DANTULURI NARAYANA RAJU COLLEGE
(Autonomous)
BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.
(Accredited at 'B^{++}' level by NAAC)
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

M.Sc (Computer Science)

S1EMESTER I

COURSE 1 - DISCRETE MATHEMATICAL STRUCTURES

CO	Course Outcomes (COs)	Level
CO1	Understand fundamental concepts of discrete mathematics	L2
CO2	Apply counting techniques (permutations, combinations)	L3
CO3	Solve problems using recurrence relations	L3
CO4	Analyze and interpret graphs and trees	L4
CO5	Apply Boolean algebra principles ethically	L3
CO6	Design and evaluate models of computation	L5

COURSE 2 - DESIGN AND ANALYSIS OF ALGORITHMS

CO	Course Outcomes (COs)	Level
CO1	Understand about the Asymptotic Notations	L2
CO2	Analyze the Divide-and-Conquer technique	L4
CO3	Define The Knapsack Problem, Prim's Algorithm	L1
CO4	Understand about the Decision Trees	L2

COURSE 3 – COMPUTER ORGANIZATION AND ARCHITECHTURE

CO	Course Outcomes (COs)	Level
CO1	Understand the basics of Digital Logic Circuits	L2
CO2	Discuss about the Concepts of Data Representation	L2
CO3	Relate the concept of Basic Computer Organization	L3
CO4	Summarize about the concept of Memory Organization	L5

COURSE 4 – OPERATING SYSTEMS

CO	Course Outcomes (COs)	Level
CO1	Understand fundamental concepts of operating systems	L2
CO2	Analyze process synchronization techniques and deadlocks	L4
CO3	Explain memory management techniques and file system design	L2
CO4	Understand protection mechanisms in operating systems	L2

COURSE 5 – COMPUTER NETWORKS

CO	Course Outcomes (COs)	Level
CO1	Understand the basics of computer networks and Data Communication	L2
CO2	Explain about Data Link Layer, IEEE Standards, design issues in networks.	L4
CO3	Analyze Internet Transport Protocols and different types of protocols.	L2
CO4	Evaluate Overview of various types of Network Devices and different types of Networks	L5

COURSE 6 – OS LAB

CO	Course Outcomes (COs)	Level
CO1	Demonstrate ability to use UNIX operating system commands effectively	L2
CO2	Solve the shortest path in networks and message simulation and routing implementation.	L3

COURSE 6 – COMPUTER NETWORKS LAB

CO	Course Outcomes (COs)	Level
CO1	Understand the programming concepts of UDP, TCP, Server and Client communication.	L2
CO2	Write shell scripts to automate tasks in the UNIX environment	L4

SEMESTER II

COURSE 1 – MSC 201 FORMAL LANGUAGES & AUTOMATA THEORY

CO	Course Outcomes (COs)	Level
CO1	Define the concept of Finite Automata and Regular Expressions, Regular sets & Regular Grammars.	L1
CO2	Explain the concept of Context-Free Grammars and Languages, Push-Down Automata.	L2
CO3	Understand about Turing Machines, Universal Turing Machines, and Undecidability in detail.	L2
CO4	Describe the concept of The Propositional Calculus and The Predicate Calculus.	L1

COURSE 2 –MSC 202 ARTIFICIAL INTELLIGENCE

CO	Course Outcomes (COs)	Level
CO1	Explain the basic concept of Artificial Intelligence.	L2
CO2	Solve the algorithms and logics in Artificial Intelligence.	L3
CO3	Describe the theories and functions related to Artificial Intelligence.	L1

COURSE 3-MSC 203 DATA WAREHOUSING AND DATA MINING

CO	Course Outcomes (COs)	Level
CO1	Understand the overview of Data Warehouse Basic Concepts, Data Warehouse Modelling, Pre-processing.	L2
CO2	Describe Introduction to Data Mining, Basic Statistical Descriptions of Data, Data Visualization, Measuring data Similarity and Dissimilarity.	L1
CO3	Explain the Concept Description, Generalization by AOI, Mining Frequent Patterns, Associations and Correlations, Mining Frequent Item set.	L2
CO4	Describe the Basic Concepts of Classification, Different Methods of Classification.	L2

