

Maharashtra State Board of Technical Education, Mumbai
TEACHING PLAN (TP)

K-1

Academic Year: 2025-26

Date: 26/12/2025

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

Program and Code: Artificial Intelligence & Machine Learning (AN)

Course Code & Abbr.: 312302 (BEE)

Course Name: Basic Electrical and Electronics Engineering (BEE)

Name of Faculty: Ms. K. J. Patil

Class: FYAN- NEURAL Total Hrs: 30 Course Index: CO202

Semester: IV

Scheme: K

• Teaching and Examination Scheme:

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	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								
312302	Basic Electrical And Electronics Engineering	BEE	AEC	2	-	2	-	4	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, IKS - Indian Knowledge System, SLA - Self Learning Assessment

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

• Course Outcomes (COs): Theory & Practical

By learning course Basic Electrical and Electronics Engineering (BEE-312302) First Year students will be able to:

CO No.	TLO No.	Course Outcomes (COs) / Theory Learning Outcomes (TLOs)
CO202.4		CO4 - Use relevant diode in different electronic circuits.
	TLO 4.1	Measure Zener voltage on given V-I characteristics of the Zener diode.
	TLO 4.2	Explain the working principle of LED.
	TLO 4.3	Describe the working principle of given type of filter.
	TLO 4.4	Explain the working principle of regulated power supply and UPS.
CO202.5		CO5 - Use BJT and FET in various electronic circuits.
	TLO 5.1	Describe with sketches the construction and working of the given type of transistors.
	TLO 5.2	Compare the performance of the given transistor configurations
	TLO 5.3	Explain applications of transistor as a switch and amplifier.
	TLO 5.4	Explain with sketches the construction and working of the given type of FET.
CO202.6		CO6 - Use various types of sensors and transducers.
	TLO 6.1	Select relevant transducer for given application.
	TLO 6.2	Differentiate the features of transducers and sensors for given quantity measurement.
	TLO 6.3	Explain with sketches the working principle of given type of thermal, optical sensors.

● **Teaching Plan:**

Chapter No. (Allotted Hrs.)	TLOs	Title/Topic Details with CO	Plan (From-To & No. of Lectures)	Actual Execution (From-To & No. of Lectures)	Teaching Method/ Media	Remark
04 (10)M	4.1	Unit - IV Special purpose diodes and their applications.	18/12/2025 (01)		Chalk,Board + LCD Projector + PPT Presentations + MKCL ERA LMS	
		4.1Zener diode: symbol and working,				
	4.1	4.2 Zener diode application and characteristics	19/12/2025 (01)			
	4.2	4.3 LED : Symbol & working principle	26/12/2025 (01)			
	4.2	4.4 LED: Applications	27/12/2025 (01)			
	4.3	4.5 Filters: Need for filters,	01/01/2026 (01)			
	4.3	4.6 Circuit diagram and working of L, C and CLC filter.	02/01/2026 (01)			
	4.4	4.7 Working principle and block diagram of regulated power supply.	08/01/2026 & 09/01/2026 (02)			
	4.5	4.9 UPS: Block diagram and details of Online UPS.	09/01/2026 (01)			
	4.5	4.10 Block diagram and details of Offline UPS.	16/01/2026 (01)			
05 (12)M	5.1	Unit - V Transistors	22/01/2026 (01)		Chalk,Board + LCD Projector + PPT Presentations + MKCL ERA LMS	
		5.1 BJT: Types, symbol				
	5.1	5.2 BJT construction details	23/01/2026 (01)			
	5.1	5.3 Working principle of NPN transistor.	29/01/2026 (01)			
	5.2	5.4 Transistor configurations: CB, CE, CC	05/01/2026 & 06/01/2026 (02)			
	5.3	5.6 Characteristics of transistor in CE configuration	06/02/2026 (01)			
	5.4	5.7 Transistor parameters: alpha, beta and derive relation between them	12/02/2026 (01)			
	5.5	5.8 Applications-Transistor as a switch and as an amplifier	13/02/2026 (01)			
	5.6	5.9 FET: Types and symbol.	20/02/2026 (01)			
	5.6	5.10 Construction and working principle of n channel JFET	21/02/2026 To 21/02/2026 (02)			
	5.7	5.12 Characteristics of JFET: Drain and Transfer characteristics.	26/02/2026 (01)			
06. (08)M	6.1	Unit - VI Sensors and Transducers	27/02/2026 (01)		Chalk,Board +	
		6.1 Sensors and Transducers: Basic definition, difference, classification.				

