



# National Institute of Technology Meghalaya

**CURRICULUM**

An Institute of National Importance

Programme	<b>Bachelor of Technology (All Branches)</b>	Academic Year of Regulation	<b>2023-24</b>				
Department	<b>Electrical &amp; Mechanical Engineering</b>	Semester	<b>II</b>				
Course Code	Course Name	Credit Structure				Marks Distribution	
		L	T	P	C	Continuous Evaluation	Total
<b>VA102</b>	<b>Skill Development and Prototyping</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>100</b>	<b>100</b>
Course Objectives	To develop basic skills in the field of Electrical and Mechanical Engineering.	Course Outcomes	CO1	To design domestic electric circuits and other basic circuits and function of different measuring instruments.			
	To make students familiar with different electrical, automobile, and plumbing instruments, setups, assembly, and tools.		CO2	To understand the concept of battery charging/discharging systems and construction of machines, its starting, and fabrication of armature coil.			
			CO3	To understand the functioning of different automobile parts and assemblies.			
			CO4	To understand the functioning of different plumbing parts, tools, and assemblies.			

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	3	2	1	3	3	0	1	0	1	1	3	3	2
2	CO2	3	3	3	2	1	1	0	0	1	0	1	1	3	3	3
3	CO3	3	3	2	3	3	3	3	0	1	0	1	1	3	3	3
4	CO4	3	3	3	3	3	2	1	0	1	0	1	1	3	3	3

**SYLLABUS**

No.	Content	Hours	COs
<b>1</b>	<b>Electrical Shop:</b> Study and design different types of electrical wiring with loads, Study the cut-section of different types of AC/DC machines, Design and fabricate an armature coil using a handy coil winding machine, Assembling different parts of the electrical machine and testing its operation, Charging and discharging circuit of Batteries, Familiarization with analog /digital universal IC tester and advanced digital measuring instruments, To study the measurement of earth resistance using an earth tester, Energy measurement using a smart energy meter, Measurement of insulation resistance of cable/machine using insulation tester/megger, Starting of machine using various starters.	<b>8</b>	<b>CO1 CO2</b>
<b>2</b>	<b>Automobile Shop:</b> Demonstration on the cut section of the single and multicylinder engine (diesel and petrol), anti-lock braking system, constructional view and internal details of common automobile parts, fuel supply system of petrol and diesel engine, and coil ignition and electrical ignition system of an automobile.	<b>4</b>	<b>CO3</b>
<b>3</b>	<b>Plumbing Shop:</b> Demonstration on full-scale sewerage system, assembly station pipes, valves and fittings, tools for plumbing (plumbing wrenches, drain tools, and tools and supports for PVC pipes), cut away models of straightway valve, corner valve, angle seat valve, nonreturn valve, pressure reducing valve, strainer, gate valve, straightway plug valve, three ways plug valve, safety valve, screwed pipe connections, changeover valve, nonreturn butterfly valve, and strainer.	<b>4</b>	<b>CO4</b>
<b>4</b>	<b>Prototyping:</b> Circuit designing based on Electrical Shop, prototyping of automobile parts, plumbing tools, and parts, etc.	<b>8</b>	<b>All</b>
<b>Total Hours</b>		<b>24</b>	

**Essential Readings**

1. R.P. Singh, 'Electrical Workshop, 3<sup>rd</sup> Edition, Dreamtech Press (Distributed by Wiley), ISBN: 9789389447057, 2021.
2. S.L. Uppal, "Electrical Wiring Estimating and Costing", Khanna Publishers; 6<sup>th</sup> Edition, ISBN-13: 978-81-7409-240-3, 1987.
3. K. Singh, "Automobile Engineering", Standard Publishers; ISBN: 978-8180142420, 2020.
4. I. Umesh Rathore, Naresh Kumar Sharma, "A Textbook of Electrical Workshop Practices", 1<sup>st</sup> Edition, S.K. Kataria & Sons, ISBN-13: 9789350146958, 2019

**Supplementary Readings**

1. Mullin R C and P. Simmons, "Electrical Wiring Residential", Cengage Learning (Publishers), ISBN: 9781435498259, 17<sup>th</sup> Edition, 2011.