
Practical 3	Creating a virtual machine	Investigating the physical-to-virtual process	RW-1 SW-1	Student will get familiarized with various performance variations that may happen in virtualized environment
	Creating a virtual machine	Loading virtualbox	SW-2	Student will get familiarized with various performance variations that may happen in virtualized environment
	Creating a virtual machine	VM configuration		Student will get familiarized with various performance variations that may happen in virtualized environment
	Installing a guest OS	Exploring oracle vm virtualbox	SW-2	Student will get familiarized with various performance variations that may happen in virtualized environment
	Creating a virtual machine	Performing P2V conversions		Student will get familiarized with various performance variations that may happen in virtualized environment
Practical 4	Understanding virtual machines	Understanding virtual machine clones	RW-2 AV-2	Student will learn about templates, creation of virtual machine clones and snapshots
	Understanding virtual machines	Understanding templates	RW-2 AV-2	Student will learn about templates, creation of virtual machine clones and snapshots
	Understanding virtual machines	Understanding snapshots	RW-2 AV-2	Student will learn about templates, creation of virtual machine clones and snapshots
	Creating a virtual machine	hot and cold cloning	RW-2 AV-2	Student will learn about templates, creation of virtual machine clones and snapshots

Practical 4	Creating a virtual machine	Full and Linked Clone in VMware Workstation	RW-2 AV-2	Student will learn about templates, creation of virtual machine clones and snapshots
	Installing a guest OS	Installing windows on a virtual machine	RW-2 AV-2	Student will learn about templates, creation of virtual machine clones and snapshots
	Installing a guest OS	Loading windows into a virtual machine	RW-2 AV-2	Student will learn about templates, creation of virtual machine clones and snapshots
	Installing a guest OS	Installing vmware tools	RW-2 AV-2	Student will learn about templates, creation of virtual machine clones and snapshots
	Installing a guest OS	Understanding configuration options	RW-2 AV-2	Student will learn about templates, creation of virtual machine clones and snapshots
	Installing a guest OS	Optimizing a new virtual machine	RW-2 AV-2	Student will learn about templates, creation of virtual machine clones and snapshots
	Installing a guest OS	Installing linux on a virtual machine	RW-2 AV-2	Student will learn about templates, creation of virtual machine clones and snapshots
Practical 5	Managing the hardware for VM	Managing cpu for a virtual machine	VL-1	Student will learn about managing hardware in virtualized environment
	Managing the hardware for VM	Understanding cpu virtualization	VL-1	Student will learn about managing hardware in virtualized environment
	Managing the hardware for VM	Configuring vm cpu options	VL-1	Student will learn about managing hardware in virtualized environment
	Protecting virtual machine	Protecting multiple virtual machines and data center	RW-2 AV-2 VL-1	Student will learn about managing hardware in virtualized environment
Practical 6	Protecting virtual machine	Cloning a virtual machine	RW-2 AV-1 VL-1	Student will learn about protecting virtual machine and its state with cloning and snapshot features
	Protecting virtual machine	Saving a virtual machine state	RW-2 AV-1 VL-1	Student will learn about protecting virtual machine and its state with cloning and snapshot features
	Protecting virtual machine	Creating a snapshot	RW-2 AV-1 VL-1	Student will learn about protecting virtual machine and its state with cloning and snapshot features

Practical 6	Protecting virtual machine	Merging snapshots	RW-2 AV-1 VL-1	Student will learn about protecting virtual machine and its state with cloning and snapshot features
Practical 7	Managing the hardware for VM	Managing memory for a virtual machine	VL-1	Student will learn about storage and memory virtualization
	Managing the hardware for VM	Understanding memory virtualization	VL-1	Student will learn about storage and memory virtualization
	Managing the hardware for VM	Managing storage for a virtual machine	VL-1	Student will learn about storage and memory virtualization
	Managing the hardware for VM	Understanding storage virtualization	VL-1	Student will learn about storage and memory virtualization
	Managing the hardware for VM	Tuning practices for vm storage	VL-1	Student will learn about storage and memory virtualization
Practical 8	Managing the hardware for VM	Configuring vm storage options	RW-1 VL-1	Student will learn about network settings and their setup in virtual Machine environment
	Managing the hardware for VM	Managing networking for a virtual machine	RW-1 VL-1	Student will learn about network settings and their setup in virtual Machine environment
	Managing the hardware for VM	Understanding network virtualization	RW-1 VL-1	Student will learn about network settings and their setup in virtual Machine environment
Practical 9	Understanding applications in a virtual machine	Examining virtual infrastructure performance capabilities	AV-1 VL-1	Student will learn about virtual machine infrastructure and its performance capability
Practical 10	Managing the hardware for VM	Choosing multiple vcpu vs. a single vcpu		Student will learn about load balancing, capacity of resources for handling load
	Managing the hardware for VM	Hyper-threading		Student will learn about load balancing, capacity of resources for handling load
	Managing the hardware for VM	Working with intel and amd servers		Student will learn about load balancing, capacity of resources for handling load
	Managing the hardware for VM	Capacity Planning	VL-1	Student will learn about load balancing, capacity of resources for handling load
Practical 11	Understanding applications in a virtual machine	Deploying applications in a virtual environment	VL-1	Student will have understanding of API and APP Engine
	Understanding applications in a virtual machine	Understanding virtual appliances and vApps	VL-1	Student will have understanding of API and APP Engine
	Understanding applications in a virtual machine	Understanding of API	VL-1	Student will have understanding of API and APP Engine
Practical 12	Understanding applications in a virtual machine	Open stack and containers	RW-4	Student will learn about Google Cloud Platform, AWS, Microsoft Azure services and Container technology

Practical 12	Understanding applications in a virtual machine	Understanding google cloud,AWS and Microsoft azure services	RW-4	Student will learn about Google Cloud Platform, AWS, Microsoft Azure services and Container technology
Practical 13	Understanding virtual machines	Examining memory in a virtual machine	AV-1 VL-1	Student will learn about vSphere with operations management for advanced storage features
	Understanding virtual machines	Examining storage in a virtual machine	AV-1 VL-1	Student will learn about vSphere with operations management for advanced storage features
	Managing the hardware for VM	Configuring vm memory options	AV-1 VL-1	Student will learn about vSphere with operations management for advanced storage features
	Managing the hardware for VM	Calculating memory overhead	AV-1 VL-1	Student will learn about vSphere with operations management for advanced storage features
	Managing the hardware for VM	Memory optimizations	AV-1 VL-1	Student will learn about vSphere with operations management for advanced storage features
Practical 14	Understanding virtual machines	Examining network resources in a virtual machine	AV-1 VL-1	Student will learn about vSphere with operations management for advanced networking features
	Managing the hardware for VM	Configuring vm network options	AV-1 VL-1	Student will learn about vSphere with operations management for advanced networking features
	Managing the hardware for VM	Tuning practices for virtual networks	AV-1 VL-1	Student will learn about vSphere with operations management for advanced networking features
	<b>SPILL OVER</b>			
Practical 15	Spill Over			