Integral University, Lucknow

Effective from Session: 2018-19							
Course Code	DCS-601	**Title of the Course**	Software Engineering	**L**	**T**	**P**	**C**
Year	3rd	**Semester**	6th	**3**	**1**	**0**	
Pre-Requisite		**Co-requisite**					
Course Objectives	1 Overview of Software Engineering						

Course Outcomes	
CO1	To understand basics about software engineering principles, methods and practices
CO2	To analyze software requirement specification and to identify software quality assurance models that are essential to develop and to measure the quality of software.
CO3	To explain the software design strategies and to apply software measurement and metrics using Function point, cyclomatic complexity .
CO4	Use exception handling mechanism to develop fault tolerant applications.
CO5	To analyze software risk with estimation parameters such as cost, effort, schedule/duration and understand the concepts of software maintenance, reverse engineering, software configuration management

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Basics of Software Engineering & the Software Development Process	The evolving Role of software & changing nature of software. Software Engineering – A layered Technology approach. A process framework & software project tracking & control. The Capability Maturity Model Integration techniques. Process patterns, process Assessment, personal & Team Process models & Process Technology Theories. Process Models –Waterfall, Incremental, RAD, Prototype, Spiral.	8	CO1
2	Software Engineering requirements & Development of Analysis & Design models	Software Engineering core principles, Communication, Planning, Modeling, Construction & Deployment principles. Requirements Engineering Tasks, Initiating the requirement process. Analysis approaches of software & preparation of Analysis model using Data modeling, Concepts, Object-oriented Analysis, Flow oriented model, Class□Based model, Behavioural Model . Design approaches of software & preparation of design model using Design concepts, Design model, and pattern based design.	8	CO2
3	Testing Strategies & Methods	Software Testing fundamentals. A Strategic approach to software testing. Test Strategies for conventional software, Unit Testing, Integration Testing, Regression testing, smoke testing. Validation testing using Alpha & beta testing, system testing using recovery, security, stress & performance testing. Black Box & White Box Testing. Debugging process strategies.	8	CO3
4	Software Project Management	The management spectrum – The people, The product, the process & the project. Project scheduling – Basic concepts, relationship between people & effort, effort distribution, defining a task for the software project, Defining a task network & scheduling of project. Risk Management – Reactive Vs Proactive risk strategies, software Risks, Risk Identification, Risk Projection & Risk refinement, monitoring &management. Change Management – SCM scenario, SCM repository & process. Formal method & clean room software development & management approach.	8	CO4
5	Software Quality Management& Estimation	Basic Quality Concepts. Software Quality Assurance, Statistical software quality assurance, Six sigma strategy. Software Reliability. The ISO 9000 quality standards .The project Planning process ,software scope & feasibility, Resources, COCOMO II model & the make / Buy design To understand software project management and software quality management and estimations.	8	CO5

References Books:

1. Sommerville, Ian, “Software Engineering”, AWL./

2. Bell, “Software Engineering for students”, Pearson Education, Delhi.

e-Learning Source:

https://www.geeksforgeeks.org/software-engineering-introduction-to-software-engineering/