COURSE 4 – MSC 204 RELATIONAL DATABASE MANAGEMENT SYSTEMS

CO	Course Outcomes (COs)	Level
CO1	Understand the Introduction of Database System and Data Modeling Using the Entity-Relationship Model.	L2
CO2	Explain the Relational Data Model, Relational Database Constraints, and Relational Algebra.	L2
CO3	Discuss Relational Calculus, Schema Definition, Basic Constraints, and Queries.	L2
CO4	Describe Relational Database Design and Indexing Structures for Files.	L1
CO5	Define Transaction Processing and Concurrency Control Techniques.	L1

COURSE 5 - MSC 205 ADVANCED JAVA PROGRAMMING

CO	Course Outcomes (COs)	Level
CO1	Define Introduction to OOP and concept of Inheritance.	L1
CO2	Understand about Interfaces, Packages, and Enumeration, Exceptions & Assertions and Develop applications using JDBC and Servlets	L2
CO3	Explain about Multi-Threading and Applets and Develop applications using JSP, JSF and EJB	L2
CO4	Describe the concept of Event Handling and Abstract Window Toolkit (AWT).	L1

COURSE 6- MSC -206 RELATIONAL DATABASE MANAGEMENT SYSTEMS LAB

CO	Course Outcomes (COs)	Level
CO1	Define SQL queries using DDL, DML, and DCL commands.	L1
CO2	Describe SQL queries on aggregate and conversion functions.	L2
CO3	Discuss PL/SQL programs on exception handling and control structures.	L2
CO4	Explain PL/SQL programs on cursors, procedures, and triggers.	L2

COURSE 7- MSC -207 ADVANCED JAVA PROGRAMMING LAB

CO	Course Outcomes (COs)	Level
CO1	Write programs in Java using OOP.	L6
CO2	Write programs related to real-life scenarios.	L6
CO3	Write code programs in Java using Inheritance , JSP, SERVLETS.	L6

COURSE 8 –MSC 208 MOOCS (PYTHON PROGRAMMING)

CO	Course Outcomes (COs)	Level
CO1	Understand the basics of Python Programming language.	L2
CO2	Use various functions and methods of Python Programming.	L1
CO3	Comprehend Multithread Programming and GUI Programming.	L4
CO4	Understand Web Programming and Database Programming.	L2

SEMESTER III

COURSE 1- MSC 301 INFORMATION SECURITY AND CRYPTOGRAPHY

CO	Course Outcomes (COs)	Level
CO1	Understand the security approaches and techniques, Introduction to number theory.	**L2**
CO2	Define Symmetric key and Asymmetric key cryptographic algorithms.	**L1**
CO3	Discuss about User Authentication Mechanisms, System security.	**L2**
CO4	Explain Internet Security Protocols and Network Security.	**L2**

COURSE 2 –MSC 302 DATA SCIENCE WITH R

CO	Course Outcomes (COs)	Level
CO1	Understand Key concepts in data science, including tools, approaches, and application scenarios.	**L2**
CO2	Summarize Topics in data collection, sampling, quality assessment, and repair.	**L5**
CO3	Define Topics in statistical analysis and machine learning.	**L1**
CO4	Evaluate State-of-the-art tools to build data-science applications for different types of data, including text and CSV data.	**L5**

COURSE 3 –MSC 303 OBJECT-ORIENTED SOFTWARE ENGINEERING

CO	Course Outcomes (COs)	Level
CO1	Describe Introduction to Object-Oriented Software Engineering, Object Orientation, Requirements Engineering.	**L2**
CO2	Construct Unified Modeling Language & Use Case Modeling, Class Design and Class Diagrams.	**L3**
CO3	Describe the Software Design and Architecture, Design Patterns.	**L2**
CO4	Analyze the Software Testing, Software Project Management, Software Process Models.	**L4**

