

SRI VENKATESWARA UNIVERSITY, TIRUPATI
Department of Computer Science
REVISED CURRICULUM FOR 2 Year MCA PROGRAMME (CBCS)
WITH EFFECT FROM 2026–2027
(effective from the batch of students admitted from the academic year 2025-26)

SEMESTER -III											
S.No	Category	Course Code	Course Title	Scheme of Instruction (Hours/Week)				No. of Credits	Scheme of Evolution		
				L	T	P	Total Hours		Sessional Marks	Semester End Examination Marks	Total
1	CC	MCA 301	301 Computer Networks	4	0	0	4	4	30	70	100
2	CC	MCA 302	302A- Data Warehousing and Data Mining	3	1	0	4	3	25	50	75
			302B – Essentials of Data Science								
3	CC	MCA 303	303A- Web Technologies	3	1	0	4	3	25	50	75
			303B – Cloud Computing								
4	SOC	MCA 304	304A- Block Chain Technologies	3	1	0	4	3	25	50	75
			304B- Cryptography and Network Security								
5	SOC	MCA 305	305A- Computer Graphics	3	1	0	4	3	25	50	75
			305B – Digital Image Processing								
6	P	MCA 306P	Computer Networks Lab / Web Technologies Lab	0	0	6	6	3	25	50	75
7	P	MCA 307P	Computer Graphics / Digital Image Processing Lab / Data Warehousing and Data Mining Lab	0	0	6	6	3	25	50	75
8	P	MCA 308P	Minor Project Work	0	0	6	6	3	25	50	75
Total							38	25	205	420	625


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

SEMESTER -IV											
S.No	Category	Course Code	Course Title	Scheme of Instruction (Hours/Week)				No. of Credits	Scheme of Evolution		
				L	T	P	Total Hours		Sessional Marks	Semester End Examination Marks	Total
1	SOC	MCA 401	401A- Quantum Computing	3	1	0	4	4	30	70	100
			401B – Big data Analytics								
			401C - Internet Of Things								
2	OOSDC	MCA 402	Open Online Skill Development Course	-	-	-	-	2	-	-	-
3	P	MCA 403	Major Project Work with Technical Seminar	0	2	10	12	12	100	200	300
Total							16	18	130	270	400

Grand Total of the MCA PROGRAMME	134	94	720	1480	2200
----------------------------------	-----	----	-----	------	------


Prof. M. PADMAVATHAMMA
 CHAIRPERSON BOS
 COMPUTER SCIENCE (COMBINED)
 DEPARTMENT OF COMPUTER SCIENCE
 S.V. UNIVERSITY, TIRUPATI-517 502

MCA 301: COMPUTER NETWORKS

UNIT I:

Data Communication: Components, Data Representation, Data Flow – Networks: Distributed Processing, Network Criteria, Physical Structure, Categories of Networks – Network Topologies - Network Models: OSI Reference Model, TCP/IP model.

Physical Layer: Data and Signals: Analog and Digital data, Analog and Digital Signal – Transmission Impairment- Performance - Multiplexing: FDM, WDM TDM - Transmission Media: Guided Media: Twisted-Pair cable, Coaxial Cable, Fiber-optic Cable, Unguided Media: Radio Waves, Microwaves, Infrared – Switching: Circuit Switching, Packet Switching.

UNIT II:

Data Link Layer: Data link layer design issues; Framing, Flow control and Error control; Error detection & correction: Parity, Checksum, CRC, hamming code; Wireless LAN's: IEEE 802.11, Bluetooth; Data link-layer Protocols: Stop-and-wait, Stop-and-wait ARQ, Go-Back-N ARQ, Selective Repeat ARQ. Virtual-Circuit Networks: Frame relay, ATM.

UNIT III:

Network Layer: LOGICAL ADDRESSING: IPv4 addresses, IPv6 addresses; INTERNET PROTOCOL: IPv4, IPV6, Transition from IPv4 to IPv6: Dual Stack, Tunneling; Address Mapping: ARP, RARP, DHCP; Network layer Protocols – ICMP, IGMP; Routing – Unicast routing Protocols: RIP, OSPF, Link State Routing, Distance Vector Routing; Multicast Routing Protocols: DVMRP, MOSPF.

