Virtual Machines: University Guide – Do’s, Don’ts, and Setup Tips

# 1. What Is a Virtual Machine?

A Virtual Machine (VM) is a software-based emulation of a physical computer. It allows students to safely run multiple operating systems on a single device. VMs are ideal for coursework, testing scripts, exploring OS features, and simulating network environments.

# 2. VM Do’s and Don’ts

Place each item under the correct category:

* ✔️ DO:
* Allocate only 50–75% of your system’s RAM and CPU to avoid crashing the host.
* Install Guest Additions for better performance and clipboard/file sharing.
* Use Host-only or Disconnected network mode when testing malware or risky software.
* Take a snapshot before installing software or changing system settings.
* Label your snapshots with clear, descriptive names.
* Back up your VM files regularly.
* Shut down VMs properly using the guest OS before closing VirtualBox.
* ❌ DON’T:
* Allocate all CPU cores or RAM to your VM.
* Ignore system updates for VirtualBox or Guest Additions.
* Use Bridged networking on public/untrusted networks when testing malware.
* Run risky commands or install unverified software without a snapshot.
* Close the VM window without saving the machine state or shutting it down.

# 3. Recommended VirtualBox Settings

Use these as a guide when creating your virtual machines:

• RAM: 2048–4096 MB for Linux, 4096–8192 MB for Windows 11 (never more than 75% of your host RAM).

• CPU: 1–2 cores for general use, 2–4 for more demanding tasks (never all cores).

• Video Memory: 16–128 MB depending on OS; enable 3D acceleration if needed.

• Storage: Use dynamically allocated VDI files unless disk speed is critical.

• Network: NAT for general use, Host-only for secure labs, Bridged only when network access is required and safe.

# 4. Taking and Restoring Snapshots in VirtualBox

To take a snapshot:

1. Open VirtualBox and select your VM.

2. Go to the “Snapshots” tab.

3. Click “Take” or right-click and choose “Take Snapshot…”.

4. Name your snapshot clearly (e.g., “Before PowerShell script”).

5. Click OK.

To restore a snapshot:

1. Go to the “Snapshots” tab.

2. Right-click your snapshot.

3. Click “Restore” to roll back to that state.

# 5. Quick Reflection

1. What might happen if you give your VM too much RAM or CPU?

2. Why are snapshots useful when experimenting with OS settings or scripts?

3. What would you include in a ‘safe’ VM configuration for malware testing?

4. Why is ‘Host-only’ networking safer than ‘Bridged’ in most student lab environments?

# 6. Top Tips for Managing Your Virtual Machine

🧠 Tip 1: Take Regular Snapshots

Snapshots are your safety net. Take one before installing software or making major changes. You can easily roll back if something breaks.

🧠 Tip 2: Roll Back with a Snapshot

To roll back:  
- Go to the 'Snapshots' tab in VirtualBox.  
- Right-click the snapshot you want to return to.  
- Choose 'Restore'.  
You can choose to keep or delete the current VM state during the rollback.

🧠 Tip 3: Install Guest Additions

Guest Additions improve integration between your VM and host system.  
- From the VM window, go to Devices > Insert Guest Additions CD image.  
- Follow the on-screen installation in the VM.  
- Restart the VM when done.  
This enables features like drag-and-drop, screen resizing, and shared clipboard.

🧠 Tip 4: Use VM Groups for Organisation

You can group related VMs together (e.g. a Linux lab and a Windows lab) by selecting multiple VMs, right-clicking, and choosing 'Group'.

🧠 Tip 5: Enable Shared Folders (Optional)

To share a folder between your host and VM:  
- Go to Settings > Shared Folders in VirtualBox.  
- Add a folder path and choose Auto-mount.  
- Install Guest Additions first for this to work correctly.