Bangladesh Sweden Polytechnic Institute, Kaptai
Electrical Department
Semester Plan (Theory)-2023

Subject: Electrical Circuit-1 (66721)　　　　　　**T-P-C**

Teacher: **Mohammad Mohaiminul Islam Sabbir (Electrical)**　　　**3-3-4**

No. of Week	Theory Content	Learning Materials	Practical Content	Learning Materials
	General & Specific Objectives (G.O. & S.O.)		**General & Specific Objectives (G.O. & S.O.)**	
1	1.1 Define direct current (DC) 1.2 Define circuit parameters.	White Board & Marker, MM.	Show skill in using oscilloscope in measuring AC voltage & frequency.	White Board & Marker, MM.
	1.3 List the circuit parameters. 1.4 Define circuit parameters with units.	White Board & Marker, MM.		
2	2.1 Define electric networks. 2.2 List the different types of electric networks. 2.3 Explain the different types of electric networks.	White Board & Marker, MM.	Show skill in verifying kerchief's laws.	White Board & Marker, MM.
	2.4 Define active and passive network. 2.5 Define current source and voltage source.	White Board & Marker, MM.		
	2.6 Explain the current and voltage source in electric network.	White Board & Marker, MM.		

	2.7 Give example of current source & voltage source.			
3	**Circuit theorems** 3.1 State & explain Kirchhoff's current Law (KCL) and Kirchhoff's voltage Law (KVL).	**White Board & Marker, MM.**	**Show skill in verifying Thevenin's theorem.**	**White Board & Marker, MM.**
	3.2 State & explain Thevenin's theorem.	**White Board & Marker, MM.**		
	3.3 State & explain Superposition theorem.	**White Board & Marker, MM.**		
4	3.5 State & explain Maxwell's theorem.	**White Board & Marker, MM.**	**Show skill in verifying Norton's theorem.**	**White Board & Marker, MM.**
	3.6 State & explain Maximum power transfer theorem. 3.7 Solve problems related to all Theorems.	**White Board & Marker, MM.**		
	Star-Delta conversion 4.1 State star-delta conversion.	**White Board & Marker, MM.**		
5	4.2 Explain star-delta conversion.	**White Board & Marker, MM.**	**Show skill in verifying Superposition theorem.**	**White Board & Marker, MM.**
	4.3 Convert star to delta connection and vice versa. 4.4 Solve problems related to star-delta conversion.	**White Board & Marker, MM.**		
	AC circuit and AC fundamentals. 5.1 Define AC circuit (AC).	**White Board & Marker, MM.**		
6	5.2 Explain the importance of AC systems.	**White Board & Marker, MM.**	**Show skill in maximum power transfer theorem.**	**White Board & Marker, MM.**

	5.3 Describe the advantages and disadvantages of AC circuit. 5.4 Principle of the generation of AC voltage.			
	5.5 Derive the equation: e = $E_{max}Sin\omega t$ 5.6 Define cycle, frequency & time period with units.	**White Board & Marker, MM.**		
	5.7 Show the relation: $f = \dfrac{PN}{120}$	**White Board & Marker, MM.**		
7	5.8 List the commercial frequency of different countries. 5.9 Explain phase & phase difference with diagram.	**White Board & Marker, MM.**	**Show skill in measuring effective resistance of a coll.**	**White Board & Marker, MM.**
	5.10 Solve related problems.	**White Board & Marker, MM.**		
	5.10 Solve related problems.	**White Board & Marker, MM.**		
8	6.1 Define instantaneous values, average and maximum values of alternating quantities. 6.2 Generalize the rms values. 6.3 Define form factor and peak factor. 6.4 Define ohmic resistance & effective resistance.	**White Board & Marker, MM.**	**Show skill in determining the values of resistance & inductance and draw the vector diagram of RL series circuit.**	**White Board & Marker, MM.**
	6.3 Define form factor and peak factor. 6.4 Define ohmic resistance & effective resistance.	**White Board & Marker, MM.**		

