G H RAISONI COLLEGE OF ENGINEERING & MANAGEMENT
(Approved by AICTE, New Delhi and Recognized by DTE, Maharashtra)
An Autonomous Institute Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
Accredited by NAAC with A+ Grade
Shraddha Park, B-37-39/1, MIDC, Hingna-Wadi Link Road, Nagpur-440016 (INDIA)
Phone Nos.: +91-07104-236102 Fax: +91-07104-236100
Email: - ghrietn@raisoni.net Web: - www.ghrietn.raisoni.net

Department of MCA

Syllabus

Semester-II

MC3TT201: Cloud Computing

Teaching Scheme				Credits	Continuous Evaluation Scheme						Exam Hours
					Theory			Practical		Total	
Th.	Tu	Pr.	Total Hours		TAE	CAE	ESE	Int	Ext		
3	-	-	3	3	20	30	50	-	-	100	3Hrs

Course Objectives	1.This course provides an insight into cloud computing
	2. To explain the evolving computer model called cloud computing
	3. To introduce the various levels of services that can be achieved by cloud.
	4. To describe the security aspects in cloud.
Course Outcomes	1. Demonstrate the computing paradigms.
	2. Ability to understand the ways in which the cloud fundamentals can be programmed and deployed.
	3. Ability to understand various service delivery models of a cloud computing architecture and management of cloud.
	4. Ability to understand the cloud service Model concepts like Iaas, Saas, and Paas.
	5. Understanding cloud service providers.

Course Content

Unit	Contents	Hours
I	**UNIT - I** **Computing Paradigms:** High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio computing, Mobile Computing, Quantum Computing, Optical Computing, Nano computing.	8
II	**UNIT - II** **Cloud Computing Fundamentals:** Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform,	10

	Principles of Cloud computing, Five Essential Characteristics, Four Cloud Deployment Models	
III	**UNIT - III** **Cloud Computing Architecture and Management:** Cloud architecture & Layer, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications, on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure Managing the Cloud application, Migrating Application to Cloud, Phases of Cloud Migration Approaches for Cloud Migration.	12
IV	**UNIT - IV** **Cloud Service Models:** Infrastructure as a Service, Characteristics of IaaS. Suitability of IaaS, Pros and Cons of IaaS, Summary of IaaS Providers, Platform as a Service, Characteristics of PaaS, Suitability of PaaS, Pros and Cons of PaaS, Summary of PaaS Providers, Software as a Service, Characteristics of SaaS, Suitability of SaaS, Pros and Cons of SaaS, Summary of SaaS Providers, Other Cloud Service Models.	8
V	**UNIT - V Cloud Service Providers:** EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue ,service, Microsoft, Windows Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM, Cloud Models, IBM Smart Cloud, SAP Labs, SAP HANA Cloud Platform, Virtualization Services Provided by SAP, Sales force, Sales Cloud, Service Cloud: Knowledge as a Service, Rack space, VMware, Manjra soft, Aneka Platform	10

Text Books	**1.** Essentials of cloud Computing: K. Chandrasekhran, CRC press, 2014
	2. Cloud Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.
	3. Distributed and Cloud Computing, Kai Hwang, Geoffery C. Fox, Jack J. Dongarra, Elsevier, 2012.
Reference Books	1. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly, SPD, rp2011
	2. Cloud Computing : A Practical Approach, Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, Tata McGraw Hill, rp2011.
	3. Cloud Computing: Implementation, Management and Security, John W. Rittinghouse, James F.Ransome, CRC Press, rp2012.
On-line TL Material	-

MC3TT202/MC2PT202: C#.NET/Practical Based on C#.NET

Teaching Scheme				Credits	Continuous Evaluation Scheme						Exam Hours
					Theory			Practical		Total	
Th.	Tu	Pr.	Total Hours		TAE	CAE	ESE	Int	Ext		
3	-	4	7	3/2	20	30	50	25	25	100/50	3Hrs