COURSE 4-MSC 304 SOFTWARE TESTING AND QUALITY ASSURANCE

CO	Course Outcomes (COs)	Level
CO1	Understand the basics of software, its process and types of process models	**L2**
CO2	Interpret about Requirements Engineering, design concepts and Architectural styles of Software Engineering.	**L3**
CO3	Analyze about Software Quality and software testing strategies	**L4**
CO4	Interpret of Software Configuration Management process, software Risks and reverse engineering.	**L3**

COURSE 4 –MSC - 304 INTERNETS OF THINGS (IOT)

CO	Course Outcomes (COs)	Level
CO1	Define Introduction to Internet of Things, IoT Enabling Technologies, IoT Levels & Deployment Templates Domain Specific IoTs.	L1
CO2	Understand IoT & M2M, SNMP.	L2
CO3	Construct IoT Platforms Design Methodology.	L3
CO4	Discuss about IoT Physical Devices & Endpoints.	L2

COURSE 4 –MSC - 304 IMAGE PROCESSING

CO	Course Outcomes (COs)	Level
CO1	Define Fundamentals of Image Processing, Basics of Histogram, Definition and Algorithm of Histogram Equalization.	L1
CO2	Describe about Image Transforms: A Detail Discussion On Fourier Transform, DFT, FFT, Image Enhancement.	L2
CO3	Explain EDGE Enhancement, Smoothening Filters in Frequency Domain. Butterworth Filter, Homomorphic Filters, Image Compression.	L2
CO4	Discuss about Image Segmentation, Morphology.	L2

COURSE 5 –MSC - 305 CLOUD COMPUTING

CO	Course Outcomes (COs)	Level
CO1	Describe Cloud Computing basics, Intranet and Cloud, Services and Business Applications, Salesforce.com, Organization and Cloud Computing.	L1
CO2	Explain about Hardware and Infrastructure, Overview of Software as a Service, Overview of Industries Software plus Services, Mobile device Integration.	L2
CO3	Understand Developing the Applications like Google, Microsoft, Intuit Quick Base, Local Clients and thin clients.	L2
CO4	Discuss Migrating the Cloud, Cloud Service.	L2

COURSE 5 –MSC - 305 SOFT COMPUTING

CO	Course Outcomes (COs)	Level
CO1	Understand soft computing techniques and their role in problem solving.	L2
CO2	Explain various problems to be solved through basic soft computing techniques.	L2
CO3	Analyze and integrate various soft computing techniques in order to solve problems effectively and efficiently.	L4

COURSE 5 –MSC - 305 MOBILE COMPUTING

CO	Course Outcomes (COs)	Level
CO1	Explain about mobile environment structure and its types.	L2
CO2	Understand wireless LAN and mobile network layer.	L2
CO3	Describe transport layer and different application protocols	L1
CO4	Acquire knowledge on WML and WAP 2.0 environment.	L1

COURSE 6-MSC 306 R LAB

CO	Course Outcomes (COs)	Level
CO1	Explain about aware of usage of few packages, functions, and libraries of R.	L2
CO2	Develop basic R commands, Interact data, Clean Data, Visualize statistical measures, data frame.	L6
CO3	Develop Apply group of functions, rbind, cbind, and some more libraries.	L6
CO4	Develop K-medoids and density-based clustering, decision trees.	L6

COURSE 7-MSC 307 OBJECT-ORIENTED SOFTWARE ENGINEERING LAB

CO	Course Outcomes (COs)	Level
CO1	Understand how to specify, visualize, construct, and document the artifacts of software systems.	L2
CO2	Understand how to use Rational Rose Enterprise Edition for modeling.	L2
CO3	Construct and Develop Software Project Management and Software Engineering activities specified can be customized according to the features of the project.	L6

COURSE 8 –MSC 308 MINI PROJECT

CO	Course Outcomes (COs)	Level
CO1	Define Implementation data structures, generic types.	L2