Cloud Computing

[As per Choice Based Credit System (CBCS) Scheme]
SEMESTER-III

Subject Code	**MCA 301**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction to Cloud: Cloud Computing at a Glance, Vision of Cloud Computing, Defining a Cloud, Cloud Computing Reference Model. Characteristics and Benefits, Challenges Ahead, Historical Developments, Risks and Approaches of Migration into Cloud ,Types of Clouds, Services models, Cloud Reference Model.	
Unit-2	**08 Hours**
Cloud Architecture: cloud architecture, features and benefits of Servive Models: Software as a Service (SaaS),Platform as a Service (PaaS), Infrastructure as a Service (IaaS), Service providers, challenges and risks in cloud adoption. Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds - Advantages of Cloud computing.	
Unit-3	**08 Hours**
Virtualization: Introduction, Characteristics of Virtualized Environment, Taxonomy of Virtualization Techniques, Virtualization and Cloud computing, Pros and Cons of Virtualization, Technology Examples- VMware and Microsoft Hyper-V. Virtualization of CPU, Memory, I/O Devices, Virtual Cluster ,datacenterand Resources Management.	
Unit-4	**08 Hours**
Securing the Cloud: Cloud Information security fundamentals, Cloud security services, Design principles, Policy Implementation, Cloud Computing Security Challenges, Cloud Computing Security Architecture. Legal issues in cloud Computing. **Data Security in Cloud**: Risk Mitigation , Understanding and Identification of Threats in Cloud, SLA-Service Level Agreements, Trust Management	
Unit-5	**08 Hours**
Defining the Clouds for Enterprise: Storage as a service, Database as a service, Process as a service, Information as a service, Integration as a service and Testing as a service. **Disaster Management in Cloud:** Disasters in the Cloud, Disaster Recovery Planning.	

Text Books:

- San Murugesan, Irena Bojanova, "Encyclopedia of Cloud Computing", Wiley , 2016
- Kai Hawang , GeofreyC.Fox, Jack J. Dongarra, "Distributed and Cloud Computing: From Parallel Processing to the Internet of Things", Morgan Kaufmann, 2013
- RajkumarBuyya, JemesBroberg, A. Goscinski, "Cloud Computing : Principal and Paradigms", Wiley, 2011

References:

- Krutz , Vines, "Cloud Security " , Wiley Pub, 2014
- Velte, "Cloud Computing- A Practical Approach" ,TMH Pub, 2015

Analysis and Design of Algorithm

[As per Choice Based Credit System (CBCS) Scheme]
SEMESTER-III

Subject Code	**MCA-302**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction - Algorithm definition and specification – Design of Algorithms, and Analysis of Algorithms, Asymptotic Notations, Growth of function: Asymptotic notations Performance Analysis Space complexity, Time complexity, Divide and conquer- General method, applications – Binary search, Merge sort, Quick sort	
Unit-2	**08 Hours**
The Greedy method General method – knapsack problem – minimum cost spanning tree (Prims and Kruskal algorithm) – single source shortest path-DijkastraAlgorithm .	
Unit-3	**08 Hours**
Dynamic Programming – general method – multistage graphs – all pair shortest path – 0/1 Knapsack – traveling salesman problem – flow shop scheduling.	
Unit-4	**08 Hours**
Backtracking: General method – 8-Queens problem – sum of subsets – graph coloring – Hamiltonian cycles– knapsack problem. Branch and bound:- The Method – 0/1 Knapsack problem – traveling sales person.	
Unit-5	**08 Hours**
Parallel models Basic concepts, performance Measures, Parallel Algorithms: Parallel complexity, Analysis ofParallel Addition, Parallel Multiplication and division, parallel Evaluation of GeneralArithmetic Expressions, First-Order Linear recurrence. **NP-hard and NP-complete problems:** Basic Concepts, non-deterministic algorithms, Np-hard graph problems and scheduling problems.	

Text Books:

- AnanyLevitin, "Introduction to the Design and Analysis of Algorithms", Third Edition, Pearson Education, 2012.
- Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012.

References:

- Donald E. Knuth, "The Art of Computer Programming", Volumes 1& 3 Pearson Education,2009.
- Steven S. Skiena, "The Algorithm Design Manual", Second Edition, Springer, 2008.