Course Objectives	**1.** Understand code solutions and compile **C#** projects within the .NET Framework
	2. Design and develop professional console and window based Application.
	3. Demonstrate knowledge of object-oriented concepts Design user experience and functional requirements **C#.NET** application.
Course Outcomes	1. Describe the purpose of C#, and explain how to use Microsoft Visual C# and Visual Studio to build .NET Framework applications.
	2. Describe the syntax of basic C# programming constructs.
	3. Describe how to create and call methods, and explain Struct, Enum, Arrays and String
	4. Describe how to catch, handle, and throw exceptions
	5. Describe how to perform basic file I/O operations in a Visual C# application C

Course Content

Unit	Contents	Hours
I	**C Sharp Concepts** Introduction to C Sharp, the main method, program output, printing & formatting output, compilation & execution, Namespace Declaration, Common Language Platform, General structure of C Sharp program, Value type, Default Constructor, Struct type, Enumeration type, Reference type, Class Type, Object Type, String Type, Interface type, Array type, Delegate type, Predefined types, Concept of Boxing & Unboxing, Array types, Variables & Parameters, Operands, Statements. Expression, operators.	10
II	**C Sharp Classes and Methods** C Sharp Objects, Classes, Objects as Data type, creating classes, Using an Object member function, Providing constructor, Types of class members Inheritance, Controlling access to Members of class, Garbage collector implementing classes, Class library and Name Space, Methods, Structure of a method, Method overloading, implementing method, class containing functions, statements and control.	10
III	**C Sharp – Struct, Enum, Arrays and String** Struct types, Structdeclaration, Struct modifier, Struct Interface, Enums, Enumerator Base type, Enum modifiers, Enum Members, Enum values and operations, Concept of Arrays, Passing array as parameters, Array initialization, Accessing array member, Arrays object, Array list (adding, deleting, searching data from array list), String operations, converting objects	10

	to string, String builder, File and folder operations, reading and writing text files, reading and writing binary files.	
IV	**.NET Overview** Introduction to .NET,theorigins of .NET, .NET framework overviews (a common substratefor all development,keydesign goals, Mega Data, Multiple language integration andsupport, Name spaces), .NET framework Base classes, User and programinterfaces(userInterface, Windows Forms, Web Forms, Console application), Programinterface,WebServices.	8
V	**CLR** Introduction to Common Language Runtime (CLR) Requirement of .NET application (Assembly, Module, Type), common type systems (Custom types, Boxing & Unboxing value types), Metadata (Attributes, Custom Attributes), Managed Data (Managed Heap, Garbage collector), Garbage collector, optimization, pinning objects.	8

Text Books	**1.** C#(CSharp) Programming, by V. K. Jain, Dreamtech Press, New Delhi. (Chap. 4,5,6,7,8,10,11,12). **2.** Programming in C# by Balguruswamy, Tata McGraw Hill. **3.** Introduction to DOT NET (.NET), be James Conardet. Al., Shroff Publisher and-Distributors Pvt. Ltd (Mumbai), (Chap 1,2). **4.** Introducing Microsoft Dot Net - David Platt, PHI Publication. **5.** C # (C Sharp) Complete Reference - Schildt, Tata McGraw Hill
Reference Books	1. Professional C# 5.0 and .NET 4.5.1 (WROX) – Christian Nagel (Author), Jay Glynn (Author), Morgan Skinner 2. C# 4.0 – The Complete Reference – Herbert Schildt 3. C# 5.0 IN A NUTSHELL Fifth Edition – Joseph Albahari and Ben Albahari
On-line TL Material	-

MC3TT203/MC2PT203: ORACLE and PL/SQL/Practical Based on Oracle											
Teaching Scheme				**Credits**	**Continuous Evaluation Scheme**						**Exam Hours**
					Theory			**Practical**			
Th.	**Tu.**	**Pr.**	**Total Hours**		**TAE**	**CAE**	**ESE**	**Int**	**Ext**	**Total**	
3	-	6	9	3/2	20	30	50	25	25	100/50	3Hrs

