	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	**V**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
ME 317	**Industrial Engineering**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives	To introduce the basics of Product Design and Development and Wok system design	Course Outcomes	CO1	Explain the concept of Product Design and Development and Wok system design. (Understanding)
	To Explain the facility design and Interpret the alternatives of Facility design		CO2	Interpret the alternatives in facility design. (Understanding)
	To develop an ability to use the different models in Forecasting, Aggregate production planning, MRP, scheduling and inventory control.		CO3	Make use of the different models in Forecasting, Aggregate production planning, MRP, scheduling and inventory control.(Application)
	To develop an ability to analyse the optimization techniques in LPP,CPM and PERT		CO4	Analyse the different optimization techniques in LPP,CPM and PERT(Analysis)
	To Justify the SQC and Evaluate the different techniques in quality control ,reliability and maintenance management.		CO5	Evaluate the different techniques in quality control ,reliability and maintenance management(Evaluation)

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

SYLLABUS

No.	Content	Hours	COs
I	**Product Design and Development:** Principles of good product design, tolerance design; quality and cost considerations; product life cycle; value engineering and analysis, concurrent engineering. Engineering Economy and Costing.	**02**	**CO1**
II	**Work System Design:** productivity – concepts and measurements;method study, micro-motion study, principles of motion economy; work measurement – stop watch time study, work sampling, standard data, PMTS; ergonomics; job evaluation, merit rating, incentive schemes, and wage administration.	**04**	**CO1**
III	**Facility Design:** Facility location factors and evaluation of alternate locations; types of plant layout and their evaluation; computer aided layout design techniques; assembly line balancing; materials handling systems.	**03**	**CO1** **CO2**
IV	**Production Planning and Inventory Control:** Forecasting techniques, aggregate production planning; master production scheduling; order control and flow control; routing, scheduling and priority dispatching; push and pull production systems, concept of JIT manufacturing system; Inventory – functions, costs, classifications, deterministic and probabilistic inventory models, quantity discount; perpetual and periodic inventory control systems.	**07**	**CO2** **CO3**
V	**Operation Research:** Linear programming – problem formulation, simplex method, duality and sensitivity analysis; transportation and assignment models; network flow models, simple queuing models; dynamic programming; simulation – manufacturing applications; PERT and CPM, time-cost trade-off, resource levelling.	**12**	**CO3** **CO4**
VI	**Quality, Reliability and Maintenance management:** Quality – concept and costs, quality circles, quality assurance; statistical quality control, acceptance sampling, ISO 9000; design of experiments – Taguchi method, Reliability, availability and maintainability; distribution of failure and repair times; determination of MTBF and MTTR, reliability models; system reliability determination; preventive maintenanceand replacement, total productive maintenance – concept and applications.	**08**	**CO2** **CO4** **CO5**
	Total Hours	**36**	

Essential Readings

1. R. Panneerselvam., “Production and Operations Management, 3rd Edition, PHI, 2012

2. Hamdy A. Taha, “Operations Research: An Introduction”, 10th Edition,Pearson, 2017

Supplementary Readings

1. Chase, Jacobs, Aquilano and Agarwal, “Operations Management for Competitive Advantage ”,11th edition, Tata McGraw Hill Publications,2008

2. ILO, “Introduction to Work Study”,4thedition,International Labour Office, Geneva,1992