NIRMA UNIVERSITY
SCHOOL OF TECHNOLOGY, INSTITUTE OF TECHNOLOGY
M. Tech. in Electronics & Communication Engineering (VLSI Design)
M.Tech Semester - I

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Course Code	6EC106CC22
Course Title	Scripting Languages for VLSI Design

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –
1. Develop the scripts for front-end RTL/Testbench code compilation and simulation flows
2. Design and develop the scripts for Running tests in regressions, analyzing failures, debug automation connectivity checks, netlist parsing, automatic generation/modification any RTL module/stubs, etc.
3. Automate Synthesis, P&R tools interfacing and backend flow.

Syllabus:

Linux Basics: Introduction to Linux, File System of the Linux, General usage of Linux kernel & basic commands, Linux users and group, Permissions for file, directory and users, Searching a file & directory, zipping and unzipping concepts, Introduction to Networking in Linux, Network basics & tools, File transfer protocol in Linux, Network file system, Shell Scripting

Perl Scripting: Introduction, working with Simple Values, Lists and Hashes, Loops and Decisions, Regular Expressions, Files and Data in Perl Scripting, References &Subroutines, Running and Debugging Perl, Modules, Object-Oriented Perl

Python Scripting: Introduction to Python, Program Development Cycle, Data types and Expressions, more about Data Output, Performing Calculations, Loops and lists, Data Structures, Modules, Input and Output, Errors and Exceptions, Classes, Functions and Modules, Floating Point Arithmetic, Tour of the Standard Python Libraries

Laboratory Work:
Laboratory work will be based on above syllabus with minimum 10 experiments to be incorporated.

Suggested List of Laboratory Experiments:
1. To acquainted with different ways of Linux operating system installation
2. Write and execute the following general purpose commands: (i) date (i) cal (iii) echo (iv) clear (v) bc (vi) who (vii) who am i (viii) uname.
3. Write and execute the following directory commands:(i) Create a directory (ii) Change the current working directory as the newly created directory (iii) List the number of files in the directory (iv) List the hidden files (v) Remove the directory.
4. Write and execute the following file commands:(i) Create a file (ii) Display the content of the file (iii) Copy the old file in a new file (iv) Rename a file (v) Remove a file (vi) Count the number of lines, words and characters of a file.
5. Write and execute the following pattern searching commands:(i) grep (ii) egrep (iii) fgrep
6. Write a shell script to check whether the given number is positive, negative or zero.
7. Write a shell script to calculate sum of 'n' natural numbers.
8. Write a shell script to list the primary input/outputs from given Verilog file
9. Write the shell script to find out Syntax error in given Verilog code.
10. Write the shell script to find out the simple linting errors in given Verilog code

11. Write a shell script to develop line justification function
12. Write a shell script to develop the fault equivalence function
13. Develop the Perl to find the linting errors in synthesis reports
14. Develop the Perl script to search the warning and errors from simulation log file
15. Develop the Python script to integrate the steps of EDA tools of IC Layout design
16. Develop the Python script to calculate the SCOAP Controllability Observability values.
17. Develop the python script for simple Automatic Test Pattern Generator.

Suggested Readings:

1. Ganesh Sanjiv Naik, Learning Linux Shell Scripting, Packet Publishing Ltd.
2. Guido Van Rossum and Fred L. Drake Jr, An Introduction to Python, Network Theory Ltd.
3. Hans Petter Langtangen, A Primer on Scientific Programming with Python, Springer.
4. Larry Wall, Tom Christiansen, and John Orwant, Programming Perl, O'Reilly Publications.