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	**V**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
EE 371	**Electrical Safety and Regulations**	**2**	**0**	**0**	**2**	**50**	**50**	**100**	**200**

Course Objectives	Course Outcomes		
To provide an overview of electrical hazards, various grounding techniques.		CO1	**Understand primary and secondary electric hazards**
To familiarise with safety issues and regulations.		CO2	**Acquire knowledge on grounding systems**
		CO3	**Ability to calculate flash hazard, approach distances ,arc protection level etc, and understand the safety requirements and implementation of safety measures and policies**
		CO4	**Acquire knowledge about the standard acts, regulations and codes pertaining to electrical safety**

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**	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**0**	**As per the respective programme**		
2	CO2	**3**	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**			
3	CO3	**3**	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**0**			
4	CO4	**3**	**0**	**2**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**0**			
5	CO5	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**			
6	CO6	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**			

SYLLABUS

No.	Content	Hours	COs
I	**Electrical safety issues:** **arc, blast, shocks-causes and effects-safety equipment- flash and thermal protection, head and eye protection-rubber insulating equipment, hot sticks, insulated tools, barriers and signs, safety tags, locking devices- voltage measuring instruments- proximity and contact testers-safety electrical one line**	**07**	**CO1**

	diagram- electrician's safety kit		
II	**General requirements for grounding -** **definitions- grounding of electrical equipment-purpose of system grounding- grounding electrode system- grounding conductor connection to electrodes-use of grounded circuit conductor for grounding equipment- grounding of low voltage and high voltage systems.**	**06**	**CO2**
III	**Electrical safety measures and safety program structure** **The six-step safety methods: pre job briefings- hot -work decision tree-safe switching of power system lockout-tag out- flash hazard calculation and approach distances- calculating the required level of arc protection-safety equipment , procedure for low, medium and high voltage systems- the one minute safety audit** **Company safety team- safety policy- programme implementation- employee electrical safety teams- safety meetings- safety audit- accident prevention- first aid- rescue techniques-accident investigation**	**08**	**CO3**
IV	**Act, Safety Regulations and relevant Code and Standards:** **Electricity Act,2003, Factories Act,1948, CEA(Measures relating to Safety and Electric Supply), Regulations,2010, CEA(Technical Standards for Construction of Electrical Plants and Lines), Regulations,2010, CEA(Technical Standards for Connectivity to the Grid) Regulations,2007, Relevant IS/NEC/IEC Standards mentioned in CEA Regulations, National Electrical Code, National Building Code**	**03**	**CO4**
Total Hours		**24**	

Essential Readings

1. Dennis Neitzel, Al Winfield,'Electrical Safety Handbook', McGraw-Hill Education, 4th Edition, 2012.

Supplementary Readings

1. Maxwell Adams. J, "Electrical safety- a guide to the causes and prevention of electric hazards", The Institution of Electric Engineers, 1st edition, 1994.
2. Ray A. Jones, Jane G. Jones, 'Electrical safety in the workplace', Jones & Bartlett learning, 1st edition, 2000.