UNIT IV

Transport Layer: Process-to-Process Delivery: Introduction, UDP – User Datagram Format, UDP operations; TCP – Services, TCP segment Format, Flow control, Error Control, Congestion Control; Quality of service (QOS) and techniques to improve QOS. Security: Introduction. Symmetric-key and Asymmetric cryptography, Message security, Digital signature, User authentication, E-mail Security, Web security, Social Issues.

UNIT – V

Application Layer: The Domain Name System (DNS) – Distribution of Name Space, DNS in the Internet. Electronic Mail: Architecture and Services, POP3, SMTP, File Transfer: FTP, WWW and HTTP.

Text Books:

1. Forouzan B A, Data Communications and Networking, 4th edition, Tata McGraw-Hill, 2007.
2. Tanenbaum A S, Computer Networks, 4th edition, Pearson Education, 2003.
3. Ajay R. Mishra, Fundamentals of network planning and optimization, Willey, 2nd edition, 2018

Reference Books:

1. Stallings W, Data and Computer Communications, 7th edition, Pearson Education, 2004.
2. Gallo M A, and Hancock W M, Computer Communications and Networking Technologies, Thomson Brooks/Cole, 2001


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

MCA 302A- Data Warehousing and Data Mining

UNIT I

Data warehousing and OLAP: Data Warehouse basic concepts, Multidimensional Data Model- Stars, Snowflakes and Fact Constellations Schemas, OLAP Operations, A three- Tier Data Warehouse Architecture, Types of OLAP Servers: ROLAP versus MOLAP versus HOLAP and Data Warehouse Implementation.

UNIT II

Data Mining and its Applications: Introduction- Basic Data Mining tasks, Data mining versus Knowledge Discovery in Databases, Data Mining Issues, Data Mining Metrics. Data Pre-processing, Data cleaning, data integration, data reduction and data transformation.

UNIT III

Association Analysis: Basic Concepts and Algorithms: Frequent Item set Generation, Rule Generation, Compact Representation of Frequent Item sets, Alternative methods for generating Frequent Item sets, FP Growth Algorithm, Evaluation of Association Patterns.

UNIT IV

Classification: Methods, improving accuracy of classification: Basics, General approach to solve classification problem, Decision Trees, Rule Based Classifiers, Nearest Neighbour Classifiers. Bayesian Classifiers, Estimating Predictive accuracy of classification methods, Improving accuracy of classification methods, Evaluation criteria for classification methods, Multiclass Problem.

UNIT V

Clustering Techniques: Overview: Features of cluster analysis, Types of Data and Computing Distance, Types of Cluster Analysis Methods, Partitional Methods, Hierarchical Methods, Density Based Methods, Quality and Validity of Cluster Analysis.

Text Books:

1. Jiawei Han and Micheline Kamber: Data Mining - Concepts and Techniques, 2nd Edition, Morgan Kaufmann Publisher, 2006.
2. Margaret H. Dunham: Data Mining- Introductory and Advance Topics, Pearson Edition, 2006.
3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar: Introduction to Data Mining, Addison- Wesley, 2005.

Reference Books:

4. Arun K Pujari: Data Mining Techniques University Press, 2nd Edition, 2009.
5. G. K. Gupta: Introduction to Data Mining with Case Studies, 3rd Edition, PHI, New Delhi, 2009.
6. Alex Berson and Stephen J.Smith: Data Warehousing, Data Mining, and OLAP Computing McGrawHill Publisher, 1997.


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

MCA 302B – Essentials of Data Science

UNIT I

Introduction: What is Data Science? - Big Data and Data Science, Statistical Inference - Populations and samples - Statistical modeling, probability distributions, fitting a model - Intro to R Language.

