SEMESTER - I & II			
CORE PRACTICAL-II GENERAL PHYSICS			
Code :21PPHCR2	Hrs/Week: 3	Hrs/Semester:45	Credits: 3

## (Any 12 Experiments)

- 1. Hall Effect, Carrier concentration.
- 2. BH curve tracing and Hysteresis loss
- 3. Elliptical fringes Young's modulus
- 4. Resistivity of semiconductor by Four Probe method at different temperatures
- 5. Resistivity two probe measurement at different temperatures.
- 6. Band Gap measurement
- 7. Determination of dielectric constant for Ferro electric substance
- 8. LASER Experiment: Thickness of insulation of a wire by Diffraction method
- 9. Solar spectrum
- 10. Iodine Absorption Spectra
- 11. Polarizability of liquids using hollow prism
- 12. Susceptibility- Quincke's method
- 13. Hyperbolic fringes Young's modulus of glass plate
- 14. Rydberg's constant
- 15. Ultrasonic interferometer
- 16. Refractive Index of the liquid at various concentrations using laser
- 17. Wavelength of He-Ne laser
- 18. Resolving Power of grating and prism using spectrometer.

SEMESTER - II			
ELECTIVE - II A. BIO-MEDICAL INSTRUMENTATION			
Code :21PPHE21	Hrs/Week: 6	Hrs/Semester:90	Credits: 4

# **Objectives:**

- Give the students basic knowledge about different life saving machines
- Enable the students to understand the principle behind the working of these instruments

## **Course Outcomes:**

CO No.	Upon completion of this course, students will be able to		CL
		addressed	
CO 1	Define resting and action potentials	1	Re
CO 2	Classify the uses of electrode paste	1	Ар
CO 3	Discuss the principle of operation of different types of	1	Un
	transducers		
CO 4	Interpret the output of bio potential recorders such as ECG,	1	Ev
	EEG and EMG		
CO 5	Investigate internal and external pacemakers	1	An
CO 6	Illustrate the working of different kinds of radiation	1	Ap
	monitoring instruments		
CO 7	Recognise the importance of computers in medicine	1	Un
CO 8	Evaluate the need for various imaging techniques such as	1	Ev
	Computer Tomography, Thermography and MRI		

SEMESTER - II			
ELECTIVE - II A. BIO-MEDICAL INSTRUMENTATION			
Code :21PPHE21	Hrs/Week: 6	Hrs/Semester:90	Credits: 4

### UNIT I: Human physiological systems and transducers

Cells and their structure-resting and action potentials – Design of medical instruments – Components of the Bio-medical instrument system – Electrodes: electrode potential-purpose of electrode paste-electrode material-Types of electrodes – Transducers Types: active – magnetic induction type-piezoelectric-photovoltaic-thermo electric-passive-resistive

### **UNIT II: Bio-Potential Recorders**

Introductions- characteristics- ECG: origin-lead configuration-practical considerationanalysis – EEG: origin-brain waves –analysis – EMG:recording set up-determination of conduction velocities in motor nerves

### **UNIT III: Physiological Assist Devices And Operation Theatre Equipments**

Pacemakers: energy requirements to excite heat muscle-methods of stimulationdifferent modes of operation:Ventricular synchronous pacemaker-Atrial synchronous pacemaker Kidney Machine: Renal function-dialysis-hemodialysis-peritoneal dialysis – Ventilators – Anesthesia machine

### **UNIT IV: Safety Instruments**

Radiation Safety Instrumentation-Physiocological Effect due to 50 Hz current passage – Microshock and Macroshock – Electrical accidents in hospitals – Devices to protect against electrical hazards.

### **UNIT V: Advances In Biomedical Instrumentation**

Computers in medicine – Lasers in medicine – Endoscopes – cryogenic surgery – Nuclear Imaging techniques – Computer Tomography –MRI

### **Text Books:**

1. Dr. Arumugam M. *Biomedical Instrumentation*. Chennai: Anuradha publications. 10th Edition 2013.

SEMESTER - II				
ELECTIVE II B. MICROPROCESSOR AND MICROCONTROLLER				
Code :21PPHE22	Hrs/Week: 6	Hrs/Semester: 90	Credits: 4	

# **Objectives:**

- Enable the students to understand microprocessor and microcontroller
- Enable them to write simple programs
- Enable them to interface microprocessor and microcontroller with other simple devices

## **Course Outcomes:**

CO No.	Upon completion of this course, students will be able to	PSOs	CL
		addressed	
CO 1	Understand the architectures and instruction sets of	1	Un
	microprocessors and microcontrollers		
CO 2	Verify bus transactions, memory organisation and address	1	Ev
	decoding, basic I/O interfaces and port addressing		
CO 3	Apply and implement learned algorithm design techniques	2	Ар
	and data structures to solve the problems		
CO 4	Understand the interfacing of peripheral devices like I/O	1	Un
	ports, keyboards, displays, ADCs, DACs, stepper motor		
CO 5	Analyze concepts associated with interfacing a	6	An
	microprocessor to memory and to I/O devices		
CO 6	Estimate how to control components of a microprocessor	4	Cr
	based system through the use of interrupts		
CO 7	Recall a microprocessor programming model at a level that	6	Re
	enables to write assemble language programs for the		
	processor meeting given specifications		
CO 8	Understand the popular 8051 Microcontroller ,the processor	1	Un
	family and Time delay		

SEMESTER - II				
ELECTIVE II B. MICROPROCESSOR AND MICROCONTROLLER				
Code :21PPHE22	Hrs/Week: 6	Hrs/Semester: 90	Credits: 4	

### **UNIT I: Microprocessor Architecture and Instruction set**

Intel 8085 Architecture-Instruction format-8085 programming model-instruction classification-8085Instructionset – Data transfer operations –Arithmetic instructions – Logic operations-Branch operations.

## **UNIT II: Microprocessor Programming & Counters and Time Delays**

Writing assembly language programs-Programming techniques: Looping, Counting and Indexing –Stack-Subroutine- -8085 Interrupt-counters and time delays

### **UNIT III: Microprocessor Interfacing**

Techniques for time delay-Basic interfacing concept-8255(PPI)-Interfacing Keyboard and Seven Segment Display- Microprocessor based stepper motor-waveform generator using ADC and DAC

## **UNIT IV: Microcontroller Programming**

Addressing mode of microcontroller 8051-arithmetic and logical instruction-8051 assembly language programmes: addition, subtraction, division, multiplication- interfacing 8051 with LED display and keyboard.

## **UNIT V: Addressing Modes & Delay**

Register Addressing -Direct byte addressing- Register indirect addressing-Immediate addressing-Logical Instructions-Time delay for 8051-Assembling and running an 8051 program

### **Text Books:**

- 1. Ramesh Gaonkar. *Microprocessor Architecture Programming and Applications with The* 8085. India: Penram International Publishing Private Limited. Fifth edition. 2011.
- Karuna Sagar D, *Microcontroller*, 8051. Delhi: Narosha publishing house PVT Ltd, Print.2011.
- 3. Dr.Godse A P. *Microprocessor and Microcontroller*. Technical Publications. Fourth Revised edition.2017.

## **Books for reference:**

- 1. Aditya.P.Mathur. *Introduction to Microprocessors*. New Delhi: Tata Mc Graw Hill Education P Ltd. Third Edition.
- 2. Ram B and Sanjay Kumar. *Fundamental of microprocessors and micro controllers*. New Delhi: Dhanpat rai Publications (P) Ltd. seventh revised Edition.