Format K1

Maharashtra State Board of Technical Education, Mumbai

TEACHING PLAN (TP)

Academic Year: **2025-26 (ODD)**
Institute Code and Name: 61303- PPCOE, Karjat **Semester**: Second
Programme and Code: Electrical Engineering **Course and Code: BSC**
Course Code: 312308 **Scheme:** K
Name of Faculty: **Walunj T.A. /Kharade S.O.** **Class: EE2K**

COURSE LEVEL LEARNING OUTCOMES (COS)

- CO1 - Identify relevant type of construction materials for the given type of building.
- CO2 - Use the relevant type of special purpose construction materials in the given situation.
- CO3 - Undertake the given type of building construction activity for the given component of building structure.
- CO4 - Design the relevant means of communication for the given building structure.
- CO5 - Use the relevant type of material for finishing purpose in the given situation.

TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category	Learning Scheme: Actual Contact Hrs/Week			Learning Scheme: SLH	Learning Scheme: NLH	Credits	Paper Duration	Assessment Scheme: 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	
312308	**Applied Science**	**BSC**	**DSC**	**4**	**-**	**4**		**8**	**4**	**1.5**	**30**	**70*#**	**100**	**40**	**50**	**20**	**50@**	**20**			**200**

Total IKS Hrs for Sem.: 6 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)							Programme Specific Outcomes (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 and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO- 1**	**PSO- 2**	**PSO- 3**
CO1	3	1	1	1	1	1	1			
CO2	3	1	1	1	1	1	1			
CO3	3	2	1	1	1	1	1			
CO4	3	1	-	1	2	2	2			
CO5	3	2	1	2	2	2	2			
CO6	3	1	-	1	2	2	2			

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:** 61303
Program: Civil Engineering, Electrical Engineeering **Course Code: 312308**
Course: Applied Science (BSC) **Semester:** Second (CE-2K/EE-2K)
Name of faculty:
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Unit No. (Allocated Hrs.)	*CO*	*TLO*	*Unit Name and Learning Content Title / Details*	*No. of Lecture*	*Plan (From-To)*	*Actual Execution (From-To)*	*Teaching method/ Media*	*Remark*
I (9 Hrs)	CO 1		**Unit - I Properties of matter and kinematics**					
		TLO 1.1	1.1 Deforming Force and Restoring Force, Elasticity, Plasticity, Rigidity.					
		TLO 1.2	1.2 Stress and Strain and their types, elastic limit and Hooke's law, types of moduli of elasticity.					
		TLO 1.3	1.3 Stress -Strain diagram, Poisson's ratio, factors affecting elasticity					
		TLO 1.4	1.4 Newton’s laws of motion, and their applications.					
		TLO 1.5	1.5 Angular displacement, angular velocity, angular acceleration, three equations of angular motion,projectile motion, trajectory, range of projectile angle of projection, time of flight					
		TLO 1.6	Work, power and energy: potential energy, kinetic energy, work –energy principle.					
II (10 Hrs)	CO 2		**Unit - II Waves and Oscillations**					
		TLO 2.1	2.1 Sound waves, amplitude, frequency, time - period, wave-length and velocity of wave, relation between velocity, frequency and time - period of wave.					
		TLO 2.2	2.2 Simple Harmonic Motion , Uniform Circular Motion as Simple Harmonic Motion, Equation of simple harmonic motion , Phase of Simple Harmonic Motion.					
		TLO 2.3	2.3 Resonance , Application of resonance.					
		TLO 2.4	2.4 Resonance concept in prehistoric times, concept of different frequencies (Mantras) used to ignite different chakras in body (IKS).					
		TLO 2.5	2.5 Ultrasonic waves, properties of ultrasonic waves.					