UNIT II

Exploratory Data Analysis and the Data Science Process - Basic tools (plots, graphs and summary statistics) of EDA - Philosophy of EDA - The Data Science Process - Case Study: Real Direct (online real estate firm)

UNIT III

Feature Generation and Feature Selection (Extracting Meaning From Data) - Motivating application: user (customer) retention - Feature Generation (brainstorming, role of domain expertise, and place for imagination) - Feature Selection algorithms – Filters; Wrappers; Decision Trees; Random Forests.

UNIT IV

Data Visualization: Basic principles, ideas and tools for data visualization 3 - Examples of inspiring (industry) projects - Exercise: create your own visualization of a complex dataset.

UNIT V

Data Science and Ethical Issues - Discussions on privacy, security, ethics - A look back at Data Science - Next-generation data scientists

Text Books

1. Cathy O’Neil and Rachel Schutt. Doing Data Science, Straight Talk From The Frontline. O’Reilly. 2014.

References Books

1. Jure Leskovek, Anand Rajaraman and Jeffrey Ullman. Mining of Massive Datasets. v2.1, Cambridge University Press. 2014. (free online)
2. Kevin P. Murphy. Machine Learning: A Probabilistic Perspective. ISBN 0262018020. 2013.


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

MCA 303 A- Web Technologies

UNIT I

Introduction to Internet-Browser Architecture-IE: Chrome-Search Engines-Introduction to HTML-5-HTML-5 Tags-Audio, Video Tags – HTML-5 Forms-Controls-CSS Styling-CSS Tags-Attributes.

UNIT II

Java Script-JQuery: JavaScript Programming Scripts- Control structures- Functions- Document, Browser, Date, Math, String objects-Events- JQuery Libraries-JQuery Objects, Functions – JQuery Events-Animations.

UNIT III

AJAX Concepts: Simple AJAX objects-Ajax Libraries-Examples, Webserver IIS, Tomcat-Hosting Website in a Web server.

UNIT IV

Introduction to PHP: Control Structures-Arrays-Functions-Database Connectivity-Introduction to ZEND Framework and applications

UNIT-V

Introduction to Java Servlets: Servlet classes and interfaces - Java Database Connectivity-Introduction to JSP-Java Server Page script lets -JSP Objects-JSP Web applications.

Text Books:

1. Deitel, Deitel and Goldberg Internet & World Wide Web how to program” by End. Pearson Education Ivan Bayross, Webenabled commercial Application Development in Java 2.0 BPB.
2. HTML 5 Black book, Kogent Learning Solutions Inc.

Reference Books:

1. Raj Kamal Internet and web Technologies, Tata McGraw Hill, 2002. Chirs Bates, Web Programming, John Wiley, 2nd Edition


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

MCA 303B – Cloud Computing

UNIT-I

Cloud Architecture and Model: Technologies for Network-Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture, Cloud Models: Characteristics – Cloud Services – Cloud models (IaaS, PaaS, SaaS) – Public Vs Private Cloud – Cloud Solutions - Cloud ecosystem – Service management – Computing on demand.

UNIT II

Virtualization: Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation. VMWare, Virtual Box Virtualization software.

UNIT III

Cloud Infrastructure: Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development – Design Challenges - Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources. Federation in the Cloud – Four Levels of Federation – Federated Services and Applications – Future of Federation

UNIT IV

Programming Model: Parallel and Distributed Programming Paradigms – MapReduce , Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support – Software environments for service development; Amazon, Azure, GoogleApp Engine, AWS - Cloud Environments -Eucalyptus, Open Nebula, Open Stack, Aneka, CloudSim. Cloud Storage – Storage-as- a-Service – Advantages of Cloud Storage – Cloud Storage Providers – S3.

UNIT V

Security In TheCloud : Security Overview – Cloud Security Challenges and Risks – Software- as-a- Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control.

Text Books:

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, “Distributed and Cloud Computing, From Parallel Processing to the Internet of Things”, Morgan Kaufmann Publishers, 2012.
2. Rittinghouse, John W., and James F. Ransome, —Cloud Computing: Implementation, Management and Security, CRC Press, 2017.

