Format K1

Maharashtra State Board of Technical Education, Mumbai

TEACHING PLAN (TP)   Academic Year: **2025-26 (Even)**

Institute Code and Name: 0078- K. K. Wagh Polytechnic, Nashik   **Semester**: Second
Programme and Code: Electrical Engineering (EE)   **Course Index:** 203
Course and Code: Elements of Electronics (EOE)   **Course Code:** 312309
Scheme: K   **Allocated Hrs.** 60   **Name of Faculty:** Ms. V. B. Shelke
CLASS: FYEE (Tesla)

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COURSE LEVEL LEARNING OUTCOMES (COS)

- CO1 - Identify various electronic components
- CO2 - Use semiconductor diodes in different applications.
- CO3 - Use semiconductor transistors in different applications.
- CO4 - Use different types of Oscillators as per requirement.
- CO5 - Test operation of regulated power supply.

TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category	Learning Scheme: Actual Contact Hrs/Week CL	TL	LL	SLH	NLH	Credits	Paper Duration	Assessment Scheme: Theory FA-TH Max	SA-TH Max	Total Max	Total Min	Based on LL & TSL Practical FA-PR Max	FA-PR Min	SA-PR Max	SA-PR Min	Based on SL: SLA Max	SLA Min	Total Marks
312309	Elements ofF Electronics	EOE	DSC	4	-	4	2	10	5	3	30	70	100	40	25	10	25 @	10	25	10	175

Total IKS Hrs. for Sem.: 1 Hrs.

Abbreviations: CL- Classroom 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

SUGGESTED COS - POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs): 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 and Environment	PO-6 Project Management	PO-7 Life Long Learning	Programme Specific Outcomes (PSOs): PSO-1	PSO-2	PSO-3
CO1	2	-	1	1	1	-	2	2	2	-
CO2	2	-	1	1	2	-	2	2	2	-
CO3	2	1	1	1	2	1	2	2	2	-
CO4	2	1	1	1	2	1	2	3	3	-
CO5	2	1	1	1	2	1	2	3	3	-

Legends :- High:03, Medium:02,Low:01, No Mapping: -
*PSOs are to be formulated at institute level

Maharashtra State Board of Technical Education K-1

Teaching Plan (TP)

Academic Year: 2025-26 **Institute Code:** 0078
Program: EE (Tesla) **Course Code:** 312309
Course: Elements of Electronics (EOE) **Semester:** Second (EE-2K)
Name of faculty: Ms. V. B. Shelke
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Chap No. (Allot-ed Hrs.)	CO Mention only Number	TLO Mention only Number	Unit Name and Learning Content Title/ Details	No. of Lecture	Plan (From-To)	Actual Execution (From-To)	Teaching method/ Media	Remark
1 (10)	**CO-1**	**TLO 1.1, TLO 1.2, TLO 1.3, TLO 1.4**	**Unit - I Electronic components and Signals** **1.1** Active and passive components **1.2** Resistor, Capacitor, inductor, symbols, applications, colour codes, specifications **1.3** Concept of Unipolar and Bipolar Devices. **1.4** Classification of signals-sinusoidal, triangular and square **1.5** Signal waveform ,Time and Frequency domain, Representation, Amplitude, Frequency, phase, wavelength **1.6** Voltage and current source Ideal and non-ideal Sources Dependent voltage and current sources.	**10**	**15/02/ 2025 To 31/12/ 2025**		Lecture Using Chalk-Board Presentations Video Demonstrations Flipped Classroom	
2(14)	**CO-1 CO-2**	**TLO 2.1, TLO 2.2, TLO 2.3, TLO 2.4**	**Unit - II Semiconductor Diodes** **2.1** Construction, symbol, working principle, specification, applications, types of biasing and V-I characteristic of Zener diode, LED, Photo diode. Working principle and applications of OLED **2.2** Rectifiers- Full wave center-tapped and Bridge Rectifier, circuit diagram, wave forms, working principle. Rectifier IC KBU 808 Pin diagram and applications **2.3** Parameters of rectifier: Average DC value of current and voltage ripple factor, PIV of diode, TUF and efficiency of rectifier. **2.4** Need of filters, Types- C, LC, CLC, L, circuit diagram wave forms and working principle. **2.5** Wave shaping circuits Linear and non-linear wave shaping -RC integrator, RC Differentiator, Diode based Clipper circuits, Diode based Clamper. Circuits.	**14**	**02/01/ 2026 To 28/01/ 2026**		Lecture Using Chalk-Board Presentations Video Demonstrations Flipped Classroom	

