Bangladesh Sweden Polytechnic Institute, Kaptai Electrical Department

Semester Plan (Practical)/2023

(2nd Semester) Mechanical

Subject: Basic Electricity (66711)	T-P-C
Teacher: Mohammad Mohaiminul Islam Sabbir (Electrical)	3-3-4

No. of	(Job. /	Practical Content	Teaching
Week	Experiment)		Aid
	/Week	General & Specific Objectives (G.O. & S.O.)	
1	Job./Exp1 (P-115+ Act- 15+A-5 = 135 min)	 G.O.1: Identify and use electrical measuring instruments. S.O: 1.1 Identify Voltmeters, Ammeters, Ohm Meter, Wattmeter, Energy meter and AVO meter. 1.2 Select & read the scale of given meters. 1.3 Connect correctly voltmeter, ammeter, and wattmeter and energy meter to a given circuit. 	White Board & Marker, MM.
2	Job./Exp2	 G.O.9: Show skill in uses of hand tools, wires and cables. S.O: 9.1 List the hand tools used in electrical wiring. 9.2 Identify the hand tools used in electrical wiring. 9.3 Draw neat sketches of hand tools used in electrical wiring. 9.4 Identify different types of wires and cables. 9.5 Measure the diameter of the identified wire and cables using standard wire gauge. 	White Board & Marker, MM.

No. of	(Job. /	Practical Content	Teaching
Week	Experiment)		Aid
	/Week	General & Specific Objectives (G.O. & S.O.)	
3	Job./Exp3	 G.O.11: Show skill in preparing wring circuit of two lamps controlled from the points Separately. S.O: 11.1 Sketch a working circuit of two lamps controlled from two poin separately. 11.2 Make the wiring circuit using required materials and equipment a wiring board. 11.3 Test the connection of circuit by providing proper supply. 	White Board & Marker, MM.
4	Job./Exp4	 G.O.12: Show skill in preparing wiring circuit of one lamp controlled from the points. S.O: 12.1 Sketch a working diagram of one lamp controlled by two SPD tumbler Switches. 12.2 Complete the wiring circuit using required materials and equipment on wiring board. 12.3 Test the connection of circuit by providing proper supply. 	White Board & Marker, MM.
5	Job./Exp5	 G.O.2: Show skill in verification of Ohm's Law. S.O: 2.1 Sketch the circuit diagram for the verification of Ohm's Law. 2.2 List tools, equipment and material required for the experiment. 	White Board & Marker, MM.

No. of	(Job. /	Practical Content	Teaching
Week	Experiment)		Aid
	/Week	General & Specific Objectives (G.O. & S.O.)	
		2.3 Prepare the circuit according to the circuit diagram using proper	
		Equipment.	
		2.4 Check all connections before the circuit is energized.	
		2.5 Verify the law by collecting relevant data.	
6		G.O.3.1: Verify the characteristics of series circuits.	White Board
		S.O:	MM.
		3.1 Draw the working circuit diagram.	
	Job./Exp6	3.2 List tools, equipment and materials required for the experiment.	
	(P-115+ Act- 15+A-5 =	3.3 Prepare the circuit according to the circuit diagram using proper equipment.	
	135 min)	3.4 Check all connections before the circuit is energized.	
		3.5 Record data and verify that in a series circuit total voltage and resistance is equal to the summation of individual voltage and resistance respectively but total current is equal to the individual current.	
7		G.O.3.2: Verify the characteristics of parallel circuits.	White Board
		S.O:	& Marker, MM.
		3.1 Draw the working circuit diagram.	
		3.2 List tools, equipment and materials required for the experiment.	
	Job./Exp7	3.3 Prepare the circuit according to the circuit diagram using proper equipment.	
		3.4 Check all connections before the circuit is energized.	
		3.6 Record data and verify that for a parallel circuit supply voltage is equal to the branch voltage, supply current is equal to summation of branch currents and total conductance is equal to the summation of branch conductance.	

