



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 | Course Outcomes | Course Outcomes | |
|---------------------------------------------------------------------|-----------------|-----------------|--------------------------------------------------------------------------------------------------------------|
| | | CO1 | CO2 |
| 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 | | | | |
| 3 | CO3 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 4 | CO4 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 5 | CO5 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 6 | CO6 | - | - | - | - | - | - | - | - | - | - | - | | | | |

SYLLABUS

| No. | Content | Hours | COs |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|
| 1 | 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 |

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| 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, 1 st Edition, 2007. | | | |
| 2. C. L. Wadhwa, 'Generation Distribution and Utilization of Electrical Energy', New Age International, 4 th Edition, 2011. | | | |
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| Supplementary Readings | | | |
| 1. S. L. Uppal and S. Rao, 'Electrical Power Systems', Khanna publishers: New Delhi, 1 st Edition, 2009. | | | |
| 2. J. B. Gupta, 'Utilisation of Electrical Energy and Electric Traction', S. K. Kataria and Sons, 10 th Edition, 1990. | | | |
| 3. E. Openshaw Taylor, Utilization of Electric Energy, Universities Press, 12 th Edition, 2009. | | | |
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