Course Objectives	1. Enhance the knowledge and understanding of Database analysis and design..
	2. Enhance the knowledge of the processes of Database Development and Administration using SQL and PL/SQL.
	3. Enhance Programming and Software Engineering skills and techniques using SQL and PL/SQL.
	4. Preparation of background materials and documentation needed for Technical Support using SQL and PL/SQL.
	5. Use the Relational model and how it is supported by SQL and PL/SQL.
Course Outcomes	1. Understanding basic database security and object privileges.
	2. Using the powerful set of built-in SQL functions.
	3. Protecting the database and extending the basic data model using declarative constraints.
	4. Performing advanced SQL queries such as grouping and Join, Sub queries, PL/SQL Blocks, functions.
	5. Use the PL/SQL code constructs of IF-THEN-ELSE and LOOP types as well as syntax and command functions.

Course Content:

Unit	Content	Hours
I	**Oracle Database Architecture and Administration :** Oracle Database Architecture, Design, Creation, Migration and Management of Oracle Databases and related databases schemes, Data Dictionary views and standard packages, Maintaining the control, Redo Log files, Managing Tablepsaces and Data Files, Storage structure and relationships, Managing rollback segment, Managing tables, Indexes, Managing data integrity, Managing password security and resources, Managing users, Privileges, Roles	10
II	**Oracle Backup and Recovery Strategies :** Backup and recovery considerations, Oracle recovery structure and processes, Oracle backup and recovery configuration, Physical backup, Complete recovery of an Oracle database, Incomplete recovery of an Oracle database with archiving, Oracle Export/Import utilities, Oracle standby database.	10
III	**INTRODUCTION TO SQL :** Features of SQL, Data types, Classification of SQL Commands. SQL table creation, Integrity Constraints, Insertion of Records, Select statement, Alter Commands, Drop Table, SQL Operators-relational, Logical, Like, Between, IN operator, Clauses-Order by, Group by, Where Clause, Having Clause. SQL Functions- Arithmetic functions, Conversion Functions, Miscellaneous functions	10

IV	**JOIN AND SUB QUERIES :** Join - Equi Join, Simple Two Table Join, Outer Joins, Self-Join, Set operators. Sub queries, Multiple sub queries, Nesting of sub queries, sub queries in DML commands, Correlated queries, comparison operators. Indexes, Sequences. Views-Create View, Drop View and Advantages.	10
V	**INTRODUCTION TO PL/SQL :** SQL Difference between SQL and PL/SQL, Block definition Structure, Block Functions - % type, % Row type, % record type, IF ELSE statement, FOR loop, While loop, GOTO Statement. Functions- MAX, MIN, SORT, COUNT, AVERAGE. CONCEPT OF CURSORS AND TRIGGERS: Types- Implicit, Explicit open, close cursor with examples. Introduction to Triggers-Block level, Field level triggers.	10

Text Books	1. Commercial Application Development using Developer2000 by Ivan Bayross.
	2. Structured Query Language by Osbome.
	3. SQL by Scott Urman
Reference Books	1. SQL & PL/SQL Black Book for Oracle by Dr. P. S. Deshpande.
	2. Fundamentals of DBMS Mark L Gillenson .
On-line TL Material	

Practical List:

Sr. No.	Name of Experiments
WEEK -1 :	Create a table called Employee with the following structure.

Name	Type
Empno	Number
Ename	Varchar2(20)
Job	Varchar2(20)
Mgr	Number
Sal	Number

a. Add a column commission with domain to the Employee table.
b. Insert any five records into the table.
c. Update the column details of job
d. Rename the column of Employ table using alter command.

e. Delete the employee whose empno is 19.

WEEK -1 :

2. Create department table with the following structure.

Name	Type
Deptno	Number
Deptname	Varchar2(20)
location	Varchar2(20)

a. Add column designation to the department table.
b. Insert values into the table.
c. List the records of emp table grouped by deptno.
d. Update the record where deptno is 9.
e. Delete any column data from the table.

