Integral University, Lucknow

Effective from Session: 2024-25								
Course Code	DMA-301	**Title of the Course**	APPLIED MATHEMATICS-II(A)			**L**	**T**	**P**	**C**
Year	2	**Semester**	3			3	1	0	NA
Pre-Requisite	DMA-301	**Co-requisite**	NA						
Course Objectives	To know the basic concepts of Mathematics with their Applications in Engineering.								

Course Outcomes	
CO1	The students learn about the application of Matrices in complex Engineering problems for recording Math reports.
CO2	The students gain the skill of applying the known results of Matrix algebra for the study of structural properties of graphs and applications of graph theory such as electrical network analysis and electronic circuits in expressing a problem.
CO3	The students use matrix transforms in computer graphics. Software and hardware graphics processor uses matrices for performing operations such as scaling, translation and rotation.
CO4	The students learn to form and solve problems using differential equations of Electrical circuits, decay of radioactive elements, Motion under gravity, Newton's law of cooling and simple Harmonic motion.
CO5	To motivate students on the relevance of differential equations in various engineering disciplines for example one-dimensional transient heat conduction.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1.	Matrix-I	Type of matrix: Null matrix, unit matrix, square matrix, symmetric and skew-symmetric matrix, orthogonal matrix, diagonal and triangular matrix, Hermitian and Skew-Hermitian matrix, unitary matrix. Algebra of Matrix: Addition, subtraction and multiplication. Determinant of matrix, cofactor of matrix, computing inverse through determinant and cofactor. Elementary row/column transformation: meaning and use in computing inverse of matrix.	10	1
2.	Matrix-II	Linear dependence/independence of vectors. Definition and computation of rank of matrix through determinants, elementary row and column transformation (Echelon and Normal form of matrix), consistency of equations.	8	2
3.	Eigen Values and Eigen Vectors, Cayley Hamiltom Theorem	Definition and evaluation of Eigen values and Eigen vectors of a matrix of order 2 and 3. CayleyIHamilton theorem (without proof) and its verification, use of Cayley-Hamilton theorem in finding inverse.I	6	3
4.	Ordinary Differential EquationI	Introduction, formation, order, degree of ordinary differential equation. Formation of ordinary differential equations through physical, geometrical, mechanical, electrical consideration. Solution of differential equations of first order and first degree by variable separable, reducible to variable separable forms, linear and Bernoulli form and exact differential equation.	8	4
5.	Second Order Differential Equation Simple Application	Properties of solution, linear differential equation of second order with constant coefficients, complimentary function and particular integral, equation reducible to linear form with constant coefficients. LCR circuit, Motion under gravity, Newton's law of cooling, Radioactive decay, Population growth, Oscillations of a string, Equivalence of electrical mechanical system.	8	5

References Books:
1. Applied Mathematics: Kailash Sinha, Meerut publication
2. Applied Mathematics: P.K Gupta, Asian Publication
3. Applied Mathematics: H.R Luthra, Bharat Bharti Prakashan.
4. Applied Mathematics: H.K Das, C.B.S Publication.I
5. Mathematics for Polytechnic: S.P Deshpande, Pune Vidyarthi Griha.

e-Learning Source:

https://youtu.be/rBNQ0r7CN2c?si=dWel4wkajbAzEvrt

https://youtu.be/syLIPtxjN0E?si=Gn9S_AjtmUriMP45

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	-	3	-	-	-	-	-	1	-	-	-
CO2	-	3	-	-	1	-	-	-	-	2	-
CO3	-	3	-	-	1	-	1	-	1	-	-
CO4	-	3	-	-	1	-	-	-	-	-	1
CO5	-	3	-	-	-	-	-	-	-	2	-

1-Low Correlation; 2- Moderate Correlation;

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

stantial Correlation

Integral University, Lucknow

Effective from Session:								
Course Code	DEC-301	**Title of the Course**	Principal of Digital Electronics		**L**	**T**	**P**	**C**
Year	2nd	**Semester**	3rd		**3**	**1**	**0**	
Pre-Requisite	None	**Co-requisite**	None					
Course Objectives	1. To acquire the basic knowledge of digital logic levels. 2. Application of knowledge to understand digital electronics circuits. 3. To prepare students to perform the analysis and design of various digital electronic circuits. 4. Have a thorough understanding of the fundamental concepts and techniques used in digital electronics							

