

## Kurigram Polytechnic Institute, Kurigram

Semester Plan

Course Name & Code : Electrical Engineering Materials (66713)

Technology : Electrical

Semester : 1<sup>st</sup>

Teacher's Name : Shakila Aktar

Serial	No of week	No. of class	General Objectives	Specific Objectives	Remarks
1.	1.	1.	<b>1. Differentiate the conducting and non conducting materials</b>	1.1 Define conducting, non conducting and semi conducting materials 1.2 Explain energy band diagram of conducting, non conducting and semi conducting materials	
		2.		1.3 Distinguish between conducting, non conducting and semi conducting materials 1.4 List at least five names of each group of materials	
2.	2.	1.	<b>2. Understand the concept of receptivity and mechanical properties of conducting materials</b>	2.1 Define receptivity of materials 2.2 Define temperature co-efficient of materials and melting point of solid materials. 2.3 List the factors affecting receptivity of electrical materials.	
		2.		2.4 Define malleability, conductivity and tensile-stress 2.5 Describe the mechanical properties and receptivity of hard and annealed copper, aluminum, low and high tensile steel.	
3.	3.	1.		Class Test & Quiz Test	
4.	4.	1.	<b>3. Understand the concept of contact materials</b>	3.1 Define contact materials 3.2 Describe the physical and electrical properties of silver, tungsten, carbon and copper.	
		2.		3.3 Explain the use of copper, carbon and graphite as materials for brushes . 3.4 Compare the advantages of using copper , carbon and graphite as brushes materials	
5.	5.	1.	<b>4. Understand the high resistive materials</b>	4.1 Define the term high resistivity. 4.2 State general properties of nichrome, eureka, manganin, german silver, tungsten and carbon.	

		2.		4.3 State composition of nichrome, eureka, manganin, german silver and tungsten. 4.4 List uses of high resistive materials.	
6.	6.	1.	<b>5. Understand the concepts of fuse materials</b>	5.1 Define fuse, metal and alloys. 5.2 Describe the properties of fuse material.	
		2.		5.3 List the name of metal and alloys to be used as fuse materials. 5.4 Compare the advantage of using metals and alloys as fuse materials.	
7.	7.	1.		Class Test & Quize Test	
8.	8..	1.	<b>6. Understand the magnetic properties of materials</b>	6.1 Define magnetic materials, soft magnetic materials and hard magnetic materials with examples. 6.2 Classify the magnetic materials as diamagnetic , paramagnetic and ferromagnetic types. 6.3 Describe the composition and properties of soft magnetic materials	
		2.		6.4 Describe composition and properties of hard magnetic materials 6.5 List the use of hard and soft magnetic, materials. 6.6 Describe magnetization curve, hysteresis loop and hysteresis loss.	
9.	9.	1.	<b>7. Understand the concepts of insulating materials</b>	7.1 Describe insulating materials 7.2 State the importance of insulating materials 7.3 State the basic of classifying insulating materials. 7.4 Interpret the classification of insulating materials on the basic of temperature.	
		2.		7.5 State the criteria for selection of proper insulating materials/ 7.6 List the properties of ideal insulating materials 7.7 State electrical properties of insulating materials 7.8 Name the normal range for the receptivity of a low grade, medium grade and high grade insulating materials 7.9 State the effect of temperature on the insulating materials.	
10.	10.	1.	<b>8. Understand the characteristics of solid insulating materials</b>	8.1 Define solid insulating materials. 8.2 List the solid insulating materials 8.3 List the fibrous type of insulating materials 8.4 State the properties and application of cotton, varnish, cloth and insulating materials	
		2.		8.5 Compare the properties and applications of cotton, varnish, cloth and silk insulating materials 8.6 State the properties of impregnated paper insulation 8.7 List the application of impregnated paper insulation materials	

				8.8 State the properties of glass and asbestos insulation 8.9 List the application of glass and asbestos insulation 8.10 Describe the properties and application of ceramic/porcelain insulating materials	
11.	11.	1.		Class Test & Quiz Test	
12.	12.	1	<b>9. Understand the characteristics of Liquid Insulating Materials</b>	9.1 Define insulating oil. 9.2 State the properties of insulating oil 9.3 State the physical properties of liquid insulating materials 9.4 Describe the electrical properties of liquid insulating materials	
		2		9.5 State thermal properties of liquid insulating materials 9.6 Describe the causes of failure of insulating oil 9.7 Compare the advantages and disadvantages of liquid insulating materials with the solid insulating materials	
13.	13.	1.	<b>10. Understand Transformer oil and Silica gel</b>	10.1 Define transformer oil. 10.2 Describe the properties of transformer oil. 10.3 Explain the testing of dielectric strength of transformer oil. 10.5 Discuss the contamination and purification of transformer oil.	
		2.		10.6 Define silica gel. 10.7 Mention the composition of silica gel. 10.8 Describe the properties of silica gel.	
14	14.	1.	<b>11. Understand the characteristics of gaseous insulating materials</b>	11.1 Define gaseous insulating materials. 11.2 List the gaseous insulating materials 11.3 State the characteristics of gaseous insulating materials 11.4 State the characteristics of SF6 gas	
		2.		11.5 List the advantages of SF6 gas 11.6 State the characteristics of Nitrogen 11.7 State the characteristics of Hydrogen 11.8 List the uses of gaseous insulating materials	
15	15	1	<b>12. Understand the semi-conducting materials</b>	12.1 Define semi-conductor 12.2 Classify the semi-conducting materials 12.3 Describe the properties of semi-conducting materials 12.4 State the importance of semi-conducting materials 12.5 Identify the physical and electrical properties of semi-conductor. 12.6 State the Hall Effect	
		2		12.7 Describe the uses of semi-conducting materials 12.8 Discuss the uses of photo-conducting materials	

				12.9 Describe Gallium Arsenide materials 12.10 Describe the properties of Gallium Arsenide materials 12.11 Describe the uses of Gallium Arsenide materials	
16	16	1	<b>13. Understand the concept of optical fiber</b>	13.1 Define optical fiber 13.2 Materials used for commercial optical fiber. 13.3 Describe the construction details of optical fiber 13.4 Discuss the types of optical fiber	
		2		13.5 Describe the advantages of optical fiber 13.6 Describe the applications of optical fiber	
17.	17.	1.		Class Test & Quiz Test	
18.	18.	2.		Review	