	National Institute of Technology Meghalaya An Institute of National Importance	CURRICULUM

Programme	**Bachelor of Technology in Electrical and Electronics Engineering**	Year of Regulation	**2018-19/Spring**
Department	**Electrical Engineering**	Semester	**IV**

Course Code	Course Name	Pre-Requisite	Credit Structure				Marks Distribution		
			L	T	P	C	Continuous Assessment		Total
EE 254	**Electrical Machines-II Laboratory**	**EE 253**	**0**	**0**	**2**	**1**	**01 Experiment**	**10**	**100**

Course Objectives		**Course Outcomes At the end of this course students will be able to**		
	To provide practical knowledge in verification of principles of electromagnetic induction & method of testing AC machines under different load conditions. Determining performance characteristics and validation of general properties of AC machines.		CO1	Set up testing strategies and select proper instruments to evaluate performance characteristics of electrical machines.
	To expose the students to the operation of Synchronous machines and induction motors and give them experimental skills.		CO2	Estimate constraints, uncertainties and risks of the system (social, environmental, business, safety issues etc.)
	To give students practical laboratory experience with the basics of Synchronization in grid		CO3	Combine an understanding of the established principles, theories, concepts and terminology relevant to electrical machines with practical laboratory experimentation.
	To introduce students to industrial control of electric machines as well with safe electrical connection and measurement practices.		CO4	Develop testing and experimental procedures on different types of electrical machines and Analyze their operation under different loading conditions.
			CO5	Originate a professional experience on working in a power plant or any practical field and to be ready for life-long involvement in the farther improvement of relevant technology.
			CO6	

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
1	No load & blocked rotor tests on a three-phase induction motor, finding rotational losses	**02**	**CO1** **CO2** **CO3** **CO4** **CO5**
2	Determining performance characteristics of three phase induction motor	**02**	
3	Different starting schemes of three phase induction motor.	**02**	
4	Speed control of 3-phase induction motor using variable rotor resistance	**02**	
5	Distributed winding study for three phase induction motor.	**02**	
6	Estimation of equivalent circuit of a single-phase induction motor, finding rotational losses	**02**	
7	Voltage regulation of 3-phase cylindrical pole alternators using EMF method	**02**	
8	Voltage regulation of 3-phase cylindrical pole alternators using ZPF method	**02**	
9	V-curves of a synchronous motor	**02**	
10	Synchronous motor as source & sink of reactive power	**02**	
	Total Hours	**20**	

Essential Readings

1) Say M. G., The performance and design of alternating current machines, CBS Publishers, Delh, 4th Edition,2004.
2) Bimbhra P. S., Electrical Machinery, Khanna Pub., Delhi., 7th Edition, 2018

Supplementary Readings

1) Clayton A. E., The performance and design of direct current machines, Pitman and sons, London. 4th Edition,1961
2) Bhag S. Guru, H. R. Hiziroglu, Electric Machinery and Transformers, Oxford, 4th Edition,2014