SEMESTER VI

Elective III

INSTRUMENTATION

Instructional Hrs: 60   **Sub. Code:15PHUE603**

Max. Marks: CIA – 25: ESE - 75   **Credits: 4**

Objective: To enable the students to understand all aspects of electronic instruments.

UNIT I   **12 Hrs.**

Qualities of Measurements: Classification of Instrument- Factors in making measurements - Errors in measurement, accuracy – precision - significant figures - statistical analysis - probability of error - limiting error,- Categories of Errors –Electrical standards.

UNIT II   **12 Hrs.**

Bridges: Wheatstone's bridge – Kelvin's bridge – AC bridges –Hay's bridge – Anderson Bridge – De Sauty Bridge-Carey Foster Bridge.

UNIT III   **12 Hrs.**

Transducers: Introduction -Resistive transducer- strain gauges: unbonded resistance wire strain gauge -Inductive transducer –LVDT -Capacitive transducer –Piezoelectric transducer – Photo electric transducer – Temperature transducer.

UNIT IV   **12Hrs.**

Digital Instruments: Digital multimeter- Digital voltmeter- Digital frequency meter- Measurement of pH- Digital tacometer – Digital phase meter- Digital measurement of time- Digital capacitance meter.

UNIT V   **12 Hrs.**

Display and Recording Devices: Cathode ray oscilloscope – Liquid Crystal Display (LCD)– Bar graph display-Segmental and dot matrix display – Null type recorders: Potentiometric recorders –(X-Y) Recorder, Magnetic tape recorders – Digital data recording – Data loggers.

TEXT BOOK

1. **Joseph J. Carr Pearson.**, "*Elements of Electronic Instrumentation and Measurements*", III

  edition.

2.**Kalsi H.S.,** "*Electronic Instrumentation*", Third Edition, Tata McGraw-Hill Company, New

Delhi, 2010.

3. **Sawhney A.K.,** "A course in Electrical and Electronic Measurement and Instrumentation", DhanpatRai and Sons, New Delhi, 2013

REFERENCES

1.**Albert D. Herlfrick& William D. Cooper.,** "*Modern electronic Instrumentation & Measurement Techniques*" Prentice Hall of India,2002.

2. **Bell, A.D.,** "*Electronic Instrumentation and Measurements*", 2nd Edition, Prentice Hall of India, New Delhi, New Delhi, 2003

FUNDAMENTALS OF MICROPROCESSORS

Instructional Hrs.: 60   **Sub. Code: 15PHUE602**

Max. Marks: CIA-25; ESE-75   **Credits: 4**

Objective: The purpose is to understand the basics of 8085 Microprocessor and to provide an in-depth knowledge in programming.

UNIT I   **12 Hrs.**

Introduction to Microprocessors and Architecture of 8085 Microprocessor: Evolution of Microprocessors – Microprocessor Based System (Micro computer) –8085 Microprocessor – Pin functionsof 8085 Microprocessor – Architecture of 8085Microprocessor – ALU – Registers – Accumulator – Flag register – program counter – Stack pointer – Bus: Address Bus – Data bus – Control bus.

UNIT II   **12 Hrs.**

Instruction set of 8085:*Computer languages –Machine language – Assembly language – High level language–* Instruction format –Opcode – Operand – Classification of instruction based on length – Classification of instruction based on function: Data transfer instructions – Arithmetic instructions –Logic instructions–Branch instructions– Machine control instructions– Stack – Subroutines– Addressing Modes.

UNIT III   **12 Hrs.**

Microprocessor Timings: Timing and Control Unit – Instruction Cycle –Machine Cycle– T-State–Fetch operation – Execute Cycle –Instruction and Data Flow – Timings of Intel 8085 –

OP Code Fetch Cycle – Memory And I/O Read Cycle – *Memory And I/O –Write Cycles*– Programming Techniques using Looping, Counting and Indexing.

UNIT IV 12 **Hrs.**

Interfacing Memory and I/O Devices: Introduction – *Address Space Partitioning* – Memory mapped I/O scheme – I/O Mapped I/O scheme –*Address Map* – Address Decoding using 3 to 8 Decoder(74LS138) – Memory Interfacing(2K x 8 EPROM and RAM) – Data Transfer Schemes : Programmed Data Transfer – Synchronous, Asynchronous, Interrupt Driven Data Transfer – DMA Principles – 8255 Programmable Peripheral Interface – Programming the 8255.

UNIT V 12 **Hrs.**

Assembly language programs and Microprocessor Applications: Assembly language programs for i) Addition of two 8 - bit numbers ii)Subtraction of two 8 - bit numbers iii) Multiplication and Division of 8 - bit numbersiv) Greatest and Smallest number in an array of 8 - bit numbers– Code Conversion:*BCD to Binary – Binary to BCD*—A temperature monitoring system – Microcontroller 8051(Block Diagram)

Note: *Italics* **denotes Self study Topics**

TEXT BOOKS

1.Aditya P Mathur.,*"Introduction To Microprocessors",* Tata McGraw –Hill Publishing Company Ltd., New Delhi, 3rd Edition.

2.Ram B.,"*Fundamentals of Microprocessors and Microcomputers" ,*DhanpatRai

Publications(p) Ltd.,New Delhi, 6th Edition, 2005**.**

3.Ramesh Gaonkar., "*Microprocessor, Architecture, Programming and Applications with the 8085***",Penram Interrnational Publishing (India)Private Limited, Mumbai, 5th Edition.

REFERENCE BOOKS

1. Anokh Singh, Chhabra A.K., **"***Fundamentals Of Microprocessor And Its Applications***"** S.Chand& Company Ltd., New Delhi, First Edition, 2005**.**

2.   V.Vijayendran.,   "*Fundamentals   Of   Microprocessor-8085"***,Viswanathan Publication,Chennnai, First Edition 2002.