	6.1	6.2 Sensors and Transducers: Basic difference and classification.	05/03/2026 (01)		LCD Projector + PPT Presentations + MKCL ERA LMS
	6.2	6.3 Thermal sensors details	06/03/2026 (01)		
	6.2	6.4 Optical and Electric sensors details	06/03/2026 (01)		
	6.3	6.5 Need of transducer and types of transducers	12/03/2026 (01)		
	6.3	6.6 Primary and Secondary transducer details	13/03/2026 (01)		
	6.3	6.7 Active, Passive and Analog, Digital transducer details	20/03/2026 (01)		
	6.4	6.8 Selection criteria of transducer	26/03/2026 (01)		
		Total	30 Hrs.		

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

Course Outcomes (COs)	Programme Outcomes (POs)							PSOs	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability & Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2
CO4	3	-	-	1	-	1	2	2	2
CO5	3	-	-	1	-	1	2	2	2
CO6	2	-	-	2	2		3	2	2

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

PSO1: Apply fundamental concepts of Computer Engineering and Artificial Intelligence and machine learning to solve technical problems.

PSO2: Implement the domain knowledge to achieve successful career as an engineering professional

- **Formative assessment (Assessment for Learning) :**

- Two offline class tests of 30 marks (Basic Electrical of 15 marks, Basic Electronics of 15 marks) and average of two class 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)

- **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)

● References:

1. Books:

Sr. No	Author	Title	Publisher
1	Sedha R.S.	Applied Electronics	S. Chand, New Delhi,2015 ISBN:9788121927833
2	V.K. Mehta	Principles of Electronics	S.Chand and Co Ram Nagar, New Delhi-110055,11th edition 2014 ISBN 9788121924504
3	Jegathesan, V.	Basic Electrical and Electronics Engineering	Wiley India, New Delhi 2014 ISBN : 97881236529513
4	Boylestad, Robert Nashelsky Louis	Electronic Devices and Circuit Theory	Pearson Education. New Delhi 2014 ISBN:9780132622264
5	Sawhney A.K.	Electrical and Electronic Measurements and Instrumentation	Dhanpat Rai and Sons, New Delhi,2005, ISBN:13-9788177000160
6	Kalsi H.S.	Electronic Instrumentation	McGraw Hill, New Delhi,2010 ISBN:13-97800707020

2. Web Sites:

Sr. No	Link /Portal	Description
1	https://www.youtube.com/watch?v=anCnrtjNLQM	LVDT
2	https://qr.page/g/4PABoASTZYW	Transistor as an Amplifier
7	https://www.tutorialspoint.com/difference-between-bjt-and-fet	BJT's and FET's
8	https://www.tutorialspoint.com/difference-between-sensor-and-transducer	Sensors and Transducers
9	https://www.electrical4u.com/jfet-or-junction-field-effect-transistor/	Junction Field Effect Transistor
10	https://fossee.in/	Open Source Electronics Simulation software
11	https://cloud.scilab.in/	Open Source Scilab Cloud for Electronics Simulation

3. URLs of referred you tube Videos :

- <https://www.youtube.com/watch?v=7kqCroY-DzE>
- <https://www.youtube.com/watch?v=jblgMxanFw8>
- <https://www.youtube.com/watch?v=QmcUjYQY9Bg>
- <https://www.youtube.com/watch?v=HVEIIWIWTm0>
- <https://www.youtube.com/watch?v=wI45Rrt4j2U>
- https://www.youtube.com/watch?v=oE1_CO4bpHI
- <https://www.youtube.com/watch?v=3Ny3wzw0ke0>
- <https://www.youtube.com/watch?v=UZLiLRLJzbU>
- <https://www.youtube.com/watch?v=fHp95e-CwWQ>

Ms. K. J. Patil
(Name & signature of staff)

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(Name & signature of HOD)