Programme	**Bachelor of Technology in Computer Science and Engineering**		Year of Regulation	**2019-20**
Department	**Computer Science and Engineering**		Semester	**VI**

Course Code	Course Name		Pre-Requisite	Credit Structure				Marks Distribution			
				L	T	P	C	INT	MID	END	Total
CS 314	**Shell Programming**		**None**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives	To introduce basic concepts and principles of command line programming, the command structure, the types of commands, and the categorizations of commands for different operating systems. To develop the skills for shell programming in different operating systems. To introduce several commands for working in different shells of different operating systems.	Course Outcomes	CO1	Able to discuss the basic concepts and principles of command line programming, the command structure, the types of commands, and the categorizations of commands for different operating systems.
			CO2	Able to use general commands, file and directory handling commands, process handling commands, network communication and user communication/ interaction related commands, some system administration related commands, and some special commands.
			CO3	Able to familiarize with different shells for different operating systems, different text editors available in Unix - like operating systems for shell programming, working on the vi editor, and writing various shell scripts and windows bat scripts for simple applications.
			CO4	Able to use decision control, looping, different data types, functions and other programming features in shell programming.
			CO5	Able to use filters, piping and regular expressions in shell programming.

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	3	1	1	0	0	0	0	0	0	1	0	1	1	1	1
2	CO2	3	1	2	1	1	0	0	0	1	1	1	0	2	2	0
3	CO3	3	2	3	1	2	0	0	0	1	1	1	0	3	2	0
4	CO4	3	2	2	1	2	0	0	0	1	1	1	0	3	2	0
5	CO5	3	1	2	1	2	0	0	0	1	1	1	0	3	2	0

SYLLABUS			
No.	Content	Hours	COs
I	Command structure for Unix - like and Windows operating systems (OSs); Command Line Interface (CLI) vs. Graphical User Interface (GUI); CLIs in different OSs: popular shells for Unix - like OSs, MS-DOS command.com shell, Windows Command Prompt, Windows Powershell; Types of CLI commands: internal and external commands for different OSs	03	CO1
II	Different commands in Unix/ Linux and Windows OSs: Simple Unix/ Linux commands, Simple Windows commands; file and directory handling utilities; process handling commands; network communication and user communication/ interaction related commands; system administration commands; special commands	12	CO1, CO2
III	Introduction to shells in different operating systems: Korn shell, Bash shell, C shell, Windows Command Prompt, Powershell; text editors in Unix - like operating systems; working on the vi editor; creating shell scripts in Unix/ Linux, creating bat files in Windows OSs; examples of shell scripts, bat scripts and powershell scripts	08	CO1, CO3
IV	Different programming features for shell programming in Unix/ Linux and Windows OSs:- decision control; looping; use of different data types: variables, arrays, files; use of functions; examples of shell scripts, bat scripts and powershell scripts	12	CO4
V	Other important concepts in shell programming in Unix/ Linux and Windows OSs:- use of filters; use of piping (redirection); use of regular expressions; examples of shell scripts, bat scripts and powershell scripts	05	CO5
	Total Hours	40	

Essential Readings

1. Behrouz A. Forouzan, Richard F. Gilberg, "Unix and Shell Programming: A Textbook", Cengage Learning, first edition, 2003.

2. Sumitabha Das, "Your UNIX/Linux: The Ultimate Guide", McGraw-Hill Education, third edition, 2012.

3. Bruce Payette, Richard Siddaway, "Windows PowerShell in Action, Manning publications, third edition, 2017.

Supplementary Readings

1. Graham Glass, King Ables, "UNIX for Programmers and Users", Pearson Education India, third edition, 2003.

2. Yashavant Kanetkar, "Unix Shell Programming", BPB publications, first edition, 2003.

3. Lee Holmes, "Windows PowerShell Cookbook", O'reilly Media, third edition, 2013.