Reference Books

1. John W.Rittinghouse and James F.Ransome, “Cloud Computing: Implementation, Management, and Security”, CRC Press, 2010.
2. Kumar Saurabh, “Cloud Computing – insights into New-Era Infrastructure”,

Wiley India,2011.

MCA 304 A- Block Chain Technologies

Unit-I

Introduction to Blockchain Distributed systems, Types of blockchain, Blockchain Architecture – Challenges – Applications – Blockchain Design Principles -The Blockchain Ecosystem - The consensus problem - Asynchronous Byzantine Agreement - AAP protocol and its analysis - peer-to-peer network – Abstract Models - GARAY model - RLA Model - Proof of Work (PoW)

- Proof of Stake (PoS) based Chains - Hybrid models.

Unit- II

Cryptography and Blockchain Hash functions, Digital signatures, Merkle trees, Public key infrastructure. Blockchain Components and Concepts - Block Header and Identifiers - Linking Blocks in the Blockchain - Mining and Consensus: Aggregating transactions into Blocks - Mining the Block - Validating and Assembling of Blocks, Selecting Chains of Blocks.

Unit-III

Origin of Ledgers – Types and Features of Distributed Ledger Technology (DLT) - Role of Consensus Mechanism - DLT Ecosystem - Distributed Ledger Implementations – Blockchain - Ethereum - Public and Private Ledgers – Registries – Ledgers - Practitioner Perspective: Keyless Technologies, Transparency as a Strategic Risk, Transparency as a Strategic Asset, Usage of Multiple IDs.

Unit - IV

Anatomy of a Smart Contracts - Life Cycle - Usage Patterns - DLT-based smart contracts -Use Cases: Healthcare Industry and Property Transfer. Implementation of Public and Private Blockchain.

Unit-V

Bitcoin architecture, Mining, Wallets, Transactions, Blockchain forks. Ethereum tokens – Augur – Golem - Understanding Ethereum tokens - App Coins and Protocol Tokens - Blockchain Token Securities Law Framework.

Text Books:

1. Dhillon, V., Metcalf, D., and Hooper, M, Blockchain enabled applications, 2017, 1st Edition, CA: Apress, Berkeley.
2. Bikramaditya Singhal, Gautam Dhameja, Priyansu Sekhar Panda, Beginning Blockchain, A Beginner's Guide to Building Blockchain Solutions, 2018, 1st edition, Apress, New York

Reference Books

1. Diedrich, H., Ethereum: Blockchains, digital assets, smart contracts, decentralized autonomous organizations, 2016, 1st Edition, Wildfire publishing, Sydney.

2. Wattenhofer, R. P, Distributed Ledger Technology: The Science of the Blockchain (Inverted Forest Publishing)

MCA 304B- Cryptography and Network Security

UNIT I

Cryptography – Terminology, Conventional Encryption Model, Steganography, Classical Encryption Techniques, DES Data Encryption Standard, Block Cipher Design principles and Modes of Operation.

UNIT II

Conventional Encryption Algorithms: Triples DES, International Data Encryption Algorithm, Blowfish, RC5, Characteristics of advanced symmetric Block Ciphers, Confidentiality using Conventional Encryption.

UNIT III:

Public-Key Cryptography, Introduction to Number Theory: Prime Numbers, Modular Arithmetic, Eulers Theorem, Primality and Factorization, discrete logarithm, D-H Key sharing technique, RSA and its variants-Homomorphic Encryption Techniques Message Authentication and Hash Functions – Hash and MAC algorithms.

UNIT IV

Digital, Signatures and authentication Protocols, Digital Signature Standard, Network Security Practice, Authentication Applications. Basic overview of Electronic Mail Security: pretty Good Privacy's /MIME: IP Security, Web Security – Intruders, Viruses and Worms – Firewalls.

UNIT V

Mobile Security, Risk Model, EcoSystem, Service Risks, App Risks, Countermeasures-Cloud Computing Security- Threats-Security in Cloud.Security at service layers. Introduction to Block chain, Crypto currency, BitCoin Security and working, *Ethereum*.

