

PTSC-7.1

“PVCNSSK” GOVT. POLYTECHNIC BILASPUR at KALOL
PLANNED THEORY SYLLABUS COVERAGE

GPB		Department: Electrical Engg.		Subject: UEE		
		Sem. & Branch :6 th & EE		Duration : 3years		
SYLLABUS COVERAGE		Total Periods: Theory:56				
Sr No	Period No.	Topic	Details	Instruction Reference	Additional Study Recommende	Remarks
1.	08 (1-8)	Electric Drives	1.1 Advantages of Electric Drives 1.2 Characteristics of different mechanical loads 1.3 Types of Motors used as electric drive 1.4 Electric braking 1.4.1 Plugging 1.4.2 Rheostatic braking 1.4.3 Regenerative braking 1.5 Methods of power transfer by direct coupling by using devices like belt drive, gears, chain drives. 1.6 Selection of motors for different types of domestic loads 1.7 Selection of drive for applications such as general workshop, textile mill, paper mill, steel mill, printing press, cranes and lift. Applications of flywheel.			
2.	08(9-16)	Illumination	2.1 Nature of light, visibility spectrum curve of relative sensitivity of human eye and wave length of light . 2.2 Definition: Luminous flux, solid angle, luminous intensity, illumination, luminous efficiency, depreciation factor, coefficient of utilization, space to height ratio, reflection factor, glare, shadow, lux level. 2.3 Laws of Illumination 2.4 Different type of lamps, construction and working of incandescent and discharge lamps—their characteristics, fittings required for filament lamp, mercury vapor, sodium lamp, fluorescent lamp, halogen lamp, neon lamp, Compact fluorescent lamp, LED lamps. 2.5 Main requirements of proper lighting; absence of glare, contrast and shadow 2.6 Illumination requirement for street lighting, flood lighting, monument lighting and decorative lighting. 2.7 LED based lighting systems, advantages of LED based lighting			

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3.	10(17-26)	Electric Heating	<p>3.1 Advantages of Electrical Heating</p> <p>3.2 Electrical Heating Methods:</p> <p>3.2.1 Resistance heating – direct and indirect resistance heating, electric ovens, their temperature range, properties of resistance heating elements, thermostat control circuit</p> <p>3.2.2 Induction Heating: Principle of core type and coreless induction furnace, their construction and applications</p> <p>3.2.3 Electric Arc Heating: direct and indirect arc heating, construction, working and applications of arc furnace.</p> <p>3.2.4 Dielectric heating: working principle and applications in industrial fields</p> <p>3.2.5 Infra-red heating and its applications</p> <p>3.2.6 Microwave heating and its applications</p>			
4.	06(27-32)	Electric Welding	<p>4.1 Advantages of Electric Welding</p> <p>4.2 Welding methods</p> <p>4.2.1 Principles of resistance welding, types – spot, projection, seam and butt welding, welding equipment</p> <p>4.2.2 Principle of arc production, electric arc welding, characteristics of arc; carbon arc, metal arc, hydrogen arc welding method and their applications. Power supply requirement. Advantages of using coated electrodes, comparison between AC and DC arc welding, welding control circuits, welding of aluminum and copper materials.</p>			
5.	06(33-38)	Electrolytic Processes	<p>5.1 Need of Electro-deposition</p> <p>5.2 Laws of Electrolysis, process of electro-deposition - clearing, operation, deposition of metals, polishing and buffing</p> <p>5.3 Equipment and accessories for electroplating</p> <p>5.4 Factors affecting electro-deposition</p> <p>5.5 Electroplating of non-conducting materials.</p>			

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6.	06(39-34)	Electrical Circuits used in Refrigeration, Air Conditioning and Water Coolers	<p>6.1 Principle of air conditioning, vapor pressure, refrigeration cycle, eco-friendly refrigerants .</p> <p>6.2 Description and Working of Electrical circuits used in</p> <p>6.2.1 Refrigerator,</p> <p>6.2.2 Air-conditioner</p> <p>6.2.3 Water cooler</p>			
7.	12(35-56)	Electric Traction	<p>7.1 Requirements of ideal Traction System, Different systems of electric traction, DC and AC systems, diesel electric system, types of services – urban, sub-urban, and main line and their speed-time curves, Advantages of Electric Traction</p> <p>7.2 Different accessories for track electrification; such as overhead catenary wire, conductor rail system, current collector-pantograph</p> <p>7.3 Electrical block diagram of an Electric Locomotive with description of various equipment and accessories used.</p> <p>7.4 Types of motors used for electric traction</p> <p>7.5 Starting and braking of electric locomotives</p> <p>7.6 Introduction to EMU (Electrical Multiple Unit) and Metro Railway</p> <p>7.7 Modern Electrical Traction systems, their features and advantages</p>			

APPROVED	SIGN HOD/OIC
DATE <u>28/11/24</u>	