https://en.wikipedia.org/wiki/Software_engineering

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	2	2	3	-	-	-	-	-	2	2
CO2	2	1	2	3	-	-	-	-	-	2	1
CO3	1	2	2	3	-	-	-	-	-	2	1
CO4	2	1	2	3	-	-	-	-	-	2	1
CO5	2	1	2	3	-	-	-	-	-	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: 2025-26							
Course Code	DCS-606	**Title of the Course**	Computer Programming Using Python	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**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	lustrate the basic information of python programming likes Data Types, variables, input output functions, control statements etc.
CO3	pply 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	Introduction to OOP	Introduction to Object Oriented Programming: Features of Object-Oriented Programming, Merits and demerits of object-oriented programming languages, applications of object-oriented programming, comparison between commonly used programming languages. 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	Decision control statements	Decision control statements: Introduction, Selection/conditional branching statements, Basic loop structures/iterative statements, Nested loops, break, continue and pass statements. 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	2
3	Strings	Strings: Concatenating, appending and multiplying strings, immutability, String formatting operator, building string methods and function, slice operation. Lists: access and update values in lists, nested and cloning lists, basic list operations, List methods using lists as Stack and Queues, list comprehensions, loping in lists. Tuple: Creating tuple, utility of tuples, accessing values in a tuple, updating tuple, deleting elements in tuple, basic tuple operations.	8	3
4	Sets and Dictionary	Sets: Creating a Set and set operations Dictionaries: Creating a dictionary, accessing values, add, modify, delete, sort items in a dictionary, looping over a dictionary. Classes and Objects: Introduction, classes and objects, class method and self-argument, init() method, class and object variables, del() method, other special methods, public and private data members, private methods, calling a class method from another class method, built-in class attributes, garbage collection, class and static methods.	8	4
5	Operator Overloading	Operator Overloading: Introduction, implementing operator overloading, reverse adding, overriding getitem() and setitem() methods, overriding the in operator, overriding miscellaneous functions, overriding the _call() method. Error and Exception Handling: Introduction to errors and exceptions, handling exceptions, multiple except blocks, multiple exceptions in a single block, except block without exception, the else clause, raising exceptions, built-in and user-defined exceptions, the finally block.	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:

Integral University, Lucknow

www.nptel.com											
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	-	-	-	-	-	1	-	-
CO2	1	-	-	-	3	-	-	-	-	-	2
CO3	-	-	-	-	3	-	-	-		2	
CO4	-	-	-	-	-	-	3	-	-	-	-
CO5	-	-	-	-	-	-	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: 2018-19							
Course Code	DCS-603	**Title of the Course**	Management Information System	**L**	**T**	**P**	**C**
Year	3rd	**Semester**	6th	**3**	**1**	**0**	
Pre-Requisite		**Co-requisite**					
Course Objectives	1.To provide the basic knowledge of Information processing and Information Security						

Course Outcomes	
CO1	Describe the role of information technology and information systems need, importance in business. Describe how the Internet and World Wide Web provide a global platform for e-business,business mobility and communications
CO2	Define an information system from both a technical and business perspective and distinguish between computer literacy and information systems literacy.
CO3	Assess the relationship between organizations, information systems and business processes, including the processes of, Database Backup & Storage, Archive & Retrieve, Disaster Recovery and protection.
CO4	Identify the major management challenges to building and using information systems in organizations such as Data and internet Security, Security Information Management and Release management.
CO5	Classification and their benefits of information security and different types of cyber laws. To understand the different security threats to E-commerce and Expert System Understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making. The underlying used technologies with emphasis on Internet Technologies.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Introduction to Information system	Introduction to Information system, Types of Information system, Components of IS, MIS, Importance and Need of MIS, Network and Internet, Information System Design, IT Infrastructure Library, Decision Support System	8	CO1
2	Basics of MIS	Structure of MIS, MIS vs Data Processing, Knowledge requirement of MIS, Information flow in MIS, MIS and Information Resource Management, Service Management, Availability Management.	8	CO2
3	MIS Data Processing	Information system in Business, Problem with MIS, Causes and solution, Problem Management, The Planning Process, Controlling process in an organization, Database Backup & Storage, Archive & Retrieve, Disaster Recovery, Database & Application Protection.	8	CO3
4	MIS Security	Internet , Intranet, Extranet, Computer and internet Security, Access Management. Intrusion Detection, Security Information Management, Identity management, Release management	8	CO4
5	Cyber Security of MIS	Introduction to Cyber Ethics, Intellectual Property, Cyber Crimes, Ethical challenges, Electronics Commerce, Electronic Data Interchange, Smart Card, Artificial Intelligence,Expert Systems..	8	CO5

References Books:

1. Goel Ritendra, Computer Application in Management, New Age International Publishers, NewDelhi.

2. Brian, “Management Information System”, Tata Mcgraw-hill Education Pvt. Ltd.

e-Learning Source:

https://www.tutorialspoint.com/management_information_system/index.htm

https://www.geeksforgeeks.org/management-information-system-mis/

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	-	1	-	-	-	-	-	-	1
CO2	1	1	-	2	-	-	-	-	2	1	3
CO3	3	1	-	-	1	-	-	2	1	2	1
CO4	-	2	-	2	1	-	-	-	3	1	-
CO5	-	-	-	-	3	-	-	-	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: 2018-19							
Course Code	DCS-604	**Title of the Course**	Artificial Intelligence & Neural Network	**L**	**T**	**P**	**C**
Year	3rd	**Semester**	6th	**3**	**1**	**0**	
Pre-Requisite		**Co-requisite**					
Course Objectives	To provide knowledge of AI is the simulation of human intelligence by computer machines						

Course Outcomes	
CO1	Students become familiar with the concept of Artificial intelligence and its relevant terminologies. Knowledge of Natural language processing.
CO2	Knowledge of the concept of Searching, its importance and various search strategies.
CO3	Develop understanding of different Knowledge representation and reasoning techniques .
CO4	Introduced with the concept of Machine learning both Supervised and Unsupervised learning.
CO5	Students become familiar with the design principles of pattern recognition system. Introduced with the concept of Neurocomputing and Neuroscience

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Introduction :	Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Intelligent Agents, Structure of Intelligent Agents. Computer vision, Natural Language Possessing.	8	CO1
2	Introduction to Search	Searching for solutions, Uniformed search strategies, Informed search strategies, Local search algorithms and optimistic problems, Adversarial Search, Search for games, Alpha - Beta pruning.	8	CO2
3	Knowledge Representation & Reasoning:	Propositional logic, Theory of first order logic, Inference in First order logic, Forward & Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models (HMM), Bayesian Networks.	8	CO3
4	Machine Learning and Pattern Recognition	Supervised and unsupervised learning, Introduction, Design principles of pattern recognition system.	8	CO4
5	Neurocomputing and Neuroscience	Historical notes, human Brain, neuron Model, Knowledge representation, Al and NN. Learning process: Supervised and unsupervised learning, Error correction learning, competitive learning, adaptation, statistical nature of the learning process Introduced with the concept of Neurocomputing and Neuroscience	8	CO5

References Books:

1. Stuart Russell, Peter Norvig, “Artificial Intelligence –A Modern Approach”, Pearson Education
2. Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata Mcgraw-hill Education Pvt.Ltd

e-Learning Source:

https://www.w3schools.com/ai/ai_whatis.asp

https://www.w3schools.com/training/aws/introduction-to-artificial-intelligence.php

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

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

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

Effective from Session: 2018							
Course Code	DEV-601	**Title of the Course**	ENVIRONMENTAL EDUCATION AND DISASTER MANAGEMENT	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**3**	**1**	**0**	
Pre-Requisite	DEV-601	**Co-requisite**	NA				
Course Objectives	1.The course objective is to provide a comprehensive understanding of ecology, environmental impacts of human activities such as urbanization and industrialization, pollution control, waste management, and the legal framework governing environmental protection. Additionally, it introduces disaster management, environmental impact assessment (EIA), and strategies for mitigation and prevention, emphasizing sustainable development and environmental preservation.						

Course Outcomes	
CO1	Understand the natural environment and its relationships with human activities.
CO2	Characterize and analyze human impacts on the environment.
CO3	Integrate facts, concepts, and methods from multiple disciplines and apply to environmental problems.
CO4	Capacity to integrate knowledge and to analyze, evaluate and manage the different public health aspects of disaster events at a local and global levels.
CO5	Capacity to obtain, analyze, and communicate information on risks, relief needs and lessons learned from earlier disasters in order to formulate strategies for mitigation in future scenarios.