Text Books

1. Cryptography and Network Security – by William Stallings, Principles and Practice, 7th Edition, Pearson
2. Cryptography and Network Security, by John Wiley, Edn.,2001

Reference Books

1. Bruce Schneier, Applied Cryptography, John Wiley, Second Edn,2001.
2. Charke Kaufman, Rodia Perlman and Mike Speciner, Network Security


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

MCA 305A- Computer Graphics

UNIT I

Overview of Graphics systems, Application areas of Computer Graphics, video-display devices, Raster-scan systems, random scan systems, graphics monitors and workstations and input devices. Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms.

UNIT II

Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms. 2-D Geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates.

UNIT III

2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to viewport coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT IV

3-D Object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-spline curves, Bezier and B-spline surfaces. Basic illumination models, polygon rendering methods.

UNIT V

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations, 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

Computer Animation: Design of animation sequence, general computer animation functions, Raster animations, Computer animation languages, Key frame systems.

Text Books:

1. Donald Hearn and M.Pauline Baker, Computer Graphics C Version, Second Edition, Pearson Educations.2005.

Reference Books:

- 1.Steven Harrington (1987), Computer Graphics – A Programming Approach, Second Edition, Mc Graw – Hill International Editions.
2. William M. Newman and Robert F. Sprowli (1979), Principles of Interactive Computer Graphics, second Edition, Mc Graw – Hill International Editions.


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

MCA 305B – Digital Image Processing

UNIT-1: INTRODUCTION & FUNDAMENTALS: Origin of DIP, examples of fields that use DIP, fundamentals of DIP, components of an DIP system, Image formation model, Spatial & Gray level resolution, Image enhancement in special domain: Piecewise transformation functions, Histogram equalization, Histogram specification, image averaging, spatial filters- smoothing and sharpening, Laplacian filter, Canny edge detector., image sampling and quantization, some basic relationships between pixels.

UNIT 2: IMAGE ENHANCEMENT AND SEGMENTATION: Image Enhancement in Spatial Domain: Background, some basic gray level transformations, Histogram processing, enhancement using arithmetic and logic operations, basic of spatial filtering, smoothing spatial filters, sharpening spatial filters. Image Enhancement in the Frequency Domain: Background, Introduction to FT and frequency domain, smoothing frequency domain filters, sharpening frequency domain filters, additional properties of the 2-D FT, convolution, line detection, Edge Detection, Edge Linking and boundary detection, Global Thresholding, Ostu's method, multiple threshold, variable threshold, multivariant threshold, Region based Segmentation., Corner Detection, segmentation using Morphological watersheds.

UNIT 3: IMAGE COMPRESSION: Fundamentals, image compression models, elements of information theory, error free Compression, run length coding, Huffman coding, LZW coding, Arithmetic coding, LZW coding, symbol based coding, bit plane coding, predictive coding, wavelet coding, loss less predictive coding, lossy predictive coding, image compression standards, DCT, JPEG, MPEG video compression standards, watermarking.

UNIT 4: MORPHOLOGICAL IMAGE PROCESSING: Erosion, dilation, opening, closing, Basic Morphological Algorithms: hole filling, connected components, thinning, skeletons, some basic morphological algorithms, Gray scale Morphology.

UNIT 5: IMAGE REPRESENTATION, DESCRIPTION & RECOGNITION: Representation, Boundary descriptors, Regional descriptors, Principal component analysis, Recognition based on decision theoretic & structural methods. Optimum statistical classifiers, neural network, string matching, matching shape numbers.

Text Books:

1. *Digital Image Processing* by Rafael .C .Gonzalez and Richard. E, Pearson Education, 2010, 3rd Edition.

