

Physics (Vocational Skill Course)

Course code: USPHPVSC1

Title: - Laboratory Equipment Maintenance

Course Objectives

After successful completion of this course students will be able to:

1. learn to identify and testing of electronic components.
2. Detecting faults in circuits and troubleshooting them.
3. Repair of different types of laboratory power supplies.
4. Learn Maintenance of basic laboratory equipment's.

Course Objectives practical's:

After successful completion of this course students will be able to:

1. Identify different types of wires, power cables, probes, fuses etc.
2. Identify, measure and testing of various types passive components and semiconductor devices.
3. Understand Soldering and desoldering given circuit on PCB and testing
4. Learn about of A.C & D.C. power supply & troubleshooting

Course Outcomes

After successful completion of this course students will be able to:

1. Gain knowledge of the different electronic components
2. Establish a basis for honing their practical electronics skills
3. Develop a lucrative and advanced profession in electronics.
4. Understand maintenance of basic laboratory equipment's

Course Outcomes Practicals:

After successful completion of this course students will be able to:

1. Comprehend to identify and testing of electronic components.
2. Understand to identify faulty components and troubleshoot circuits
3. Acquire skills of circuit Soldering and desoldering of electronic components in a given circuit
4. Comprehend hands on experience in handling and maintaining laboratory/electronic equipment.

Unit-I (15 Periods)

Testing of Passive Electronic Components using Digital Multimeter (DMM)

Passive components - resistors, capacitors, inductors, failures in fixed resistors, testing of resistors,

variable resistors, variable resistor as potentiometer, measuring resistors using color codes.

Testing of various types of capacitors & inductors.

Unit-II (15 Periods)

Testing of semiconductor devices, soldering and troubleshooting.

Semiconductor devices: diode, bipolar junction transistors etc, causes & types of failures in semiconductor devices.

Basics of soldering: soldering alloy, soldering iron, soldering & desoldering, dry soldering and good contact.

Laboratory Power supplies – basic testing and troubleshooting.

List of Experiment

- 1.To identify different types of Wires, power cables, probes, fuses used in the laboratory and check their continuity using DMM
- 2.Identification of various types passive components - resistors, capacitors and inductors used in laboratory.
- 3.Measurement of resistors using colour codes & DMM and testing of capacitors and inductors.
- 4.Identification of various types of semiconductor devices: diode, bipolar junction transistors, Field effect transistors etc.
- 5.Testing of semiconductor devices: diode, bipolar junction transistors, Field effect transistors etc.
- 6.Soldering and desoldering of electronic components in a given circuit
- 7.Mounting simple circuit on PCB and testing.
- 8.Troubleshooting a given circuit.
- 9.Study of a.c power supply & troubleshooting
- 10.Study of d.c power supply and troubleshooting

Reference Books

- 1.Text book of Electrical Technology, by B.L. Theraja and A.K. Theraja
2. Modern Electronic Equipment: Troubleshooting, Repair and Maintenance by Khandpur, TMH 2006
3. Electronic Instruments and Systems: Principles, Maintenance and Troubleshooting by R. G. Gupta
Tata McGraw Hill Edition 2001
4. Student Reference Manual for Electronic Instrumentation Laboratories by Stanley Wolf, and
Richard F. M. Smith, Prentice Hall of India Pvt. Ltd. New Delhi
5. Consumer Electronics by S. P. Bali, Pearson
6. Troubleshooting and Maintenance of Electronic Equipment by K. Sudeep Singh

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1. Modern Electronic Equipment: Troubleshooting, Repair and Maintenance by Khandpur, TMH 2006
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Internal Continuous Assessment: 40% (20 Marks)	Semester End Examination: 60% (30 Marks)
Continuous Evaluation through: Practical's	

Format of Question Paper: 30 Marks Duration: One Hour

VSC: 2 credits

VSC of 2 credits, Duration: 60 Hrs , Total marks: 50

(30 Marks for Theory paper + 20 Marks for Practical Exam.)

Semester End Theory Examination: 60% (30 Marks)	Internal Semester End Practical Examination: 40 % (20 Marks)
As per paper pattern attached	As per practical exam. pattern attached

Theory Paper Pattern for 30 marks Semester End Theory Examination:

1. Duration - These examinations shall be of **one hours** duration

Duration: 1 Hrs

Total Marks -30

Unit -I (15Marks)	Q:1 A) Attempt any Two 10Marks i) Theory ii) Theory iii) Theory iv) Theory B) Attempt any One 05 Marks i) Problem ii) Problem
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Unit -II (15Marks)	Q:2 A) Attempt any Two i) Theory ii) Theory iii) Theory iv) Theory B) Attempt any One i) Problem ii) Problem	10Marks 05 Marks
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Internal Practical Examination Pattern for 20 marks Semester End Examination:

1. Duration - These examinations shall be of **Two hours** duration in laboratory

Sr. No.		Total 20 Marks
1	One Experiment	15 Marks
2	Certified Journal	3 Marks
3	Vi-va	2 Marks