Course Outcomes	
CO1	Convert different type of codes and number systems which are used in digital communication and computer systems.
CO2	Employ the codes and number systems converting circuits and compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency
CO3	Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.
CO4	Assess the nomenclature and technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world application.
CO5	To develop skills to build and troubleshoot counter circuits and programmable logic devices.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Introduction to digital electronics	Basic difference between analog and digital signal. Number system: Binary number system, Decimal number system, octal number system, Hexadecimal number system. Conversion of bases: conversion from Decimal, Octal & Hexadecimal to Binary and vice-versa. Binary addition, subtraction, multiplication and division including binary points. Binary Codes: BCD, 8421 code, Gray code, Binary to Gray code conversion and Gray to Binary code conversion. Complements: Signed numbers, Signed magnitude representation, 1's and 2's complement representation. Addition and subtraction of numbers in 2's complement representation.	8	1
2	Logic gates	Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, Exclusive OR, Exclusive NOR gates. Logic simplification: Boolean algebra, Boolean theorems, karnaugh-mapping upto 4 variables, Implementation of logic equations with gates.	8	2
3	Combinational Logic Circuits	Introduction to combinational and sequential logic circuits. Arithmetic circuits: half adder, full adder, half subtractor, full subtractor. Multiplexer: 2:1, 4:1. Demultiplexer: 1:2, 1:4. Decoder: 3 to 8 Decoder, Encoder.	8	3
4	Flip Flops	Introduction, Latches and flip flop, SR, T, D, JK and master slave JK flip flop. Counter: Introduction, counter classification, 2-bit, 3-bit ripple counter, MOD-5 counter.	8	4
5	Shift Registers:	Introduction, serial in serial out, shift left, serial in parallel out, parallel in serial out, and parallel in parallel out shift registers. Memory and Programmable logic: volatile and non-volatile, RAM, ROM, PLA, PAL.	8	5

References Books:

1. Digital Principles & Application: Malvino & Leach, Mcgraw Hill-5th Edition.
2. Digital logic & Computer Design: Mano, M. Morris, PHI publication.
3. Digital Electronics: D.A. Godse and A.P. Godse: Technical Publication.
4. Digital Electronics Circuits & System: Puri, V: TMH

e-Learning Source:

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3			3								1		2	3	2
CO2		2		2						1							2
CO3		2		2							1						2
CO4	1	2		3													2
CO5		2							2		1						2

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2017-18								
Course Code	DCS-302	**Title of the Course**	OPERATING SYSTEM		**L**	**T**	**P**	**C**
Year	2ND	**Semester**	3RD		**3**	**1**	**0**	
Pre-Requisite		**Co-requisite**						
Course Objectives	1.To make students familiar with program language and its related terminologies 2.Study of different types of programming module along with their functionality 3.To Understand the basic Concept of Programming Language							

Course Outcomes	
CO1	Students become familiar with Operating System, its evolution through different generations.
CO2	Knowledge of different types of OS and its various functionalities.
CO3	Students are familiarized with the concept of process and various CPU scheduling algorithms. Familiarized with the concept of paging and various Page replacement algorithms.
CO4	Develop understanding of memory management by OS and the concept of virtual memory. Knowledge of disk structure and various disk scheduling algorithms.
CO5	Develop the ability to compare between Linux, Unix and Windows OS.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Introduction	Evolution of Operating System, Computer system overview, characteristics of operating system, GUI, CUI, Single user, Multi-user operating system Time Sharing and Real Time System.	8	CO1
2	Management of Operating System	Process Management - Process concepts, Process scheduling, Process Synchronization, Inter process communication, CPU scheduling and dead lock.	8	CO2
3	Memory Management	Main memory, Contiguous memory allocation, Segmentation, Paging, Virtual memory, Demand paging, Page replacement, Allocation, Thrashing.	8	CO3
4	Input Output Management	Mass storage structure, Overview, Disk scheduling and Management. .	8	CO4
5	File Management	File concepts, File system and structure, Directory structure. Linux /UNIX and Windows basic concepts, system administration, requirement for Linux.	8	CO5

