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: 2018-19							
Course Code	DCS-602	**Title of the Course**	(Dot) .Net Technology	**L**	**T**	**P**	**C**
Year	3rd	**Semester**	6th	**3**	**1**	**0**	
Pre-Requisite		**Co-requisite**					
Course Objectives	1. The .Net framework provide a comprehensive programming model for building all kinds of applications on windows, from mobile to web to desktop.						

Course Outcomes	
CO1	Design, create, build, and debug Visual Basic applications
CO2	Implement syntax rules in Visual Basic programs.
CO3	Write and apply loop structures to perform repetitive tasks.. Write and apply procedures, sub-procedures, and functions to create manageable code
CO4	Create one and two-dimensional arrays for sorting, calculating, and displaying of data. Multiple Forms used to create Projects.
CO5	Write Visual Basic programs using objects, Common Controls, MDI forms Graphics used to create animation. 10. Mouse Monitoring used to keep track of mouse.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	THE DOT(.) NET FRAMEWORK :	Introduction, Common Language Runtime, Common Types System, Common Language Specification, The Base Class Library, The .NET class library Intermediate language. Justin- Time compilation, garbage collection, Application installation and Assemblies, Web Services, Unified classes.	8	CO1
2	C# BASICS :	Getting started with .NET framework, Exploring Visual Studio .NET, Inside a C# Program, Data Types, Statements, Arrays, Using Strings, Objects, Classes and Structs, Properties, Inheritance, Indexers, elegates, Events, Namespaces, Generics	8	CO2
3	ADVANCED FEATURES OF C# :	Collection and Data Structure, Exception, Handling, Threading, Using Streams and Files, Reflection, Assemblies, Verioning, Windows Forms, Controls, Data binding to Controls, Advanced Database Programming using ADO.net, Using GDI+, Networking, .net Remoting, Manipulation XML.	8	CO3
4	VB .NET :	Creating Applications with Visual Basic .NET, Variables, Constants and Calculations, Making Decisions and Working with Strings, List, Loops, Validations, Sub Procedures and Functions, Multiple Forms, Standard Modules and Menus. Array, Timers, Form Controls, File Handling, Exception Handling, Working with Database, Advanced Database, Programming using ADO.net, Classes, Generics, Collections, Inheritance, Custom Controls, Packaging and deployment, Using Crystal Reports.	8	CO4
5	ASP .NET 2.0 :	Features of ASP .NET 2.0, Stages in Web Forms Processing, Introduction to Server Control, HTML Controls, Validation Controls, User control, Data Binding Controls, Configuration, Personalization, Session State, ADO.NET, Database Programming - Connecting with Database using DAO,RDO & ADO.	8	CO5

References Books:

1. Application of .NET Technology, ISRD Group- McGraw Hill.
2. Beginning ASP.NET 4:in C# and VB by Imar Spaanjaars

e-Learning Source:

https://www.profajaypashankar.com/wp-content/uploads/2018/08/beginning_asp.net_4.5_in_C.pdf

https://www.w3schools.com/asp/default.ASP

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

Integral University, Lucknow

Effective from Session: 2018-19							
Course Code	DEV-601	**Title of the Course**	ENVIRONMENTAL EDUCATION AND DISASTER MANAGEMENT	**L**	**T**	**P**	**C**
Year	3rd	**Semester**	6th	**3**	**1**	**0**	
Pre-Requisite		**Co-requisite**					
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.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Ecology & Ecosystem	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	Water & Noise Pollution	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	Air Pollution & Radioactive Pollution	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	Solid Waste Management & Legislations	Internet , Intranet, Extranet, Computer and internet Security, Access Management. Intrusion Detection, Security Information Management, Identity management, Release management	8	CO4
5	Environmental Impact Assessment (EIA) & Disaster Management	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. “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

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	-	-	-	-	2	-	-	-
CO2	3	-	-	-	-	-	-	-	2	-	-
CO3	3	-	-	-	-	-	-	-	2	-	-
CO4	3	-	-	-	-	-	-	-	-	-	2
CO5	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: 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: 2018-19							
Course Code	**DCS-652**	**Title of the Course**	**(Dot) .Net Technology**	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**00**		**03**	
Pre-Requisite		**Co-requisite**					
Course Objectives	**The Dot Net framework comprehensive model for building all kinds of application on windows, from mobile to web to desktop**						

Course Outcomes	
CO1	Understanding About History Of Dot net Programming and Customizing a form.
CO2	Students Are Introduced To Visual Basic Programming Language, Integrated Development Environment, Properties Of Basic Controls
CO3	Students Learn How To Display Information Using Dialog Boxes, Various Loop Structures And About Functions And Procedures
CO4	Creation Of Single Dimensional, Multi Dimensional And Control Array. Also, List Boxes, Combo Boxes, Menus And Mdis Are Being Covered
CO5	Students Are Introduced To Database Management System Concepts , Its Advantages And Components. Data Types And Normal Forms Are Being Covered

Practical No.	**List of Practicals**	**Contact Hrs.**	**Mapped CO**
1	Introduction to .Net framework	03	CO1
2	Design Login form with validation	03	CO2
3	Design Registration form with validation of email address, date of birth, blank field, telephones and mobile numbers etc	03	CO2
4	Design form, make it a class, create its object and access it from another form.	03	CO3
5	Design student class, marks class, inherits it in result class and access it using form.	03	CO3
6	Create instance of class using new operator of above example	03	CO4
7	Design mark sheet of student using XML file and dataset.	03	CO4
8	Design employee details with help of database (back-end) using data adapter, data reader and datasets. Use data grid to display result.	03	CO-4
9	Generation of database (data table) of employee or student with help of data tables of .Net.	03	CO-5
10	To use multiple table design example of employee and department.	03	CO-5

References Books:

1. Application of .NET Technology, ISRD Group- McGraw Hill.
2. Beginning ASP.NET 4:in C# and VB by Imar Spaanjaars

e-Learning Source:

https://www.geeksforgeeks.org/introduction-to-net-framework/

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