Artificial Intelligence

[As per Choice Based Credit System (CBCS) Scheme]

SEMESTER-III

Subject Code	**MCA-303**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 3

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
General Issues and overview of AI Concept of AI, AI technique, Characteristics of AI applications Problem Solving, Search and Control Strategies General Problem solving, Production systems, and Control strategies, forward and backward chaining Exhaustive searches: Depth first and Breadth first search.	
Unit-2	**08 Hours**
Heuristic Search Techniques Hill climbing, Branch and Bound technique, Best first search and A* algorithm, AND/OR Graphs,Problem reduction and AO* algorithm, Constraint Satisfaction problems, Game Playing Min Max Search procedure.	
Unit-3	**08 Hours**
Knowledge Representation First Order Predicate Calculus, Resolution Principle and Unification, Inference Mechanisms Horn'sClauses, Semantic Networks, Frame Systems , Scripts, ConceptualDependency AI Programming Languages.	
Unit-4	**08 Hours**
Natural Language Processing: Origins and challenges of NLP – Language Modeling: Grammar-based LM, Statistical LM – RegularExpressions, Finite-State Automata – English Morphology, Tokenization, Part-of-Speech Tagging, Issues in Part-of-Speech tagging.Semantics and pragmatics-Requirements for representation, Syntax-Driven Semantic analysis, Introduction to syntactic analysis.	
Unit-5	**08 Hours**
Expert Systems Introduction to Expert Systems, Architecture of Expert Systems, Expert System Shells, Knowledge Acquisition, Case Studies of Expert System. **Learning**: Concept of learning, Types of learning.	

Text Books:

1. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill, 3 rd edition, 2009.
2. Dan W. Patterson, "Introduction to Artificial Intelligence and Expert Systems", Prentice Hall of India, 1 st edition, 1997.
3. Winston, Patrick, Henry, "Artificial Intelligence", Pearson Education, 3 rd edition, 2004
4. SubhasreeBhattacharjee, "Artificial Intelligence for Student" Shroff Publishers and Distributors Pvt.LTD., 1 st Edition, 2016

ReferenceBooks:

1. Nils J. Nilsson, "Principles of Artificial Intelligence (Symbolic Computation / Artificial Intelligence)", reprint edition, 2014.
2. Stuart Russell, Peter Norvig, "Artificial Intelligence: A Modern Approach", Pearson Education, 3 rd edition, 2010.
3. Daniel Jurafsky, James H. Martin Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, Pearson Publication, 2014.

Information Security

[As per Choice Based Credit System (CBCS) Scheme]
SEMESTER-III

Subject Code	**MCA 304**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Introduction to Information Security : Attacks, Vulnerability, Security Goals, Security Services and mechanisms. Conventional substitution and transposition ciphers, One-time Pad, Block cipher and Stream Cipher, Steganography. Classical Encryption Techniques.	
Unit-2	**08 Hours**
Symmetric and Asymmetric Cryptographic Techniques: DES, AES, RSA algorithms. Hash Functions Message Authentication & Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Birthday Attacks, Security Of Hash Function & MACS, MD5 Message Digest Algorithm, Secure Hash Algorithm (SHA), Digital Signatures: Digital Signatures, Authentication Protocol, Digital Signature Standard (DSS), Proof Of Digital Signature Algorithm.	
Unit-3	**08 Hours**
Program Security : Nonmalicious Program errors – Buffer overflow, Incomplete mediation, Time-of-check to Time-of- use Errors, Viruses, Trapdoors, Salami attack, Man-in-the- middle attacks, Covert channels.	
Unit-4	**10 Hours**
Security in Networks : Threats in networks, Network Security Controls – Architecture, Encryption, Content Integrity, Strong Authentication, Access Controls, Wireless Security, Honeypots, Traffic flow security, Firewalls – Design and Types of Firewalls, Personal Firewalls, IDS, Email Security – PGP,S/MIME	
Unit-5	**06 Hours**
Administering Security: Security Planning, Risk Analysis, Organizational Security policies. Legal Privacy and Ethical Issues in Computer Security: Protecting Programs and data, Information and the law, Rights of Employees and Employers, Software failures, Computer Crime, Ethical issues in Computer Security, case studies of Ethics.	