References Books:
1-Milenekovie - Operating System Concept- McGraw Hill
2-Petersons - Operating System - Addision Wesley
3-Dietal - An Introduction to Operating System- Addision Wesley

e-Learning Source:
1-https://www.geeksforgeeks.org/what-is-an-operating-system/
2-https://www.tutorialspoint.com/operating_system/os_memory_management.htm

PO-PSO \ CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	-	2	1	-	-	-	-	-	-	-	-
CO2	-	2	-	1	1	-	-	-	-	-	-
CO3	-	2	-	3	-	-	-	-	-	-	-
CO4	-	2	2	-	-	-	-	-	-	-	-
CO5	-	2	-	3	-	-	-	-	-	-	-

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2013-14							
Course Code	DEC-304	**Title of the Course**	Electronics Devices & Circuits - I	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	3	1	0	-
Pre-Requisite	-	**Co-requisite**	-				
Course Objectives	To introduce the fundamentals of the measurement system, covering transducers, bridges, analog and digital meters, CRO, display devices, signal generators, and analyzers.						

Course Outcomes	
CO1	Evaluate frequency response curve for different multi stage amplifier
CO2	Perform comparison between different class of power amplifiers.
CO3	Evaluate the impact of feedback on single stage transistor amplifier.
CO4	Understand the selection and rejection of signals using tuned voltage amplifier.
CO5	Define different transmission line & calculation of their parameters.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	**Multistage Transistor Amplifiers**	Need of multistage amplifier, different coupling schemes and their working, Application of each of the type of coupling in brief, Working of R.C. coupled and transformer coupled multistage amplifier, approximate calculation of voltage gain for a two stage RC coupled amplifier, Frequency response of R-C coupled and transformer coupled amplifiers and its physical explanation, definition and physical significance of the term as bandwidth, upper and lower cross over frequencies etc., Direct coupled amplifier and its limitations, differential amplifier typical circuits diagram and its working.	8	1
2	**Transistor Audio Power Amplifiers**	Difference between voltage and power amplifier, importance of impedance matching in power amplifier, collector efficiency of power amplifier, Typical single ended power amplifier and its working, graphical method for calculation of output power, heat dissipation curve and importance of heat sinks, class A, class B, class C amplifier (without derivation). Working principle of push pull amplifier and circuits, its advantages over single ended power amplifier, cross over distortion in class B operation and its reduction, different driver stages for push pull amplifier circuit, Working principle of complementary symmetry push pull circuit and its advantages, Transformer less audio power amplifiers and their typical application.	8	2
3	**Feed Back Amplifiers**	Basic principle and types of feedback, Derivation of expression for the gain of an amplifier employing feedback, Effect of negative feedback on gain, stability, distortion and band width (Only physical explanation) Typical feedback circuits: (a) A.C. coupled amplifiers with emitter by-pass, capacitor removed. (b) Emitter follower and its application, simple mathematical analysis for voltage gain and input impedance of above circuits.	8	3
4	**Tuned Voltage Amplifiers**	Classification of amplifiers on the basis of frequency, Review of basis characteristics of tunned circuits, (Series and Parallel), Single and Double tuned amplifier, their working principles and frequency response (no mathematical derivation).	8	4
5	**Sinusoidal Oscillators And Wave Shaping Circuits**	Sinusoidal Oscillators: Application of oscillators, Use of positive feedback/negative resistance for generation of oscillation, barkhawn's criterion for oscillations, Different oscillators circuits, tuned collector, Hartley, colpitts, phase shift, Wien's bridge and crystal oscillator and their working principles (no mathematical derivation). Wave Shaping Circuits: General idea about different wave shapes, Review of transient phenomena in R-C and R-L circuits, R-C and R-L differentiating circuits and integrating circuits and their applications.	8	5

References Books:

