



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with ‘B+’ grade by NAAC)

DEPARTMENT OF PHYSICS

CERTIFICATE COURSE IN INSTRUMENTATION

AND HOME APPLIANCES – SYLLABUS

(Under CBCS based on OBE) (For those admitted during 2024 – 2025 and after)

1

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24CPSC11	INTRODUCTION TO INSTRUMENTATION	CERTIFICATE COURSE	20 Hrs.	-	-

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	-	-	100	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input checked="" type="checkbox"/>
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COURSE DESCRIPTION:

This certificate course provides an introduction to the instrumentation and provide the knowledge about the working of Home appliances by applying the principles of Physics.

COURSE OBJECTIVES:

- To identify and categorize the most common household equipments
- To understand the basic principles of domestic equipments
- To predict the goodness or age estimation of domestic equipments
- To perform layman checks and rectify minor defects
- To troubleshoot the defects of the most common household equipments

COURSE OUTCOMES (COs):

At the end of this course, students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom’s Taxonomy)
CO1	suggest & do remedial measures in the domestic equipment	Upto K3
CO2	provide useful tips to users for prolonged usage	Upto K3
CO3	adopt proper handling procedures of the domestic equipment	Upto K3
CO4	do layman checks and identify the problems in the home appliances	Upto K3
CO5	familiarize and understand the maintenance of household equipment	Upto K3

K1–KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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INTRODUCTION TO INSTRUMENTATION

UNIT – I: MEASURING INSTRUMENTS

Introduction – Cathode Ray Oscilloscope – signal generator – Multimeter – Working principles and Usages.

UNIT – II: RESISTANCE IN CIRCUITS

Necessity – Various instruments like Voltmeter, ammeter and galvanometer – their types – resistor types – values and codes – Ohm's law – resistivity and conductivity – photocell – thermistor combination.

UNIT – III: CAPACITORS IN CIRCUITS

Capacitors – various types – combination – time constant – charging – AC capacitor – DC capacitor – spike generator

UNIT – IV: INDUCTORS AND DIODES

Inductors working – time constant – transformer – electromagnetic relays – meaning of diodes – V-I characteristics – diodes for rectification – Zener diodes – p-n junction

UNIT – V: TRANSISTOR IN CIRCUITS

Introduction – pnp and npn transistors- current through a transistor – output characteristics – testing the transistor – power dissipation – transistor relay drivers – load line – transistor ratings.

REFERENCE BOOK:

Basic Electronics by Hodder and Stoughton, School Council.

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	2	1	2	3
CO2	1	2	3	2	3	2
CO3	2	1	2	2	2	2
CO4	2	2	3	3	2	2
CO5	2	1	2	3	3	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24CPSC12	PRINCIPLES OF PHYSICS IN HOME APPLIANCES	CERTIFICATE COURSE	20 Hrs.	-	-

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	-	-	100	100

NATURE OF COURSE	Employability	Skill Oriented	Entrepreneurship
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

COURSE DESCRIPTION:

This certificate course provides an introduction to the Principles of Physics in Home Appliances and provide the knowledge about the working of Home appliances by applying the principles of Physics

COURSE OBJECTIVES:

- To identify and categorize the most common household equipment
- To understand the basic principles of domestic equipment
- To predict the goodness or age estimation of domestic equipment
- To perform layman checks and rectify minor defects
- To troubleshoot the defects of the most common household equipment

COURSE OUTCOMES (COs):

At the end of this course, students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO1	suggest & do remedial measures in the domestic equipment	Upto K3
CO2	provide useful tips to users for prolonged usage	Upto K3
CO3	adopt proper handling procedures of the domestic equipment	Upto K3
CO4	do layman checks and identify the problems in the home appliances	Upto K3
CO5	familiarize and understand the maintenance of household equipment	Upto K3

K1–KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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PRINCIPLES OF PHYSICS IN HOME APPLIANCES

UNIT – I: HOUSE WIRING

Symbols of electrical parameters - Switches- plug wires –phase, neutral and earth wire cables- fuse- lamp holders- distribution of electricity in a house- transformer- inverter-UPS

UNIT – II: EARTHING

Necessity of earthing – materials and methods used for earthing – First aid on electric shock precautions to be observed while installing different electric appliances in houses

UNIT – III: WORKING PRINCIPLE OF BULB AND MOTORS

Working principle of CFL- tube light-electric motor- mixer and grinder

UNIT – IV: HOME APPLIANCES

Electric cooker-iron box-water heater-washing machine-refrigerator

UNIT – V: PRINCIPLES OF TROUBLE SHOOTING AND REPAIRING

Use of multimeter and line tester-tube light circuits-iron box connection- switches board wiring – fan-regulator condition.

REFERENCE BOOKS:

1. L. Palaniappan, *Hand Book on Home Appliances*, S.P. Publications, Chidambaram, TN, 1st Edition, 2019: ISBN No. 978-93-5351-441-9.
2. Eric Keinert, *Troubleshooting and Repairing Major Appliances*, McGraw – Hill Professional Publishers 2014, New Delhi.
3. Haper, *How Things Work Vol I and II. The Universal Encyclopedia of Machines*, Collin. Pub. India PVT. Ltd (1992).
4. Manahar Lottia, *Modern mobile phone service system*, BPB Publication, New Delhi (2001)
4. Anwani I.M, *Electrical Appliances: Theory and Repair*, R.B. Publication, Enlarged and new Edition, Delhi (1981).
5. Sujatha, *Yen, Yetharku, Yeppadi (Tamil)*, Vikadan Pirasuram, 2005, Chennai.

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	2	1	2	3
CO2	1	2	3	2	3	2
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3. Advanced Application 2. Intermediate Development 1. Introductory Level