INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

SCRIPTING LANGUAGES FOR VLSI DESIGN								
VI Semester: ECE								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
AECD35	**Elective**	3	-	-	3	40	60	100
Contact Classes: 45	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 45**		
Prerequisite: VLSI, Linux, Python								

I. COURSE OVERVIEW:

The course is intended to provide Linux utilities to perform specific tasks such as file handling, text processing. Tool command language (TCL) is a simple textual programming language, intended for issuing commands to interactive programs such as text editors, debuggers and shells. While this course deals largely with the dynamic scripting language such as Java script, PERL and Python for VLSI design. Course learning is to write scripts for the VLSI engineers for the network administration automation is definitely worth the effort, even if it does take some time.

II. COURSE OBJECTIVES:

The students will try to learn:

I. Familiarize with digital systems like Pulse code modulation (PCM), Differential pulse code modulation (DPCM), Delta modulation (DM) and Adaptive DM. The utilities used in Linux environment for file handling, text processing and TCL command for interacting text editors.
II. The scripting language fundamentals, libraries and packages for IC design.
III. Scripting language such as Java script, PERL and Python for interpreting VLSI designs in the EDA tool.

III. COURSE OUTCOMES:

After successful completion of the course students should be able to:

CO 1: Build a framework and a design tool to implement the end-to-end design flow of a processor-centric system-on chip.
CO 2: Implement high-level abstract models of blocks, e.g. arithmetic, memory and logic blocks, connect those using structural Python descriptions
CO 3: Translate abstract models automatically to FPGA (Field programmable gate arrays) synthesizable Very high speed integrated circuit Hardware Description Language (VHDL)
CO 4: Outline TCL scripts for verifying VLSI designs.
CO 5: Summarize the commands for scripting using Linux commands
CO 6: Build scripting models using object-oriented concepts.

IV. COURSE CONTENT:

MODULE -I: INTRODUCTION TO LINUX (09)

Linux utilities: A brief history of LINUX, architecture and features of LINUX, introduction to vi editor. General purpose utilities, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands; Text processing and backup utilities: Text processing utilities and backup utilities; SED: Scripts, operation, addresses, commands; AWK: Execution, fields and records, scripts, operation, patterns, actions, associative arrays, string and mathematical functions, system commands in awk, applications, Subroutines, Scripts with arguments.

MODULE -II : TCL9 (09)

The TCL phenomena, Philosophy, Structure, Syntax, Parser, Variables and data in TCL, Control flow, Data structures, Simple input/output, Procedures, Working with Strings, Patterns, Files and Pipes, Example code, EDA tool flows, DML- statements.

MODULE -III: ADVANCED TCL9 (09)

The eval, source, exec and up-level commands, Libraries and packages, Namespaces, trapping errors, Event- driven programs.

Making applications 'Internet-aware', 'Nuts-and-bolts' internet programming, Global ISP, Regional ISP Security issues, running un trusted code, The C interface

MODULE -IV: TK AND JAVA SCRIPTS (09)

Visual tool kits, Fundamental concepts of TK, TK by example, Events and bindings, Geometry managers, Extensive Exercises for Programming in PERL. PERL-TK, Debugger Internal & Externals Portable Functions JavaScript – Object models, Design Philosophy, Versions of JavaScript, The Java Script core language.

MODULE -V: INTRODUCTION TO PYTHON (09)

Basic concepts of Python. Object Oriented Programming Concepts (Qualitative Concepts Only): Objects, Classes, Encapsulation, Data Hierarchy. libraries and modules, Files for Scripts. Logical design using Python: Installing Python, Python data types and data structures, control flow, functions, modules, packages, file handling. Useful of PEP8 for Python.

V. TEXT BOOKS:

1. Guido Van Rossum, Fred L. Drake Jr., “Python Tutorial” by editor, Release 2.6.4
2. Brent Welch, “Practical Programming in Tcl and Tk”, Updated for Tcl 7.4 and Tk4.0.

VI. REFERENCE BOOKS:

1. Brent Welch, “Practical Programming in Tcl and Tk”, 4th Edition, 2003.
2. David Barron, “The World of Scripting Languages”, Wiley Publications, 2000.
3. Guido van Rossum, and Fred L. Drake, “Python Tutorial”, Jr., editor, Release 2.6.4.
4. Neil Mathew, Richard Stones, “Beginning Linux Programming”, Wrox, Wiley India, 4th Edition, 2011.

VII. ELECTRONICS RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc24_ee29/preview
2. https://onlinecourses.nptel.ac.in/noc24_ee44/preview
3. https://onlinecourses.nptel.ac.in/noc24_cs61/preview
4. https://onlinecourses.swayam2.ac.in/aic20_sp05/preview

5. https://onlinecourses.swayam2.ac.in/aic20_sp24/preview
6. https://onlinecourses.swayam2.ac.in/aic20_sp25/preview

VIII. MATERIALS ONLINE

1. Course template
2. Tutorial question bank
3. Definition and terminology
4. Tech-talk topics
5. Assignments
6. Model question paper-I
7. Model question paper - II
8. Lecture notes
9. Early learning readiness videos (ELRV)
10. Power point presentations