No. of	(Job. /	Practical Content	Teaching
Week	Experiment)		Aid
	/Week	General & Specific Objectives (G.O. & S.O.)	
8		G.O.4: Show skill in measuring the power of an electric circuit. S.O:	White Board & Marker, MM.
		4.1 Sketch the necessary circuit diagram of an electrical circuit w electrical load, ammeter, voltmeter and wattmeter.	
	Job./Exp8	4.2 Prepare the circuit according to the circuit diagram using ammeter, voltmeter and wattmeter.	
		4.3 Record the power, measured by the wattmeter and verify t reading with that of calculated from ammeter and voltmeter.	
		4.4 Compare the measured data with that of calculated and rat power.	
9		G.O.5: Show skill in measuring the energy consumed in an electrical circuit.	White Board & Marker, MM.
		5.1 Sketch the necessary diagram of an electric circuit wattmeter, energy meter and electrical load.	
	Job./Exp9	5.2 Prepare the circuit according to the circuit diagram user wattmeter and energy meter.	
		5.3 Record the energy measured by the energy meter and verify with that of	
		Calculated from wattmeter for a fixed time.	
10	lob./Exp -10	G.O.13: Show skill in preparing wiring circuit of one bell with	White Board
10		two indicating lamp	& Marker,
	(P-115+ Act-	Controlled from two points.	MM.
	135 min)	S.O:	

No. of Week	(Job. / Experiment)	Practical Content	Teaching Aid
	/Week	General & Specific Objectives (G.O. & S.O.)	
11		 13.1 Sketch a working diagram of one bell with two indicating lamps controlled by two push button switch. 13.2 Make the wiring circuit using required materials and equipment in wiring board. 13.3 Test the connection of circuit by providing proper supply. G.O.14: Show skill in preparing wiring circuit of a fluorescent 	White Board
11	Job./Exp11	 tube light. S.O: 14.1 Sketch a working diagram of a fluorescent tube light circuit. 14.2 Make the connection of a fluorescent tube light circuit using required materials and equipment. 14.3 Test the connection of the circuit by providing supply. 	& Marker, MM.
12		Review(Practical/Theory)	White Board & Marker, MM.

*MM- Multimedia

* P- Practical. Act.- Activity, A- Attendance.

Bangladesh Sweden Polytechnic Institute, Kaptai Electrical Department

Semester Plan(Theory)-2023

2nd Semester (Mechanical)

Subject : Basic Eletricity (66711)

T-P-C

Teacher: Mohammad Mohaiminul Islam Sabbir (Electrical)

3-3-4

No.	No. of	Theory Content	Teaching
of Week	Lesson	General & Specific Objectives (G.O. & S.O.)	Aid
1	Lession-1 (L- 37 + F-8+ A-5 =45 min)	 G.O.1: Understand electricity and its nature. S.O: 1.1 State the meaning of electricity. 1.2 Describe the structure of atom. 1.3 Define current, voltage and resistance. 1.4 State the units of current, voltage and resistance. * 	White Board & Marker, MM.
	Lession-2	 G.O.2: Understand conductor and insulator. S.O: 2.1 Define conductor and insulator. 2.2 Explain the conductor and insulator according to electron theory. 2.3 List at least 5 conductors and 5 insulators G.O.2: Understand conductor and insulator. S.O: 	White Board & Marker, MM.

No.	No. of	Theory Content	Teaching
of	Lesson		Aid
Week		General & Specific Objectives (G.O. & S.O.)	
		2.4 Describe the factors upon which the resistance of a conductor depends.	
		2.5 State laws of resistance.	
		*	
		Feedback	
		S.O: 2.6 Prove the relation $\mathbf{P} = \mathbf{a}^{\underline{L}}$	White Board & Marker,
	Lession-3	2.7 Explain the meaning of resistivity and name the unit of resistivity.	NIN.
		2.8 Solve problems relating to laws of resistance.	
		* Feedback,	
		Assignment	
		S.O:	White Board & Marker, MM.
		2.8 Solve problems relating to laws of resistance.	
		G.O.13: Understand the uses of wires and cables.	
	Lossion 4	S.O:	
2	LE351011-4	13.1 Define electrical wires and cables.	
Z		13.2 Distinguish between wires and cables.	
		13.3 Describe the construction and uses of PVC, VIR, TRS or CTS and flexible	
		* Feedback	
	Lession-5	S.O:	White Board & Marker, MM.

No.	No. of	Theory Content	Teaching
of	Lesson	General & Specific Objectives (G.O. & S.O.)	Aid
Week			
		13.4 Describe the procedure of measuring the size of wires and cables by wire gauge	
		13.5 Describe the current carrying capacity of a wire.	
		G.O.14: Understand the usefulness of joints and splices.	
		S.O:	
		14.1 Define the meaning of joints and splices.	
		14.2 State the five steps of making a joint.	
		*	
		Feedback	
		S.O:	White Board
		14.3 Describe the procedure to make a pig tail joint, western union joint, Britannia joint, duplex joint, tap joint, simple splice.	& Marker, MM.
	Lession-6	14.4 Give example of uses of above mentioned joints	
		*	
		Feedback	
		G.O.15: Understand the different methods of house wiring.	White Board & Marker,
		S.O:	MM.
		15.1 State the meaning of wiring.	
3	Lession-7	15.2 List the types of wiring.	
		 15.3 State the procedure for Channel wiring, surface conduit wring and concealed wiring. * Feedback 	

