

Department of Physics

Revised Syllabus of II Year Diploma Program

Preamble:

Diploma in Instrumentation is three year integrated course for under graduate students. The students from Physics should be competent about handling and measurements of various instruments. In this diploma course students will be able to understand basics of instruments used in Physics.

Program Objectives of the Course:

1. To enhance the students practical knowledge.
2. To make the students aware about handling of instruments.
3. To make them aware of basic electronic components.

Program Outcomes:

1. Student should able to understand the handling of electronic instruments
2. Student should able to understand basic electronic components.

II Year Diploma Programme

1. Title: Instrumentation
2. Year of Implementation: 2021
3. Duration: One Year
4. Pattern: Semester
5. Medium of Instruction: English
6. Contact hours: 7 hours/week
8. Structure of Course:

Syllabus Structure (UG)

Year	Semester	Course No.	Course Code	Contact Hours	Credits (1Credit=15 H)	Total Marks
2	III	CT III	DPT 303	30	2	75
		CL III	DPL303	60	2	75
	IV	CT IV	DPT 404	30	2	75
		CL IV	DPL404	60	2	75
	Annual	CP II	DPP202	30	1	50
	Industrial and or Incubation and or Research and or Field Training			30	1	-
			Total		240	10

D: Diploma, Departmental Code (P: Physics)

C: Course, T: Theory, L: Lab (Practical), P: Project

Total No. of Courses: 10 (Theory: 06, Practical: 06, Project: 03) Theory and Practical: Semester, Project: Annual

Semester III

DPT 303: Instrumentation III

(Contact Hrs: 30 Credits: 2)

Learning Objectives:

Students will be able to

1. Understand structure and working of AC and DC motor.
2. Understand spectrometer, telescope, sextant and BG galvanometer
3. Understand handling of travelling microscope.

Unit I: AC and DC Motors

(15)

AC and DC sources, DC motors, constructions, types of DC motors: series motor, shunt motor, compound motor, Classification of AC motors: synchronous and asynchronous motors

Unit II: Instruments

(15)

Spectrometer, travelling microscope, Telescope, Sextant, ballistic galvanometer, principle, construction and working of each instrument.

Learning Outcomes:

After completion of the unit, Student is able to

1. Understand AC and DC motor working and handling
2. understand about handling of instruments like spectrometer, travelling microscope, telescope, sextant and galvanometer

Reference Books:

1. A test book in electrical technology- B. L. Theraja- S chand and co.
2. Performance and Design of AC machines – M.G. Say, ELBS Edn

Practicals

(Contact Hrs: 60 Credits: 02)

DPL303: Instrumentation (Practical)

Learning Objectives: Students will be able to

1. Understand handling of traveling microscope.
2. Understand use of spectrometer to study dispersion of light.
3. Understand handling of BG to measure current and voltage sensitivity.
4. Understand the handling of telescope.

List of Practical's (15)

1. Measurement of diameter / radius of capillary bore.
2. Calibration of spectrometer.
3. Measurement of resistance by using P.O box.
4. Transistor series voltage regulator.
5. Measurement of R.C phase shift
6. Determination of angle of prism by spectrometer
7. Measurement of current sensitivity of B.G.
8. Measurement of voltage sensitivity of B.G.
9. Measurement of figure of merit of B.G.
10. Measurement resistance of galvanometer by half deflection method
11. Magnifying power of Telescope.
12. Resolving power of Telescope
13. Sextant
14. Focusing of spectrometer for parallel light.
15. Measurement of resistance of galvanometer by Kelvin method.

Learning Outcomes:

After completion of the unit, Student is able to

1. Understand handling of traveling microscope.
2. Understand use of spectrometer to study dispersion of light.
3. Understand handling of BG to measure current and voltage sensitivity.
4. Understand the handling of telescope.

Reference Books:

1. B.Sc. Practical Physics by by Singh Harnam, Hemne P.S.
2. Performance and Design of AC machines – M.G. Say, ELBS Edn

Semester IV**DPT 404: Instrumentation IV**

(Contact Hrs: 30 Credits: 2)

Learning Objectives:

Students will be able to

1. Understand structure and working of Cathode Ray Oscilloscope.
2. Understand working and maintenance of electrical appliances.

Unit I: Cathode Ray Oscilloscope (15)

Block diagram of CRO, construction of cathode ray tube, time base operation, synchronization, front panel controls, uses of CRO, measurement of D.C, A.C, voltages Time period, frequency and phase difference, special features of dual trace CRO.

Unit II: Maintenance of Electrical Appliances (15)

Principles of working, parts and servicing of Electric fan, Electric Iron box, Water heater, Induction heater.

Learning Outcomes:

After completion of the unit, Student is able to

1. Understand structure and working of Cathode Ray Oscilloscope.
2. Understand working and maintenance of electrical appliances.

Reference Books:

1. A test book in electrical technology- B. L. Theraja- S chand and co.
2. Performance and Design of AC machines – M.G. Say, ELBS Edn

Practicals

(Contact Hrs: 60 Credits: 02)

DPL404: Instrumentation (Practical)**Learning Objectives:**

Students will be able to

1. Understand use of CRO for measurement of AC and DC voltage and frequency.
2. Understand Lissajous figure.
3. Understand structure and working of rectifier.
4. Understand working and maintenance of electrical appliances.

List of Practical's (15)

1. Bridge rectifier with π filter
2. Low pass filter
3. High pass filter
4. Identification of tools.
5. Measurement of resistance of galvanometer by Kelvin method.
6. Measurement of A.C voltage using C.R.O
7. Measurement of D.C voltage using C.R.O
8. Measurement of frequency using C.R.O

9. Measurement of frequency by Lissajous figure
10. Testing of electronic components by C.R.O
11. Measurement of phase shift of RC network using CRO
12. Servicing of Electric fan,
13. Servicing of Electric Iron box
14. Determine room temperature resistance of a given coil by P. O. box
15. Study of LR circuit

Learning Outcomes:

After completion of the unit, Student is able to

1. Understand use of CRO for measurement of AC, DC voltage and frequency.
2. Understand Lissajous figure.
3. Understand structure and working of rectifier.
4. Understand working and maintenance of electrical appliances.

Reference Books:

1. A test book in electrical technology- B. L. Theraja- S chand and co.
2. Performance and Design of AC machines – M.G. Say, ELBS Edn

CP-II: DPP202: Project
(Contact Hrs. 60, Credits: 2)

BOS Sub-Committee

1. Dr. P. K. Pagare-Chairman
2. Mr. S. D. Jituri-Member

Expert Committee

1. Dr. Bobade D.H., C.T. Bora College
2. Mr. Shambhuraj Yadav (Electra Solar Energy Systems, Satara))