1. Basic Electronics & Linear Circuits: Bhargava, Kulshreshtha & Gupta, Tata Mcgraw-Hill..

2. Micro Electronics Circuits: Sedra, Adel S. Smith, Kenneth. C., Oxford University Press 5th Edtion

3. Neaman D A, "Electronics Circuits", 3rd Ed TMH

4. Jacob Millman and Arvin Grabel, "Microelectronics", 2nd Ed TMH
e-Learning Source:
1. Network Analysis by NPTEL
2. Transmission Line Model

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3				1											
CO2	3												3			
CO3	3															
CO4					2										2	
CO5		2					1									

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2024-25							
Course Code	DEC-305	**Title of the Course**	Basic Networking	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	3	1	0	
Pre-Requisite		**Co-requisite**					
Course Objectives	After undergoing the subject, the students will be able to Understand networks & their significance, understand and describe communication media, compare different types of Topologies, Compare OSI and TCP/IP models.						

Course Outcomes	
CO1	To analyze the classification of network services, protocols and architectures.
CO2	Understand the overview of reference models.
CO3	To learn basic concepts of MAC protocols.
CO4	Understand various routing algorithms and their operations.
CO5	To understand key Internet applications and their protocols.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Introduction to Networks	Introduction to Computer Networks, Element and Types of Networks, Network Topologies: Bus, Star, Mesh, Ring. NIC, Repeaters, Hub and its types, Bridges, Switches, Routers. Common LAN Media: STP, UTP, Coaxial cable, Optical fibre.	8	1
2	Network Model	Description of the layers of OSI Model-Physical layer, Datalink layer, Network layer, Transport layer, Session layer, Presentation layer, Application layer, TCP/IP Model, Comparison of OSI & TCP/IP Model.	8	2
3	Physical and Data Link Layer	Digital Modulation and Multiplexing-Baseband and passband transmission, TDMA, FDMA, CDMA. Data link protocols- Simplex Stop-and-Wait Protocol, Go-Back-N Protocol, Selective Repeat Protocol. Multiple Access Protocols-Aloha, Carrier Sense Multiple Access Protocols.	8	3
4	Network layer	Types of Routing, Inter and Intradomain routing, Distance Vector Routing, Link State Routing, Path Vectoring Routing., IP address, IP address Classes, Basics of Sub-netting, Subnet Masking.	8	4
5	Transport and Application Layer	Introduction to Application Layer Protocols and their role. The Domain name system, Electronic Mail, the World Wide Web, FTP, Telnet, HTTP, DHCP.	8	5

References Books:

1. Data Communications and Networks, Achyut S. Godbole, Tata McGraw Hill

2. Computer Networking, Tularam M Bansod Dreamtech, Wiley

3. Data Communications and Networking with TCPIP Protocol Suite by Behrouz A. Forouzan

4. Computer Network by Andrew S. Tanenbaum Pearson

e-Learning Source:

http://swayam.gov.in

http://spoken-tutorial.orgs

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1		3	2	1	3	3	1	1		3	2
CO2		3			3	3			2	3	2
CO3		3			3	3				3	2
CO4		3	2		3	3				3	2
CO5		3			2	3				3	2

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2024-25							
Course Code	DCS-307	**Title of the Course**	Fundamental of Programming using Python	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	3	1	0	
Pre-Requisite		**Co-requisite**					
Course Objectives	After undergoing the course, the students will be able to execute Python code in a variety of environments, use correct Python syntax in Python programs, use the correct Python control flow construct.						

Course Outcomes	
CO1	Obtain knowledge of programming concepts and languages especially python language.
CO2	Illustrate the basic information of python programming likes Data Types, variables, input output functions, control statements etc.
CO3	Apply programming concepts and techniques to build the basic programs of python languages as well as develop the practical approach on programming.
CO4	Illustrate the other advance programming concepts like Array, Pointer, Union, Structure and Functions.
CO5	Trap various errors via the Python Exception Handling model

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Basics of Python Programming	Features, future of python, writing and executing first python program, Literal constants, variables and identifiers, data types, input operation, comments, reserved words, indentation, operators and expressions, expressions, Type conversion.	8	1
2	Control and Iterative statements	Introduction, Selection/conditional branching statements, Basic loop structures/iterative statements, Nested loops, break, continue and pass statements	8	2
3	Functions and Modules	Introduction, function declaration and definition, function definition, function call, variable scope and lifetime, the return statement, recursive functions, modules, packages in python.	8	3
4	Strings and Lists	Concatenating, appending and multiplying strings, immutability, String formatting operator, building string methods and function, slice operation	8	4
5	Tuple, Sets and Dictionaries	Creating tuple, utility of tuples, accessing values in a tuple, updating tuple, deleting elements in tuple, basic tuple operations. Creating a Set and Dictionary, various set operations on sets and dictionary.	8	5

