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	**V**

Course Code	Course Name	Pre-Requisite	Credit Structure				Marks Distribution		
			L	T	P	C	Continuous Assessment		Total
EE 351	**Power System II Lab**	**None**	**0**	**1**	**2**	**2**	**11 Experiments**	**11**	**100**

Course Objectives	Course Outcomes		
To understand the economics of power system operation and perform load flow analysis.		CO1	Perform load flow analysis for any power system models.
To develop an ability and skill to analyse power system faults and stability.		CO2	Ability to compute faults in the transmission network.
To understand the requirements and methods of real and reactive power control in power system.		CO3	Perform economic load dispatch for thermal units.
To realize optimal scheduling of hydro-thermal generation.		CO4	Perform AGC of multi-area power system model.
		CO5	Solve the unit commitment problem considering various constraints and perform hydro-thermal generation scheduling.

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

SYLLABUS

No.	Content	Hours	COs

1	**Introduction to MATLAB, Siemens PSSE and SINCAL software's**	**03**	
2	**Construction of bus admittance and impedance matrices for a given power system**	**03**	
3	**Power flow analysis using Gauss-Seidal technique given power system**	**03**	
4	**Power flow analysis using Newton-Raphson technique of a given power system**	**03**	
5	**Single phase, double phase and three phase fault analysis in the given power system**	**03**	**CO1**
6	**Computation of sequence components under fault in the given power system**	**03**	**CO2**
7	**Computation of alternator rotor angle oscillations in a given power system**	**03**	**CO3** **CO4**
8	**To solve economic load dispatch considering losses in Matlab**	**03**	**CO5**
9	**To perform the analysis and control on multi-area system in Matlab Simulink.**	**03**	
10	**To solve unit commitment problem using dynamic programming method.**	**03**	
11	**To perform hydro-thermal scheduling program using gradient method in Matlab.**	**03**	
12	**Make – up laboratory class**	**03**	
Total Hours		**36**	

Essential Readings

1. W. D. Stevenson, "Element of Power System Analysis", Tata McGraw Hill, 4th edition, 1982
2. J. Nagrath and D.P. Kothari, "Power System Engineering", Tata McGraw Hill, 2nd edition, 2007
3. O.I. Elgerd, "Electrical Energy System Theory: An introduction", 2nd Edition, 1983, TMH.

Supplementary Readings
1. P. Kundur, “Power System Stability and Control”, Tata McGraw Hill, 1st edition, 2006
2. G. W. Stagg and A. H. EI-Abaid, “Computer Methods in Power System Analysis”, McGraw Hill, 1st edition, 1971.