UnitNo.	Title of the Unit		Contact Hrs.	Mapped CO
UNIT-I	**Ecology & Ecosystem**	Basics of ecology, Ecosystem, Biodiversity Human activities and its effect on ecology and eco system, different development i.e. irrigation, urbanization, road development and other engineering activities and their effects on ecology and eco system, Mining and deforestation and their effects. Lowering of water level, Urbanization. Biodegradation and Biodegradability, composting, bioremediation, Microbes. Use of biopesticides and bio fungicides. Global warning concerns Ozone layer depletion, Greenh ouse effect, Acid rain etc. Sources of pollution, natural and man-made, their effects on living environments and related legislation.	8	CO-1
UNIT-II	**Water & Noise Pollution**	Factors contributing to water pollution and their effect. Domestic wastewater and industrial wastewater. Heavy metals, microbes and leaching metal. Physical, Chemical and Biological Characteristics of Wastewater. Indian Standards for quality of drinking water. Indian Standards for quality of treated wastewater. Treatment methods of effluent (domestic wastewater and industrial/ mining wastewater), its reuse/safe disposal Sources of noise pollution, its effect and control.	8	CO-2
UNIT-III	**Air Pollution & Radioactive Pollution**	Definition of Air pollution, types of air pollutants i.e. SPM, NOX, SOX, GO, CO2, NH3, F, CL, causes and its effects on the environment. Monitoring and controlling air pollutants, Control measures techniques. Introductory Idea of control equipment in industries i.e. Settling chambers Cyclones Scrubbers (Dry and Wet) Multi Clones Electrostatic Precipitations Bog Fillers. Ambient air quality measurement and their standards. Process and domestic emission control Vehicular Pollution and Its control with special emphasis of Euro-I, Euro-II, Euro-III and Euro IV. Sources and its effect on human, animal, plant and material, means to control and preventive measures.	8	CO-3
UNIT-IV	**Solid Waste Management & Legislations**	Municipal solid waste, Biomedical waste, Industrial and Hazardous waste, Plastic waste and its management. Preliminary knowledge of the following Acts and rules made there under- The Water (Prevention and Control of Pollution) Act - 1974. The Air (Prevention and Control of Pollution) Act - 1981. The Environmental Protection (Prevention and Control of Pollution) Act -1986. Rules notified under EP Act - 1986 Viz. The Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000. The Hazardous Wastes (Management and Handling) Amendment Rules, 2003. Bio-Medical Waste (Management and Handling) (Amendment) Rules, 2003. Noise Pollution (Regulation and Control) (Amendment) Rules, 2002. Municipal Solid Wastes (Management and Handling) Rules, 2000. The Recycled Plastics Manufacture and Usage (Amendment) rules, 2003.	8	CO-4
UNIT-V	**Environmental Impact Assessment (EIA) & Disaster Management**	Basic concepts, objective and methodology of EIA. Objectives and requirement of Environmental Management System (ISO-14000) (An Introduction). Definition of disaster - Natural and Manmade, Type of disaster management, How disaster forms, Destructive power, Causes and Hazards, Case study of Tsunami Disaster, National policy- Its objective and main features, National Environment Policy, Need for central intervention, State Disaster Authority- Duties and powers, Case studies of various Disaster in the country, Meaning and benefit of vulnerability reduction, Factor promoting vulnerability reduction and mitigation, Emergency support function plan. Main feature and function of National Disaster Management Framework, Disaster mitigation and prevention, Legal Policy Framework, Early warning system, Human Resource Development and Function, Information dissemination and communication.	8	CO-5

References Books:

1. "Environmental Education and Disaster Management" – Dr. Sameer Rastogi, Dr. Praveen Kumar Gaur, Ms. Nidhi Srivastava.

e-Learning Source:
1. https://www.youtube.com/watch?v=k_sYIs8C-IQ&t=10s&pp=ygUURWNvbG9neSBhbmQgRWNvc3R5ZW0%3D
2. https://www.youtube.com/watch?v=76snt7DG57U&pp=ygUXV2F0ZXIgYW5kIGFpciBwb2xsdXRpb24%3D
3. https://www.youtube.com/watch?v=t6wKiSyhmtE&list=PLfYetoC-zFdCM1v0OvvqcQJsmcuKLmRET

PO-PSO CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13	PO 14	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PS O6
CO 1	3								2						2					1
CO 2	3								2							2				
CO 3	3								2							2				
CO 4	3								1									2		
CO 5	3								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: 2018-19							
Course Code	**DCS-651**	**Title of the Course**	**Software Engineering Lab**	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**00**		**03**	
Pre-Requisite		**Co-requisite**					
Course Objectives	To develop skill for preparing the project						

