	National Institute of Technology Meghalaya An Institute of National Importance	CURRICULUM
Programme	**Bachelor of Technology in Mechanical Engineering**	Year of Regulation **2018**
Department	**Mechanical Engineering**	Semester **III**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
ME 291	**SAFETY ENGINEERING**	2	0	0	2	50	50	100	200

Course Objectives	To explain the basic concept of safety, Philosophy of safety, accidents in industries and their prevention.	Course Outcomes	CO1 Students will be able to outline of safety, accidents in industry and the preventive measures.
	To explain the implication of safety engineering in industries, associated hazards, risk involved and the mitigation methods and to understand different types of machine guarding, manual and mechanical material handling.		CO2 Students will understand the necessity of safety engineering in by way of identifying the hazards, assessing the risk involved and the mitigation measures like machine guarding and safe material handling techniques etc to ensure safety at work.
	To explain the use of hand tools & portable power tools and to understand the electrical safety, fires, explosions and toxic releases in the industry.		CO3 Students will be able to Illustrate different safety tools to deal with electrical safety, fires, explosion and toxic release in industries.
	To explain the safety in construction industries and to understand the use of personal protective equipments.		CO4 Students will be able to describe the personal protective equipments and safety measures in construction sites.
	To explain the process of First Aid for the workers and safety management in the industries.		CO5 Students will be able to Illustrate the First Aid process. To demonstrate the cyber security tools.

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	2	3	-	-	3	2	3	-	-	-	2	2	2	-
2	CO2	3	2	3	-	-	3	2	3	-	-	-	2	2	2	-
3	CO3	3	2	3	-	-	3	2	3	-	-	-	2	2	2	-
4	CO4	3	2	3	-	-	3	2	3	-	-	-	2	2	2	-
5	CO5	3	2	3	-	3	3	2	3	-	-	-	2	2	2	-

SYLLABUS

No.	Content	Hours	COs
I	Concept of safety, Philosophy of safety, safety terminology, behaviour based safety, Accident - cause and prevention.	**4**	**CO1**
II	Safety engineering in industry, statutory provisions, Principles of Machine guarding, types and selection of guards, ergonomics of machine guarding, mechanical and manual material handling, hand tools and portable power tools.	**4**	**CO2**
III	Electrical safety, safety measures for electric work, fires and explosion, classification fires and fire extinguishers, toxic gas release and preventive measures thereof.	**4**	**CO3**
IV	Safety in construction industry, underground works, above ground works, underwater works, movement of men and materials, Personal protective equipment, selection and classification of PPE, statutory provisions to ensure safety at work.	**4**	**CO4**
V	Need of First Aid, Electrical injuries, artificial respiration, poisoning, first aid and antidotes, Industrial safety management, Safety Audit, Job safety analysis, Safety motivation.	**4**	**CO5**
VI	Introduction to cyber securtiy, internet, network mobile and cloud security, identity theft, encryption, security tools, cyber security metrics, antiviruses	**4**	**CO5**
	Total Hours	**24**	

Essential Readings

1. Dr. K.U. Mistry, 'Fundamentals of industrial safety and health, Siddharth Prakashan, 1st edition,2008.

Supplementary Readings

1. Charles D. Reese, Industrial Safety and Health for People-Oriented Services, CRC Press
2. C. Ray Asfahl, David Rieske, Industrial Safety and Health Management, Pearson
3. N. Godbole, Information Systems Security: Security Management, Metrics, Frameworks and Best Practices, 2nd Ed., Wiley, 2017