Unit No. (Allocated Hrs.)	*CO*	*TLO*	*Unit Name and Learning Content Title / Details*	*No. of Lecture*	*Plan (From-To)*	*Actual Execution (From-To)*	*Teaching method/ Media*	*Remark*
		TLO 2.6	2.6 Piezoelectric and Magnetostriction method to produce ultrasonic waves .					
		TLO 2.7	2.7 Applications of ultrasonic waves.					
III (11 Hrs)	CO 3		**Unit - III Modern Physics (Photoelectricity , X rays, LASER and nanotechnology)**					
		TLO 3.1	3.1 Planck's hypothesis, properties of photons.					
		TLO 3.2	3.2 Photo electric effect: threshold frequency, threshold wavelength, stopping potential, Work function, characteristics of photoelectric effect, Einstein's photoelectric equation					
		TLO 3.3	3.3 Photoelectric cell and LDR : principle ,Working and applications					
		TLO 3.4	3.4 Production of X-rays by modern Coolidge tube, properties and engineering applications.					
		TLO 3.5	3.5 Laser: properties, absorption, spontaneous and stimulated emission,					
		TLO 3.6	3.6 Population inversion, active medium, optical pumping, three energy level system, He-Ne Laser.					
		TLO 3.7	3.7 Engineering applications of Laser.					
		TLO 3.78	3.8 Nanotechnology : Properties of nanomaterials (optical, magnetic and dielectric properties) , applications of nanomaterials, Metallic Bhasma (Ancient Ayurveda, IKS).					
IV (10 Hrs)	CO 4		**Unit - IV Metals and Alloys**					
		TLO 4.1	4.1 Ancient Indian Metallurgy (IKS)					
		TLO 4.2	4.2 Metals: Occurrence of metals in free and combined state. Basic concepts : Mineral, ore, gangue, flux and slag, metallurgy.					
		TLO 4.3	4.3 Metallurgy:Extraction processes of metal from ore Concentration : Gravity separation, electromagnetic separation, froth floatation, calcination and roasting, Reduction : Smelting, aluminothermic process, Refining,poling , electrorefining.					

Unit No. (Allocated Hrs.)	*CO*	*TLO*	*Unit Name and Learning Content Title / Details*	*No. of Lecture*	*Plan (From-To)*	*Actual Execution (From-To)*	*Teaching method/ Media*	*Remark*
		TLO 4.4	4.4 Mechanical properties of metals :Hardness, ductility, malleability, tensile strength, toughness, machinability, weldability, forging, soldering, brazing, castability.					
		TLO 4.5	4.5 Alloys: Purposes of making alloys with examples.					
		TLO 4.6	4.6 Preparation methods of alloys : Fusion, compression.					
		TLO 4.7	4.7 Classification of alloys :Ferrous and non-ferrous alloys Ferrous alloys: Composition ,properties and applications of low carbon, medium carbon, high carbon steels. Non- ferrous alloy:Composition ,properties and applications of Brass, Bronze, Duralumin, Tinman Solder, Woods metal.					
V (8 Hrs)	CO 5		**Unit - V Water Treatment**					
		TLO 5.1	5.1 Hard and soft water, causes of hardness, types of hardness					
		TLO 5.2	5.2 Hard water in boilers and prevention: Boiler corrosion, caustic embrittlement, priming and foaming, scales and sludges,and methods of prevention of boiler corrosion.					
		TLO 5.3	5.3 Methods of water softening: lime soda process (hot lime soda and cold lime soda process), zeolite process, ion exchange process.					
		TLO 5.4	5.4 Potable water treatment: Sedimentation, coagulation, filtration and sterilization .					
		TLO 5.5	5.5 Wastewater treatment: Sewage treatment, BOD and COD of sewage water.					
		TLO 5.6	5.6 pH and pOH: Concept of pH, pOH, pH Scale, Numerical.					
VI (12 Hrs)	CO 6		**Unit - VI Fuels and Combustion**					
		TLO 6.1	6.1 Fuel: Calorific value and ignition temperature, classification.					
		TLO 6.2	6.2 Solid fuels: Coal, Classification and composition , Proximate analysis, Ultimate analysis, Calorific value of coal by Bomb calorimeter.					
		TLO 6.3	6.3 Liquid fuels: Fractional distillation of crude petroleum, boiling range, composition, propertie Knocking,					

Unit No. (Allocated Hrs.)	*CO*	*TLO*	*Unit Name and Learning Content Title / Details*	*No. of Lecture*	*Plan (From-To)*	*Actual Execution (From-To)*	*Teaching method/ Media*	*Remark*
			cracking, octane number and cetane number.					
		TLO 6.4	6.4 Gaseous fuels: Biogas, LPG, and CNG. Combustion equation of gaseous fuels, mass and volume of air required for complete combustion.					
		TLO 6.5	6.5 Green hydrogen: Producing green hydrogen by electrolysis from renewable sources , Advantages and disadvantages of green hydrogen.					
		TLO 6.6	6.6 Electrical conductance in metals and electrolytes, specific conductance, equivalent conductance, cell constant					
		TLO 6.7	6.7 Cells and batteries :Construction ,working and applications of dry cell, lead acid storage cell H2 - O2 fuel cell, Ni-Cd battery and Lithium ion battery					

X. ASSESSMENT METHODOLOGIES/TOOLS

- **Formative assessment (Assessment for Learning)**
  - Tests
  - Rubrics for COs Assignment
  - Midterm Exam
  - Self-learning
  - Term Work
  - Seminar/Presentation
- **Summative Assessment (Assessment of Learning)**
  - End Term Exam Theory
  - Micro-project
  - Tutorial Performance

(Name & Signature of Staff) **(Name & Signature of HOD)**