References Books:

1. Python Programming Using Problem Solving Approach-Reema Thareja, Oxford University Press, 2019.

2. Python for Informatics- Exploring Information-Charles Severance 1st edition Shroff Publishers

3. Introduction to Computation and Programming Using Python-John V. Guttag The MIT Press, 2013

e-Learning Source:

http://swayam.gov.in

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	1			1	1	3			3	1
CO2		1			1		3			3	1
CO3						1	3			3	1
CO4							3			3	1
CO5							3			3	1

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session:								
Course Code	DEC-351	**Title of the Course**	**Principal of Digital Electronics Lab**	**L**	**T**	**P**	**C**
Year	2nd	**Semester**	3rd	**0**	**0**	**3**	
Pre-Requisite	None	**Co-requisite**	None				
Course Objectives		1. Students will learn and understand the Basics of digital electronics and able to design basic logic circuits, combinational and sequential circuits. 2. Learn and understand the basics of Boolean algebra, and test/verify the functionality of the logic circuits.					

Course Outcomes
CO1 Identify the various digital ICs and understand their operation.
CO2 Designing from simple to complex logic circuits.
CO3 Construct basic combinational circuits and verify their functionalities
CO4 Describe the operation and timing constraints for latches and registers

Experiment No.	Title of the Experiment	Content of the Unit	Contact Hrs.	Mapped CO
1	IC Identification	Identification of IC no's, Pin no's and IC types.	3	1
2	Gate IC verification	Verification of truth table for 2 Input NOT, AND, OR, NAND, NOR, XOR gates.	3	1
3	Basic gates using NAND	Realization of NOT, OR, AND, NOR, EX-OR and EX-NOR gates using NAND gate.	3	1
4	Basic gates using NOR	Realization of NOT, OR, AND, NOR, EX-OR and EX-NOR gates using NOR gate.	3	1
5	Design using Logic gates	Design and Implementation of Simple Logic Circuits.	3	2
6	Design Combinational circuit	To construct half adder and half subtractor using XOR and NAND gates verification of their truth tables	3	3
7	Design Combinational circuit	Implementation of full adder and full subtractor using logic gates.	3	3
8	Design Combinational circuit	Implementation of 4x1 multiplexer using logic gates.	3	3
9	Simplification of large circuits	To construct a full adder circuit with XOR and NAND gates.	3	3
10	Four Adder Circuit	To verify the truth table of 4 bit adder IC chip 7483	3	4

References Books:

1. The 8051 Microcontroller and Embedded Systems: Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay, "Pearson Prentice Hall"

2. Microprocessor & Application: B. Ram, TMH Publication.

3. Microprocessor and Interference: D V Hall, TMH Publication.

e-Learning Source:

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1		3										1	1			3	2
CO2		1	3							1			2			2	2
CO3	1	2	3										2			2	2
CO4		2	1								2		1			2	2

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2017-18							
Course Code	DCS-352	**Title of the Course**	OPERATING SYSTEM LAB	**L**	**T**	**P**	**C**
Year	2ND	**Semester**	3RD	0	0	2	
Pre-Requisite		**Co-requisite**					
Course Objectives	1.To make students familiar with program language and its related terminologies 2.Study of different types of programming module along with their functionality 3.To Understand the basic Concept of Programming Language						

Course Outcomes	
CO1	Students become familiar with Operating System, its main components and its functionalities.
CO2	Students will learn the complete process involved in installation of an OS
CO3	Students are familiarized with the concept of process and various CPU scheduling algorithms. Familiarized with the concept of paging and various Page replacement algorithms.
CO4	Learn the concept of disk scheduling and its various algorithms.
CO5	Develop the ability to compare between Linux, Unix and Windows OS.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	EXPERIMENT 1	Installation of operating system	2	CO1
2	EXPERIMENT 2	Repairing and Removal of operating system	2	CO2
3	EXPERIMENT 3	Exercise on Windows Latest Version.	2	CO3