Text Books:

- William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall, 4th edition, 2010.
- Michael T. Goodrich and Roberto Tamassia, Introduction to Computer Security, Addison Wesley, 2011.
- William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall,4th edition, 2010.

References:

- Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone, Handbook of AppliedCryptography, CRC Press, 2011.

Mobile Application Development

[As per Choice Based Credit System (CBCS) Scheme]

SEMESTER-III

Subject Code	**MCA-305**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
INTRODUCTION Introduction to mobile applications, Market and business drivers for mobile applications, Difficulties in Mobile Development, Mobile Myths, When to Create an App, Types of Mobile App. Design Constraints for mobile applications, both hardware and software related, Architecting mobile applications, user interfaces for mobile applications, touch events and gestures.	
Unit-2	**08 Hours**
ADVANCED DESIGN Designing applications with multimedia and web access capabilities. Integration with GPS and social media networking applications, Accessing applications hosted in a cloud computing environment, Design patterns for mobile applications, Understanding Application users, Information Design, Achieving quality constraints.	
Unit-3	**08 Hours**
TECHNOLOGY I ANDROID Establishing the development environment Android architecture Android Application Structure, Emulator, Android virtual device, UI design, Fragments, Activity, Services, broadcast receiver, Intents/Filters, Content provider-SQLite Programming, SQLITE open, Helper, SQlite Database, Interaction with server side applications	
Unit-4	**08 Hours**
Advanced ANDROID Using Google Maps, GPS and Wi-Fi Integration, Android Notification, Audio Manager, Bluetooth, Camera and Sensor Integration, Sending SMS, Phone Calls, Publishing Android Application.Introduction to KOTLIN	
Unit-5	**08 Hours**
TECHNOLOGY II IOS Introduction to Objective C iOS features UI implementation Touch frameworks Data persistence using Core Data and SQLite, Action and Outlets, Delegates and Storyboard, Location aware applications using Core Location and Map Kit, Integrating calendar and address book with social media application Using Wifi iPhone marketplace.	

Text Books:

RetoMeier , “Professional Android app development”, Wiley, 2019.

Matt Neuburg, “IOS 13 Programming Fundamentals with Swift: Swift, Xcode, and Cocoa Basics”, O’Reilly, 2019.

Michael Dippery, ”Professional Swift”, Wiley, 2015.

Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012.

Charlie Collins, Michael Galpin and Matthias Kappler, “Android in Practice”, DreamTech, 2012.

Reference Books:

Reto Meier, Ian Lake,”Professional Android, 4th Edition”, Wiley, 2018.

Neil Smyth “Android studio 2.2 Development Essentials 7th Edition” Payload Media 2017.

Murat Yener, OnurDundar, ”Expert Android Studio”, Wiley, 2016.

Jerome Dimarzio “Beginning Android Programming with Android Studio” Wiley Publication, 2016.

David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, “Beginning iOS 6 Development: Exploring the iOS SDK”, Apress, 2013.

James Dovey and Ash Furrow, “Beginning Objective C”, Apress, 2012.

Paul Deitel, Harvey Deitel, Abbey Deitel and Michel Morgano, “Android for Programmers an App-Driven Approach”, Pearson, 2012.

Data Mining and Data Warehousing

Elective I(a)

As per Choice Based Credit System CBCS)Scheme)

SEMESTER-III

Subject Code	**MCA-306-I(a)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Data Warehousing: Introduction to Data Warehouse and OLAP ,Data Warehouse and DBMS Multidimensional data model ,OLAP operations. Data preprocessing ,Data cleaning ,Data transformation ,Data reduction ,Discretization and generating concept hierarchies.	
Unit-2	**08 Hours**
Data Mining: Introduction, Definition, KDD vs. DM, DBMS vs. DM, DM Techniques, Issues and Challenges in DM, DM Applications. DM algorithms: Classification and Prediction - Parametric and non-parametric technology: Bayesian classification, two class and generalized class classification, classification error.	
Unit-3	**08 Hours**
Association rules:Association Rules: Apriori Algorithm, Partition, FP-tree growth algorithms, Generalized association rule. Motivation and terminology,Correlation analysis. **Clustering:** Basic issues in clustering ,Partitioning methods: k-means, K-MEDOID Algorithm ,Hierarchical methods: distance-based agglomerative and divisible clustering , non-hierarchical techniques.	
Unit-4	**08 Hours**
Decision Trees: Decision tree introduction, Tree pruning, Extracting classification rules from decision trees, Decision tree construction algorithms, Decision tree construction with presorting.	
Unit-5	**08 Hours**
Techniques for Data mining: Data Mining software and applications: Introduction to Text mining: extracting attributes (keywords), structural approaches (parsing, soft parsing). Introduction to Web mining: classifying web pages, extracting knowledge from the web Data Mining software and applications.	

