

Maharashtra State Board of Technical Education, Mumbai

Laboratory Plan (LP-PR)/ Course Information Sheet (CIS)

K-2

Academic Year: 2025-26

Date: 15/12/2025

Institute Name: K. K. Wagh Polytechnic, Nashik

MSBTE Code: 0078

Program and Code: Computer Technology (CM)

Course Code & Abbr.: 312302 (BEE)

Course Name: Basic Electrical & Electronics Engineering (BEE)

Name of Faculty: Ms.S.B.Pund

Class: FYCM-Lin **Semester:** 2nd **Scheme:** K

Course Index: CI 202 **Learning Hrs.:**30

• Teaching-Learning & Assessment Scheme:

Title	Course Code / Abbr	Course Category	Learning Scheme					Credits	TH Paper Duration	Assessment Scheme										Total Marks
			Actual Contact Hrs/Week			SLH	NLH			Theory				Based on LL & TSL Practical				Based on SL		
			CL	TL	LL					FA TH	SA TH	Total		FA-PR		SA-PR		SLA		
																			Max	
312302	BASIC ELECTRICAL AND ELECTRONIC S ENGINEERING	BEE	4	-	4	2	10	5	1.5	30	70*#	100	40	50	20	50 @	20	50	20	250

Abbreviations: CL- Class Room Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, SLA - Self Learning Assessment

Legends: # External Assessment

• Course Outcomes (COs): Theory & Practical

By learning course Database Management System (BEE-312302) First Year Students will be able to:

CO No.	Course Outcomes (COs) / Unit Outcomes (UOs)
CO202.1(CO1)	Calculate and measure basic electrical quantities and parameters.
CO202.2(CO2)	Use different electrical machines by making connections.
CO202.3(CO3)	Use electrical safety devices in electrical circuit.

• COs, Practical Laboratory Learning Outcome (LLOs) and Mapping:

Pr. No	COs	LLO	Practical -Laboratory Learning Outcome (LLO)
PR 1	CO202.1 (CO1)	LLO 1.1 LLO 1.2	Use electrical meters for measurement of electrical parameters. Identify presence of magnetic flux lines. Identify presence of magnetic flux lines.
PR 2	CO202.2 (CO1)	LLO 2.1	Interpret the AC waveform for resistive and inductive circuit displayed on CRO
PR 3	CO202.3 (CO1)	LLO 3.1	Measure the phase difference between voltage and current in the AC circuit of the inductive circuit.
PR 4	CO302.3 (CO3)	LLO 4.1 LLO 4.2	Measure the line voltage, phase voltage a, phase current, and line current in three phase star connected balanced load. Determine phase voltage and line current relation in star connected load.
PR 5	CO302.3 (CO3)	LLO 5.1	Find the phase voltage and line current relation in delta connected load.
PR 6	CO302.3 (CO3)	LLO 6.1	Determine the transformation ratio.
PR 7	CO302.3 (CO3)	LLO 7.1	DC shunt motor operation.
PR 8	CO302.3 (CO3)	LLO 8.1	DC series motor operation
PR 9	CO302.3 (CO3)	LLO 9.1	Speed reversal of universal motor.

PR 10	CO302.3 (CO3)	LLO 10.1	Demonstrate stepper motor operation.
PR 11	CO302.3 (CO3)	LLO 11.1	Use of multimeter for measurement.
PR 12	CO302.3 (CO3)	LLO 12.1	Connection of fuses in electrical circuit.
PR 13	CO302.3 (CO3)	LLO 13.1	Connection of MCB in electrical circuit
PR 14	CO302.3 (CO3)	LLO 14.1	Connection of ELCB in electrical circuit.
PR 15	CO302.3 (CO3)	LLO 15.1	Measurement of earth resistance.

