

ECE5030	Scripting Languages for VLSI Design Automation	L	T	P	J	C
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Pre-requisite	None	Syllabus version				
		1.0				
Course Objectives:						
1. To write scripts in the LINUX environment.						
2. To study the principles of Scripting Languages like Perl, TCL and Python.						
3. To write the scripts for automation using the languages like Perl, TCL and Python.						
Expected Course Outcome:						
The students will be able to :						
1. Work in LINUX environment.						
2. Make and run the Perl scripts.						
3. Handle files, directories and manage processes using Perl scripts.						
4. Generate and run TCL scripts.						
5. Handle files, directories and manage process using TCL scripts.						
6. Build and manipulate with files and directories using Python scripts.						
Student Learning Outcomes (SLO):	1,14,17					
1. Having an ability to apply mathematics and science in engineering applications						
14. Having an ability to design and conduct experiments, as well as to analyze and interpret data						
17. Having an ability to use techniques, skills and modern engineering tools necessary for engineering practice.						
Module:1	LINUX Basics	3 hours				
Introduction to Linux, File System of Linux, General usage of Linux Kernel and Basic Commands, Linux users and group, Permissions for file, directory and users, Searching a file and directory, zipping and unzipping concepts.						
Module:2	PERL Basics	5 hours				
History and Concepts of PERL - Scalar Data - Arrays and List Data - Control structures – Hashes - Basics I/O - Regular Expressions – Functions - Miscellaneous control structures - Formats.						
Module:3	Advanced Topics in PERL	4 hours				
Directory access - File and Directory manipulation - Process Management - Packages and Modules.						
Module:4	TCL Basics	4 hours				
An Overview of TCL and Tk -Tcl Language syntax – Variables – Expressions – Lists - Control flow – procedures - Errors and exceptions - String manipulations.						
Module:5	Advanced Topics in TCL	4 hours				
Accessing files- Processes. Applications - Controlling Tools - Basics of Tk.						
Module:6	Python Basics	4 hours				
Introduction to Python – Using Python interpreter – Control flow Tools – Data structures – Modules						
Module:7	Advanced Topics in Python	4 hours				

Input and Output – Errors and Exceptions – Classes – Brief tour on standard library			
Module:8		Contemporary issues:	
		2 hours	
Reference Books			
1.	Guido van Rossum Fred L. Drake, Jr., editor, “Python Tutorial Release 3.2.3”, 2012.		
2.	Larry Wall, Tom Christiansen, John Orwant, “Programming PERL”, Oreilly Publications, Fourth Edition, 2012.		
3.	John K. Ousterhout, Ken Jones, “Tcl and the Tk Toolkit”, Pearson Education, Second Edition, 2010.		
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar			
List of Challenging Experiments (Indicative)			CO: 3,5,6
1.	Write a script to generate random test vectors for a given Verilog design.		6 hours
2.	Write a script which reads a verilog design module and identifies whether it is a sequential or combinational design. Accordingly, the perl script should generate the testbench file in verilog. Also, the input vectors from the testbench should be in a randomized fashion.		6 hours
3.	Write a script that reads a set of log files from different simulation directories and generates a consolidated report in .xls format which should contain the information of the test name, status and error messages. If the test is indicated as successful in the log file, the status in the report should be as “TEST PASSED” and if the test is unsuccessful, then the report should display the status as “TEST FAILED”.		4 hours
4.	Write a TCL Script which when executed should automatically compile your design modules and testbench modules and then perform the simulation. If the simulation is successful, then the script should synthesize the design module. The TCL script should also create a separate directory to dump the log files and a separate directory to write the netlist file.		6 hours
5.	Write a script to perform netlist patching.		4 hours
6.	Verification automation tool development using Perl/Python scripts		4 hours
Total Laboratory Hours			30 hours
Mode of evaluation: Review I, II and III.			
Recommended by Board of Studies		05-03-2019	
Approved by Academic Council		No. 54	Date 14.03.2019