

Kurigram polytechnic Institute, Kurigram.

Semester plan

Course Name & Code: Electrical & Electronic Measurement-I(66751)

Technology :Electrical

Semester :5th

Teachers Name :Shahinur Islam

| Serial | No Of Week | No Of Class | | General Objectives | Specific Objectives | Remark |
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| | | Theo | Pa c | | | |
| 1 | 1 | 1 | | 1. Recognize the basic concept of measurements | 1.1 Define measurements of electrical quantities. 1.2 Discuss significance of measurements. 1.3 Describe the terms accuracy, precision, sensitivity and resolution or discrimination. 1.4 Distinguish between accuracy and precision. | |
| | | 2 | | | 1.5 Demonstrate errors in measurements. 1.6 State true value, loading effect. static error or absolute error, relative error, static correction, limiting error and percentage limiting error. 1.7 Describe the loading effects due to shunt connected instruments | |
| | | 3 | | | 1.8 Explain the loading effects due to series connected instruments. 1.9 Solve problems related to errors in measurement | |
| | | | 1 | | Find various types of measuring instruments. | |
| 2 | 2 | 1 | | 2. Interpret the classification of measuring instrument. | 2.1 Describe measuring instrument. 2.2 Name different types of measuring instruments. 2.3 Demonstrate absolute and secondary instruments. | |
| | | 2 | | | 2.4 List secondary instruments according to their mode of operation and functions. 2.5 Explain indicating, recording and integrating instruments | |
| | | 3 | | | 2.6 Describe the various effects of current or voltage utilized in measuring instrument upon which their operation depends. | |
| | | | 2 | | Study the operation of indicating, integrating, recording and digital instruments. | |
| 3 | 3 | 1 | | | Class Test& Quize Test | |
| 4 | 4 | 1 | | 3. Understand the principle of operation of | 3.1 List different types of torque applied in indicating instrument which act upon their moving system. 3.2 Describe deflecting torque and controlling | |

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| | | | | indicating instruments. | torque. 3.3 Explain spring control and gravity control system. | |
| | | 2 | | | 3.4 Distinguish between spring control and gravity control system. 3.5 Explain damping torque. 3.6 State different types of damping systems | |
| | | 3 | | | 3.7 Compare air friction damping, fluid friction damping and eddy current damping 3.8 Solve problems related to spring control and gravity control system. | |
| | | | 3 | | Select the correct type of ammeter and voltmeter. | |
| 5 | 5 | 1 | | 4. Perceive the constructional features of measuring instruments. | 4.1 Name the essential parts of measuring instruments. 4.2 Describe the parts of the instrument such as supporting, moving system, balancing, permanent magnets, pointer, scale, zero-adjuster, cases, etc. | |
| | | | | | 4.3 Discuss the torque weight ratio. 4.4 Explain the principle of operation of ammeter and voltmeter. | |
| | | | | | 4.5 Distinguish between the working principle of ammeter and voltmeter. 4.6 List the various types of ammeter and voltmeter | |
| | | | 2 | | 4 | Measure the single phase power by ammeter, voltmeter and wattmeter. |
| 6 | 6 | 1 | | 5. Interpret the principle of operation of moving iron instruments | 5.1 Describe the construction and working principle of moving iron attraction type instruments. 5.2 Derive the torque equation of moving iron attraction type instruments. | |
| | | 2 | | | 5.3 Describe the construction and working principle of repulsion type moving iron instrument. 5.4 Derive the torque equation of repulsion type moving iron instrument. | |

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| | | 3 | | | 5.6 Discuss errors in moving iron instruments. 5.7 Solve problems related to of moving iron instrument | |
| 7 | 7 | 2 | | Class Test & Quiz Test | | |
| 8 | 8 | 1 | | 6.Conceive the principle of operation of moving coil instruments | 6.1 Describe the construction and working principle of permanent magnet moving coil instruments. | |
| | | 2 | | | 6.2 Derive the torque equation of the moving coil instrument. | |
| | | 3 | | | 6.3 Mention the advantages and disadvantages of permanent magnet moving coil instruments. 6.4 Describe the construction and working principle of dynamometer type moving coil instruments. | |
| | | 5 | | | 6.5 Indicate the arrangement of coils of dynamometer type instruments for measurements of current and voltage. | |
| | | | | Study the different parts of an energy meter | | |
| 9 | 9 | 1 | | 7,8,9Understand the principle of electrostatic voltmeter,watt meter. | 7.1 Describe the construction and working principle of a quadrant type voltmeter. 7.2Mention the uses of electrostatic voltmeter | |
| | | 2 | | | 8.1 Describe the construction and principle of operation of dynamometer type wattmeter. 8.3 Specify the disadvantages of dynamometer type wattmeter. | |
| | | 3 | | | 9.3 List the advantages of induction type wattmeter. 9.4 List the disadvantages of induction type wattmeter | |
| | | 6 | | | Measure the three phase power by two wattmeter method. | |
| 10 | 10 | 1 | | 10,11,12. Interpret the concept of measurement of single phase power,three phase circuit, energy meter | 10.1 Derive the equation, $P = EI \cos \phi$ 10.2 Demonstrate the circuit diagram connecting wattmeter in a single phase circuit. . | |
| | | 2 | | | 11.1 List the method for the measurement of power in three phase circuit. 11.2 Describe the method for measurement of three phase power by two wattmeter | |
| | | 3 | | | 12.1 Describe the principle of operation of energy meter. 12.2 List the different types of energy meter. | |
| | | 7 | | | Study the different parts of an energy meter. | |

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| 11 | 11 | 1 | 8 | 13. Perceive the concept of testing of energy meter. | 13.1 Explain the necessity of testing of energy meter. | |
| | | 2 | | | 13.2 List the apparatus required for testing of energy meter | |
| | | 3 | | | 13.3 State the methods of testing of energy meter. | |
| | | | | | 13.4 Explain the short period testing using a standard wattmeter. | |
| | | | | | 13.5 Solve problems related to energy meter testing | |
| 12 | 12 | 1 | 9 | 4. Conceive the concept of digital instrument and digital display. | 14.1 Explain the principle of operation of digital instruments. | |
| | | 2 | | | 14.2 Describe the advantages of digital instruments. | |
| | | 3 | | | 14.3 Compare digital instruments with the Analog instruments. | |
| | | | | | 14.4 Mention the different types of digital display system. | |
| | | | | | 14.5 Describe seven segment display and 3×5 dot matrix display. | |
| | | | | | 14.6 Demonstrate the construction of liquid crystal display. | |
| | | | | | 14.7 Express the operation of gas discharge plasma display. | |
| 13 | 13 | 1 | | 15. Interpret the concept of digital voltmeter and digital energy meter. | 15.1 Explain the operation of transistor voltmeter (TVM). | |
| | | 2 | | | 15.2 Describe the operation of ramp type digital voltmeter (RDVM). | |
| | | 3 | | | 15.3 Enumerate the operation of successive approximation digital voltmeter | |
| | | | | | 15.4 Describe the principle of operation of digital single phase energy meter | |
| | | | | | Measure the energy of a three phase circuit by single phase digital energy meter. | |
| 14 | 14 | | | Review | Review | |