

Faculty: FACULTY OF ELECTRICAL ENGINEERING	
Subject : ELECTRICAL ENGINEERING LABORATORY	Review : Release Date : 16 March 2026 Last Amendment Procedure Number
Subject Code : SKEL 3742	



**FAKULTI KEJURUTERAAN ELEKTRIK
UNIVERSITI TEKNOLOGI MALAYSIA
KAMPUS SKUDAI
JOHOR**

**SKEL 3742
VLSI SYSTEM DESIGN LAB**

Pre-Lab : VLSI Physical Design with OpenLane EDA

Prepared by : 1. Prof. Madya Ir. Dr. Ab Al-Hadi bin Ab Rahman Signature & Stamp :  ASSOC. PROF. IR. DR. AB AL-HADI AB RAHMAN Faculty of Electrical Engineering Universiti Teknologi Malaysia 81310 Johor Bahru Johor Date: 16 March 2026	Approved by: Name:  PROF. IR. DR. RUBITA SUDIRMAN HEAD OF DEPARTMENT DEPT. OF ELECTRONIC AND COMPUTER ENGINEERING FACULTY OF ELECTRICAL ENGINEERING UNIVERSITI TEKNOLOGI MALAYSIA 81310 JOHOR BAHRU, JOHOR email: rubita@utm.my Signature & Stamp: Date: 19/3/2026
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VLSI Physical Design Lab (Pre-Lab)

Faculty of Electrical Engineering

Universiti Teknologi Malaysia

16 March 2026

In this lab, we will be using the Electronic Design Automation (EDA) tools to perform a complete design verification and physical design of a digital system.

Verification Tool: EDA Playground

Physical Design Tool: OpenLane

The use of the tools requires knowledge of Linux commands. In this pre-lab, you will familiarize yourself with the Linux environment.

The following are the steps to complete this prelab:

1. Linux Download and Installation

There are several ways to run Linux on your own computer/laptop:

- Select your favorite Linux Distro and Flavor (e.g., Almalinux, Ubuntu, etc.)
- Install and run as dual-boot **or** virtual machine **or** from a thumb drive or as Linux in Windows Subsystem

(Hint: You can use Gemini or ChatGPT to find step-by-step instructions.)

2. Launch the Linux terminal

- Right-click** on the Linux desktop and click **Open in Terminal**. You should see a similar screen as in Figure 2.

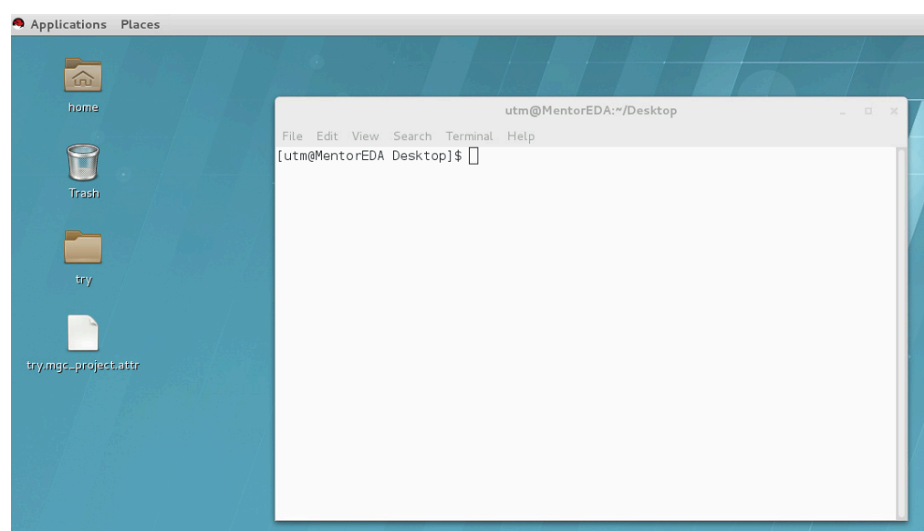


Figure 2: Linux terminal

3. Command help and options can be found by typing: `help <command>` (or `<command> --help`), for example in Figure 3.

```
[utm@MentorEDA Desktop]$ help pwd
pwd: pwd [-LP]
    Print the name of the current working directory.

Options:
  -L      print the value of $PWD if it names the current working
          directory
  -P      print the physical directory, without any symbolic links

By default, `pwd' behaves as if `-L' were specified.

Exit Status:
Returns 0 unless an invalid option is given or the current directory
cannot be read.
```

Figure 3

4. In this pre-lab work, you will learn the following Linux Terminal commands:

Comman d	Function
cd	Change directory
mkdir	Create new directory
ls	List files information
pwd	Print name of directory
cp	Copy files
mv	Move files
rm	Remove files
rmdir	Remove directory
tar	Compress and decompress files
gedit	Load text editor gedit
vim	Load text editor vim
grep	Search for pattern in file
diff	Compare files

5. Part1: Basic navigation

Complete the following tasks by typing in the appropriate commands at the Linux terminal:

- a. From the Desktop directory, go to the **home** directory

- b. List the contents in the home directory

- c. Create a directory called **dir1** at the home directory and verify with **ls**

- d. From the home directory, create a directory called **dir2** at the Desktop

- e. Navigate to the home directory and list its contents, including hidden files, with permissions, size, and date for each file

- f. Print and Show the full path of the current directory

- g. Show the command history

6. Part 2: Files manipulation

- a. go to the ~/Documents directory

- b. Copy the **dir1** directory at the home directory to the Documents directory

- c. Delete the **dir1** directory at the home directory and go to Documents/dir1

- d. Create files called **file1**, **file2** and **file3** in Documents/dir1 directory

- e. Delete **file2** in the Documents/dir1 directory

- f. Compress and combine **file1** and **file3** into a tar file called my_files.tar.gz

- g. Decompress contents of my_files.tar.gz to the home directory

7. Part 3: Using text editors

- a. Using gedit, open **file1** and type in the following:

Delay 3 ns

Frequency 10 MHz

Area 355 um²

Power 15 mW

Save and close **file1**

- b. Using grep, print and show the “Area” information from **file1**

- c. Using vim, open **file3** and type in the following:

Delay 3 ns

Frequency 15 MHz

Area 355 um²

Dynamic Power 10 mW

Static Power 5 mW

- d. Using vim commands, search for the word “Power”

- e. Using vim commands, go to the third line

- f. Using vim commands, go to the end of file

- g. Using vim commands, save the file

- h. Using vim commands, exit vim

- i. Using Diff in Linux terminal, print and show the difference between **file1** and **file3**
