Maharashtra State Board of Technical Education, Mumbai

K-2A

LABORATORY PLAN (LP)/ Course Information Sheet (CIS)

Academic Year: 2025-26

Academic Year: 2025-26 **Date**: 15/12/2025

Institute Name: K. K. Wagh Polytechnic, Nashik-3 **Institute Code** (0078)

Program and Code: Computer Technology (CM) **Course Code &. Abbr.:** 312302 (BEE)

Course Name: Basic Electrical and Electronics Engineering (BEE) **Course Index:** CI202 **Total Hrs:** 30 Hrs

Class: FYCM-Mac **Semester:** II[nd] **Scheme:** K **Name of Faculty:** Mr. D. K. Lakhe

Teaching and Examination Scheme:

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Paper Duration	Assessment Scheme										
				Actual Contact Hrs/Week			SLH	NLH			Theory				Based on LL & TSL Practical				Based on SL		Total Marks
											FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
				CL	TL	LL					Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
312302	Basic Electrical and Electronics Engineering	BEE	AEC	4	-	4	2	10	5	1.5	30	70*#	100	40	50	20	50 @	20	50	10	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, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination, @$ Internal Online Examination

- **Course Outcomes (COs): Theory & Practical**

FYCM-Win students will be able to achieve & demonstrate the following COs on completion of course based learning

CO No.	Course Outcomes
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

- **Laboratory Learning Outcome (LLO)**

LLO No.	Title of LLO
LLO 1.1	Measure the parameters of simple electrical and identify presence of flux lines in magnetic circuit.(e.g. current, voltage, power, flux)
LLO 2.1	Measure frequency, time period, rms value, peak value of sinusoidal AC waveform for resistive and inductive circuit using CRO.
LLO 3.1	Phase difference of voltage and current in inductive circuit
LLO 4.1	Measure the line voltage, phase voltage and phase current and line current in three phase star connected balanced load.
LLO 5.1	Measure the line voltage, phase voltage and phase current and line current in three phase delta connected balanced load
LLO 6.1	Determination of the voltage and current ratio of single phase transformer.
LLO 7.1	Operate DC shunt motor by connecting three point starter
LLO 8.1	Operate DC series motor by connecting three point starter
LLO 9.2	Reverse the direction of rotation of universal motor
LLO 10.1	Use multimeter for measurement of voltage, current (AC,DC), resistance and continuity of the given electrical circuit
LLO 11.1	Connect MCB in electrical circuit and check its operation at normal and abnormal conditions.
LLO 12.1	Use of earth tester for measurement of earthing resistance of a installed earthing of laboratory.

- **Practical Plan:**

PR. No	Practical - Laboratory Learning Outcome (LLO)	Practical Titles	Planned Dates			Actual Date of conduction	Remark/ Assessment Date with Staff sign
			Batch	From	To		
*1	LLO 1.1 LLO 1.2	Measure the parameters of simple electrical and identify presence of flux lines in magnetic circuit.(e.g. current, voltage, power, flux)	A	19/12/2025	26/12/2025		
			B	20/12/2025	27/12/2025		
			C	18/12/2025	01/01/2026		
*2	LLO 2.1	Measure frequency, time period, rms value, peak value of sinusoidal AC waveform for resistive and inductive circuit using CRO.	A	26/12/2025	09/01/2026		
			B	27/12/2025	10/01/2026		
			C	01/01/2026	08/01/2026		
*3	LLO 4.1 LLO 4.2	Measure the line voltage, phase voltage and phase current and line current in three phase star connected balanced load.	A	09/01/2026	16/01/2026		
			B	10/01/2026	17/01/2026		
			C	08/01/2026	15/01/2026		
4	LLO 5.1	Measure the line voltage, phase voltage and phase current and line current in three phase delta connected balanced load.	A	16/01/2026	23/01/2026		
			B	17/01/2026	24/01/2026		
			C	15/01/2026	22/01/2026		
5	LLO 6.1	Determination of the voltage and current ratio of single phase transformer.	A	23/01/2026	30/01/2026		
			B	24/01/2026	31/01/2026		
			C	22/01/2026	29/01/2026		
6	LLO 7.1	Operate DC shunt motor by connecting three point starter.	A	30/01/2026	06/02/2026		
			B	31/01/2026	07/02/2026		
			C	29/01/2026	05/02/2026		
7	LLO 8.1	Operate DC series motor by connecting two point starter	A	06/02/2026	13/02/2026		
			B	07/02/2026	14/02/2026		
			C	05/02/2026	12/02/2026		
8	LLO 9.1	Reverse the direction of rotation of universal motor.	A	13/02/2026	20/02/2026		
			B	14/02/2026	21/02/2026		
			C	12/02/2026	26/02/2026		
9	LLO 10.1	Use multimeter for measurement of voltage, current (AC, DC), resistance and continuity of the given electrical circuit.	A	20/02/2026	27/02/2026		
			B	21/02/2026	28/02/2026		
			C	26/02/2026	05/03/2026		
10	LLO 12.1	Connect fuse in electrical circuit and check its operation at normal and abnormal conditions	A	27/02/2026	06/03/2026		
			B	28/02/2026	07/03/2026		
			C	05/03/2026	12/03/2026		
11	LLO 13.1	Connect MCB in electrical circuit and check its operation at normal and abnormal conditions.	A	06/03/2026	13/03/2026		
			B	07/03/2026	14/03/2026		

			C	12/03/2026	12/03/2026		
12	LLO 15.1	Use of earth tester for measurement of earthing resistance of a installed earthing of laboratory.	A	13/03/2026	27/03/2026		
			B	14/03/2026	28/03/2026		
			C	12/03/2026	26/03/2026		

- **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)

1. 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

2. 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)

1. 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.
2. 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

Sr. No	Equipment Name with Broad Specifications	Relevant LLO Number
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
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:**

1. 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

2. 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

3. Video reference URL

Sr. No	URL
1	https://www.youtube.com/watch?v=jz92oOkJFNA
2	https://www.youtube.com/watch?v=shJAV59NS6k
3	https://www.youtube.com/watch?v=t-EhLjdAY0M
4	https://www.youtube.com/watch?v=XplD4hAvXVY
5	https://youtube.com/watch?v=8VhgQ9Q9ixA
6	https://www.youtube.com/watch?v=FVU5xOeiiKA

Signature of Faculty

Name: Mr. D. K. Lakhe

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Name: Prof. M. P. Bhosale