Text Books:

1. Alex Berson, Stephen J. Smith, Data Warehousing, Data Mining and OLAP, McGrawHill, 2014
2. D. Hand, H. Mannila, and P. Smyth, Principles of Data Mining, MIT Press, 2011
3. Jiawei Han, MichelineKamber, Data Mining: Concepts and Techniques, Harcourt India Pvt., 2011

References:

1. W. H. Innmon, Building the Data Warehouse, Wiley Computer Publishing, 2005

Big Data Technologies

MCA_306_Elective I(b)

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-II

Subject Code	**MCA-306-I(b)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENT	**Teaching Hours**
Unit-1	**08 Hours**
Understanding Big Data: Introduction, Need, Importance of Big data, Classification of Digital Data, Four Vs, Drivers for Big data, Big data Terminology, Industry examples and Top Challenges Facing Big Data, Responsibilities of data scientists, Technology Challenges for Big data, Convergence of key trends, Big data Architecture. **Big data Applications:** Healthcare, Finance, Advertising, Marketing, Transportation, Education, Government, Cyber Security etc.	
Unit-2	**08 Hours**
Web Analytics: Big data and Marketing, fraud and big data, risk and big data, credit risk management, big data and algorithmic trading, Open source technologies, cloud and big data, Crowd Sourcing Analytics, inter and trans firewall analytics.	
Unit-3	**08 Hours**
Hadoop Ecosystem: Introduction to Hadoop, Features of Hadoop, Hadoop Versions, Hadoop Architecture, Introduction to Data Management and Data Access tools: Data Management using Flume, Oozie, Zookeeper; Hive, Pig, Avro, SQOOP for data access. Introduction to Data Processing and Data Storage tools: MapReduce, YARN, HDFS, HBase.	
Unit-4	**08 Hours**
HDFS: HDFS concepts, NameNode, Design working of Hadoop distributed file system (HDFS). **MapReduce:** Introduction, MapReduce workflows, Split, map, combine, scheduling, shuffle and sort YARN. Problems & examples in MapReduce.	
Unit-5	**08 Hours**
NO SQL Data Management: Problem with Relational Database Systems. Introduction to NOSQL, Advantages of NOSQL, SQL versus NOSQL. Aggregate data models, key-value and document data models, relationships, graph databases, schemaless databases.	

Text Books:

- Michele Chambers, Michael Minelli, AmbigaDhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013
- Anil Maheshwari, " Big Data", McGraw-Hill; Second edition, 2019
- SubhashiniChellappanSeemaAcharya, "Big Data and Analytics", Wiley, 2019

References:

- ArshdeepBahga, Vijay Madisetti, "Big Data Analytics: A Hands-On Approach", VPT, 2018
- NandhiniAbirami R, SeifedineKadry, Amir H. Gandomi, BalamuruganBalusamy, "Big Data: Concepts, Technology, and Architecture", Wiley, 1st edition 2021
- EMC Education Services, " Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data", 2015

Soft Computing

Elective I(c)

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-III

Subject Code	**MCA-306-I(c)**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 3

