GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Bachelor of Technology	Branch/ Spec.	Computer Science & Engineering Computer Science & Engineering (Big Data and Analytics) Computer Science & Engineering (Cyber Security) Computer Science & Engineering (Artificial Intelligence and Machine Learning)
Semester	II	Version	1.0.0.0
Course Code	2ESC1118	Course Name	BASICS OF OPERATING SYSTEM & SHELL SCRIPTING
Effective from Academic Year	2026-27	Effective for the batch admitted in	July 2026
Course Category	ESC		

Teaching, Learning, and Examination Scheme

Teaching & Learning Scheme							Examination scheme (Marks)					
Hours (per week)				Cr	SL	TSL	Theory			Practical		
L	TU	P	TTH				CE	SEE	Total	CE	SEE	Total
0	0	4	4	2	30	60	0	0	0	50	50	100

L: Lecture, TU: Tutorial, P: Practical, TTH: Total Teaching Hours/Week, Cr: Credit, SL: Min. Self Learning/Term Work Hours/Sem, TSL: Min. Total Teaching & Learning Hours/Sem, CE: Continuous Evaluation, SEE: Semester End Examination,

Pre-requisites

Working knowledge of any Operating System

Course Outcomes

COs	After completing the Course, students will be able to
CO1	Understand Linux computing environment and how to access Linux file systems.
CO2	Understand and implement file and directory management concepts
CO3	Apply various Linux System Administration and Network Administration-related concepts to resolve related issues in an organization
CO4	Create and implement shell scripts.

Practicals are defined based on the following topics:

Unit	Content
1	**Basic of Operating System** Structure of LINUX OS, Accessing the Command Line, Executing Commands Using the Bash Shell.
2	**Managing Files from the Command Line** Describing Linux File System Hierarchy Concepts, Managing Files Using Command-line Tools, Making Links Between Files, Matching File Names with Shell Expansions.
3	**Basic Commands of LINUX** Creating, Viewing, and Editing Text Files, Redirecting Output to a File or Program, Editing Text Files from the Shell Prompt, Changing the Shell Environment
4	**Managing Local Users and Groups** Describing User and Group Concepts, Gaining Superuser Access, Managing Local User Accounts, Managing Local Group Accounts, Managing User Passwords.
5	**Controlling Access to Files** Interpreting Linux File System Permissions, Managing File System Permissions from the Command Line, Managing Default Permissions and File Access
6	**Monitoring and Managing Linux Processes** Listing Processes, Controlling Jobs, Killing Processes, Monitoring Process Activity Controlling Services and Daemons
7	**Controlling Services and Daemons** Identifying Automatically Started System Processes, Controlling System Services
8	**Configuring and Securing SSH** Accessing the Remote Command Line with SSH, Configuring SSH Key-based Authentication, Customizing OpenSSH Service Configuration

9	**Analysing and Storing Logs** Describing System Log Architecture, Reviewing Syslog Files, Reviewing System Journal Entries, Preserving the System Journal, Maintaining Accurate Time.
10	**Managing Networking** Describing Networking Concepts, Validating Network Configuration, Configuring Networking from the Command Line, Editing Network Configuration Files, Configuring Host Names and Name Resolution
11	**Installing and Updating Software Packages** Registering Systems for Red Hat Support, Explaining and Investigating RPM Software Packages, Installing and Updating Software Packages with Yum, Enabling Yum Software Repositories, Managing Package Module Streams
12	**Shell Scripting Basics** Introduction to shell scripting, Looping
13	**Improving Command-line Productivity using Shell Script** Writing Simple Bash Scripts, Running Commands More Efficiently Using Loops, Matching Text in Command Output with Regular Expressions

Practical Content
Practicals cover topics such as basic concepts of compute system.

Text Books	
1	Red Hat System Administration Part-1 & Part-2.
2	Operating System Concepts,8th Edition by silberschatz galvin gagne.

Reference Books	
1	Linux Shell Scripting, Step by Step
2	Beginning the Linux Command Line by Sander van Vugt

ICT/MOOCs Reference	
1	Course Name: Spoken Tutorial Link: https://spoken-tutorial.org/tutorial-search/?search_foss=BOSS+Linux&search_language=English Exam : RHCSA - Red Hat Certified System Administrator

Mapping of Cos, POs, and PSOs

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO1	3	2	3	0	2	2	3	0	2	0	0	3	3	2
CO2	3	2	3	0	2	2	3	3	0	0	2	2	3	2
CO3	3	2	0	0	2	3	0	2	2	2	0	2	3	3
CO4	2	0	3	0	2	0	3	3	3	3	2	3	2	3

Unit	Unit Title	Aligned COs	Learning Hours	BTL Level
1	Basic of Operating System	1,2	-	U,R
2	Managing Files from the Command Line	1,2	-	U,R,A
3	Basic Commands of LINUX	2,3	-	U,A
4	Managing Local Users and Groups	2,3	-	U,A
5	Controlling Access to Files	3	-	N,A
6	Monitoring and Managing Linux Processes	2,3	-	N,A,U
7	Controlling Services and Daemons	2,3	-	A,N
8	Configuring and Securing SSH	3,4	-	C,N
9	Analysing and Storing Logs	3	-	N,A,R
10	Managing Networking	3,4	-	A,C
11	Installing and Updating Software Packages	3,4	-	A,C
12	Shell Scripting Basics	3,4	-	E,A,C
13	Improving Command-line Productivity using Shell Script	3,4	-	E,A,C

Note:

- Version 1.0.0.0 (First Digit= New syllabus/Revision in Full Syllabus, Second Digit=Revision in Teaching Scheme, Third Digit=Revision in Exam Scheme, Forth Digit= Content Revision)
- L=Lecture, TU=Tutorial, P= Practical/Lab., TW= Term work, DT= Direct Teaching, Lab.= Laboratory work CE= Continuous Evaluation, SEE= Semester End Examination
- 1 Hour Lecture = 1 Credit, 1 Hour Tutorial = 1 Credit, 2 Hours Practical = 1 Credit, 2 Hours Internship/Project/Seminar = 1 Credit

- As per NCrF/NEP 2020, Minimum Self-Learning or Term Work Hours per Semester should be calculated in such a way that 1 Credit should have minimum 30 Hours of Teaching and Self Learning Engagement per semester