• **Practical Plan:**

Sr No	COs and LLOs	Practical Titles	Planned Dates		Remark & Faculty Sign with Assessment Date
			From	To	
1	CO1 LLO 1.1	Measure the parameters of simple electrical and identify presence of flux lines in magnetic circuit.(e.g. current, voltage, power, flux)	A-15/12/2025 B-16/12/2025 C-17/12/2025	A-15/12/2025 B-16/12/2025 C-17/12/2025	
2	CO3 LLO 1.3	Measure frequency, time period, rms value, peak value of sinusoidal AC waveform for resistive and inductive circuit using CRO.	A-22/12/2025 B-23/12/2025 C-24/12/2025	A-22/12/2025 B-23/12/2025 C-24/12/2025	
3	CO3 LLO 1.3	Measure the line voltage, phase voltage and phase current and line current in three phase star connected balanced load	A-29/12/2025 B-30/12/2025 C-31/12/2025	A-29/12/2025 B-30/12/2025 C-31/12/2025	
4	CO3 LLO 1.3	Measure the line voltage, phase voltage and phase current and line current in three phase delta connected balanced load.	A-05/01/2026 B-06/01/2026 C-07/01/2026	A-05/01/2026 B-06/01/2026 C-07/01/2026	
5	CO3 LLO 1.3	Determination of the voltage and current ratio of single phase transformer.	A-12/01/2026 B-13/01/2026 C-14/01/2026	A-12/01/2026 B-13/01/2026 C-14/01/2026	
6	CO3 LLO 1.3	Operate DC shunt motor by connecting three point starter.	A-19/01/2026 B-20/01/2026 C-21/01/2026	A-19/01/2026 B-20/01/2026 C-21/01/2026	
7	CO3 LLO 1.3	Operate DC series motor by connecting two point starter	A-02/02/2026 B-27/01/2026 C-28/01/2026	A-02/02/2026 B-27/01/2026 C-28/01/2026	
8	CO3 LLO 1.3	Reverse the direction of rotation of universal motor	A-09/02/2026 B-03/02/2026 C-04/02/2026	A-09/02/2026 B-03/02/2026 C-04/02/2026	
9	CO3 LLO 1.3	Use multimeter for measurement of voltage, current (AC,DC), resistance and continuity of the given electrical circuit.	A-16/02/2026 B-10/02/2026 C-11/02/2026	A-16/02/2026 B-10/02/2026 C-11/02/2026	
10	CO3 LLO 1.3	Connect fuse in electrical circuit and check its operation at normal and abnormal conditions.	A-23/02/2026 B-24/02/2026 C-25/02/2026	A-23/02/2026 B-24/02/2026 C-25/02/2026	
11	CO3 LLO 1.3	Connect MCB in electrical circuit and check its operation at normal and abnormal conditions.	A-02/03/2026 B-10/03/2026 C-04/03/2026	A-02/03/2026 B-10/03/2026 C-04/03/2026	
12	CO3 LLO 1.3	Use of earth tester for measurement of earthing resistance of a installed earthing of laboratory	A-09/03/2026 B-17/03/2026 C-11/03/2026	A-09/03/2026 B-17/03/2026 C-11/03/2026	

• Learning Assessment (Theory):

A. Formative assessment (FA-TH)

For the Formative Assessment, Two MSBTE class tests will be conducted during semester each of 30 Marks. Final score of Formative Assessment out of 30 will be the average of 2 class Tests.

B. Summative Assessment (SA-TH)

As Summative Assessment an end semester examination for 70 Marks will be conducted by MSBTE after the completion of the term. The schedule of examination will be given by MSBTE.

Final Score out of 100 Marks will be derived as the total score of (SA-TH + FA-TH [Average of class test marks]) i.e. (70+30) =100

• Learning Assessment (Practical):

A. Formative assessment (FA-PR)

- For the Formative Assessment (FA-PR) each experiment will be assessed out of 50 marks. Practical will be assessed considering 60% weightage to process and 40% weightage to product.
- Final term work(FA-PR) of 50 (out of which 25 marks given by Electrical Engg.& 25 marks given by Electronics engg. teacher) marks is calculated based on scored in Formative Assessment for each experiment Term Work Marks = (50* Total Marks Obtained in FA-PR) / (50*Total Number of Experiments)

