5192 - BIOTELEMETRY

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)			
					Theory		Practical Ex.	Total
Lectures	Practical	Credits						
3	2	5	25	25	3 Hrs	100	50	200
Pre-requisite		Source						
Nil		MEX						

Semester	Theory	Test	Total	TW	PR	Gr Total

Rationale: Telemetric transmission of functional and physiological information offers many advantages in medical diagnostics and patient surveillance. The telemetric data link avoids direct connections to the recording equipment, which are sometimes embarrassing and restraining, thus leaving the patient freely movable. The course helps to understand this new and emerging field.

COURSE CONTENTS	Hrs	Mks
1. INTRODUCTION AND OVERVIEW OF COMMUNICATION SYSTEMS Classification of communication networks. The variety and description of tele-communications traffic. The conversion of analogue and digital signals. The transmission of information. The relationship between information, bandwidth and noise. The description and types of communication channels. Digital transmission and switching. Standards.	10	20
2. COMMUNICATION TECHNIQUES Time, frequency and bandwidth, analog modulation and demodulation AM, FM, PM. Digital modulation, ASK, FSK and PSK. Spread spectrum techniques. Digital demodulation, DPSK and MSK. Noise in communication systems: probability and random signals. Errors in digital communication. Timing control in digital communication. Design limitations on maximum data-rate and channel capacity.	10	30
3. COMMUNICATION CHANNELS Transmission lines. Optical fibre wave-guide. The electromagnetic spectrum: propagation in free space and the atmosphere, noise in free-space. Microwave link communication. Satellite communication. Optical fibre cables. Mobile communications.	10	20
4. INFORMATION AND CODING THEORY Information sources and Entropy; Information source coding; Channel coding-Hamming distance; Channel capacity; Error detection coding; Error correction coding; Encryption.	8	10
5. BROADBAND ISDN, SWITCHING & NETWORKS Broadband ISDN services, Network architecture, Signalling, Protocol Reference Model, Operation and maintenance, Asynchronous Transfer Mode (ATM), ATM Adaptation Layer, Physical Layer, SONET and SDH, Connectionless Service, Switching, Transfer Modes, Switches, Switching services in networks, High Speed Networks, Medium access control at high data rates, Fibre Distributed Data Interface (FDDI), Distributed Queue Dual Bus (DQDB), High performance parallel Interface (HIPPI), 100 base – VG, ATMLANS.		
Total	48	100

PRACTICALS:

1. Assemble and test 2/3 band radio receiver, fault finding and servicing the receiver.
2. Assemble and test AM/FM modulator, demodulator and detector.
3. Fibre optic link.
4. Study of optical fibre.
5. Study of LAN systems.
6. Study of modems.

FIELD VISIT:

Visit to A.I.R.

REFERENCE BOOKS:

1. Electronic Communication Systems by George Kennedy.
2. Electronic Communication Techniques by Young.