

C.U.SHAH UNIVERSITY – Wadhwan City



FACULTY OF: -Technology and Engineering
DEPARTMENT OF: -Electrical Engineering
SEMESTER: - IV **CODE:** - 2TE04ECT1
NAME – Electrical Commissioning and Testing (ECT)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							Total Marks
		Th	Tu	Pr	Total		Theory				Practical (Marks)			
							Sessional Exam		University Exam		Internal		University	
							Marks	Hours	Marks	Hours	Pr	TW	Pr	
2TE04ECT1	Electrical Commissioning and Testing (ECT)	3	0	2	5	4	30	1.5	70	3	30	20	-----	150

Objectives:-

- To Developed the Basic Knowledge of Principles & Concept of Commissioning.
- Importance of Testing Before & After Commissioning.
- Installation & Maintenance of Electrical Equipment & Domestic Appliances.
- Trouble Shooting & Safety

Prerequisites: - Basic Knowledge Commissioning & Testing

Course Outlines:-

Sr, No,	Course Contents	No Of Hours
1	<p>Commissioning and Testing: Standard Procedure For Commissioning of Various Static/ Rotating Electrical Machines/Equipment and Power Installation, Oil Sampling, Testing & Filtering, Polarization Index, Drying Out Procedure of Transformer, Winding Etc, Measurement of Insulation Resistance (I.R.), Check Before Commissioning Such as Mechanical & Electrical Checks As Per I.S., Safety Rules and Regulations to be Observed, Technical Reports to be Prepared, Standard Procedure for Commissioning of Various Static/ Rotating Electrical Machines/Equipment and Power Installation. Importance of Testing After Commissioning, Different Types of Electrical and Mechanical Tests, Insulation Resistance Test, Classification of Insulating Materials, Reasons for Deterioration I.R. and Drying Insulation and Impregnation.</p>	08
2	<p>Commissioning Of Transformer and Induction Motor : Pre-Commissioning Test for Transformer, Classification of Testing Methods -Ratio Test, Load Loss , Separate Source Voltage Testing ,Induced Voltage Testing , Impulse & Surge Testing , Noise Level & Vibration Testing , Short Circuit Withstand Test , Measurement of Impedance, Testing of Auxiliaries & Safety Device , Properties of Insulating Oil , Oil Sampling, Testing Filtering, DC & AC Resistance Measurement, Temp. Rise Test, Short Circuit Test, Dielectric Test, Partial Discharge, Insulation Resistance Testing, Polarity Testing, Short Time Current Rating, Impulse & Surge Testing, Determination of Polarization Index for Transformer,Drying Out Procedure for Transformer. Commissioning Steps for Transformer, Troubleshooting & Maintenance of Transformer. Pre-Commissioning Test For Three Phase Induction Motor, Classification of Testing</p>	08

	Methods - Hammer Test, Testing Against Variation of Voltage/Current/Frequency, Load Test, DC & AC, Resistance Measurement, Insulation Measurement, Starting Test, Temp. Rise Test, Slip Measurement, HV Test, Testing on Auxiliaries, Vibration Test, Noise Level Test, Drying Out Methods, Polarization Index, Commissioning Steps For Induction Motor, Heat Run Test, Commissioning of Induction Generator, Troubleshooting & Maintenance of Induction Motor.	
3	Installation Maintenance Of Electrical Machine: Standard Procedure For Installation Of Various Electrical Machines, Inspection on Arrival and Before Installation, Foundation Preparation For Installation, Tools / Instruments Required For Installation, Safety Precautions To Be Observed, Installation Procedure For Electrical Machine/ Equipment, Preparation Of Technical Report & Specification Sheet. Basic Need Of Maintenance, Meaning, Importance And Advantages Of Preventive Maintenance Of Preventive Maintenance, Maintenance Schedules Of Different Types Of Electrical Machines (Rotating And Static) And Equipment, Transmission Line, Circuit Breakers And Cables, Break Down Maintenance And Its Record Keeping, Safety Rules Applicable For Preventive Maintenance And Breakdown Maintenance.	08
4	Installation & Maintenance Of Domestic Appliances: Common Faults In Domestic Appliances, Installation Procedure For Domestic Appliances, Maintenance Procedure for Domestic Appliances, Tools/Equipments Required for Maintenance of Domestic Appliances, Safety Rules Observed During Maintenance of Domestic Appliances.	06
5	Trouble Shooting: Definition of Trouble Shooting, Causes of Faults And Types of Faults, Common Faults In Domestic Appliances and Electrical Machine/Equipment, Common Faults In Electrical Installation And Cable, Location of Faults In Above Machines And Equipments, Trouble Shooting Charts For Above Electrical Equipment And Machines, Tools And Equipment Used In Trouble Shooting And Repairs, Servicing Procedure For Electrical Equipment And List of The Servicing Materials, Testing Of Equipment After Repairs And Servicing.	06
6	Earthing: Necessity of Earthing, System Earthing, Equipment Earthing, Methods of Earthing, Earth Electrodes, Earth Bus & Earth Wire, Measurement of Earth Resistance, Values of Earthing Resistance of Different Equipment/ Installation, Reduction of Earth Resistance, Earthing Procedure of The Following - Installations In Building, Domestic Fitting & Appliances, Industrial Premises, Substation & Generating Station, Overhead Power Lines.	06
7	Electrical Accidents And Safety: Types And Causes Of Electrical Accidents, Factors Affecting Severity of Electric Shock, Preventive Measures Against Electrical Accident, General And Specific Safety Rules To Avoid Electrical Accident As Per I.E, Acts, Importance of "Permit To Work" In Power Station, Safety Tools And Devices With Their Applications Like Slogan, Board, Notice, Fire Extinguisher.	06

List of Experiments:-

- Testing Of Insulating Oil As Per IS 1962-1978.
- Commissioning of Three Phase Induction Motor.
- Commissioning of Three Phase Transformer.
- Prepare Technical Reports For Induction Motor.
- Trouble Shooting Of An Induction Motor
- Dismantle and Trouble Shoot of Ceiling Fan.
- Prepared Troubleshooting Chart For Different Electrical Machine.
- Prepared Troubleshooting Chart For Different Domestic Appliances.
- Prepare Plate/ Pipe Earthings As Per I.S. And Measure The Earth Resistance.
- Measurement of Earth Resistance By VA Method.
- Measurement of Insulation Resistance By Megger.

Learning Outcomes:-

- Commissioning and Testing of electrical machines.
- Troubleshooting of electrical home appliances.

Books Recommended:-

- Testing, Commissioning & Maintenance of Electrical equipment By S.S. Rao. Khanna publications
- The commissioning of Electrical Plant by RCH Richardson (Chapman & Hall)
- Electrical Maintenance and Repair By J.I. Watts
- Electrical Installation estimating and costing S.L. Uppal - Khanna Publication.
- A Course in Electrical Installation Estimating & Costing by J.B.Gupta- Katso Pub.