



SRI VENKATESWARA UNIVERSITY

4-Year UG Honours in B.Sc. (Data Mining) as Major in consonance with Curriculum framework (W.E.F. AY-2026-27)

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
II	IV	8	Data Warehousing & OLAP	3	3
			Data Warehousing & OLAP-Practical	2	1
		9	Big Data Tools & Technologies	3	3
			Big Data Tools & Technologies-Practical	2	1
		10	Data Communications and Computer Networks	3	3
			Data Communications and Computer Networks-Practical	2	1



SRI VENKATESWARA UNIVERSITY

II Year Syllabus for 4-Year UG Honours in B.Sc. (Data Mining) as Major in consonance with the Curriculum framework w.e.f. AY 2026-27

II Year IV Semester

Sl. No.	Category	Course No.	Course Name	No. of Hours		Total No. of Hours	No. of Credits		Total No. of Credits
				Theory	Practical		Theory	Practical	
1	Major-Core	8	Data Warehousing & OLAP	3	2	5	3	1	4
2	Major-Core	9	Big Data Tools & Techniques	3	2	5	3	1	4
3	Major-Core	10	Data Communications and Computer Networks	3	2	5	3	1	4
4	Minor	2		3	2	5	3	1	4
5	MDC	3		2	0	2	2	0	2
6	SEC	4	SEC: Design Thinking/Problem solving/ others	2	0	2	2	0	2
				16	8	24	16	4	20

SEMESTER-IV

COURSE 10: DATA COMMUNICATION AND COMPUTER NETWORKS

Theory

Credits: 3

3 hrs/week

Course objectives:

- To understand the basics of data communication, network types, topologies, and models like OSI & TCP/IP.
- To learn about various transmission media, modes, bandwidth, and signal propagation methods.
- To study data encoding, multiplexing, and error detection & correction techniques.
- To gain knowledge of network devices, switching methods, routing algorithms, IP addressing, and subnetting.
- To introduce fundamentals of network security, security services, and common types of network attacks

Syllabus:

Unit 1: Introduction to Data Communication and Networking

Definition and components of data communication, Types of networks: LAN, MAN, WAN, PAN, Network topologies: bus, star, ring, mesh, hybrid, Network models: OSI and TCP/IP models, Protocols and standards

Unit 2: Transmission Media

Guided media: twisted pair, coaxial cable, optical fiber, Unguided media: radio waves, microwaves, infrared, satellite, Transmission modes: simplex, half-duplex, full-duplex, Bandwidth, data rate, and signal propagation

Unit 3: Data Encoding and Transmission Techniques

Analog and digital signals, Digital-to-Digital, Analog-to-Digital, Digital-to-Analog, Analog-to-Analog conversion, Multiplexing: FDM, TDM, WDM, Error detection and correction: parity check, CRC, Hamming code

Unit 4: Network Devices and Switching

Network devices: hubs, switches, routers, gateways, access points, Switching techniques: circuit switching, packet switching, message switching, Routing algorithms: Distance Vector Routing Implement routing table updates using Bellman-Ford algorithm, Link State Routing, Use Dijkstra's algorithm to find shortest path, IP addressing and subnetting

Unit 5: Network Security

Basics of Security: Confidentiality, Integrity, Availability (CIA triad), Security services and mechanisms, Types of network attacks: Active vs Passive attacks, DoS, DDoS, Eavesdropping, Spoofing, Phishing, Security policies and models

Prescribed Textbooks:

1. Behrouz A. Forouzan – *Data Communications and Networking* (McGraw Hill)
2. Andrew S. Tanenbaum & David J. Wetherall – *Computer Networks* (Pearson)
3. William Stallings – *Cryptography and Network Security: Principles and Practice* (Pearson)

SEMESTER-IV

COURSE 10: DATA COMMUNICATION AND COMPUTER NETWORKS

Practical

Credits: 1

2 hrs/week

List of experiments:

1. Client–Server communication using sockets
2. Demonstration of Transmission Modes (Simplex, Half-Duplex, Full-Duplex)
3. Implementation of Line Encoding schemes (NRZ, Manchester)
4. Error detection using Parity Check
5. Error detection using CRC
6. Error detection and correction using Hamming Code
7. Implementation of Distance Vector Routing (Bellman–Ford Algorithm)
8. Implementation of Link State Routing (Dijkstra’s Algorithm)
9. IP Addressing and Subnetting practice program
10. Implementation of Caesar Cipher (encryption & decryption)
11. Simulation of DoS attack (concept/demo)
12. Demonstration of Network Topologies (Bus, Star, Ring, Mesh, Hybrid)

SRI VENKATESWARA UNIVERSITY::TIRUPATI
B.Sc. Data Mining Honours
II year IV Semester
COURSE 10: Data Communications and Computer Networks

MODEL QUESTION PAPER

Time: **3 Hours**

Max. Marks: **75**

PART-A

Answer any **FIVE** of the following. Each Question Carries 3 marks.

(5X3=15)

1. Short answer question from unit-I
2. Short answer question from unit-I
3. Short answer question from unit-II
4. Short answer question from unit-II
5. Short answer question from unit-III
6. Short answer question from unit-III
7. Short answer question from unit-IV
8. Short answer question from unit-IV
9. Short answer question from unit-V
10. Short answer question from unit-V

PART-B

Answer **FIVE** of the following. Each Question Carries 12 marks.

(5X12=60)

11. a) Essay question from Unit-I
OR
b) Essay question from Unit-I
12. a) Essay question from Unit-II
OR
b) Essay question from Unit-II
13. a) Essay question from Unit-III
OR
b) Essay question from Unit-III
14. a) Essay question from Unit-IV
OR
b) Essay question from Unit-IV
15. a) Essay question from Unit-V
OR
b) Essay question from Unit-V