References Books:

1. *Digital Image Processing* – by William K. Pratt 3rd Edition John Wiley and Sons Inc.
2. P. Suetens, *Fundamentals of image processing*, Cambridge University Press, 2002.
3. R. C. Gonzalez, R. E. Woods, S. L. Eddins , *Digital Image Processing Using MATLAB(R)*, Course Technology, 1 edition, 2004


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

MCA 401A- Quantum Computing

Unit I:

History and Principles of Quantum Mechanics, Quantum States and Superposition
Quantum Entanglement and interference. Qubits and Quantum Gates

Unit-II

Quantum Circuits -Basic Quantum Algorithms (e.g., Deutsch's Algorithm) – A General
Model of a Quantum Computer

Unit- III

Quantum Algorithms and Complexity - Shor's Algorithm - Grover's Algorithm - Quantum
Generative Adversarial networks.

Unit IV:

Variational Quantum Algorithms -Quantum Error Correction Codes -Fault-Tolerant
Quantum Computation -Decoherence and Noise.

Unit V:

Introduction to Quantum Machine Learning - Quantum Cryptography concepts -
Quantum Simulation and Quantum Annealing concepts- Quantum applications.

Textbooks:

1. Quantum Mechanics: The Theoretical Minimum by Leonard Susskind and Art Friedman
2. Quantum Computing for Everyone by Chris Bernhardt
3. Quantum Error Correction by Daniel A. Lidar and Todd A. Brun
4. Quantum Computing: A Gentle Introduction by Eleanor G. Rieffel and Wolfgang H. Polak

References:

1. Jack D. Hidary, Quantum Computing: An Applied Approach, First edition, Springer International Publishing, 2019
2. N. David Mermin, Quantum Computer Science: An Introduction First edition, Cambridge University Press, 2007

MCA 401B - Bigdata Analytics

UNIT I

What is Big Data: Varieties of Data – Unstructured data – Trends in Data Storage - Basically Available Soft State Eventual Consistency (BASE) - Industry Examples of Big Data.

UNIT - II

Big Data Technology: New and older approaches – Data Discovery –Terminologies used in Big Data Environments- Open-Source technologies for Big Data Analytics – Cloud and Big Data – Big Data Foundation – Computation – Limitations – Big Data Emerging Technologies.

UNIT III

Business Analytics –Consumption of Analytics – Creation to Consumption of Analytics – Data visualization by Organizations – 90/10 rule of critical thinking – Decision sciences and analytics – Learning over knowledge – Agility – Scale and convergence – Privacy and security in Big Data.

UNIT IV

Predictive Analytics – Target Definition - Linear Regression – Logistic Regression - Decision trees – Neural Networks – Support Vector machines - Classification trees – Ensemble methods – Association Rules – Segmentation, Sequence Rules, Social Network analytics.

UNIT V

Hadoop – Why Hadoop? – Why not RDBMS? – RDBMS Versus Hadoop - Components of Hadoop – Hadoop File System – Hadoop Technologies Stack – Managing Resources and Applications with Hadoop YARN - Dataware housing Hadoop Concepts – Applications of Hadoop using PIG, YARN, HIVE.

Text Books

1. Big Data and Analytics, seema Acharya ,Subhashini chellapan, Wiley publicaitons
2. Baesens, 2014, Analytics in a Big Data World: The Essential Guide to Data Science and Its applications, Wiley India Private Limited.

Reference Books

1. “Big Data Analytics: Systems, Algorithms, Applications” **Prabhu, C.S.R., Sreevallabh**

Chivukula, A., Mogadala, A., Ghosh, R., Livingston, L.M.J.

MCA 401C – Internet Of Things

UNIT I

Fundamentals of IoT: Introduction, Definitions & Characteristics of IoT, IoT Architectures, Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, About Things in IoT, The Identifiers in IoT, About the Internet in IoT, IoT frameworks, IoT and M2M.

UNIT II

Sensors Networks: Definition, Types of Sensors, Types of Actuators, Examples and Working, IoT Development Boards: Arduino IDE and Board Types, Raspberry Development Kit, RFID Principles and components, Wireless Sensor Networks: History and Context, The node, Connecting nodes, Networking Nodes, WSN and IoT.