3. Create a table called Customer table

Name	Type
Cust name	Varchar2(20)
Cust street	Varchar2(20)
Cust city	Varchar2(20)

a. Insert records into the table.
b. Add salary column to the table.
c. Alter the table column domain.
d. Drop salary column of the customer table.
e. Delete the rows of customer table whose cust_city is „hyd".

4. Create a table called branch table.

Name	Type
Branch name	Varchar2(20)

Branch city	Varchar2(20)
Asserts	Number

a. Increase the size of data type for asserts to the branch.

b. Add and drop a column to the branch table.

c. Insert values to the table.

d. Update the branch name column

e. Delete any two columns from the table

WEEK -1 :

5. Create a table called sailor table

Name	Type
Sid	Number
Sname	Varchar2(20)
rating	Varchar2(20)

a. Add column age to the sailor table.

b. Insert values into the sailor table.

c. Delete the row with rating >8.

d. Update the column details of sailor.

e. Insert null values into the table.

6. Create a table called reserves table

Name	Type
Boat id	Integer
sid	Integer
day	Integer

a. Insert values into the reserves table.

b. Add column time to the reserves table.

c. Alter the column day data type to date.

d. Drop the column time in the table.

e. Delete the row of the table with some condition

WEEK -2 :

QUERIES USING DDL AND DML

1. a. Create a user and grant all permissions to the user.

   b. Insert the any three records in the employee table and use rollback. Check the result.

   c. Add primary key constraint and not null constraint to the employee table.

   d. Insert null values to the employee table and verify the result.

2. a. Create a user and grant all permissions to the user.
   b. Insert values in the department table and use commit.

	c. Add constraints like unique and not null to the department table. d. Insert repeated values and null values into the table.
	3. a. Create a user and grant all permissions to the user. b. Insert values into the table and use commit. c. Delete any three records in the department table and use rollback. d. Add constraint primary key and foreign key to the table
	4. a. Create a user and grant all permissions to the user. b. Insert records in the sailor table and use commit. c. Add save point after insertion of records and verify save point. d. Add constraints not null and primary key to the sailor table.
	5. a. Create a user and grant all permissions to the user. b. Use revoke command to remove user permissions. c. Change password of the user created. d. Add constraint foreign key and not null.
	6. a. Create a user and grant all permissions to the user. b. Update the table reserves and use save point and rollback. c. Add constraint primary key , foreign key and not null to the reserves table d. Delete constraint not null to the table column.
WEEK -3 :	**QUERIES USING AGGREGATE FUNCTIONS** 1. a. By using the group by clause, display the enames who belongs to deptno 10 along with average salary. b. Display lowest paid employee details under each department. c. Display number of employees working in each department and their department number. d. Using built in functions, display number of employees working in each department and their department name from dept table. Insert deptname to dept table and insert deptname for each row, do the required thing specified above. e. List all employees which start with either B or C. f. Display only these ename of employees where the maximum salary is greater than or equal to 5000.

WEEK -3 :	2. a. Calculate the average salary for each different job. b. Show the average salary of each job excluding manager. c. Show the average salary for all departments employing more than three people. d. Display employees who earn more than the lowest salary in department 30 e. Show that value returned by sign (n) function. f. How many days between day of birth to current date.
	3. a. Show that two substring as single string. b. List all employee names, salary and 15% rise in salary. c. Display lowest paid emp details under each manager d. Display the average monthly salary bill for each deptno. e. Show the average salary for all departments employing more than two people. f. By using the group by clause, display the eid who belongs to deptno 05 along with average salary.
	4. a. Count the number of employees in department 20 b. Find the minimum salary earned by clerk. c. Find minimum, maximum, average salary of all employees. d. List the minimum and maximum salaries for each job type. e. List the employee names in descending order. f. List the employee id, names in ascending order by empid.
	5. a. Find the sids ,names of sailors who have reserved all boats called "INTERLAKE b. Find the age of youngest sailor who is eligible to vote for each rating level with at least two such sailors. c. Find the sname , bid and reservation date for each reservation. d. Find the ages of sailors whose name begin and end with B and has at least 3 characters. e. List in alphabetic order all sailors who have reserved red boat. f. Find the age of youngest sailor for each rating level
WEEK -3 :	6. a. List the Vendors who have delivered products within 6 months from order date.