CONTENT	**Teaching Hours**
Unit-1	**08 Hours**
Introduction to Soft Computing Introduction of Hard and Soft Computing, Unique features of Soft computing, Components of Soft computing, Fuzzy Computing, Evolutionary Computation, Genetic Algorithm, Swarm Intelligence, Ant Colony Optimizations, Neural Network, Machine Learning , Associative Memory, Adaptive Resonance Theory, Introduction to Deep Learning.	
Unit-2	**08 Hours**
Neural Networks Introduction and Architecture: Neuron, Nerve structure and synapse, Artificial Neuron and its model, Neural network architecture: single layer and multilayer feed forward networks, recurrent networks. Back propagation networks architecture: perceptron model, solution, single layer artificial neural network, multilayer perception model; back propagation learning methods, back propagation algorithm, applications.	
Unit-3	**08 Hours**
Fuzzy Logic Basic concepts of fuzzy logic, Fuzzy sets and Crisp sets, Fuzzy set theory and operations, Properties of fuzzy sets, Fuzzy and Crisp relations, Fuzzy to Crisp conversion, Membership functions, interference in fuzzy logic, fuzzy if-then rules, Fuzzy implications and Fuzzy algorithms, Fuzzyfications & Defuzzificataions, Fuzzy Inference Systems, applications.	
Unit-4	**08 Hours**
Genetic Algorithms Traditional optimization and search techniques, Genetic Algorithms: Basic concepts of GA, working principle, procedures of GA, Process flow of GA, Genetic representations, (encoding) Initialization and selection, Genetic operators, Mutation, Generational Cycle, applications.	
Unit-5	**08 Hours**
Hybrid Systems Integration of neural networks, fuzzy logic and genetic algorithms. GA Based Back Propagation Networks, Fuzzy Back Propagation Networks, Fuzzy Associative Memories, Simplified Fuzzy ARTMAP.	

Text Books:

1. S. Rajasekaran and G.A.VijaylakshmiPai.. Neural Networks Fuzzy Logic, and Genetic Algorithms, Prentice Hall of India 2007.
2. K.H.Lee.. First Course on Fuzzy Theory and Applications, Springer-Verlag.
3. D. K. Pratihar, Soft Computing, Narosa, 2008.
4. J.-S. R. Jang, C.-T. Sun, and E. Mizutani,Neuro-Fuzzy and soft Computing, PHI Learning, 2009.

ReferenceBooks:

1. J. Yen and R. Langari.. Fuzzy Logic, Intelligence, Control and Information, Pearson Education.
2. N.P.Padhy,"Artificial Intelligence and Intelligent Systems" Oxford University Press.
3. Melanie Mitchell, An Introduction to Genetic Algorithms, MIT Press, 2000.
4. Simon Haykin, Neural Networks and Learning Machines, (3rd Edn.), PHI Learning, 2011.

ADA Lab

As per Choice Based Credit System (CBCS) Scheme)
SEMESTER-III

Subject Code	**MCA-351**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**02**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 01

Objective: The course is designed to develop skills to design and analyze various algorithms. It aims to strengthen the ability of the students to identify and apply suitable concepts of Analysis and Design of algorithms for the given real world problems. It enables them to gain knowledge in practical applications of various algorithms.

Contents

1. Linear search & binary search, Sorting Techniques
2. Single source shortest path-Dijkastra Algorithm
3. Greedy method:-knapsack problem
4. Greedy method minimum cost spanning tree
5. Traveling salesman problem – flow shop scheduling.
6. Dynamic Programming – 0/1 Knapsack
7. Dynamic Programming – traveling salesman problem
8. Backtracking 8-Queens problem
9. Backtracking Sum of Subsets
10. Backtracking – graph coloring – Hamiltonian cycles– knapsack problem

Mobile Application Development Lab

As per Choice Based Credit System (CBCS) Scheme

SEMESTER-III

Subject Code	**MCA-352**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**02**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 01

Lab Experiments

1. Develop an application that uses GUI components, Font and Colours.
2. Write an android program to implement activity life cycle using toast messageswith proper positioning
3. Develop an application that uses Layout Managers and event listeners.
4. Write an application that draws basic graphical primitives on the screen.
5. Write an application that basic graphical primitives and animations.
6. Develop an application that makes use of databases.
7. Develop an application that makes use of Notification Manager.
8. Develop a native application that uses GPS location information.
9. Implement an application that creates an alert upon receiving a message
10. Write a mobile application that makes use of feed.
11. Develop a mobile application to send an email.
12. Mini Project using Android Studio

Summer Industrial Training Presentation

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-III

Subject Code	**MCA-353**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**02**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 01

Mandatory Summer Training: **45 Working Days Summer Training** during Semester Break, of 100 Marks. Evaluation will be done in Semester-III Examinations.

