GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Bachelor of Technology					Branch/Spec.	Biomedical Engineering		
Semester	VII					Version	1.0.0.0		
Effective from the Academic Year	2025-26					Effective for the Batch admitted in	July 2022		
Course Code	2BM71PE05		Course Name			Elective-IV: Telemedicine and Telemetry			
Teaching Scheme						Examination Scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	-	1	-	4	Theory	40	60	100
Hours	3	-	2	-	5	Practical	30	20	50

Pre-requisites

Foundational knowledge in electronics, communication, programming, biomedical basics, networking, awareness of healthcare processes, and data security.

Course Outcomes

On successful completion of the course, the students will be able to:

CO1	Understand the fundamentals and history of telemedicine
CO2	Analyze communication and networking technologies in telemedicine
CO3	Apply the concepts of telemedicine in various medical specialties
CO4	Analyze the implementation of Picture Archiving and Communication Systems (PACS) and the associated standards, such as DICOM, for efficient telemedicine workflows.
CO5	Evaluate the applications of telemedicine across various medical domains and their impact on healthcare delivery.

Theory Syllabus

Unit	Content	Hrs.
1	HISTORY DEVELOPMENT AND FUNDAMENTALS OF TELEMEDICINE History and Evolution of telemedicine, the definition of telemedicine, Functional diagram of a telemedicine system, Telemedicine, Telehealth, Telecare, benefits & limitations of telemedicine, Introduction of Ethical and legal aspects of Telemedicine - Confidentiality, Social and legal issues, Safety and regulatory issues, Advances in Telemedicine.	9
2	COMMUNICATION & NETWORK Principles of Multimedia - Text, Audio, Video, Data, Data communications and networks, PSTN, POTS, ANT, ISDN, Internet, Air/ wireless communications: GSM satellite and Microwave, Amplitude Modulation (Qualitative Analysis), Communication infrastructure for telemedicine – LAN and WAN technology.	9
3	ETHICAL AND LEGAL ASPECTS OF TELEMEDICINE Ethical and legal aspects of Telemedicine (Case study) - Confidentiality, Social and Legal issues (Case Study), Safety and regulatory issues (Case Study), the patient-doctor relationship, access to medical records, consent treatment - data protection & security.	9
4	PICTURE ARCHIVING AND COMMUNICATION SYSTEM Types of image formats, DICOM standard, PACS system: Block diagram, Storing & retrieving images, Algorithm for retrieving images, Compressions and their significance, Lossless data Storage and in-house communication.	9

5	APPLICATIONS OF TELEMEDICINE Teleradiology, Telepathology, Telecardiology, Teleoncology, Teledermatology, Telesurgery, and e-Health care.	9
Practical Content		
Term Work and Practical shall be based on the above syllabus.		
Text Books		
1	Olga Ferrer-Roca, M.Sosa Ludicissa, "Handbook of Telemedicine", IOS press 2002.	
2	Norris A.C, "Essentials of Telemedicine and Telecare", John Wiley & Sons, 2002.	
3	Wootton R, Craig J, Patterson, "Introduction to Telemedicine" Royal Society of Medicine Press Ltd., (2nd ed.), 2006.	
Reference Books		
1	Maheu M.M, Whitten P, Allen A, "E-Health, Telehealth, and Telemedicine" Jossy-Bass, 2001.	
2	Keith J, Dreyer, David S, Hirschron, James Thrall H, Amit Mehta, PACS: "AGuide to the Digital Revolution", 2nd Edition, Springer.	
3	Huang H K, "PACS and imaging informatics – Basic Principles & application", Wiley-Blackwell	
ICT/MOOCs Reference		
1.	https://www.youtube.com/watch?v=KYwbkP9bDZA	

Mapping of CO with PO and PSO:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	0	3	2	2	2	0	1	0	2	1	1	0	0	0
CO2	0	0	0	3	3	1	2	2	1	3	3	2	0	0	0
CO3	0	0	3	3	0	2	1	0	0	1	3	1	0	0	0
CO4	2	1	3	3	2	2	1	1	0	3	3	1	0	1	0
CO5	3	2	2	3	3	3	2	2	1	3	2	2	1	1	0