National Institute of Technology Meghalaya

An Institute of National Importance

CURRICULUM

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

Course Code	Course Name	Credit Structure				Marks Distribution		
		L	T	P	C	Continuous Assessment		Total
EE 354	**Switchgear and Protection Lab**	**0**	**1**	**2**	**2**	**10 Experiments**	**10**	**100**

Course Objectives	Course Outcomes		
To introduce electrical switchgear and protective relays		CO1	**Able to acquire knowledge about switchgears and identification of its application**
To teach the computation of fault current in the electrical system		CO2	**Able to acquire knowledge about protective relays and identification of application**
To develop an ability and skill to design various relay settings		CO3	**Able to compute the fault current and design of switchgears**
To develop an ability and skill to design various electrical protection schemes		CO4	**Able to design of protective relays**
		CO5	**Able to design of protection schemes for electrical equipments**

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**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**0**	**3**
2	CO2	**3**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**2**
3	CO3	**2**	**3**	**3**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**3**	**2**
4	CO4	**2**	**2**	**3**	**0**	**2**	**2**	**3**	**0**	**2**	**0**	**0**	**1**	**2**	**3**	**2**
5	CO5	**2**	**2**	**3**	**0**	**2**	**2**	**3**	**0**	**2**	**0**	**0**	**1**	**3**	**3**	**3**
6	CO6	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

SYLLABUS

No.	Content	Hours	COs
0	**Introduction to laboratory class**	**03**	

1	**Over current and under voltage protection schemes**	**03**	**All CO's**
2	**Over or under frequency protection schemes**	**03**	
3	**Directional over current protection relay characteristics**	**03**	
4	**Power Reverse relay protection schemes**	**03**	
5	**Earth fault relay protection schemes**	**03**	
6	**Differential relay protection schemes**	**03**	
7	**Digital relay and design of distance protection schemes**	**03**	
8	**Study of MCB, Characteristics of HRC fuse, Visit report on protection schemes in substation**	**03**	
9	**Simulation exposure of switchgears and protection schemes**	**03**	
10	**Study of industrial circuit breaker and testing**	**03**	
11	**Make – up laboratory class**	**03**	
Total Hours		**36**	

Essential Readings

1. P. M. Anderson, "Power System Protection", JW and IEEE Press, 1st Edition, 1998.
2. S. S. Rao, "Switchgear Protection and Power Systems", Khanna Publishers, 13th Edition, 1977.

Supplementary Readings

1. C. R. Mason, "Art & Science of Protective Relaying", John Wiley & Sons, 6th Edition, 1967.
2. T. S. M. Rao, "Solid State Protective Relaying", Tata McGraw-Hill, 2nd Edition, 2001.
3. Y. G. Paithankar and S.R. Bhide, "Fundamentals of Power Systems Protection", PHI, 2nd Edition, 2013.