	6.5 Compare ohmic & effective resistance. 6.6Solve problems on instantaneous, average and rms values.	**White Board & Marker, MM.**		
9	**Vectors and vector quantities.** 7.1 Define vector quantities. 7.2Explainvector representation of alternating voltage and current.	**White Board & Marker, MM.**	**Show skill in determining the values of resistance & capacitance and drawing vector diagram of RC series circuit.**	**White Board & Marker, MM.**
	7.3Explain vector in Polar form. 7.4 Explain vector in Rectangular form.	**White Board & Marker, MM.**		
	7.5Formulate the relation between vectors expressed in rectangular and polar co-ordinate. 7.6Solve problems relating to vector sum & difference, multiplication and division.	**White Board & Marker, MM.**		
10	**AC circuit (containing pure resistance, inductance and capacitance).** 8.1 Sketch a circuit containing pure Resistance.	**White Board & Marker, MM.**	**Show skill in determining the values of resistance & inductance, capacitance and draw the vector diagram from of RLC series circuit.**	**White Board & Marker, MM.**
	8.2 Explain the vector & phasor diagram of a pure resistive circuit.	**White Board & Marker, MM.**		
	8.3 Deduce the current and voltage relation in pure resistive circuit.	**White Board & Marker, MM.**		
11	8.4 Sketch a circuit containing pure Inductance.	**White Board & Marker, MM.**	**Show skills in determining power factor of a RLC series circuit and drawing vector diagram**	**White Board & Marker, MM.**

	8.5 Explain the vector & phasor diagram of pure Inductive circuit.			
	8.6 Evaluate the relation among inductive reactance, current and voltage in pure Inductive circuit. 8.7 Sketch a circuit containing pure Capacitance.	**White Board & Marker, MM.**		
	8.8 Explain the vector & phasor diagram of pure capacitive circuit. 8.9 Formulate capacitive reactance.	**White Board & Marker, MM.**		
12	**AC series circuit (containing resistance, inductance and capacitance).** 9.1 Draw circuit containing resistance and inductance (RL) in series. 9.2 Explain vector & phasor diagram in RL series circuit. 9.3 Formulate impedance, current and voltage drop in RL series circuit.	**White Board & Marker, MM.**		
	9.4 Draw impedance triangle in RL series circuit. 9.5 Draw circuit containing resistance and capacitance (RC) in series. 9.6 Explain vector & phasor diagram in RC series circuit.	**White Board & Marker, MM.**		

	9.7Formulate impedance, current and voltage drop in RC series circuit. 9.8 Draw impedance triangle of RC series circuit.	**White Board & Marker, MM.**		
13	9.9 Solve problems on RL & RC series circuits. 9.10 Sketch a circuit containing resistance, inductance and capacitance (RLC) in series.	**White Board & Marker, MM.**		
	9.11 Explain vector & phasor diagram of RLC series circuit. 9.12 Draw impedance triangle of RLC series circuit.	**White Board & Marker, MM.**		
	9.13Calculate inductive reactance, capacitive reactance, total impedance, current & voltage drop in RLC series circuit. 9.14 Solve problems on RLC series circuit.	**White Board & Marker, MM.**		
14	**Power & power factor in AC circuit.** 10.1Define power, power factor, active & reactive power. 10.2Calculate power and power factor of pure resistive circuit.	**White Board & Marker, MM.**		
	10.2Calculate power and power factor of pure resistive circuit.	**White Board & Marker, MM.**		
	10.3Calculate power and power factor of pure Inductive circuit.	**White Board & Marker, MM.**		

15	10.4Calculate power and power factor of pure capacitive circuit.	**White Board & Marker, MM.**		
	10.5 Calculate power, power factor, active & reactive power of RL, RC & RLC series circuit.	**White Board & Marker, MM.**		
	10.6 Explain the power diagram of R, L, C, RL, RC & RLC series circuit. 10.7 Solve problems on power & power factor of different series circuit.	**White Board & Marker, MM.**		
16	**Review**(Theory)		**Review**(Theory/Practical)	