Maharashtra State Board of Technical Education, Mumbai
TEACHING PLAN (TP-TH)/ Course Information Sheet (CIS)

K-1

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:

Course Title	Course Code / Abbr	Course Category	Learning Scheme					Credits	TH 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	
312302	BASIC ELECTRICAL AND ELECTRONICS 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 (DMS-313315), the Second Year students will be able to:

CO No.	TLO No.	Course Outcomes (COs) / Theory Learning Outcomes (TLOs)
CO202.1 (CO1)	**Calculate and measure basic electrical quantities and parameters.**	
	TLO 1.1	Apply Faraday's law of electromagnetic induction and Fleming's right hand rule, Lenz's law for induced emf to find its magnitude and direction.
	TLO 1.2	Differentiate alternating current (AC) and direct current (DC)
	TLO 1.3	Explain parameters of single phase AC sinusoidal waveform.
	TLO 1.4	Describe the silent features of three phase AC supply system.
	TLO 1.5	Explain star and delta connection in three phase AC system.
	TLO 1.6	Calculate the phase and line current and voltage in star and delta connections.
CO202.2 (CO2)	**Use different electrical machines by making connections.**	
	TLO 2.1	Explain the working principle of the given type of transformer.
	TLO 2.2	Distinguish the construction of the given type of transformer.
	TLO 2.3	Describe the construction and working of the given type of DC motor.
	TLO 2.4	Select relevant type of DC motor for the given application with justification
	TLO 2.5	Explain working principle and operation of Universal motor.
	TLO 2.6	Describe the procedure to connect stepper motor for the given application with sketches.
CO202.3 (CO3)	**Use electrical safety devices in electrical circuit**.	
	TLO 3.1	Describe the characteristics and features of the given type of protective device.
	TLO 3.2	Select the relevant protective device for the given application with justification
	TLO 3.3	Select suitable switchgear for the given situation with justification.

	TLO 3.4	State the I.E. rule related to be applied for the given type of earthing with justifications.

- **Teaching Plan (TP-TH)/ Course Information Sheet (CIS):**

Unit No. (Allotted Hrs. & Marks)	COs & TLOs	Unit Title with Topic Details/Contents	Plan Dates (From-To & No. of Lectures)	Actual Execution (From-To & No. of Lectures)	Teaching Method/ Media	Remark
01 (11) (14)	CO1 TLO-1.1, 1.2, 1.3, 1.4, 1.5, 1.6.	**Unit-1 Basic Electrical Fundamentals** 1.1 Electric and magnetic circuits. 1.2 Series and parallel magnetic circuits. 1.3 Faraday's laws of electromagnetic induction, Fleming's right hand rule,Lenz's law 1.4 Dynamically and statically induced emf, self and mutual inductance 1.5 AC and DC quantity, advantages of AC over DC supply.	16/12/2025 To 01/01/2026 (05)		Chalk-Board, LCD+PPTs, eNotes, MKCL ERA, YouTube Videos	
		1.6 Single phase AC, sinusoidal AC wave: instantaneous value, cycle, amplitude, time period, frequency, angular frequency, RMS value, Average value for sinusoidal waveform, form factor, peak factor. 1.7 Three phase supply system over single phase supply system, Phase sequence and balanced and unbalanced load 1.8 Star and delta connections, Phase and line current, phase and line voltage in star connected and delta connected balanced system.	06/01/2026 To 22/01/2026 (06)		Chalk-Board, LCD+PPTs, eNotes, MKCL ERA, YouTube Videos	
02. (10) (12)	CO2 TLO-2.1, 2.2, 2.3, 2.4, 2.5, 2.6	**Unit-2 Electrical Machines** 2.1 Transformer: Working principle, emf equation, Voltage ratio, current ratio and transformation ratio, losses. 2.2 DC motor construction - parts its function and material used. 2.3 DC motor -Principle of operation. 2.4 Types of DC motors, schematic diagram, applications of dc shunt, series and compound motors. 2.5 Universal motor: principle of operation, reversal of rotation and applications. 2.6 Stepper motor: types, principle of working and applications	27/01/2026 To 05/02/2026 (04) 10/02/2026 To 26/02/2026 (06)		Chalk-Board, LCD+PPTs, MKCL ERA, YouTube Videos,	
03. (09) (10)	CO3 TLO-3.1 3.2 3.3 3.4	**Unit-3 Electrical Safety and Protective Devices** 3.1 Low rating Fuse: Operation, types 3.2 Switch Fuse Unit and Fuse Switch Unit: Differences, use of multimeter for electrical quantities/ parameters measurements. 3.3 MCB and ELCB/RCB: Operation and	05/03/2026 To 17/03/2026 (04)		Chalk-Board, LCD+PPTs, MKCL ERA, YouTube Videos	

