National Institute of Technology Meghalaya

An Institute of National Importance

CURRICULUM

Programme	**Bachelor of Technology in Respective Programme**	Year of Regulation	**2019-20**
Department	**Electrical Engineering**	Semester	**VI**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
EE 372	**Utilization of Electric Power**	**2**	**0**	**0**	**2**	**50**	**50**	**100**	**200**

		After the completion of the course, the student should be able to:		
Course Objectives	To know and familiarise about the applications of electrical power.	Course Outcomes	CO1	understand various Illumination techniques and design lighting scheme for specific applications
	To learn about domestic uses of electric power		CO2	understand the operation of refrigeration, air conditioning and evaluate the energy efficiency
	To learn about the industrial uses of electrical power		CO3	acquire knowledge about domestic applications of electric power
			CO4	acquire knowledge about different methods of heating
			CO5	understand and evaluate the performance of a traction unit.

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	**3**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**As per the respective programme**		
2	CO2	**3**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			
3	CO3	**3**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			
4	CO4	**3**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			
5	CO5	**3**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			
6	CO6	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**			

SYLLABUS

No.	Content	Hours	COs
I	**Illumination** Terminology, Laws of illumination, Different types of lamps, LED lighting and Energy efficient lamps. Design of lighting schemes - factory lighting - flood lighting – street lighting.	**04**	**CO1**

II	**Refrigeration** Domestic refrigerator and water coolers. Air-Conditioning - Various types of air conditioning system and their applications, smart air conditioning units. Energy Efficient motors: Standard motor efficiency, need for more efficient motors, Motor life cycle, Direct Savings and payback analysis, efficiency evaluation factor.	**06**	**CO2**
III	**Domestic utilization of electrical energy** House wiring. Induction based appliances, Online and Offline UPS, Batteries. Power quality aspects – nonlinear and domestic loads.	**04**	**CO3**
IV	**Electric Heating and Electrolytic processes** Types of heating and applications, Electric furnaces - Resistance, inductance and Arc Furnaces, Electric welding and sources of welding– electro-metallurgy and electro-plating.	**04**	**CO4**
V	**Traction system** power supply, traction drives, electric braking, tractive effort calculations and speed-time characteristics. Locomotives and train - recent trend in electric traction.	**06**	**CO5**
Total Hours		**24**	

Essential Readings

1. R. K. Rajput, 'Utilisation of Electrical Power', Laxmi Publications, 1st Edition, 2007.
2. C. L. Wadhwa, 'Generation Distribution and Utilization of Electrical Energy', New Age International, 4th Edition, 2011.

Supplementary Readings

1. S. L. Uppal and S. Rao, 'Electrical Power Systems', Khanna publishers: New Delhi, 1st Edition, 2009.
2. J. B. Gupta, 'Utilisation of Electrical Energy and Electric Traction', S. K. Kataria and Sons, 10th Edition, 1990.
3. E. Openshaw Taylor, Utilization of Electric Energy, Universities Press, 12th Edition, 2009.