

DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE

(AUTONOMOUS)
 (Approved by AICTE & Affiliated to Anna University, Chennai)
 Re-Accredited with 'A' Grade by NAAC, Accredited by TCS
 Accredited by NBA – BME, ECE & EEE
PERAMBALUR - 621 212. Tamil Nadu.
 website : www.dsengg.ac.in

**COURSE PLAN**

Name of the Faculty				
Designation/Department	<i>Assistant Professor/ECE</i>			
Course Code/Name	<i>U200BM71/Telehealth Technology</i>			
Year/Section/Department	<i>IV / A & B/ECE</i>			
Credits Details	<i>L: 3</i>	<i>T: 0</i>	<i>P: 0</i>	<i>C: 3</i>
Total Contact Hours Required	<i>45</i>			

Syllabus:

UNIT I/ History	No. Of Periods: 9
<i>History of Telemedicine, Block diagram of telemedicine, Definition of telemedicine, Tele health, Telecare, Origins and development of telemedicine, Scope, Benefits and limitation of Telemedicine.</i>	
UNIT II/ Information Technique	No. Of Periods: 9
<i>Types of information: Audio, Video, still images, Text and Data, Fax. Types of communication and network: PSTN, POTS, ATN, ISDN, Internet, Wireless Communication: GSM, Satellite and Micro wave. Different modulation techniques, Types of antennas depending on requirements, Integration and Operational issues: System integration, Store-and-forward operation, real time telemedicine.</i>	
UNIT III/ Data Exchange	No. Of Periods: 9
<i>Network Configuration, Circuit and packet switching, H.320 series (Video phone-based ISBN) T.120, h.324 (Video phone based PSTN), Video Conferencing.</i>	
UNIT IV/ Data Security and Standards	No. Of Periods: 9
<i>Encryption, Cryptography, Mechanisms of encryption, Phase of Encryption. Protocols: TCP/IP, ISO-OSI, Standards to followed DICOM, HL7. Ethical and legal aspects of Telemedicine.</i>	
UNIT V/ Applications	No. Of Periods: 9
<i>Tele radiology: Basic parts of Teleradiology systems: Image Acquisition systems, Display system, Communication network, Interpretation. Tele Pathology: Multimedia databases, color images of sufficient resolution: Dynamic range, spatial resolution, compression methods, Interactive control of colour, Controlled sampling, security and confidentiality tools. Tele cardiology, Tele oncology, Telesurgery.</i>	

Objective:

- ❖ Know Scope, Benefits and Limitations of Telemedicine.
- ❖ Know Security and standards and their use in Telemedicine Applications
- ❖ Explain basic parts of Teleradiology systems like Image Acquisition Systems, Display system, Communication Network, Interpretation.
- ❖ Describe the need of various Communication Networks, Antennas in Designing the Telemedicine Systems.

Text Book:

T1: Norris A C, "Essentials of Telemedicine and Telecare", John Wiley, New York, 2002.

T2: H K Huang, "PACS and Imaging Informatics: Basic Principles and Applications" Wiley, New Jersey, 2010

Supplementary Book:

S1: Dr.L. Jabasheela V. Sathiya G. Senthilkumar, "Telehealth technology", 2017

Website:

W1: Types of Antennas for Biomedical Applications | Encyclopedia MDPI & Antenna in medical applications.pptx (slideshare.net)

W2: Switching Techniques in Computer Networks | Baeldung on Computer Science

W3: <https://www.slideshare.net/chshoaib/fax-machine>

W4: <https://interpretationservices.com/telehealth-interpretation>

W5: <https://www.slideshare.net/slideshow/unit-iii-ethical-and-legal-aspects-of-telemedicine-pptx/269746830>

Reference book:

R1: Olga Ferrer Roca, Marcelo Sosa Iudicissa, "Handbook of Telemedicine", IOS Press, Netherland, 2002

R2: Khandpur R S, "Handbook of Biomedical Instrumentation", Tata McGraw Hill, New Delhi, 2003

Course Plan:

Topic Number	Topic	Reference Detail	Page Number	Mode of teaching	Number of Periods Required	Cumulative Period
UNIT I - History						
1	History of telemedicine	T1	1.6-1.8	BB	2	2
2	Block diagram of telemedicine	WS	-	BB	2	4
3	Definition of telemedicine	T1	2-3	BB	1	5
4	Tele health, Tele care	T1	3-4	BB	1	6
5	Origins and development of telemedicine	T1	5-8	BB	1	7
6	Scope of telemedicine	T1	20-25	BB	1	8
7	Benefits and limitations of telemedicine	T1	30-35	BB	1	9
Outcome of Unit I:						
CO1: Know the telecommunication technologies and its application						
UNIT II -						
8	Types of information: Audio, Video	T1	40-42	BB	1	10
9	Still images, text and data, Fax	T1, W2, R1	42-45,24	BB	1	11
11	Types of communication and network: PSTN/POTS	T1, S1	49, 2.11	BB	1	12
12	ATN, ISDN, internet	S1	2.13-2.20	BB	1	13
13	Wireless communication: GSM	S1	2.43-2.47	BB	1	14
14	Satellite and Microwave	S1,R1	2.36-2.40	BB	1	15
15	Different modulation techniques	W	-	BB	1	16
16	Types of antennas depending on requirements	W1	-	BB	1	17
17	Integration and Operational issues	T1	55	BB	1	18
Outcome of Unit II:						
CO2: Apply multimedia technologies in telemedicine						
UNIT III -						
18	Network configuration	R1	100	BB	1	19
19	Circuit and packet switching	W2	-	BB	2	21

20	H.320 series (Video phone-based ISBN)	S1,R1	3.40-3.45&103	BB	1	22
21	T.120	R1	105	BB	2	24
22	h.324(Video phone based PSTN)	S1	3.45	BB	2	26
23	Video Conferencing	R1	187-189	BB	1	27

Outcome of Unit III:

CO3: Gain foundational knowledge in Data transfer methods and video conferencing protocols for real-time communication over various networks.