3(14)	**CO-2 CO-3**	**TLO 3.1, TLO 3.2, TLO 3.3, TLO 3.4, TLO 3.5,**	**Unit - III Semiconductor Transistors** **3.1** Current operating Devices, Bipolar Junction Transistor- Types NPN , PNP, symbol, construction and working principle. **3.2** Need of biasing ,Types- Fixed bias and Voltage divider bias **3.3** Regions of operation and their significance - Cut off region , Active region and Saturation region **3.4** Transistor configurations: CB, CE, CC, working , comparison and applications **3.5** Transistor parameters- Alpha, Beta, Gama, Input, and output resistance, Relationship between alpha and beta, numerical on same. **3.6** Applications- Transistor as an amplifier- Small signal and power amplifier , Class A, Class B, Class C, Class AB Amplifier , Transistor as a switch , **3.7** Voltage operating devices, Construction Of JFET(N-Channel and P channel),symbol ,working principle, different parameters of JFET and applications. **3.8** MOSFET: Construction ,symbol ,working principle of Enhancement and Depletion MOSFET, and their applications.	**14**	**30/01/ 2026 To 23/02/ 2026**		Lecture Using Chalk-Board Presentations Video Demonstrations Flipped Classroom	
4(12)	**CO-2 CO-4**	**TLO 4.1, TLO 4.2, TLO 4.3, TLO 4.4,**	**Unit - IV Oscillators** **4.1** Oscillator: Need, Definition **4.2** Types of feedback: Positive feedback, Negative feedback. Barkhausen's criterion **4.3** Oscillator: Circuit Diagram, working and comparison of RC, LC, and Crystal oscillator. **4.4** Types of RC oscillator- Wien bridge and RC Phase shift Oscillator Frequency calculation **4.5** Types of LC oscillator-Colpitts oscillators, Hartley oscillators. Frequency calculation	**12**	**24/02/ 2026 To 17/03/ 2026**		Lecture Using Chalk-Board Presentations Video Demonstrations Flipped Classroom	

5(10)	**CO-3 CO-4 CO-5**	**TLO 5.1, TLO 5.2, TLO 5.3, TLO 5.4,**	**Unit - V Regulators and power supply** **5.1** Voltage regulation Load and line regulation :Definition, formulae **5.2** Block diagram, Construction, and operation of DC Regulated power supply **5.3** Basic Zener diode as a voltage regulator. **5.4** Regulator IC's: IC's 78XX,79XX ,IC 723 as fixed, variable and Dual Regulated DC power supply **5.5** Switch mode power supply: Need, block diagram and working.	**10**	**17/03/ 2026 To 30/03/ 2026**		Lecture Using Chalk-Board Presentations Video Demonstrations Flipped Classroom	

ASSESSMENT METHODOLOGIES/TOOLS

A. Formative assessment (Assessment for Learning) (FA-TH)

- Continuous assessment based on process and product related performance indicators. Each practical will be assessed considering
  - 60% weightage is to process
  - 40% weightage to product

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

- Continuous Assessment based on Process and Product related performance indicators. Each practical will be assessed considering
  - 60% weightage to Process
  - 40% weightage to Product

SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	V .K. Mehta ,Rohit Mehta	Principles of Electronics	S.Chand and Company Ram Nagar, New Delhi-110 055,11th edition 2014, ISBN 9788121924504
2	B.L.Theraja	Basic Electronics	S. Chand Publishing, 2007,ISBN:9788121925556
3	R.S.Sedha	A textbook of Applied Electronics	S Chand, New Delhi 2008, ISBN:978-8121927833
4	Mottershead,Allen	Electronic Devices and Circuit: An introduction	Goodyear Publishing Co. New Delhi ISBN: 9780876202654

LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://www.youtube.com/watch?v=Fwj_d3uO5g8	Diodes
2	http://www.eleccircuit.com	Electronic circuit
3	www.futurlec.com	Electronic tools/components
4	www.futurlec.com	Electronic tools/components

Sr.No	Link / Portal	Description
5	www.alldatasheet.com	Datasheets
6	www.electronics-tutorials	Electronic circuits
7	https://www.learningaboutelectronics.com/	Voltage Regulator

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students

Ms. V. B. Shelke
(Name & Signature of Staff)

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