



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
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Department	Electrical Engineering	Semester	V
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Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
EE319	Electrical Machine Design	3	0	0	3	50	50	100	200

Course Objectives	To develop knowledge on principles of design of static and rotating machines.		Course Outcomes students will be able to	CO1	Understand the importance of design of machines based on their applications.
	To understand the fundamental concepts of machine design			CO2	Acquire knowledge on design concepts of transformers and design methodology of its various parts
	To know about methods to design main dimensions & cooling systems of transformers			CO3	Understand the design of various parts of DC machines and solve the problems of design
	To understand the design procedure of main dimensions of rotating machine.			CO4	Understand the design concepts of synchronous machines and solve the problems related to design.
				CO5	Acquire knowledge about computer-based designing of various electrical machines

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	1	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	0	3	0	0	0	0	0	0	0	2	3	2
4	CO4	2	2	3	0	2	2	1	0	3	0	0	1	2	3	2
5	CO5	2	2	2	1	2	2	3	1	2	0	0	1	3	3	3

SYLLABUS

No.	Content	Hours	COs
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I	Basic design principles and approaches, specification, Magnetic and electric loading, output equations and output coefficients, Main dimensions. Ratings, Heating cooling and temperature rise.	7	CO1
II	Transformer: Magnetic circuit, core construction and design, winding types, insulation, Loss allocation and estimation, Reactance, Temperature rise.	7	CO2
III	D C Machine: No. of poles and main dimensions, armature, windings, Magnetic circuit and Magnetisation curve, Commutator and brushes.	7	CO3
IV	AC Machines: Induction Machine-3 phase: Rating specifications, standard frame sizes, Main dimensions specific loadings, Design of stator windings, Rotor design – slots and windings, calculations of equivalent circuit parameters. Synchronous Machine: Main dimensions, Magnetisation characteristic, Field winding design.	10	CO4
V	Computer assisted design of above machines.	5	CO5
Total Hours		36	
Essential Readings			
1. A course in Electrical Machine Design, A.K. Sawhney & A. Chakrabarty, Dhanpat rai & Co, 6 th edition, 2010.			
2. Principle of Electrical Machine Design with computer programming, S.K. Sen, Oxford & IBH, 1 st edition, 2006.			
Supplementary Readings			
1. Clayton A E & Hancock N N : The Performance and Design of Direct Current Machines ; CBS Publishers and Distributors, 1 st edition, 2004.			
2. Norton, Machine design, Pearson Education, 2 nd edition, 2000.			