

<p>Academic Course Description BHARATH UNIVERSITY Faculty of Engineering and Technology Department of Mechanical Engineering BME 004- PLANT LAYOUT AND MATERIAL HANDLING Eighth Semester, 2015-16 (Even Semester)</p>

Course (catalog) description :

To equip students with adequate knowledge for running an organization and to understand the integration of material handling systems.

Compulsory/Elective course : Elective for Mechanical students

Credit & Contact hours : 3 & 45

Course Coordinator : Mrs.C.M.Meenakshi

Instructors :

Name of the instructor	Class handling	Office location	Office phone	Email (domain: @bharathuniv.ac.in)	Consultation
Mr.R.Hariharan	Fourth Year Mechanical Sec-A	Mechanical		mech.hariharan17@gmail.com	10..50 am-12.30am
Mr.V.P.Durairaj	Fourth Year Mechanical Sec-B	Mechanical		durairaj_vp@yahoo.com	1.30pm-2.20pm
Mrs.Sucharitha	Fourth Year Mechanical Sec-C	Mechanical		saisuchi200@2gmail.com	9.00 am- 10.40 a.m
Mr.N.Lenin Rakesh	Fourth Year Mechanical Sec-D	Mechanical		leninrakesh@gmail.com	3.10 pm -4.00 pm

Relationship to other courses:

Pre –requisites : MANUFACTURING TECHNOLOGY –I

Assumed knowledge : To apply the concepts for effectively running an organization.
To apply the concepts in integration of material handling systems

Syllabus Contents:

UNIT I PLANT LOCATION AND FACILITIES 8

Factors to be considered – influence of location on plant layout, selection of plant site, Consideration in facilities planning and layout. Equipments required for plant operation, Capacity, serviceability and flexibility and analysis in selection of equipments, space requirements, and man power requirements.

UNIT II PLANT LAYOUT 8

Need for layout, types of layout, factors influencing product, process. Fixed and combination layout: tools and techniques for developing layout, process chart, flow diagram, string diagram, template and scale models – machine data. Layout planning procedure. Visualization of layout, revision and improving existing layout, balancing of fabrication and assembly lines.

UNIT III MATERIAL HANDLING 10

Importance and scope. Principles of material handling. Planning, operating and costing Principles, types of material handling systems, factors influencing their choice.

UNIT IV INDUSTRIAL BUILDING AND UTILITIES 12

Centralized electrical, pneumatic water line systems. Types of buildings, lighting, heating, air conditioning and ventilation utilities - planning and maintenance, waste handling, statutory requirements. Packing and storage materials: Importance of Packaging, layout for Packaging – Packaging machinery – wrapping and Packing materials, cushion materials.

UNIT V ANALYSIS OF MATERIAL HANDLING 7

Motion analysis, flow analysis, graphic analysis, safety analysis, equipment cost analysis, palletization analysis, analysis of operation, material handling surveys.

Text Books :

1. S. C. sharma, *Plant layout and material handling*, Khanna publishers.
2. Agarwal, *Plant layout and material handling*, Jain brothers publication.

References :

1. Shubin J A, *Plant layout*, P H I publications.1965
2. Oberman. Ya, *Material handling*, Mir publishers.1980
3. S.C. Sharma, *Material Management And Material Handling*, Khanna Publishers.1995

Total : 45 hours

Computer usage:

Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	100%
Professional subject	-	100%

Broad area : Industrial Application in moving parts & Materials

Test Schedule:

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	22.2.16	Session 1 to 12	2 Periods
2	Cycle Test-2	24.03.16	Session 13to 26	2 Periods
3	Model Test	18.04.16	Session 1 to 45	3 Hrs
4	University Examination	03.5.16	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome:

	Correlates to program outcome		
	H	M	L
1. To equip students with adequate knowledge for running an organization and to understand the integration of material handling systems. 2. To apply the concepts, methodologies of industrial utilities.			
1. Understand the procedures for systematic integration of organization.	a		
2. Will understand various techniques and tools of layout planning.	a,c		g
3. Students will be able to get knowledge on industrial layouts.	a,c	e,f	i,k
4. Understand material handling systems	a,c		l
5. Learn the concepts of industrial building	a	f,h	
6. Learn the concepts of industrial utilities	a,c		l