UNIT III

Wireless Technologies for IoT: WPAN Technologies for IoT: IEEE 802.15.4, Zigbee, HART, NFC, Z- Wave, BLE, Bacnet, Modbus. IP Based Protocols for IoT: IPv6, 6LowPAN, RPL, REST, AMPQ, CoAP, MQTT. Edge connectivity and protocols.

UNIT IV

Data Handling & Analytics: Introduction, Bigdata, Types of data, Characteristics of Big data, Data handling Technologies, Flow of data, Data acquisition, Data Storage, Introduction to Hadoop. Introduction to data Analytics, Types of Data analytics, Local Analytics, Cloud analytics and applications, Edge/Fog Computing.

UNIT V

Applications of IoT: Home Automation, Smart Cities, Energy, Retail Management, Logistics, Agriculture, Health and Lifestyle, Industrial IoT, Legal challenges, IoT design Ethics, IoT in Environmental Protection.

Text Books:

1. Olivier Hersent, David Boswarthick, and Omar Elloumi, — “The Internet of Things: Key Applications and Protocols”, Wiley Publications
2. Vijay Madisetti and Arshdeep Bahga, — “Internet of Things (A Hands-on-Approach)”, 1st Edition, VPT, 2014.

Reference Books

1. Daniel Minoli, — “Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications”, ISBN: 978-1-118- 47347-4, Wiley Publications
2. Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press.


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

Paper Code: 12-00-03-01
Paper Title: Computer Networks

Time: 3 Hrs

Max Marks: 70

Answer any One question from each Unit

5 x 14 = 70

Unit – I

1.a

b

OR

2.a

b

Unit – II

3.a.

b

OR

4.a

b

Unit – III

5.a

b

OR

6.a

b

Unit – IV

7.a

b

OR

8.

a

b

Unit – V

9.a

b

OR

10.a

b

S V UNIVERSITY ::
Master of Computer Application (2025 – 2026 Revised)
Paper Code: 12-00-03-

Paper Title: Data Warehousing and Data Mining

Time: 3 Hrs

Max Marks: 50

Answer any One question from each Unit

5 x 10 = 50

Unit – I

1.a
b

OR

2.a
b

Unit – II

3.a.
b

OR

4.a
b

Unit – III

5.a
b

OR

6.a
b

Unit – IV

7.a
b

OR

8.a
b

Unit – V

9.a
b

OR

10.a

b


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::
Master of Computer Application (2025 – 2026 Revised)
Paper Code: 12-00-03-02 B Paper

Title: Essentials of Data Science

Time: 3 Hrs

Max Marks: 50

Answer any One question from each Unit

5 x 10 = 50

Unit – I

1.a
b

OR

2.a
b

Unit – II

3.a.
b

OR

4.a
b

Unit – III

5.a
b

OR

6.a
b

Unit – IV

7.a
b

OR

8.a
b

Unit – V

9.a
b

OR

10.a
b


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::

Master of Computer Application (2025 – 2026 Revised

Paper Code: 12-00-03-

Paper Title: Web Technologies

Time: 3 Hrs

Max Marks: 50

Answer any One question from each Unit

5 x 10 = 50

Unit – I

1.a

b

OR

2.a

b

Unit – II

3.a.

b

OR

4.a

b

Unit – III

5.a

b

OR

6.a

b

Unit – IV

7.a

b

OR

8.a

b

Unit – V

9.a

b

OR

10.a

b


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::
Master of Computer Application (2025 – 2026 Revised)
Paper Code: 12-00-03-

Paper Title: Cloud Computing

Time: 3 Hrs

Max Marks: 50

Answer any One question from each Unit

5 x 10 = 50

Unit – I

1.a
b

OR

2.a
b

Unit – II

3.a.
b

OR

4.a
b

Unit – III

5.a
b

OR

6.a
b

Unit – IV

7.a
b

OR

8.a
b

Unit – V

9.a
b

OR

10.a
b


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::
Master of Computer Application (2025 – 2026 Revised
Paper Code: 12-00-03-
Paper Title: Block Chain Technologies

