Maharashtra State Board of Technical Education, Mumbai

K-2

LABORATORY PLANNING (LP)

Academic Year: 2025-26 (Even)
Institute Name: K. K. Wagh Polytechnic, Nashik **MSBTE Code:** 0078
Program and Code: Electrical Engineering (EE) **Course Code &. Abbr.:** 316327 (ECA)
Course Name: Energy Conservation & Audit **Name of Faculty:** Mr. H. M. Kakad
Class: TYEE- Tesla **Semester:** 6th **Scheme:** K **Course Index:** 310 **Learning Hrs.** 60

• Teaching-Learning & Assessment Scheme:

Course Code	Course Title & Abbr	Course Category	Learning Scheme					Credits	Paper Duration (Hrs.)	Assessment Scheme										
			Actual Contact Hrs/Week			SLH	NLH			Theory				Based on LL & TSL Practical				Based on SL		Total Marks
			CL	TL	LL					FA TH	SA TH	Total		FA-PR		SA-PR		SLA		
										Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
334322	Energy Conservation & Audit-DMT	DSC	4	-	2	2	8	4	3	30	70	100	40	25	10	20#	10	25	10	150

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 LEVEL LEARNING OUTCOMES (COS)**

By learning course DC Machines & Transformers (DMT-314322) Second Year students will be able to achieve & demonstrate the following COs on completion of course based learning.

- CO1 - Interpret energy conservation policies in India.
- CO2 - Implement energy conservation techniques in electrical machines.
- CO3 - Apply energy conservation techniques in electrical installations.
- CO4 - Use Co-generation and relevant tariff for reducing losses in facilities.
- CO5 - Carryout energy audit for electrical system.

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

Pr. No	COs	LLO	Name of Experiments/Assignment/ Sheet/ Job/ Project Activity	Planned Date A/B/C		Actual date of Performance	Rmk
				From	To		
1	CO1	LLO 1.1	Identification of star labelled electrical appliances/equipment and compare data sheets of various star labelled ratings.	A- 17-12-2025 B- 15-12-2025 C- 16-12-2025	A- 17-12-2025 B- 15-12-2025 C- 16-12-2025		
2	CO1	LLO 2.1	Determination of reduction in power consumption in star mode operation of 3 phase Induction motor compared to delta mode.	A- 24-12-2025 B- 22-12-2025 C- 23-12-2025	A- 24-12-2025 B- 22-12-2025 C- 23-12-2025		
3	CO1	LLO 3.1	Performance of load test on three phase induction motor for different loading conditions and plot the curve.	A- 31-12-2025 B- 29-12-2025 C- 30-12-2025	A- 31-12-2025 B- 29-12-2025 C- 30-12-2025		

4	CO2	LLO 6.1	Comparison of energy conserved in two identical transformers where one is a single-phase transformer and the other one comprises of two single phase transformers in parallel operation. (For the same load)	A- 07-01-2026 B- 05-01-2026 C- 06-01-2026	A- 07-01-2026 B- 05-01-2026 C- 06-01-2026		
5	CO2	LLO 7.1	Power factor improvement using static capacitor.	A- 14-01-2026 B- 12-01-2026 C- 13-01-2026	A- 14-01-2026 B- 12-01-2026 C- 13-01-2026		
6	CO2	LLO 8.1	Comparison of power consumption of different types of Tube Light with choke, electronic ballast and LED lamps by direct measurement.	A- 21-01-2026 B- 19-01-2026 C- 20-01-2026	A- 21-01-2026 B- 19-01-2026 C- 20-01-2026		
7	CO2	LLO 9.1	Comparison of reduction in power by replacement of lamps in a classroom / laboratory by energy efficient lamps.	A- 28-01-2026 B-26-01-2026 C- 27-01-2026	A- 28-01-2026 B-26-01-2026 C- 27-01-2026		
8	CO2	LLO 13.1	Tariff for industrial consumer for reducing the electricity bill.	A- 04-02-2026 B- 02-02-2026 C- 03-02-2026	A- 04-02-2026 B- 02-02-2026 C- 03-02-2026		
9	CO2	LLO 15.1	Tariff for commercial consumer for reducing the electricity bill.	A- 11-02-2026 B- 09-02-2026 C- 10-02-2026	A- 11-02-2026 B- 09-02-2026 C- 10-02-2026		
10	CO3	LLO 16.1	Tariff for residential consumer for reducing the electricity bill.	A- 18-02-2026 B- 16-02-2026 C- 17-02-2026	A- 18-02-2026 B- 16-02-2026 C- 17-02-2026		
11	CO3	LLO 17.1	Estimation of Energy saved by improving power factor and load factor for given case.	A- 25-02-2026 B- 23-02-2026 C- 24-02-2026	A- 25-02-2026 B- 23-02-2026 C- 24-02-2026		
12	CO3	LLO 18.1	Preparation of Energy audit questionnaire for the given facility	A- 04-03-2026 B- 02-03-2026 C- 03-03-2026	A- 04-03-2026 B- 02-03-2026 C- 03-03-2026		
13	CO3	LLO 19.1	Preparation of Energy audit report of electrical department.	A- 11-03-2026 B- 09-03-2026 C- 10-03-2026	A- 11-03-2026 B- 09-03-2026 C- 10-03-2026		
14	CO3	LLO 20.1	Comparison of energy consumption using DOL, star delta and soft starter in a three-phase induction motor.	A- 18-03-2026 B- 16-03-2026 C- 17-03-2026	A- 18-03-2026 B- 16-03-2026 C- 17-03-2026		
15	CO3	LLO 21.1	Energy audit using energy audit software such as Safety Culture (formally iAuditor), Energy CAP or any other equivalent software.	A- 25-03-2026 B- 23-03-2026 C- 24-03-2026	A- 25-03-2026 B- 23-03-2026 C- 24-03-2026		

ASSESSMENT METHODOLOGIES/TOOLS

A. Formative assessment (Assessment for Learning)

1. Two-unit tests, each worth 30 marks, will be conducted, and the average of the two tests will be considered
2. For formative assessment of laboratory learning 25 marks:

Each practical will be assessed considering appropriate % weightage to process and product and other instructions of assessment. and the average of all practical will be considered.

B. Summative Assessment (Assessment of Learning) (SA-TH)

1. End semester summative assessment of 25 marks for laboratory learning.
2. End semester assessment of 70 marks through offline mode of examination.

SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING /SKILLS DEVELOPMENT (SELF LEARNING)

Micro project

3. Collect electricity bill of your institute and suggest suitable measures for energy conservation and reduction of energy bill.
4. Prepare Energy conservation chart using different luminaries.
5. Prepare an energy audit report of your department/Institute/Workshop using energy audit instruments.
6. Visit MEDA website and enlist various energy conservation schemes. Prepare a presentation highlighting the salient features of any one scheme. (objectives, entitlement, methodology and financial assistance etc.)
7. Carry out a case study of at least two nearby industries and prepare a report on energy conservation measures adopted by them.
8. Carry out internet survey (BEE) to collect information and prepare a report related to any two energy conservation projects.
9. Poster preparation and competition on energy conservation (Visit MEDA website).

Mr. H. M. Kakad
(Name & Signature of Staff)

Prof. S. B. Pawar
(Name & Signature of HOD)