B. Summative Assessment (SA-PR)

- A comprehensive Final External Practical examination (SA-PR) of 50 Marks (out of which 25 marks given by Electrical Engg.& 25 marks given by Electronics engg. teacher) will be conducted by MSBTE at the end of semester.
- The schedule of MSBTE Practical Examination will be display on Notice board prior to examination. The schedule of examination will be given by MSBTE

• Self-Learning(SLA):

Self-learning Activities (SLA) includes micro project / assignment / other activities related to\ subject and it will be evaluated out of 25 Marks

• LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr. No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Single Phase Transformer: 1kVA, single-phase, 230/150 V, air cooled	6
2	Single phase auto transformer (Dimmer stat) – 0-230 volt 2/5Amp	6,13
3	CRO - 20 MHz. Dual channel	2,3,18
4	Three phase Auto Transformer -10/5 kVA, Input 415 V 3 phase. 50 Hz. Output 0-415 V, 10/20 A	4,5
5	Rheostat (0-500 Ohm, 1.2A), Nichrome wire wound rheostat on epoxy resin or class F insulating tube with two fixed and one sliding contact	7
6	Rheostat (0-100 Ohm, 5A), Nichrome wire wound rheostat on epoxy resin or class F insulating tube with two fixed and one sliding contact	8
7	DC Ammeter range (0-5-10A), Portable analog PMMC type as per relevant BIS standard	7
8	DC series and shunt machines at least one each (up to 230 V, 3/5 HP).	7,8
9	D. C. Supply, A 230 V d.c. supply (with inbuilt rectifier to convert a.c.to d.c)	7,8

Sr. No	Equipment Name with Broad Specifications	Relevant LLO Number
10	DC Voltmeter Range (0-150/300V), Portable analog PMMC type as per relevant BIS standard.	7,8
11	AC Ammeter range (0-2.5-5-10A), Portable analog MI type as per relevant BIS standard	5,6,13,14
12	AC Voltmeter Range (150/300/600V), Portable analog MI type as per relevant BIS standard	5,6
13	Lamp Bank load -230 V 0-10 A	13,14
14	Tachometer, noncontact type 0-10000rpm	7,8,9,10
15	Single phase Universal motor -1/4 or 1/2 HP ,230 V	9
16	Earth tester analog/digital type	15
17	Variable DC power supply 0-30V, 2A, SC protection, display for voltage and current.	16,17,21,22,23,24
18	Digital Multimeter: 3 1/2 digit	1,16,17,21,22,23

• References:

• Suggested Learning Materials / Books:

Sr. No	Author	Title	Publisher with ISBN Number
1	Theraja, B. L. Theraja, A. K.	A Text Book of Electrical Technology Vol-I	S.Chand and Co. New Delhi 2014 ISBN: 9788121924405
2	Mittle, V. N.	Basic Electrical Engg.	Tata McGraw-Hill, New Delhi ISBN : 978-0-07-0088572-5
3	Hughes, Edward	Electrical Technology	Pearson Education, New Delhi ISBN-13: 978-0582405196
4	Saxena, S. B. Lal	Fundamentals of Electrical Engineering	Cambridge University Press, New Delhi ISBN : 9781107464353

• Learning Websites & Portal

Sr. No	URL
1	https://www.electrical4u.com/
2	https://studyelectrical.com/
3	https://archive.nptel.ac.in/courses/117/106/117106108/
4	https://archive.nptel.ac.in/courses/108/105/108105155/
5	https://youtu.be/ivP_8w4FegE?si=5BLH_hvyhros570A
6	https://byjus.com/physics/working-principle-of-an-electrical-fuse/
7	https://youtu.be/9Xgn40eGcqY?si=YQy0vmxQ_yGR8-tz
8	https://youtu.be/ikLhqUCQKkc?si=8VqRbV1zZlQUSYLd

Ms. S.B.Pund
Faculty Name & signature

Mr. A. D. Talole
CIAAN Coordinator

Prof. M.P.Bhosale
HOD Computer Tech.

CC-

- BEE – 312302 course File
- Notice Board / ERP
- Institute Website / CIAAN Coordinator