Course Outcomes	
CO1	To understand the purpose of testing,types of errors, fault models and various test process.
CO2	To understand adequacy assessment using control flow and path testing techniques.
CO3	To understand mini project by following SDLC.
CO4	Analyze various states, transitions and graph matrices regarding to state and graph matrices.
CO5	Design test cases for the real world problems effectively by following standards

Practical No.	List of Practicals	Contact Hrs.	Mapped CO
1	Mini project (simple programs) by following SDLC	10	CO1
2	Mini project (simple programs)by following SDLC	10	CO2
3	Mini project (simple programs)by following SDLC	10	CO2

References Books:

1. Sommerville, Ian, “Software Engineering”, AWL.
2. Bell, “Software Engineering for students”, Pearson Education, Delhi.

e-Learning Source:

https://www.geeksforgeeks.org/software-engineering-introduction-to-software-engineering/

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	3						1	2		1		
CO2	1	2	1	3						1	2		1		
CO3	1	2	1	3						1	2			2	
CO4	2	1	2	3						1	2			2	
CO5	2	1	2	3						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: 2025-26							
Course Code	DCS-656	**Title of the Course**	Computer Programming Using Python Lab	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**0**	**0**	**3**	
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.

Unit No.	**Title of the Unit**		**Contact Hrs.**	**Mapped CO**
1	Experiment-1	Write a menu driven program using functions to convert a decimal number toits binary, octal and hexadecimal equivalents: DecimalToBinary(), DecimalToOctal(), DecimalToHex()	3	1
2	Experiment-2	Write a program to check whether a given number is Armstrong number, automorphic and palindrome	3	3
3	Experiment-3	Write a program to display Floyd's Triangle	3	3
4	Experiment-4	Write a python program to perform a Binary search on a 1-D array	3	1
5	Experiment-5	Write a python program to perform Insertion sort on a 1-D array	3	1
6	Experiment-6	Write a python program to perform Matrix Multiplication of two array	3	2
7	Experiment-7	Write a python program to convert a given number into equivalent Roman Number.	3	2
8	Experiment-8	Write a python program that takes any two lists L and M of the same size and adds their elements together to form a new list Whose elements are sum of the corresponding elements in L and M.	3	3
9	Experiment-9	Write a python program that rotates the elements of a list so that the element atthe first index moves to the second index and the element in the last indexmoves to the first index.	3	4
10	Experiment-10	To write a python program simulate bouncing ball in Pygame.	3	4

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:

www.nptel.com

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	-	-	-	-	-	1	-	-
CO2	1	-	-	-	3	-	-	-	-	-	2
CO3	-	-	-	-	3	-	-	-		2	
CO4	-	-	-	-	-	-	3	-	-	-	-
CO5	-	-	-	-	-	-	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: 2018-19							
Course Code	**DCS-655**	**Title of the Course**	**Project**	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**00**		**03**	
Pre-Requisite		**Co-requisite**					
Course Objectives	Purpose of the project work is : (i) To develop abilities of diagnosing problems. (ii) To develop the abilities to : (a) Make literature survey. (b)develop skill and knowledge specification of software used in computers (c) Work as a team.						

Course Outcomes	
CO1	Students are able to address the real world problems and find the required solution
CO2	Develop the ability to discover potential research areas in the field of IT.
CO3	Develop the understanding to compare and contrast between vast array of literatures available.
CO4	Develop skills and knowledge specification of softwares used in computers
CO5	Student are able to work and learn from implementing an application software and study its functional and performance aspects and submit a report.

Practical No.	List of Practicals	Contact Hrs.	Mapped CO
1	**COMPUTER SCIENCE PROJECT (SW/HW):** The student is expected to work on a project in consultation and acceptance with the Supervisor on either system software or hardware aspects related to industrial environment. The student is expected to work and learn from implementing an application software and study its functional and performance aspects and submit a report. The evaluation must be based on the project report and the seminars.	30	

References Books:

e-Learning Source:

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

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

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