

SYLLABUS

ANNA UNIVERSITY, CHENNAI

For B.E. / B.Tech. ECE, CSE, IT and Bio Technology Branches

TELEHEALTH TECHNOLOGY

UNIT I **TELEMEDICINE AND HEALTH** 9

History and Evolution of telemedicine, Organs of telemedicine, Global and Indian scenario, Ethical and legal aspects of Telemedicine - Confidentiality, Social and legal issues, Safety and regulatory issues, Advances in Telemedicine.

UNIT II **TELEMEDICAL TECHNOLOGY** 9

Principles of Multimedia - Text, Audio, Video, data, Data communications and networks, PSTN, POTS, ANT, ISDN, Internet, Air / wireless communications Communication infrastructure for telemedicine - LAN and WAN technology. Satellite communication, Mobile communication.

UNIT III **TELEMEDICAL STANDARDS** 9

Data Security and Standards: Encryption, Cryptography, Mechanisms of encryption, phases of Encryption. Protocols: TCP/IP, ISO-OSI, Standards to followed DICOM, HL7, H. 320 series Video Conferencing, Security and confidentiality of medical records, Cyber laws related to telemedicine

UNIT IV **MOBILE TELEMEDICINE** 9

Tele radiology: Image Acquisition system Display system, Tele pathology, Medical information storage and management for telemedicine - patient information, medical history, test reports, medical images, Hospital information system

UNIT V **TELEMEDICAL APPLICATIONS** 9

Telemedicine - health education and self care. Introduction to robotics surgery, Telesurgery. Telecardiology, Teleoncology, Telemedicine in neurosciences, Business aspects - Project planning and costing, Usage of telemedicine.

TOTAL : 45 PERIODS

CONTENTS

UNIT - I

TELEMEDICINE AND HEALTH	1.1 - 1.48
1.1. Introduction.....	1.1
1.2. History and Evolution of Telemedicine (Orgins)	1.6
1.2.1. Telephony & Telegraphy Phase	1.7
1.2.2. Radio Phase	1.7
1.2.3. Television / Space Technologies	1.8
1.2.4. Digital Technologies	1.9
1.2.5. Wireless & Mobile Technologies.....	1.10
1.3. Organs / Modes of Telemedicine	1.10
1.3.1. Store and Forward (Asynchronous).....	1.11
1.3.2. Real-Time (Synchronous)	1.13
1.3.3. Remote Monitoring / "Telemonitoring"	1.16
1.3.4. Hybrid Systems	1.16
1.4. Drivers of Telemedicine and Telecare.....	1.17
1.5. Global and Indian Scenario	1.18
1.6. Ethical and Legal Aspects of Telemedicine	1.25
1.7. Confidentiality	1.28

1.8. Social and Legal Issues	1.29
1.9. Safety and Regulatory Issues	1.31
1.10. Advances in Telemedicine	1.34
1.10.1. Telenursing	1.37
1.10.2. Electronic Referrals	1.37
1.10.3. General Practitioner Teleconsulting	1.38
1.10.4. Call Centres and Online Health	1.40
1.10.5. Healthcare Applications, Website & Kiosk	1.40
1.10.6. Smartphone Revolution	1.41
1.10.7. Sensors, Sensors Everywhere	1.41
1.10.8. Wireless Data	1.42
Two Marks Questions with Answers	1.43
PART B - 13 Marks	1.47
PART C - 15 Marks	1.48

UNIT - II

TELEMEDICAL TECHNOLOGY	2.1 - 2.53
2.1. Introduction to Telemedical Technology	2.1
2.2. Principles of Multimedia	2.1
2.3. Data Communications and Networks	2.11
2.3.1. PSTN / POTS	2.11
2.3.2. ANT (Adaptive Network Topology)	2.13

2.3.3. ISDN - Integrated Services Digital Network.....	2.15
2.3.4. Internet.....	2.20
2.3.5. Air / Wireless Technologies	2.26
2.4. Communication Infrastructure for Telemedicine.....	2.33
2.4.1. LAN and WAN Technology	2.34
2.4.2. Satellite Communication (An object that orbits (Moves) around another object).....	2.36
2.4.3. Mobile Communication.....	2.40
Two Marks Questions with Answers.....	2.47
PART B - 13 Marks	2.53
PART C - 15 Marks	2.53

UNIT - III

TELEMEDICAL STANDARDS	3.1 - 3.62
3.1. Standards	3.1
3.2. Telemedical Standards	3.3
3.3. Security	3.4
3.4. Cryptography, Encryption.....	3.5
3.5. Phases of Encryption	3.8
3.6. TCP / IP	3.10
3.6.1. TCP / IP	3.11
3.7. ISO / OSI.....	3.15

3.8. STANDARDS TO BE FOLLOWED	3.21
3.8.1. DICOM (Digital Image Communications in Medicine)	3.21
3.8.2. Basic Structures and Concepts in DICOM.....	3.28
3.8.3. Transfer syntax	3.30
3.8.4. Value Representation.....	3.30
3.9. HL7 (Health Level seven).....	3.32
3.10. H. 320 series Video Conferencing.....	3.40
3.10.1. H.320(ISDN) / Narrow-band visual telephone systems and terminal equipment.....	3.41
3.10.2. H.323 (Internet, LAN).....	3.43
3.10.3. H.324 (Plain Old Telephone Service)	3.45
3.10.4. H.261 / H.263 / H.264 / H.265 standards	3.46
3.11. Security and confidentiality of Medical Records	3.48
3.11.1. Data Integrity.....	3.48
3.11.2. Data Security	3.49
3.11.3. System Security	3.49
3.11.4. System reliability.....	3.49
3.11.5. Confidentiality.....	3.50
3.12. Contents in medical records based on NABH (National Accreditation Board for Hospitals & Healthcare Providers) standards.....	3.50
3.13. Cyber	3.51
3.14. Cyber Crime	3.51
3.15. Cyber Law	3.52
3.16. Cyber law in Telemedicine	3.53

Two Marks Questions with Answers.....	3.54
PART B – 13 Marks.....	3.62
PART C – 15 Marks	3.62

UNIT - IV

MOBILE TELEMEDICINE	4.1 - 4.28
4.1. Image Acquisition/Image sending station.....	4.3
4.2. Display Systems	4.8
4.3. Medical Information / Information Sources.....	4.12
4.4. Medical Informatics / Health Information	4.13
4.5. Picture archiving and communication system (PACS)	4.16
4.5.1. HOSPITAL INFORMATION SYSTEM.....	4.18
4.6. Objectives of HIS	4.21
4.7. Need for HIS.....	4.21
4.8. Flow of HIS.....	4.22
Two Marks Questions with Answers.....	4.23
PART B - 13 Marks	4.27
PART C - 15 Marks	4.28

UNIT - V

TELEMEDICAL APPLICATIONS	5.1 - 5.31
5.1. Health Education	5.1

5.2. Self-Care	5.6
5.3. Tele-Mentoring.....	5.9
5.4. Robot-assisted Surgery	5.9
5.4.1. Types of Robotic surgery systems.....	5.10
5.5. Tele presence / Tele-robotic surgery	5.14
5.6. Application of tele-surgery.....	5.15
5.7. Benefits to healthcare professionals	5.26
5.8. Benefits to patients.....	5.27
Two Marks Questions with Answers.....	5.27
PART B - 13 Marks	5.31
PART C - 15 Marks	5.31
Solved Anna University Question Paper.....	SQ.1 - SQ.19