		general specifications 3.4 Earthing: Types, Importance of earthing, factors affecting earthing resistance. 3.5 Measures for reducing earth resistance, I.E rules relevant to earthing.	18/03/2026 To 24/03/2026 (05)			
		Total	**30 Hrs.**			

- **Chapter wise CO-PO Mapping:**

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes PSOs		
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO-1	PSO-2	PSO-3
CO1	3	--	--	2	--	--	2	--	--	--
CO2	2	--	--	2	--	--	2	--	--	--
CO3	2	--	--	3	2	--	3	--	--	--

- **Legends:-** High:03, Medium:02, Low:01, -- :No Mapping

Sr. No.	Programme Outcomes (POs)	Programme Specific Outcomes (PSOs)
1.	**PO-1** Basic and Discipline Specific Knowledge	**PSO1** Apply acquired skills of programming, networking, hardware & database for computer based problem solving and software development. **PSO-2** Pursue higher studies in the field of Computer Science / Computer Engineering /Information Technology.
2.	**PO-2** Problem Analysis	
3.	**PO-3** Design/ Development of Solution	
4.	**PO-4** Engineering Tools	
5.	**PO-5** Engineering Practices for Society, Sustainability and Environment	
6.	**PO-6** Project Management	
7.	**PO-7** Life Long Learning	

- **Weightage to Learning Efforts & Assessment Purpose (Specification Table)**

Unit No.	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	**Basic Electrical Fundamentals**	CO1	6	4	6	4	14
2	**Electrical Machines.**	CO2	8	2	6	4	12
3	**Electrical Safety and Protective Devices**.	CO3	12	2	4	4	10
		Total :	**30**	**08**	**16**	**12**	**36**

*# **Learning Levels with reference to Bloom's Taxonomy:** R Level: Remember, U Level: Understand, A-Level: Apply*

- **Formative & Summative Assessment Criteria:**

a) Theory Assessment:

1. Formative Assessment (FA-TH) :

- Two offline unit tests of 30 marks (Basic Electrical of 15 marks, Basic Electronics of 15 marks) and average of two unit test marks will be consider for out of 30 marks.
- For formative assessment of laboratory learning 50 marks (Basic Electrical -25 marks, Basic Electronics- 25 marks).
- Each practical will be assessed considering 60% weightage to process, 40% weightage to product.
- Note: Unit test will be conducted on written pattern (Not MCQ based)

2. **Summative Assessment (Assessment of Learning)**
   - End semester assessment of 70 marks through online MCQ examination.
   - End semester summative assessment of 50 marks for laboratory learning (Basic Electrical- 25 marks, Basic Electronics- 25 marks)

b) Practical Assessment:

- Formative Assessment (FA-PR) of each practical/experiment will be performed progressively for 50 marks.
- The assessment will be performed based on the Regularity in Practical Performance, Tool Selection Ability, Use of Appropriate tool to perform the Identified tasks, Algorithm/Solution developed, Quality of output achieved, Answer to sample questions and Submit report in total time.
- Final Term Work (FA-PR) of 50 marks is calculated based on scores in Formative Assessment for all practicals/experiments as:
  *Term Work Marks(FA-PR)=((Total Marks Obtained in F.A.)/(50*Total Number of Experiments))*50*
- A Summative (comprehensive) Assessment (SA-PR) of Practical will be performed as End Semester Examination (ESE). The Final SA-PR of 25 Marks will be conducted with MSBTE guidelines at the end of semester. The schedule of MSBTE Practical (SA-PR) will be display on Notice board prior to examination.

c) Self-Learning Activities:

- Self-learning Activities (SLA) includes Micro project / Assignment / other activities related to subject/course and it will be evaluated out of 25 Marks.