	g. Display the Vendor details who have supplied both Assembled and Sub parts. h. Display the Sub parts by grouping the Vendor type (Local or Non Local). i. Display the Vendor details in ascending order. j. Display the Sub part which costs more than any of the Assembled parts. k. Display th l. e second maximum cost Assembled part.
WEEK – 4 :	**PROGRAMS ON PL/SQL** 1. a. Write a PL/SQL program to swap two numbers. b. Write a PL/SQL program to find the largest of three numbers. 2. a. Write a PL/SQL program to find the total and average of 6 subjects and display the grade. b. Write a PL/SQL program to find the sum of digits in a given number. 3. a. Write a PL/SQL program to display the number in reverse order. b. Write a PL / SQL program to check whether the given number is prime or not. 4. a. Write a PL/SQL program to find the factorial of a given number. b. Write a PL/SQL code block to calculate the area of a circle for a value of radius varying from 3 to 7. Store the radius and the corresponding values of calculated area in an empty table named areas, consisting of two columns radius and area. 5. a. Write a PL/SQL program to accept a string and remove the vowels from the string. (When „hello" passed to the program it should display „Hll" removing e and o from the world Hello).

MC3TT204: Data Structure

Teaching Scheme				Credits	Continuous Evaluation Scheme						Exam Hours
					Theory			Practical		Total	
Th.	Tu	Pr.	Total Hours		TAE	CAE	ESE	Int	Ext		
3	-	-	3	3	20	30	50	-	-	100	3Hrs

Course Objectives	1. To understand basic data structures arrays, records, linked structures, stacks, queues, trees, and graphs.
	2. To understand algorithms for arrays, records, linked structures, stacks, queues, trees, and graphs.
	3. To understand the computational efficiency of the principal algorithms for sorting and searching
Course Outcomes	**1.** Describe how arrays are represented in memory and various operations on it.
	2. Describe representation of linked list, all possible operations on it.
	3. Demonstrate stack, it representation, evaluation of expressions and recursion.
	4. Describe queues, operations using array and linked list, searching and sorting.
	5. Demonstrate different methods for traversing trees and graph

Course Contents:

Unit	Contents	Hours
I	**UNIT - I** Basic data Structures: Primitive Data Types, Abstract Data Types, Arrays - Static and Dynamic, Types of Arrays, Representation of Array in Computer Memory, Operations on Array, Algorithm traversing of Array, Algorithm to insert, to delete, to search elements in Array.	8
II	**UNIT - II** **Linked List:** Linked List, Representation of Single, Double, Circular Single and Double Linked list, All possible operations on Single and Double linked List using Dynamic representation, and its Manipulation.	8
III	**UNIT – III** **Stacks:** Stacks terminology, Representation of Stacks in Memory, Operation on Stacks, Polish Notations, Translation of infix to postfix & prefix expression, Infix to Postfix Conversion, Evaluation of Postfix Expression, Recursion, Problems on Recursion	10
IV	**UNIT – IV** **Queue:** Representation of Queues in Memory, Circular Queue, Dequeue and Priority Queue. Operations of above Structure using Array and Linked Representation. **Sorting and Searching:** Selection Sort, Insertion Sort, Merge Sort, Efficiency of Sorting Methods, Linear Search, Binary Search	10

V	**UNIT – V** **Trees:** Basic Terminologies, Representation of Binary Trees in Memory, Traversing of Binary tree, Binary Search Tree, Operation on Binary Search Tree **Graphs:** Basic Terminologies, Definition and Representation of Graphs in Memory: Linked List and Matrix Representation. Traversing graphs: BSF, DFS Method.	12