No.	No. of	Theory Content	Teaching
of	Lesson	Concret & Specific Objectives (C.O. & S.O.)	Aid
Week		General & Specific Objectives (G.O. & S.O.)	
	Lession-8 (L-37 + F-8+ A- 5 =45 min)	G.O.17: Understand the construction and uses of protective devices. S.O: 17.1 Define protective devices. 17.2 Name the different types of protective devices. 17.3 Name the different types of fuses used in house wiring. * Feedback	White Board & Marker, MM.
		** Class Test	Question's Paper
4	Lession-9	 S.O: 15.4 State the types of wiring used in : a) Residential building, b) Workshop, c) Cinema hall/Auditorium, d) Temporary shed 15.5 List the name of fittings used in different types of electrical wiring G.O.17: Understand the construction and uses of protective devices. S.O: 17.1 Define protective devices. 17.2 Name the different types of protective devices. 	White Board & Marker, MM.

No.	No. of	Theory Content	Teaching
of	Lesson	General & Specific Objectives (G.O. & S.O.)	Aid
Week			
		*	
		Feedback	
		S.O:	White Board & Marker, MM.
		17.3 Name the different types of fuses used in house wiring.	
	Lession-10	17.4 Describe the construction and uses of renewable fuse.	
		17.5 Name the different types of circuit breaker used in house.	
		*	
		Feedback	
		G.O.3: Understand Ohm's Law	White Board & Marker, MM.
		S.O:	
		3.1 State Ohm's law.	
	Lession-11	3.2 Deduce the relation between current, voltage and resistance.	
		3.3 Solve problems relating to Ohm's law.	
		* Feedback,	
		Assignment	
		G.O.4: Understand electric circuit.	White Board & Marker, MM
5	Lession-12	S.O:	1 41141.
		4.1 Define electric circuit.	

No.	No. of	Theory Content	Teaching
of	Lesson	General & Specific Objectives (G.O. & S.O.)	Aid
Week			
		4.2 Name the different types of electric circuits.	
		4.3 Define series circuit, parallel circuit and mixed ckt.	
		*	
		Feedback	
		S.O:	White Board & Marker, MM.
	Lession-13	4.4 Describe the characteristic of series circuit and parallel circuit.	
		 4.5 Calculate the equivalent resistance of series circuit, parallel circuit and Mixed circuit. * Feedback 	
	Lession-14	S.O:4.6 Solve problems relating to series circuit, parallel circuit and mixed ckt	White Board & Marker, MM.
		* Feedback,	
		Assignment	
			White Board & Marker, MM.
		S.O:	
7	Lession-15	4.6 Solve problems relating to series circuit, parallel circuit and mixed ckt	
		G.O.18: Understand the necessity of ear thing.	
		S.O:	
		18.1 Define earthling	
		1	1

No.	No. of	Theory Content	Teaching
of	Lesson	General & Specific Objectives (G.O. & S.O.)	Aid
Week		General & Specific Objectives (G.O. & S.O.)	
		18.2 Explain necessity of earthling	
		18.2 Nome different trace of ear thing	
		18.5 Name different types of ear timig	
		* Feedback,	
		Assignment	
		**Quiz Test/Class Test	Question's Paper
		G.O.5: Apply the concept of electrical power and	White Board
		energy.	& Marker, MM.
		S.O:	
	Lession-17	5.1 Define electrical power and energy.	
	(I_27 ± E_8± A_	5.2 State the unit of electrical power and energy.	
	5 =45 min)	5.3 Show the relation between electrical power and energy.	
		5.4 List the name of instruments for measuring of electrical power and energy.	
		* Feedback	
			White Board
		S.O:	& Marker, MM.
		5.5 Draw the connection diagram of wattmeter and energy	
		meter in an electrical circuit.	
8	Lession-18	5.6 Solve problems relating to electrical power and energy Calculation.	
		* Feedback, Assignment	

No.	No. of	Theory Content	Teaching
of	Lesson		Aid
Week		General & Specific Objectives (G.O. & S.O.)	
	Lession-19	S.O: 5.6 Solve problems relating to electrical power and energy Calculation. * Feedback, Assignment	White Board & Marker, MM.
	Lession-20	 G.O.6: Understand the principles of Joule's law. S.O: 6.1 Describe the heating effect of electricity when current flows through a Conductor. 6.1 Explain Joule's law regarding the development of heat in electrical circuit. 6.2 Describe meaning of "J". 6.3 Solve problems relating to Joule's law. * Feedback, Assignment 	White Board & Marker, MM.
9	Lession-21	 S.O: 6.3 Solve problems relating to Joule's law. G.O.7: Understand the concept of cells. S.O: 7.1 Describe the meaning of potential difference. 7.2 Define the meaning of cell. 7.3 Classify the Cell 	White Board & Marker, MM.