S.NO	Topics	Problem solving (Yes/No)	Text / Chapter
Unit 1	PLANT LOCATION AND UTILITIES		
1.	Factors to be considered – influence of location on plant layout	No	Text book 1 /Reference 1
2.	Selection of plant site, Consideration in facilities planning and layout	No	
3.	Equipments required for plant operation	No	
4.	Capacity, serviceability	No	
5.	Flexibility	No	
6.	Analysis in selection of equipments	No	
7.	Space requirements	No	
8.	Man power requirements.	No	
Unit- 2	PLANT LAYOUT		
9.	Need for layout , types of layout	No	Text book 2 /Reference 1
10.	Factors influencing product, process.	No	
11.	Fixed and combination layout:	No	
12.	Tools and techniques for developing layout	No	
13.	String diagram, template and Scale models – machine data.	No	Text book 1 /Reference 1
14.	Layout planning procedure. Visualization of layout,	No	
15.	Revision and improving existing layout	No	Text book 1 /Reference 2
16.	Balancing of fabrication and assembly lines.	No	
Unit- 3	MATERIAL HANDLING		
17.	Importance of material handling	No	Text book 2 /Reference 2
18.	Scope of material handling	No	
19.	Principles of material handling	No	
20.	Principles of planning	No	
21.	Operating principles	No	
22.	Costing Principles	No	
23.	Adv,disadv of material handling	No	
24.	Factors influencing planning	No	

25.	Material handling system	No	
26.	Factors influencing their choice.	No	
Unit - 4	INDUSTRIAL BUILDING AND UTILITIES		
27.	Centralized electrical	No	Text book 1 /Reference 3
28.	Pneumatic water line systems. Types of buildings,	No	
29.	Lighting, heating, air conditioning	No	
30.	Ventilation utilities	No	
31.	Planning and maintenance	No	
32.	Waste handling	No	
33.	Statutory requirements.	No	
34.	Packing and storage materials: Importance of Packaging,–	No	
35.	Layout for Packaging	No	
36.	Packaging machinery	No	
37.	Wrapping and Packing materials,	No	Text book 2 /Reference 2
38.	Cushion materials.	No	
Unit-5	ANALYSIS OF MATERIAL HANDLING		
39.	Motion analysis	No	
40.	Flow analysis, graphic analysis	No	
41.	Safety analysis	No	
42.	Equipment cost analysis	yes	
43.	Palletization analysis	No	
44.	Analysis of operation	No	
45.	Material handling surveys.	No	

H: high correlation, M: medium correlation, L: low correlation

Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures
- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.
- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.
- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	10%
Assignment / Seminar / Online		
Test / Quiz	-	5%
Attendance	-	5%
Final exam	-	70%

Prepared by **N. Lenin Rakesh**

Addendum

ABET Outcomes expected of graduates of B.Tech / MECH / program by the time that they graduate:

- a) The ability to apply knowledge of mathematics, science, and engineering fundamentals.
- b) The ability to identify, formulate and solve engineering problems.
- c) The ability to design a system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- d) The ability to design and conduct experiments, as well as to analyze and interpret data
- e) The ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- f) The ability to apply reasoning informed by the knowledge of contemporary issues.
- g) The ability to broaden the education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- h) The ability to understand professional and ethical responsibility and apply them in engineering practices.
- i) The ability to function on multidisciplinary teams.
- j) The ability to communicate effectively with the engineering community and with society at large.
- k) The ability in understanding of the engineering and management principles and apply them in project and finance management as a leader and a member in a team.
- l) The ability to recognize the need for, and an ability to engage in life-long learning.

Program Educational Objectives

PEO1: PREPARATION:

Mechanical Engineering graduates are enthusiastic to provide strong foundation in mathematical, scientific and engineering fundamentals necessary to analyze, formulate and solve engineering problems in the field of Mechanical Engineering.

PEO2: CORE COMPETENCE:

Mechanical Engineering graduates have competence to enhance the skills and experience in defining problems in the field of Mechanical Engineering and Technology design and implement, analyzing the experimental evaluations, and finally making appropriate decisions.

PEO3: PROFESSIONALISM:

Mechanical Engineering graduates made competence to enhance their skills and embrace new thrust areas through self-directed professional development and post-graduate training or education.

PEO4: PROFICIENCY:

Mechanical Engineering graduates became skilled to afford training for developing soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, inter personal relationship, group discussion and leadership skill to become a better professional.

PEO5: ETHICS:

Mechanical Engineering graduates are morally merged to apply the ethical and social aspects of modern Engineering and Technology innovations to the design, development, and usage of new products, machines, gadgets, devices, etc.

BME004 -PLANT LAYOUT AND MATERIAL HANDLING

Course Teacher	Signature
Mr.Hariharan	
Mr.N.lenin Rakesh	
Mr.V.P. Durairaj Mrs.Sucharitha	

Course Coordinator
N.Lenin Rakesh

HOD/MECH