Text Books	1. Classical Data Structures: Debasis. Samanta, Second Edition, PHI, New Delhi.
	2 Data Structure: Seymour Lipschutz Schaum Series, TMH Publication
	3. Fundamentals of Data Structures in C, 2nd edition, University Press, 2008, Sartaj Sahni
Reference Books	1. C & data Structure, Prof. P. S. Deshpande, Prof. O. G. Kakde
	2. Data structures by Bhagat Singh Naps
	3. Data Structure through C++, Yashwant Kanetkar, BPB Publication
	4. Expert Data Structure with C, R. B. Patel, Third Edition, Khanna Book Publication
On-line TL Material	

MC3TT205: SAD

Teaching Scheme				Credits	Continuous Evaluation Scheme						Exam Hours
					Theory			Practical		Total	
Th.	Tu	Pr.	Total Hours		TAE	CAE	ESE	Int	Ext		
3	-	-	3	3	20	30	50	-	-	100	3Hrs

Course Objectives	**1.** Techniques and tools for data and process modeling: entity-relationship diagrams, physical database design, and data flow diagrams.
	2. Relational database terminology and design concepts.
	3. How to use prototyping in the analysis and design phases of systems development.
	4. Project planning: defining the scope, purpose and activities of a project.
	5. What a CASE (computer-aided systems engineering) tool is and how it is used in software development.
Course Outcomes	1. Explain the purpose and activities of the systems development life cycle phases.
	2. To understand System planning and initial investigation.
	3. Understand and model system processes, events, and data flows within a system.
	4. To understand the concept of Data Dictionary.
	5. To understand hardware /software selection.

Course Contents :-

Unit	Contents	Hours
I	**Introduction** System Analysis & Design concepts. Role of system analyst. Review of System DLC. Organization as systems. Levels of management culture. Project fundamentals. Feasibility study. Activity planning & control. Case (Compuetr aided software engineering)	8
II	Sampling and investigating hard data interviewing. Planning & conducting interview & reporting. Joint application design. Rapid Application Design. Using questionnaires.	8
III	Agile Approche. Prototyping: User reactions. Approaches to prototyping & developing prototype. Data flow approach to requirements. Developing DFDs. Logical & Physical DFDs. ExamplesofDFDs.	8

IV	Data dictionary concept. Data repository. Creating & using data dictionary. Overview of process specifications. Decision tables/trees. Decision support system & decision-making concepts relevant to DSS. Semi structured decisions. Multiple-criteria decision-making.	10
V	System Proposal: Ascertaining hardware/software needs. Identifying & forecasting cost/benefit & comparing cost/ benefit. Basics of Pay-back Period Method, select evaluation method	10

Text Books	1. "System Analysis and Design" (Pearson Education) 3/e: Kenneth E.Kendall, Julie E. Kendall
Reference Books	1. "System Analysis & Design (Macmillan) Yeates
	2. "Fundamentals of System Analysis & Design" J. Fitgerald & A. Fitgeral (John-Wiley) 3/e
	3. "System Analysis & Design" (McGraw-Hill) Edward
	4. "System Analysis & Design Methods" (Galgotia) 2/e, Whilten, Bentley, Barlow

MC3TT206: COMPUTER FORENSICS

Teaching Scheme				Credits	Continuous Evaluation Scheme						Exam Hours
					Theory			Practical		Total	
Th.	Tu	Pr.	Total Hours		TAE	CAE	ESE	Int	Ext		
3	-	-	3	3	20	30	50	-	-	100	-

Course Objectives	1. To understand the cyberspace.
	2. To understand the forensics fundamentals.
	3. To understand the evidence capturing process
	4. To understand the preservation of digital evidence.
Course Outcomes	• To Study Computer Forensics concept
	• Study of Evidence Collection and Data Seizure
	• To study Forensics analysis and validation
	• Study of Computer Forensic tools
	• Study of Windows and DOS Systems for Computer Forensic

Course Contents:

Unit	Contents	Hours
I	**Computer Forensics Fundamentals**: What is Computer Forensics?, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of Law Enforcement — Computer Forensic Technology — Types of Business Computer Forensic Technology Computer Forensics Evidence and Capture: Data Recovery Defined — Data Back-up and Recovery — The Role of Back-up in Data Recovery — The Data-Recovery Solution.	12
II	**Evidence Collection and Data Seizure:** Why Collect Evidence? Collection Options — Obstacles — Types of Evidence — The Rules of Evidence — Volatile Evidence — General Procedure — Collection and Archiving — Methods of Collection — Artifacts — Collection Steps — Controlling Contamination: The Chain of Custody Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene — Computer Evidence Processing Steps — Legal Aspects of Collecting and Preserving Computer Forensic Evidence Computer Image Verification and Authentication: Special Needs of Evidential Authentication — Practical Consideration —Practical Implementation.	10
III	**Computer Forensics analysis and validation:** Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, and performing remote acquisitions Network Forensics: Network forensics overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet	12

	project. Processing Crime and Incident Scenes: Identifying digital evidence, collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case.	
IV	**Current Computer Forensic tools:** evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools, validating and testing forensics software E-Mail Investigations: Exploring the role of e-mail in investigation, exploring the roles of the client and server in e-mail, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools, Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.	10
V	**Working with Windows and DOS Systems:** Understanding file systems, exploring Microsoft File Structures, Examining NTFS disks, Understanding whole disk encryption, windows registry, Microsoft startup tasks, MS-DOS startup tasks, virtual machines.	10

Text Books	1. Computer Forensics, Computer Crime Investigation by John R. Vacca, Firewall Media, New Delhi.
	2. Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning
Reference Books	1. Real Digital Forensics by Keith J. Jones, Richard Bejtiich, Curtis W. Rose, AddisonWesley Pearson Education
	2. Forensic Compiling, A Tractitioneris Guide by Tony Sammes and Brian Jenkinson, Springer International edition.
On-line TL Material	

MC3TT207: Principals of Deep Learning

Teaching Scheme				Credits	Continuous Evaluation Scheme					
					Theory			Practical		
Th.	Tu.	Pr.	Total Hours		TAE	CAE	ESE	Int	Ext	Total
3	-	-	3	3	20	30	50	-	-	100

Course Objectives	1. Understand complexity of Deep Learning algorithms and their limitations
	2. Understand modern notions in data analysis oriented computing
	3. Able to performing distributed computations
Course Outcomes	1. Learn topics such as convolutional neural networks, recurrent neural networks, training deep networks and high-level interfaces
	2. Understand the language and fundamental concepts of artificial neural networks

Course Content :

Unit	Content	Hours
I	**Deep learning basics:** Introduction, History, capabilities, the perceptron Gradient Descent and Backpropagation: Gradient Descent, Stochastic Gradient Descent, Backpropagation, Autoencoders, Batch-normalization	10
II	**Artificial Neural Networks :** Introduction, Perceptron Training Rule, Gradient Descent Rule.	10
III	**Convolutional neural networks:** Intro to CNNs, Convolution, Correlation, Filtering. CNN architectures. Detection and Segmentation, Visualizing and Understanding , Advanced CNNs for computer vision	10
IV	**Advanced Deep architectures:** Recurrent Neural networks (RNNs) , Advanced RNN: LSTM, GRU, Generative Adversarial Networks (GANs) ,Advanced GANs	10
V	**Introduction to Tensor Flow :** Computational Graph, Key highlights, Creating a Graph, Regression example, Gradient Descent, Tensor Board, Modularity, Sharing Variables, Keras	10

Text Books	1. Goodfellow, I., Bengio,Y., and Courville, A., Deep Learning, MIT Press.
	2. Nikhil Buduma, Nicholas Locascio, "Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithms", O'Reilly Media.
Reference Books	1. Bishop, C. ,M., Pattern Recognition and Machine Learning, Springer, 2006
	2. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.
	3. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw-Hill Education, 2004
	4. Golub, G.,H., and Van Loan,C.,F., Matrix Computations, JHU Press,2013