No.	No. of	Theory Content	Teaching
of	Lesson	General & Specific Objectives (G.O. & S.O.)	Aid
Week			
		7.4 Define Primary Cell	
		7.5 List the different types of primary Cell	
		* Feedback,	
		Assignment	
		7.5 List the different types of primary Cell.	White Board
		7.6 Describe the construction and principle of action of a simple Voltaic cell.	& Marker, MM.
	Lession-22	7.7 List the defects of a simple Voltaic cell.	
		* Feedback,	
		Assignment	
		S.O:	White Board
		7.8 Describe the causes of defects of a simple Voltaic cell.	MM.
	Lession-23	7.9 Describe the methods of removing the defects of a simple Voltaic cell.	
		* Feedback	
		G.O.8: Understand the construction and principle of action of secondary cell.	White Board & Marker,
10		S.O:	MM.
		8.1 Define secondary cell.	
	Lession-24	8.2 Describe the construction and principle of action of a lead acid cell.	
		8.3 List the uses of lead acid cell.	
		* Feedback,	
		Assignment	

No.	No. of	Theory Content	Teaching
of	Lesson	General & Specific Objectives (G.O. & S.O.)	Aid
Week		·····	
		**Quiz Test/Class Test	Question's Paper
		S.O:	White Board
		8.4 List the advantages of secondary cell.	MM.
		8.5 Distinguish between a cell and a battery.	
	Lession-25	8.6 Describe the series and parallel grouping of cells.	
		*	
		Feedback	
		S.O:	White Board & Marker
	Lession-26	8.6 Describe the series and parallel grouping of cells.	MM.
11	(L-37 + F-8+ A- 5 =45 min)	8.7 Distinguish between Primary & Secondary Cell	
		*	
		Feedback	
			White Board & Marker,
		G.O.9: Understand the concept of capacitors and capacitance.	MM.
		S.O:	
	Lession-27	9.1 Define capacitor and capacitance.	
		9.2 Name the unit of capacitance.	
		9.3 Name the different types of capacitor.	
		9.4 Write the uses of capacitor.	
		Feedback	

No. of	Theory Content	Teaching
Lesson		Aid
	General & Specific Objectives (G.O. & S.O.)	
Lession-28	 S.O: 9.5 Determine the equivalent capacitance of a number of capacitors connected in series. 9.6 Determine the equivalent capacitance of a number capacitors connected in parallel. * Feedback 	White Board & Marker, MM.
Lession-29	 S.O: 9.7 Explain the energy stored in a capacitor. 9.8 Solve problems relating to capacitor connected in series and in parallel. * Feedback, Assignment 	White Board & Marker, MM.
Lession-30	 G.O.10: Understand Electro - magnetism. S.O: 10.1 Describe magnetic field, magnetic lines of force and its properties. 10.2 Describe field intensity and magnetic flux density. 10.3 Distinguish between absolute permeability and relative permeability. 10.4 Describe the concept of magnetic effect of electrical current. * Feedback 	White Board & Marker, MM.
	No. of Lesson Lession-28	No. of Lesson Theory Content General & Specific Objectives (G.O. & S.O.) General & Specific Objectives (G.O. & S.O.) Lession-28 S.O: 9.5 Determine the equivalent capacitance of a number of capacitors connected in series. 9.6 Determine the equivalent capacitance of a number capacitors connected in parallel. * Feedback Lession-29 S.O: 9.7 Explain the energy stored in a capacitor. 9.8 Solve problems relating to capacitor connected in series and in parallel. * Feedback Lession-29 G.O.10: Understand Electro - magnetism. S.O: 10.1 Describe magnetic field, magnetic lines of force and its properties. 10.2 Describe field intensity and magnetic flux density. 10.3 Distinguish between absolute permeability and relative permeability. 10.4 Describe the concept of magnetic effect of electrical current. *