GENERAL INSTRUCTIONS FOR PREPRATION OF SUMMER INDUSTRIAL TRAINNING PRESENTATION/ REPORT

(i) Cover Page
(ii) Title Page
(iii) Certificate
(iv) Acknowledgement
(v) Table of Contents

1. Introduction

2. Project Specifications
- 2.1 Project Need
- 2.2 Project Overview

3. Specific Requirements
- 3.1 External Interface Requirements
- 3.2 Hardware Interfaces
- 3.3 Software Interfaces
- 3.4 Communications Protocols (Networking Protocols)
- 3.5 Security / Maintainability / Performance

4. Software Product Features
- 4.1 System Architecture
- 4.2 Database Requirements
- 4.3 ER Diagram
- 4.4 Data Flow Diagram
- 4.5 Use Case Diagrams
- 4.6 User Interfaces (Input Forms / Processing Forms/ Search Forms/ Output Forms)
- 4.7 Report Formats

5. Drawbacks and Limitations
6. Proposed Enhancements
7. Conclusion
8. Bibliography
9. Annexure:
- 9.1 User Interface Screens (Optional)
- 9.2 Output Reports with Data (if any)
- 9.3 Sample Program Code

Software Project Management

As per Choice Based Credit System (CBCS) Scheme)

SEMESTER-IV

Subject Code	**MCA-401**	**INTERNAL ASSESSMENT (IA) MARKS**	**30**
Number of Lecture Hours / Week	**03**	**END TERM EXAM (ETE) MARKS**	**70**
Total Number of Lecture Hours	**40**	**SEMESTER END EXAM HOURS**	**03**

Credits: 03

CONTENTS	**Teaching Hours**
Unit-1	**08 Hours**
Project Management: The management spectrum, the people, the product, the process, the project, critical practices Metrics for Process and Project: Metrics in the process and project Domains, software measurements, metrics for software quality, integrating metrics within software process, metrics for small organizations, establishing a software metrics program. Introduction of Project Management tool: Trello, Jira, Asana, Zoho, Wrike.	
Unit-2	**08 Hours**
Estimation: Project planning Process, software scope and feasibility, resources, software project estimation, empirical estimation models, estimation for object oriented projects, estimation for Agile development and web engineering projects, the make/buy decision.	
Unit-3	**08 Hours**
Project Scheduling: Basic concepts, project scheduling, defining a task set and task network, scheduling, earned value analysis. Risk Management: Reactive V/S proactive Risk Strategies, software risks, Risk identification, Risk projection, risk refinement, risk mitigation, monitoring and management, the RMMM plan Quality Planning: Quality Concepts, Procedural Approach to Quality Management, Quantitative Approaches to Quality Management, Quantitative Quality Management Planning, Setting the Quality Goal, Quality Process Planning, Defect Prevention Planning.	
Unit-4	**08 Hours**
Quality Management: Quality Concepts, Software Quality assurances, software reviews, formal technical reviews, Formal approaches to SQA, Statistical Software Quality assurances, Change Management: software Configuration Management, The SCM repository, SCM Process, Configuration Management for Web Engineering	
Unit-5	**08 Hours**
Project Execution And Closure: Reviews. The Review Process, Planning, Overview and Preparation, Group Review Meeting, Rework and Follow-up, One-Person Review, Guidelines for Reviews in Projects, Project Closure: Project Closure Analysis, The Role of Closure Analysis, Performing Closure Analysis. **Project Monitoring and Control:** Project Tracking, Activities Tracking, Defect Tracking, Issues Tracking, Status Reports, Milestone Analysis, Actual Versus Estimated Analysis of Effort and Schedule, Monitoring Quality.	

Text Books:

- Bob Hughes , Mike Cotterell and Rajib Mall "Software Project Management", 6th Edition, McGraw Hill Edition, 2017.
- PankajJalote, "Software Project Management in practice", 5th Edition, Pearson Education, 2017.
- Murali K. Chemuturi ,Thomas M. Cagley Jr." Mastering Software Project Management: Best Practices, Tools and Techniques", J. Ross Publishing, 2010
- Sanjay Mohapatra, " Software Project Management" , Cengage Learning, 2011