

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 1/5
Branch	Electronics and Telecommunication Engineering		Semester	V	
Course Code		Course Name	Medical Electronics		
Course Outcome 1	Explain the fundamentals of Bio-Electronics of human body.			Teach Hrs.	Marks
Learning Outcome 1	Define fundamentals of the biomedical. (Cognitive)			6	10
Contents	Human cell Human cell ionization characteristics. Bio-electric potential: Origin, Resting and action potential, depolarization and repolarisation Blood cells Pathophysiology of blood cells, parameters: RBC,WBC,Platelets, ESR,Hb,MCV,MCH				
Method of Assessment	Internal				
Learning Outcome 2	Classify the biomedical signals in human muscle. (Cognitive)			6	10
Contents	Cardiac muscle Electrophysiology of Heart Muscles Transmission of Cardiac impulse Brain Electrophysiology of Brain and neurons, Transmission of impulse, excitation of neurons, brain waves.				
Method of Assessment	Internal				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 3/5
Branch	Electronics and Telecommunication Engineering		Semester	V	
Course Code	E03	Course Name	Medical Electronics		
Course Outcome 2	Explain the working and principle of various therapeutic equipment.			Teach Hrs.	Marks
Learning Outcome 3	Illustrate the working of cardiac pacemakers, defibrillator and hearing aid. (Cognitive)			7	10
Contents	Therapeutic Equipment - Cardiac Implantable pacemakers- working principle with functional block diagram AC Defibrillator- working principle with functional block diagram, block diagram of microprocessor-based-defibrillator. Hearing aid- Working principle with functional block diagram				
Method of Assessment	External				
Learning Outcome 4	Describe the working of diathermy, Laser therapy and electrotherapy. (Cognitive)			7	10
Contents	Diathermy- working principle with Functional block diagram of microwave diathermy machine. Laser Retinal photo-coagulator- Types of lasers and their therapeutic applications, Functional block diagram of Retinal photo-coagulator. Electrotherapy –Types of waveforms used, working principle with Functional block diagram of electrotherapeutic muscle stimulator.				
Method of Assessment	External				
Learning Outcome 5	Demonstrate the working of various therapeutic equipment. (Psychomotor)			6	10
Contents	Demonstration of hearing aid, Diathermy, Laser therapy and electrotherapy equipment.				
Method of Assessment	Internal				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 4/5
Branch	Electronics and Telecommunication Engineering		Semester	V	
Course Code	E03	Course Name	Medical Electronics		
Course Outcome 3	Classify various medical measurement and analysis instruments.			Teach Hrs	Marks
Learning Outcome 6	Explain working of various blood constituents' measurement and analysis instruments. (Cognitive)			7	10
Contents	<p>Block Diagram of a Generalized Bio-Medical Instrument System</p> <p>Measurement and analysis Techniques:</p> <p>Coulter Blood cell counter- working principle with Functional block diagram. Various Blood parameters.</p> <p>Spectrophotometer- working principle with Functional block diagram. Analysis of blood.</p>				
Method of Assessment	External				
Learning Outcome 7	Compare different non-invasive measurement methods. (Cognitive)			7	10
Contents	<p>Finger-tip Oximeter – Blood parameters measured by oximeter. Ultrasonic Doppler-shift based FHR measurement, advantages.</p> <p>BP measurement- Define systolic & diastolic pressure, Working principle of Mercury BP measurement machine, Digital BP measurement machine.</p> <p>Rheographic method of BP measurement.</p>				
Method of Assessment	External				
Learning Outcome 8	Demonstrate various medical measurement techniques. (Psychomotor)			6	15
Contents	Demonstration of Finger-tip Oximeter, Mercury BP measurement machine, Digital BP measurement machine				
Method of Assessment	External				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 2/5
Branch	Electronics and Telecommunication Engineering		Semester	V	
Course Code	E03	Course Name	Medical Electronics		
Course Outcome 4	Identify the working of different bio potential recorders.			Teach Hrs.	Marks
Learning Outcome 9	Explain the working principle of ECG (Electro Cardio Graph). (Cognitive)			7	10
Contents	Bio potential Recorders: Block diagram of ECG, isolated preamplifier, ECG leads, effects of artefacts on ECG recordings, Multichannel ECG machine, specifications, Applications of ECG.				
Method of Assessment	External				
Learning Outcome 10	Define the principle of EEG (Electro Encephalon Graph). (Cognitive)			6	10
Contents	Block diagram of EEG machine, 10-20 electrode placement system for EEG, Evoked potential, specifications, applications, advantages and disadvantages.				
Method of Assessment	Internal				
Learning Outcome 11	Demonstrate the working and recording of ECG and EEG. (Psychomotor)			6	15
Contents	Demonstration, operation and recording of ECG and EEG machines.				
Method of Assessment	External				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 5/5
Branch	Electronics and Telecommunication Engineering		Semester	V	
Course Code		Course Name	Medical Electronics		
Course Outcome 5	Compare various type of imaging systems of medical electronics.			Teach Hrs	Marks
Learning Outcome 12	Differentiate between Endoscope and CT imaging. (Cognitive)			7	10
Contents	Working principle of Imaging systems: Endoscope- Endoscope imaging machine, applications, specifications, advantages and disadvantages. Computerized tomography CT Scan- basic principle, block diagram of a typical CT imaging system, advantages, disadvantages and applications of CT imaging.				
Method of Assessment	External				
Learning Outcome 13	Explain the working principle of ultrasonography. (Cognitive)			6	10
Contents	Ultrasonography- Properties of ultrasonic waves, Principles of imaging, basic components of imaging system, applications, advantages and disadvantages of Ultrasonic imaging.				
Method of Assessment	External				
Learning Outcome 14	Demonstrate various medical imaging techniques. (Psychomotor)			6	10
Contents	Demonstration of Endoscope, CT scan, Ultrasonography machine.				
Method of Assessment	Internal				

Suggested List of Experiments:

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ReferenceBooks/WebPortals:

S.N.	Title	Author/Publisher
1	Human Anatomy and Physiology SB Shah Publication	Dr. Ramesh K Goyal, Dr. Gandhi
2	Elements of Pharmacology SB Shah Publication	Dr. Ramesh K Goyal,Dr. Anita, Dr. R Balaraman, Dr.Mahesh D Burande
3		
4		
5	spoken-tutorial.org	
6.	nptel.ac.in	
7.	swayam.gov.in	