Time: 3 Hrs

Max Marks: 50

Answer any One question from each Unit

5 x 10 = 50

Unit – I

1.a
b

OR

2.a
b

Unit – II

3.a.
b

OR

4.a
b

Unit – III

5.a
b

OR

6.a
b

Unit – IV

7.a
b

OR

8.a
b

Unit – V

9.a
b

OR

10.a
b


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::

Master of Computer Application (2025 – 2026 Revised

Paper Code: 12-00-03-

Paper Title: Cryptography and Network Security

Time: 3 Hrs

Max Marks: 50

Answer any One question from each Unit

5 x 10 = 50

Unit – I

1.a
b

OR

2.a
b

Unit – II

3.a.
b

OR

4.a
b

Unit – III

5.a
b

OR

6.a
b

Unit – IV

7.a
b

OR

8.a
b

Unit – V

9.a
b

OR

10.a
b


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::
Master of Computer Application (2025 – 2026 Revised)
Paper Code: 12-00-03-
Paper Title: Computer Graphics

Time: 3 Hrs

Max Marks: 50

Answer any One question from each Unit

5 x 10 = 50

Unit – I

1.a
b

OR

2.a
b

Unit – II

3.a.
b

OR

4.a
b

Unit – III

5.a
b

OR

6.a
b

Unit – IV

7.a
b

OR

8.a
b

Unit – V

9.a
b

OR

10.a

b


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::
Master of Computer Application (2025 – 2026 Revised)
Paper Code: 12-00-03-

Paper Title: Digital Image Processing

Time: 3 Hrs

Max Marks: 50

Answer any One question from each Unit

5 x 10 = 50

Unit – I

1.a

b

OR

2.a

b

Unit – II

3.a.

b

OR

4.a

b

Unit – III

5.a

b

OR

6.a

b

Unit – IV

7.a

b

OR

8.a

b

Unit – V

9.a

b

OR

10.a

b


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::

Master of Computer Application (2025 – 2026 Revised

Paper Code: 12-00-03-

Paper Code: 12-00-04-01 A

Paper Title: Quantum Computing

Time: 3 Hrs Max Marks: 70

Answer any One question from each Unit

5 x 14 = 70

Unit – I

1.a

b

OR

2.a

b

Unit – II

3.a.

b

OR

4.a

b

Unit – III

5.a

b

OR

6.a

b

Unit – IV

7.a

b

OR

8.

a

b

Unit – V

9.a

b

OR

10.a


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::

Master of Computer Application (2025 – 2026 Revised

b

Paper Code: 12-00-03-


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::

Master of Computer Application (2025 – 2026 Revised



Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::
Master of Computer Application (2025 – 2026 Revised)

Paper Title: Big Data Analytics

Time: 3 Hrs

Max Marks: 70

Answer any One question from each Unit

5 x 14 = 70

Unit – I

1.a
b

OR

2.a
b

Unit – II

3.a.
b

OR

4.a
b

Unit – III

5.a
b

OR

6.a
b

Unit – IV

7.a
b

OR

8.a
b

Unit – V

9.a
b

OR

10.a
b


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::
Master of Computer Application (2025 – 2026 Revised)
Paper Code: 12-00-04-01 C
Paper Title: Internet Of Things

Time: 3 Hrs

Max Marks: 70

Answer any One question from each Unit

5 x 14 = 70

Unit – I

1.a
b

OR

2.a
b

Unit – II

3.a.
b

OR

4.a
b

Unit – III

5.a
b

OR

6.a
b

Unit – IV

7.a
b

OR

8.
a
b

Unit – V

9.a
b

OR

10.a


Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::

Master of Computer Application (2025 – 2026 Revised

b



Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502

S V UNIVERSITY ::

Master of Computer Application (2025 – 2026 Revised



Prof. M. PADMAVATHAMMA
CHAIRPERSON BOS
COMPUTER SCIENCE (COMBINED)
DEPARTMENT OF COMPUTER SCIENCE
S.V. UNIVERSITY, TIRUPATI-517 502