CVM UNIVERSITY
Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2020-21

Programme: **Bachelor of Engineering (Information Technology)**

Semester: **VII**

Course Code: **102047808**

Course Title: **Management of IT Infrastructure**

Course Group: **Professional Elective Course - III**

Course Objectives: Through this course the students will learn requirement of IT infrastructure in an organization. The students will be able to manage the infrastructure and IT services. The students can identify and analyse requirement of IT infrastructure such as network, storage, computing facilities including servers and software services based on the need of the organization. The learners will also study security aspects associated with management of IT infrastructure.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
3	0	2	4	40/14	60/21	20/07	30/10	150/52

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**Introduction to IT Infrastructure:** Introduction to IT building blocks, Non-functional attributes, calculating availability, Availability percentages and intervals, IT infrastructure performance metrics like Mean Time Between Failures (MTBR), Mean time to repair (MTTR), Sources of unavailability, Availability patterns, Introduction to performance, Performance during infrastructure design, Performance of a running system.	8
2	**Trends in IT Infrastructure:** Cloud computing, Cloud computing models, Deployment models, Service models, Infrastructure as a service (IaaS), Green IT, Use of greener equipment, Introduction to data Center.	8
3	**Networking:** Introduction and history, Networking building blocks, Network availability, Network performance, LAN, WAN, NAT, IPv4, Subnetting, Concepts of public and private IP, Private IP ranges, Firewall, and network security.	8

4	**Storage:** Introduction and History, Storage building blocks, Storage availability, Network Attached storage (NAS), Storage area network (SAN), Storage performance and Storage security. virtualization, advantages and disadvantages of virtualization, Virtual machine.	**5**
5	**Data Centers:** Introduction, Data center building blocks, Data center categories, Location of the data center, Physical structure, Power supply, Cooling, Fire prevention, Detection and suppression, Equipment racks, Data center cabling and patching, Data center energy efficiency, Data center availability, Availability tiers, Redundant data centers, Data center performance – Data center security.	**6**
6	**Infrastructure Security:** Introduction, Risk management, Risk response, Exploits, Security controls, Attack vectors, Identity and access management, Segregation of duties and least privilege, Layered security, Cryptography, Monitoring, Vulnerability patching, go live process / checklist, Decommissioning a service / device.	**5**
	Total	**40**

List of Practicals / Tutorials:

1	Study about internal components of Computer and steps to Install fresh Operating System.
2	Study about Virtual Box tool. Installation of OS in virtual environment. Installation of dual operating system on computer.
3	Study about File server configuration. Understanding of Domain user and workgroup user.
4	Study about different types of cables, connection tools, and cable structures.
5	Study about Networking equipment like Network Switch, Hub, Router.
6	Study and implementation of Local Area Network for organization. File sharing, Printer sharing and remote Desktop Application.
7	Router configuration to provide internet access and to create wireless Local Area Network. DHCP server configuration. MAC filtering.
8	Study about various network scanning tools like Advanced IP Scanner and DUDE, Network troubleshooting and performance tuning.
9	Implementation of NAT on a simulator or in a real environment.
10	Case study on Firewall management, Configuration.
11	Case study on Institute Network architecture and prepare the network diagram for the same.
12	Case study on Data Centre.

Reference Books:

1	IT Infrastructure Architecture - Infrastructure Building Blocks and Concepts Second Edition, by: Sjaak Laan
2	Richard McMohan Introduction to Networking Tata McGraw Hill
3	Behrouz A. Forouzan – Local Area Networks McGraw Hill Edn.
4	Understanding the Network A Practical Guide to Internetworking, Michael J. Martin New Riders Publishing

Supplementary learning Material:	
1	Coursera course on "System Administration and IT Infrastructure Services" offered by Google.
2	Coursera course on "Troubleshooting and Debugging Techniques" offered by Google.
3	Coursera course on "IT Infrastructure and Emerging Trends" offered by University of Minnesota.

Pedagogy:

- Direct classroom teaching
- Audio Visual presentations/demonstrations
- Assignments/Quiz
- Continuous assessment
- Interactive methods
- Seminar/Poster Presentation
- Industrial/ Field visits
- Course Projects

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
20%	25%	25%	15%	10%	5%	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Learn the fundamentals of IT Infrastructure management.	**25**
CO-2	Understand and manage storage and backup requirements for an organization.	**15**
CO-3	Establish and maintain networking for an organizational requirement	**25**
CO-4	Perform Troubleshooting for IT infrastructure.	**20**
CO-5	Analyze the importance of Security in IT infrastructure and Risk management.	**15**

Curriculum Revision:	
Version:	1.0
Drafted on (Month-Year):	June -2020
Last Reviewed on (Month-Year):	-
Next Review on (Month-Year):	June-2025