MC3TT208: Image Processing

Teaching Scheme				Credits	Continuous Evaluation Scheme					
					Theory			Practical		Total
Th.	Tu	Pr.	Total Hours		TAE	CAE	ESE	Int	Ext	
3	-	-	3	3	20	30	50	-	-	100

Course Objectives	• Provide a theoretical and mathematical foundation of fundamental Digital Image Processing concepts.
	• The topics include image acquisition; sampling and quantization.
	• Pre-processing, enhancement, restoration, segmentation and compression.
Course Outcomes	• Demonstrate the knowledge of the basic concepts of two-dimensional signal acquisition, sampling, and quantization.
	• Demonstrate the knowledge of filtering techniques.
	• Demonstrate the knowledge of 2D transformation techniques.
	• Demonstrate the knowledge of image enhancement, segmentation, restoration and compression techniques.
	• Demonstrate the knowledge of image Compression

Course Contents:

Unit	Contents	Hours
I	**Digital Image Fundamentals:** Digital Image through Scanner, Digital Camera. Concept of Gray Levels. Gray Level to Binary Image Conversion. Sampling and Quantization. Relationship between Pixels. Imaging Geometry. 2D Transformations-DFT, DCT, KLT and SVD.	12
II	Image Enhancement in Spatial Domain Point Processing, Histogram Processing, Spatial Filtering, Enhancement in Frequency Domain, Image Smoothing, Image Sharpening.	10
III	Image Restoration Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.	12
IV	Image Segmentation Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region Oriented Segmentation.	10
V	Image Compression Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Source Encoder and Decoder, Error Free Compression, Lossy Compression.	10

Text Books	1.Digital Image Processing: R.C. Gonzalez & R. E. Woods, Addison Wesley/ Pearson Education, 2nd Ed, 2004.
	2.Digital Image Processing: William K. Pratt, John Wilely, 3rd Edition, 2004.
Reference Books	1. Fundamentals of Digital Image Processing: A. K. Jain , PHI.
	2. Digital Image Processing using MAT LAB: Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins: Pearson Education India, 2004.
On-line TL Material	

AEMC1TI210: Communication Skills

Teaching Scheme				Credits	Continuous Evaluation Scheme					
					Theory			Practical		Total
Th.	Tu	Pr.	Total Hours		TAE	CAE	ESE	Int	Ext	
1	-	-	1	1	15	10	-	-	-	25

Course Objectives	This course is aimed to develop the communication skills at the work place.
	1. In this course, we concentrate on English at the workplace
	2. To empower the learners with skills necessary for global placements;
	3. To equip the learners with the skills essential for their academic subjects;
Course Outcomes	1. In this course, you will learn some theoretical inputs into the process of communication, its different types, the difference between written and oral communication.
	2. To communicate effectively with coherence and relevance in speech and writing
	3. To participate in brainstorming sessions for cooperative learning
	4. To expose the learners to cultural diversity and value education through the humanistic curriculum;

Course Contents:

Unit	Contents	Hours
I	**The Process of Communication** Introduction: What is Communication? The Process of Communication, Barriers to Communication Different Types of Communication , Written vs. Oral Communication, Different Types of Face-to-Face Interactions , Characteristics and Conventions of Conversation , Conversational Problems of Second/Foreign Language Users ,Difference between Conversation and Other Speech Events	8
II	**Communication Techniques**: Telephone Techniques, Job Applications and Interviews, Group Discussion, Managing Organizational Structure, Meeting, Taking Notes and Preparing Minutes.	10
III	**Presentations Skills:** Prestantion Skills-I, Presentation Skills-II, Negotiation Skills	12

Text Books	1. Developing Communication skills By Krishna Mohan/ Meera Banerji, Macmillan India Ltd.
	2. Communication Skills By Leena Sen-PHI Learning Pvt Ltd.New Delhi.
Reference Books	1. Business Communication By Asha Kaul, Prentice- Hall of India, Pvt.Ltd, New Delhi.
On-line TL Material	-