References Books:
1-Milenekovie - Operating System Concept- McGraw Hill
2-Petersons - Operating System - Addision Wesley
3-Dietal - An Introduction to Operating System- Addision Wesley

e-Learning Source:

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1		2	1								
CO2		2		1	1						
CO3		2		3							
CO4		2	2								
CO5		2		3							

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2024-25							
Course Code	DEC-355	**Title of the Course**	Basic Networking Lab	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	0	0	2	
Pre-Requisite		**Co-requisite**					
Course Objectives	After undergoing the practical, the students will be able to understand networks & their significance, understand and describe communication media, compare different types of Topologies, Compare OSI and TCP/IP models.						

Course Outcomes	
CO1	Understand various routing algorithms and their operations
CO2	Understand the use of various devices using in networking.
CO3	Understand various routing algorithms and their operations
CO4	To learn about basic concepts of LAN

Experiment No.	Title of the Experiment	Content of the Unit	Contact Hrs.	Mapped CO
1	Networking device	Study of following Network Devices in Detail: Repeater, Hub, Switch, Bridge, Router Gate Way	2	2
2	IP Address	Study of network IP	2	1
3	IP Address	Study of basic network command like ping, trace etc	2	4
4	LAN Media	Study & implementation of cable designs in networking	2	2
5	LAN Media	Implementation of PC to PC with IEEE 802.3	2	2
6	Study of datalink Layer	Study the performance network with CSMA/CA protocol and compare with CSAMA/CD protocol.	2	3
7	Study of datalink Layer	Implementation and study of Stop and Wait protocol.	2	3
8	Study of datalink Layer	Implementation and study of Go Back N and Selective Repeat protocols	2	3
9	Routing	Implementation of Distance Vector Routing algorithm	2	1
10	Routing	Implementation of Link state routing/Dijkistra's algorithm	2	1

References Books:

e-Learning Source:

www.vlab.co.in

PO-PSO \ CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1		3			2	3	2		3	
CO2			3	2		2	3	2		3	1
CO3			3				3	2		3	1
CO4		1	3			2	3	2		3	1

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**
Effective from Session: 2024-25	

Integral University, Lucknow

Course Code	DCS-357	Title of the Course	Fundamental of programming using Python Lab	L	T	P	C
Year	II	Semester	III	0	0	2	
Pre-Requisite		Co-requisite					
Course Objectives		After undergoing the course, the students will be able to execute Python code in a variety of environments, use correct Python syntax in Python programs, use the correct Python control flow construct.					

Course Outcomes	
CO1	Develop practical approach using input and output function.
CO2	Develop practical approach using various python operators.
CO3	Knowledge of Control Statements like if, else if, switch case, While, Do While and For loop.
CO4	Develop practical approach using Array, List, Strings etc.

Experiment No.	Title of the Experiment	Content of the Unit	Contact Hrs.	Mapped CO
1	Sorting	Write a python program to perform Insertion sort on a 1-D array	2	
2	Searching	Write a python program to perform a Binary search on a 1-D array	2	
3	Controlling/iteration statement	Write a program to check whether a given number is Armstrong number.	2	
4	String	Write a program that find the ASCII values of the letters in the strings	2	
5	Controlling/iteration statement	Swap two integer numbers using a temporary variable. Repeat the same without using a temporary variable.	2	
6	Controlling/iteration statement	Write a program that determines whether the number is prime.	2	
7	Controlling/iteration statement	Find all numbers which are multiple of 17, but not the multiple of 5, between 2000 and 2500?	2	
8	Strings	Write a program using function which receives a string as an input and returns the reverse of the string	2	
9	Controlling/iteration statement	Write a program check if a given string is palindrome or not	2	
10	Function	Write a Program for simple calculator	2	

References Books:

e-Learning Source:

www.vlab.co.in

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1					1	1	3			3	1
CO2					1		3			3	1
CO3					1		3			3	1
CO4						1	3			3	1
										3	1

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**