DEPARTMENT OF COMPUTER SCIENCE				*CLASS: II B.Sc. Computer Science*				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours/week**	**CIA**	**Ext**	**Total**
IV	Core -6	20U4DMC6	Linux & shell programming	5	5	25	75	100

Nature of Course				
Knowledge and skill	✓		Employability oriented	
Skill oriented			Entrepreneurship oriented	

COURSE OBJECTIVES :

This course is designed

- To understand and make effective use of Linux utilities and
- Shell scripting language (bash) to solve problems.

Units	**TOPICS**	**Total Hours:75**	**K-Levels**
Unit -I	Introduction to Linux : operating system and Linux - History of Linux and Unix - Linux overview - Linux Distributions - Vi editors.	15 hrs	Up to K2
Unit-2	Shell - comparison of Shells - working in the shell - Learning Basic Commands - Compiler and interpreter differences - various directories - Drilling deep into process management, job control and Automation.	15 hrs	Up to K3
Unit-3	Text processing - Text filtering Tools - working with commands. - Logical operators. - local variables and its scope - working with arrays	15 hrs	Up to K3
Unit-4	Tricks with shell scripting - interactive shell scripts - The here document and << operator - sort command - WC command - file handling - Debugging -	15 hrs	Up to K3
Unit-5	Automating Decision - Making in scripts - Automating repetitive tasks - working with Functions.	15 hrs	Up to K4

Books for Study:

1. The Complete Reference LINUX - Richard L. Petersen, McGraw Hill,
2. LINUX shell scripting by Ganesh Naik, Packt Publishing Ltd.,

Books for Reference :

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the UNIX environment, 2nd Edition, W.R.Stevens, Pearson Education.
3. UNIX Network Programming, W.R. Stevens, PHI.
4. UNIX for Programmers and Users, 3rd Edition, Graham Glass, King Ables, Pearson Education

Web resources:

1. https://www.kau.edu.sa/files/830/files/60761_linux.pdf
2. http://www.crectirupati.com/sites/default/files/lecture_notes/LINUX%20FINAL%20NOTESconverted.pdf

Rationale for Nature of the course:

Now a days LINUX is one of the most widely used operating system. Knowledge of LINUX operating system is essential as it provides many features such as multitasking, multiuser, security etc. These features are mainly used in both server and workstation systems. So, this course will enable the students to inculcate the basics of LINUX operating system, writing shell scripts.

Activities having direct bearing on Skill development / Employability /Entrepreneurship

- Seminar
- Assignment preparation
- Scientific discussion
- Thinking and analysis on theoretical concepts

Pedagogy:

The teaching methods includes Chalk and talk, PowerPoint, demonstrations, assignments and group discussions.

Lecture schedule:

Unit	Topics	Hrs	Mode
Unit I	Introduction to Linux : operating system and Linux	3	Chalk and talk, Quiz and assignment
	History of Linux and Unix	2	
	- Linux overview - Linux Distributions	5	
	- Vi editors.	5	
Unit II	Shell - comparison of Shells - working in the shell	3	Chalk and talk, Group discussion
	- Learning Basic Commands	3	
	Compiler and interpreter differences - various directories	3	
	- Drilling deep into process management	3	
	job control and Automation	3	
Unit III	Text processing - Text filtering Tools	5	Chalk and talk, Quiz and assignment
	working with commands. - Logical operators	5	
	- local variables and its scope	2	
	working with arrays	3	
Unit IV	Tricks with shell scripting - interactive shell scripts	5	PPT, Chalk and talk, Quiz and assignment
	The here document and << operator - sort command	5	
	WC command - file handling - Debugging	5	
Unit V	Automating Decision - Making in scripts	5	PPT, Chalk and talk, Quiz and assignment
	Automating repetitive tasks	5	
	working with Functions	5	

Learning Outcome Based Education & Assessment (LOBE)
Blue Print – LINUX & shell programming
Articulation Mapping – K Levels with Courses Learning Outcomes (CLOs)
BLUE PRINT FOR INTERNAL ASSESSMENT – I