• References :

1. Suggested Books for Reference:

Sr. No	Author	Title of the Book	Publisher
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	Sedha R.S.	Applied Electronics	S. Chand, New Delhi,2015 ISBN:9788121927833
4	Hughes, Edward	Electrical Technology	Pearson Education, New Delhi ISBN-13: 978-0582405196
5	V.K. Mehta	Principles of Electronics	S.Chand and Co Ram Nagar, New Delhi-110055,11th edition 2014 ISBN 9788121924504
6	Saxena, S. B. Lal	Fundamentals of Electrical Engineering	Cambridge University Press, New Delhi ISBN : 9781107464353
7	Jegathesan, V.	Basic Electrical and Electronics Engineering	Wiley India, New Delhi 2014 ISBN : 97881236529513
8	Boylestad, Robert Nashelsky Louis	Electronic Devices and Circuit Theory	Pearson Education. New Delhi 2014 ISBN:9780132622264

9	Sawhney A.K.	Electrical and Electronic Measurements and Instrumentation	Dhanpat Rai and Sons, New Delhi,2005, ISBN:13-9788177000160
10	Kalsi H.S.	Electronic Instrumentation	McGraw Hill, New Delhi,2010 ISBN:13-9780070702066

2. Learning Websites & Portals and URLs of referred YouTube Videos:

Sr. No	Website /Portal Link/URL	Description
1	https://www.youtube.com/watch?v=anCnrtjNLQM	LVDT
2	https://qr.page/g/4PABoASTZYW	Transistor as an Amplifier
3	https://youtu.be/XT-UmPviH64?si=MLIZBB5BgOA2SWBk	Electromagnetic Induction
4	https://youtu.be/M-QfX2fvpp4?si=xpZDAiX3-_7xrnnr	Basics of magnetic circuits
5	https://archive.nptel.ac.in/courses/117/106/117106108/	Basic electrical circuits
6	https://archive.nptel.ac.in/courses/108/105/108105155/	Electrical Machines-1
7	https://youtu.be/ivP_8w4FegE?si=5BLH_hvyhros570A	Single phase and Three phase electrical system
8	https://byjus.com/physics/working-principle-of-an-electrical-fuse/	Electrical fuse
9	https://youtu.be/9Xgn40eGcqY?si=YQy0vmxQ_yGR8-tz	Miniature circuit breaker
10	https://youtu.be/ikLhqUCQKkc?si=8VqRbV1zZlQUSYLd	Earth leakage circuit breaker

3. Self-Prepared Video URLs:

Sr No.	URL of referred YouTube Videos	Description
1	https://youtu.be/MsRkCxjxdV4?si=h-OC1Haxlw3u1Pjm	Electric Circuit
2	https://youtu.be/h3k68oIQkjE?si=FKz_EnxgGxbWMH-J	Magnetic Circuit
3	https://youtu.be/4MdxIOL3EeU?si=RXmXfBabxOhOgnhf	Electromagnetic Induction
4	https://youtu.be/T04HaqVG8eI?si=2dD0DJdTHpHTzD-g	Types of Supply
5	https://youtu.be/yqb90yctdr8?si=6vtyvPFjRWkMuSqV	Transformer

4.Tools to Use for Teaching-Learning, Assessment and Evaluation:

- Google Classroom – Google Classroom to have a real-time view of student progress. It will be used to Upload E-Material, Conduct Quizzes and perform Assessment.
- MKCL LMS Era – It will be used to Upload E-Material, Conduct Quizzes and perform Assessment.

Ms.S.B.Pund — **Faculty Name & signature**

Mr.A.D.Talole — **CIAAN Coordinator**

Prof. M.P.Bhosale — **HOD Computer Tech.**

CC-

a. BEE - 322302 Course File
b. Notice Board / ERP
c. Institute Website / CIAAN Coordinator