UNIT IV -

24	Encryption, Cryptography	S1	3.5-3.8	BB	1	28
25	Mechanisms of encryption	R1	151	BB	1	29
26	Phases of encryption	S1, R1	3.8-3.11&152	BB	1	30
27	Protocols: TCP/IP	S1	3.11-3.15	BB	1	31
28	ISO-OSI	S1	3.15-3.21	BB	1	32
29	Standards to followed DICOM	S1	3.21-3.31	BB	1	33
30	HL7.	S1	3.32-3.39	BB	2	35
31	Ethical and legal aspects of Telemedicine	W4	-	BB	1	36

Outcome of Unit IV

CO4: Explain Protocols behind encryption techniques for secure transmission of data.

UNIT V -

32	Tele radiology, Basic parts of Teleradiology system	S1, T1, R1	4.1, 67-75	BB	1	37
33	Image Acquisition systems	S1	4.3-4.7	BB	1	38
34	Display system	S1	4.7-4.12	BB	1	39
35	Communication network, interpretation	T2, W3, R1	330, 824,69	BB	1	40
36	Tele Pathology, Multimedia database	T1	67	BB	1	41
37	Color images of sufficient resolution, Dynamic range, Spatial	R1	71	BB	1	42

	<i>resolution</i>					
38	<i>Compression methods, Interactive control of colour</i>	T2	210	BB	1	43
39	<i>Controlled sampling, Security and confidentiality tools</i>	R1	73-75	BB	1	44
40	<i>Tele cardiology, tele oncology, telesurgery</i>	S1, R1	5.12-5.20&78,84	BB	1	45

Outcome of Unit V:

CO5: Knowledge about E health and its mobile application

CO6: Application of telemedicine in various fields

Course Outcome:

At the end of course: Students should be able to do:

CO1: Know the telecommunication technologies and its application

CO2: Apply multimedia technologies in telemedicine

CO3: Gain foundational knowledge in Data transfer methods and video conferencing protocols for real-time communication over various networks.

CO4: Explain Protocols behind encryption techniques for secure transmission of data.

CO5: Knowledge about E health and its mobile application

CO6: Application of telemedicine in various fields

Course Outcome Vs Program Outcome Mapping:

COs	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PS01	PS02
CO1	0	1	2	2	0	1	0	0	0	0	2	2	2	2
CO2	0	1	2	2	0	0	0	0	0	1	0	0	1	2
CO3	0	1	2	2	0	1	0	0	0	1	2	2	0	2
CO4	0	1	2	2	0	1	0	0	0	1	0	0	1	2
CO5	0	1	0	0	1	1	0	0	0	1	0	1	1	2
CO6	0	1	2	1	1	1	0	0	0	0	1	1	1	2
AVG	0	1	2	2	0	0	0	0	0	1	1	1	1	2

Content beyond Syllabus:

- ❖ E Medicine
- ❖ E Patient card

Internal Evaluation Components:

Webportal	Assignment	Components	Topic Number with Topic / Unit Details	Relevance to CO
Webportal 1	--	Assessment - I (65)	Unit I and II	CO 1 & CO2
	1	Assignment - Handwritten (32)	1.History of telemedicine 2.Integration and operational issue	CO1&CO2
	2	Assignment - Poster Presentation / PPT (33)	1.POTS, ANTS 2.GSM SATELLITE	CO2
Webportal 2	--	Assessment - II (65)	Unit III and IV	CO3 & CO4
	3	Seminar (32)	1. Phases of Encryption 2. Patient data base system	CO3&CO4
	4	Case Study Report (33)	Applications of Telemedicine in various field	CO5
Webportal 3	--	Model Exam (75)	Unit I to V	CO1 to CO6
	5	MCQ (15)	Unit I to V	CO1 to CO6
	-	Course Attendance (10)	--	--

Submission Details:

Phase 1 (Before AT 1)		Phase 2 (Before AT 2)		Phase 3 (Model)
Assignment 1	Assignment 2	Assignment 3	Assignment 4	Assignment 5

Google Class Code Details: [5auprn2](#)

Class Name: IV ECE A&B

PLAN OF ASSESSMENT TEST -DISTRIBUTION OF MARKS:

TEST	CO- MARK WISE DISTRIBUTION						BLOOM'S LEVEL MARK WISE DISTRIBUTION					
	CO1	CO2	CO3	CO4	CO5	CO6	BTL1	BTL2	BTL3	BTL4	BTL5	BTL6
AT-1												
AT-2												
MODEL												

Prepared By

Approved By

Verified By