No.	No. of	Theory Content	Teaching
of	Lesson	Concret & Specific Objectives (C.O. & S.O.)	Aid
Week		General & Specific Objectives (G.O. & S.O.)	
		S.O:	White Board
		10.4 Describe the concept of magnetic effect of electrical current.	& Marker, MM.
	Lession-31	10.5 States Maxwell's cork screw rule and Fleming's right hand rule for determining the direction of magnetic field and current.	
		10.6 Explain the force experienced in a current carrying conductor placed in a magnetic field.* Feedback	
		5.0	White Deered
		5.0:	White Board & Marker,
		10.7 State Fleming's left hand rule.	MM.
		10.8 Explain the work done by a moving conductor in a magnetic field.	WIWI.
	Lession-32	10.9 Explain the force between two parallel current carrying conductor	
		*	
		Feedback	
12			White Board & Marker, MM.
13		G.O.11: Understand magnetic circuit.	& Marker, MM.
		S.O:	
	Lession-33	11.1 Define a magnetic circuit.	
		11.2 Define the terms magnetizing force magneto motive	
		force, ampere – turns, reluctance, presence, permeability, magnetic linkage and leakage.	
		* Feedback	
			White Roard
	Lession-34	S.O:	& Marker, MM.

No.	No. of	Theory Content	Teaching
of	Lesson	General & Specific Objectives (G.O. & S.O.)	Aid
Week			
		11.3 Show the relation between magneto motive force, reluctance and magnetic field intensity or magnetizing force.	
		11.4 Compare a magnetic circuit with an electrical circuit.	
		*	
		Feedback	
		G.O.12: Understand electro- magnetic induction.	White Board & Marker, MM.
	Lession-35	12.1 Define Faraday's laws of electro-magnetic induction.	Aid Aid Aid White Board & Marker, MM. White Board & Marker, MM. White Board & Marker, MM.
14		12.2 Describe the magnitude of dynamically induced emf and statically	
		Induced emf.	
		Feedback	
	Lession-36	G.O.12: Understand electro- magnetic induction.	White Board & Marker, MM.
	/I 27 + E 9+ A		
	(L-37 + F-8+ A- 5 =45 min)	12.3 Solve problems relating to emf generation.	Aid White Board & Marker, MM. White Board & Marker, MM.
		 12.4 Define Lenz's law and Fleming's right hand rule for determining the direction of induced emf and current. * Feedback 	
	Loosier 27	S.O:	White Board & Marker, MM.
	Lession-37	12.5 Define self-induced emf and self-inductance.	
		12.6 Explain inductance of a iron cored inductor.	

No.	No. of	Theory Content	Teaching
of	Lesson		Aid
Week		General & Specific Objectives (G.O. & S.O.)	
		12.7 Define mutual inductance and co-efficient of coupling.	
		Feedback	
		G.O.16: Understand the construction and uses of controlling devices.	White Board & Marker, MM.
		S.O:	
		16.1 Define controlling device.	
	Lession-38	16.2 Name the different types of controlling devices.	
		16.3 Describe the constructional features and uses of tumbler switch, iron clad switch, push button switch and gang switch.	
		*	
15		Feedback	
15		G.O.19: Apply the principle of controlling electrical circuit by switch.	White Board & Marker, MM.
		S.O:	
	Lession-39	19.1 Sketch the wiring diagram of one lamp controlled by one SPST switch and describe its uses.	
		19.2 Sketch the wiring diagram of one lamp controlled by two SPDT switch and describe its uses.	
		* Feedback	
	Lession-40	S.O:	White Board & Marker, MM.

No.	No. of	Theory Content	Teaching
of	Lesson	Concrel & Specific Objectives (C.O. & S.O.)	Aid
Week		General & Specific Objectives (G.O. & S.O.)	
		19.3 Draw the wiring diagram of one calling bell with a	
		lamp controlled from one point.	
		19.4 Draw the wiring diagram of a fluorescent tube light circuit.	
		19.5 Describe the working principle of fluorescent tube light.	
		*	
		Feedback	
		**Ouiz Test/Class Test	Question's
			Paper
		ELECTRICITY ACT	White Board
		G.O.20: Understand electricity act/rule of Bangladesh and safety practices.	& Marker, MM.
		S.O:	
16	Lession-41	20.1 State electricity act/rule of Bangladesh to be followed in electrical wiring.	
		20.2 Describe the importance of electricity act/rule	
		20.3 Describe safety procedure against electrical hazards.	
		20.4 List the performance of safety practices for electrical	
		equipment, machines and accessories	
		* Feedback	
	Lession-42	Review(Theory)	Do

*MM- Multimedia

*L- Lecture/Demonstration/Discussion method, F- Feedback, A-Attendance.