S. No.	CLOs	K-Level	Section A		Section B		Section C (Either / or Choice)	Section D (Open Choice)
			MCQs		Short Answers			
			No. of Questions	K-Level	No. of Questions	K-Level		
1.	CLO 1	Up to K 2	2	K1 & K2	1	K1	2 (K1&K1)	1(K2)
2.	CLO 2	Up to K 3	2	K1 & K2	1	K2	2 (K2&K2)	1(K3)
No. of Questions to be asked			4		3		4	3
No. of Questions to be answered			4		3		2	2
Marks for each Question			1		2		5	10
Total Marks for each Section			4		6		10	30

BLUE PRINT FOR INTERNAL ASSESSMENT – II

S. No.	CLOs	K-Level	Section A		Section B		Section C (Either / or Choice)	Section D (Open Choice)
			MCQs		Short Answers			
			No. of Questions	K-Level	No. of Questions	K-Level		
1.	CLO 3	Up to K 4	2	K1 & K2	1	K2	2 (K3&K3)	1(K4)
2.	CLO 4	Up to K 3	2	K1 & K2	1	K1	2 (K3&K3)	1(K3)
No. of Questions to be asked			4		3		4	3
No. of Questions to be answered			4		3		2	2
Marks for each Question			1		2		5	10
Total Marks for each Section			4		6		10	30

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			MCQs		Short Answers			
			No. of Questions	K-Level	No. of Questions	K-Level		
1	CLO 1	Up to K-2	2	K1 & K2	1	K1	2 (K1&K1)	1(K2)
2	CLO 2	Up to K-3	2	K1 & K2	1	K2	2 (K2&K2)	1(K3)
3	CLO 3	Up to K-3	2	K1 & K2	1	K2	2 (K3&K3)	1(K4)
4	CLO 4	Up to K-3	2	K1 & K2	1	K1	2 (K3&K3)	1(K3)
5	CLO 5	Up to K-4	2	K1 & K2	1	K2	2 (K4&K4)	1(K3)
No. of Questions to be asked			10		5		10	5
No. of Questions to be answered			10		5		5	3
Marks for each Question			1		2		5	10
Total Marks for each Section			10		10		25	30

Distribution of Section-wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (No Choice)	Section C (Either/or)	Section D (Open Choice)	Total Marks	% of Marks without choice	Consolidated
K1	5	4	10	-	**19**	15.83	**42%**
K2	5	6	10	10	**31**	25.83	
K3	-	-	20	30	**50**	41.67	**42%**
K4	-	-	10	10	**20**	16.67	**16%**
Total Marks	10	10	50	50	**120**	100.00	**100%**

Distribution of Unit-wise questions with K Levels

Section A	Section B	Section C	Section D
2 Questions for each Unit (K1 & K2 Level)	1 Question from each Unit (K1 & K2 Level)	2 Questions from Unit-I (K1 Level)	1Question from Unit-I (K2 Level)
		2 Questions fromUnit-II (K3 Level)	1Question from Unit-II (K3 Level)
		2 Questions from Unit-III (K3 Level)	1Question from Unit-III (K4 Level)
		2 Questions from Unit-IV (K2 Level)	1Question from Unit-IV (K3 Level)
		2 Questions from Unit-V (K4 Level)	1Question from Unit-V (K3 Level)

K1 –Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving Problems
K4 – Examining, analyzing, presentation and make interferences with evidences

COURSE OUTCOMES:

On the completion of the course the students will be able to

COs	COURSE OUTCOME	Knowledge Level (basis of Bloom's Taxonomy)
CO-1	Understand the structure of LINUX operating system and the editors used for developing shell programs.	Up to K2
CO-2	Understand the concepts of shell process and management, control of compiler and interpreters.	Up to K3
CO-3	Demonstrate the development of text formatting and filtering tools related programs.	Up to K3
CO-4	Demonstrate the debugging and file handling operations of Linux OS.	Up to K4
CO-5	Acquire the knowledge related with functions ,control loops etc.	Up to K3

MAPPING OF COs WITH PSOs:

Course Outcomes	PSO 1 (Knowledge Base)	PSO 2 (Problem Analysis & Investigation)	PSO 3 (Communication Skills & Design)	PSO 4 (Individual and Team Work)	PSO 5 (Professionalism Ethics and equity)	PSO 6 (Life Long Learning)
CO-1	1	1	1	2	1	1
CO-2	2	3	2	1	1	1
CO-3	2	3	1	1	1	2
CO-4	3	2	2	1	2	1
CO-5	2	2	2	3	2	1

3- Advanced Application 2- Intermediate 1- Introductory

Course Designer(s):

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