Topics and Allocation of Hours:

<table>
<thead>
<tr>
<th>UNIT</th>
<th>PROGRAMME</th>
<th>HOURS / WEEK</th>
<th>TOTAL HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>VI</td>
<td>DIPLOMA IN MECHANICAL ENGINEERING</td>
<td>5</td>
<td>80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE NAME</th>
<th>MAXIMUM MARKS</th>
<th>MIN. MARKS FOR PASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>M7ME314</td>
<td>INDUSTRIAL ENGINEERING AND MANAGEMENT</td>
<td>75</td>
<td>30</td>
</tr>
</tbody>
</table>

RATIONALITY:

In the Indian Economy, Industries and enterprises always find prominent place. After globalization, the government of India has announced liberalization policy of starting an enterprise which resulted in the mushroom growth of industries. The present day students should be trained not only in manufacturing processes but also in managing activities of industries. Training must be imparted to students not only to shape them as technicians but also as good managers. The knowledge about plant, safety, work study techniques, personnel management and financial management will definitely mould the students as managers to suit the industries. Due to the presence of such personalities the industries will leap for better prosperity and development.

OBJECTIVES:

- Explain the different types of layout and compare them.
- Appreciate the safety aspects and its impacts on an organization.
- Compare different productivity improvement technique.
- Explain different work measurement techniques.
- Estimate standard time for a job.
- Explain production planning and control and its functions.
- Study the role of PPC as a tool for cost control.
- Prepare process control charts.
- Explain the principles of management and function of management.
- Compare different organizational structure.
- Explain the selection and training of staff.
- Analyze inventory control system and the tools used in stock control.
- Explain the procurement and consumption cycle.
## Contents: Theory

<table>
<thead>
<tr>
<th>Unit</th>
<th>Name of the Topic</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>PLANT ENGINEERING AND PLANT SAFETY</td>
<td>15 Hrs</td>
</tr>
<tr>
<td>II</td>
<td>WORK STUDY, METHOD STUDY AND WORK MEASUREMENT</td>
<td>15 Hrs</td>
</tr>
</tbody>
</table>
**Method Study**: Definition – Objectives – Selection of a job for method study – Basic procedure for conduct of method study – Tools used – Operation process chart, Flow process chart, two handed process chart, Man machine chart, String diagram and flow diagram.  
**Work Measurement**: Definition – Basic procedure in making a time study – Employees rating factor – Application of time allowances – Rest, Personal, Process, Special and Policy allowances – Calculation of standard time – Problems.  
**Basic concept of production study** – Techniques of work measurement-Ratio delay study, Synthesis from standard data, analytical estimating and Pre determined Motion Time System (PMTS). | |
| III  | PRODUCTION PLANNING AND QUALITY CONTROL | 15 Hrs |
| IV   | PRINCIPLES OF MANAGEMENT AND PERSONNEL MANAGEMENT | 15 Hrs |
FINANCIAL MANAGEMENT AND MATERIAL MANAGEMENT


Text Books:

Reference Books:
MODEL QUESTION - I

Term : VI      Time : 3 Hrs
Programme : Diploma in Mechanical Engineering      Max. Marks : 75
Course : INDUSTRIAL ENGINEERING AND MANAGEMENT
Course Code : M7ME314

PART – A
Marks 15 x 1 = 15

Note : Answer any 15 Questions. All Questions carry equal marks.
1. What is a plant?
2. Define line layout.
3. What is meant by maintenance?
4. State any two provisions of safety.
5. Define method study.
7. What is operation process chart?
8. What is PMTS?
9. What is PPC?
10. Define scheduling.
11. Explain first piece inspection.
12. What do you mean by producer’s risk?
13. Define Administration.
15. What is an organization chart?
17. State the types of capital required.
18. List the sources of capital.
19. What is meant by prime cost?
20. Define depreciation.

PART – B
Marks 5 x 12 = 60

21. 1. What are the different types of plant layout? Explain any two with neat sketches. (12)
(OR)
2. State the important Provisions of Factories Act 1948 governing safety & health of workers. (12)

22. 1. With a neat sketch. Explain man type flow process chart. (12)
(OR)
2. Write short notes on the following
   (i) Ratio delay study (6)  (ii) Analytical estimation (6)

23. 1. What is forecasting? Explain the different techniques of forecasting. (12)
(OR)
2. Write short notes on
   (i) Double sampling plan (6)  (ii) OC curve for a simple plan (6)

24. 1. A Worker completes a job in 6 hrs. The allowed standard time for the job is 8 hrs. His wage rate is Rs.5 per hour. Calculate the total earnings of the worker under the following Systems of payment
   (i) Halsey’s 50% plan (6)  (ii) Rowan’s plan (6)
   (OR)
2. State the principles of management as enumerated by Henry Fayol. Explain any eight of them (12)

25. 1. Explain by means of a block diagram how the selling price of a product is determined. (12)
(OR)
2. Explain how total cost of inventory can be efficiently controlled by “ABC Analysis” technique. (12)
PART– A
Marks 15 x 1= 15

Note: Answer any 15 Questions. All Questions carry equal marks.

1. Define Plant
2. List any two Safety law’s
3. State one major factor that causes industrial dispute.
4. For what purpose screw conveyors are used.
5. Give any two objectives of work study.
6. List any four tools used in method study.
7. Define standard time.
8. What is production study.
9. What is the definition of EBQ?
10. State the UCL & LCL of R-Chart?
11. Explain the term dispatching.
12. Define attributes inspection.
13. What are the types of organization?
14. What are two methods of wage payment plan?
15. Define Quality Circle.
16. State any two qualities of a good leadership.
17. State any two types of debentures.
18. State any two objectives of stock control system.
19. What is lead time?
20. What is ABC analysis?

PART – B
Marks 5 x 12=60

Answer all the Questions

21 a. i) What are the different types of plant layout? Explain any one type of layout with a neat sketch. What are its advantages. (6)
ii) Explain the various factors to be considered for selection of equipment. (6)
(or)
b.i) Briefly explain the procedure for preventive maintenance. (6)
ii) Explain the planning for accident prevention. (6)
(or)
22. a.i) Explain ratio delay study. (6)
ii) Explain various allowance added to basic time. (6)
(or)
b.i) State the objectives of work measurement. (6)
ii) Describe with diagram how rating factor is applied in calculating normal time for below average performer. (6)
23 a.i) Explain OC curve for a simple plan. (6)
ii) Explain roaming inspection. (6)
(or)
b.i) Explain the procedure for construction of a X- Chart. (6)
ii) Explain characteristics of a job order type production. (6)
24 a.i) Explain any four of the Henry Fayol’s principles of management. (6)
ii) Explain the key factors for the success of TQM. (6)
(or)
b.i) Explain the selection process in personnel management. (6)
ii) Explain the factors affecting wage structure. (6)
25. a.i) Write short notes on receiving a issuing of material. (6)
ii) Briefly explain purchasing procedure. (6)
(or)
b.i) Explain general overhead in factory costing. (6)
ii) Explain the factors which determine the working capital requirements. (6)
Topics and Allocation of Hours:

<table>
<thead>
<tr>
<th>Unit No</th>
<th>Topics</th>
<th>Hours</th>
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<tbody>
<tr>
<td>I</td>
<td>Introduction CIM And Computer Aided Design &amp; Analysis</td>
<td>15</td>
</tr>
<tr>
<td>II</td>
<td>Computer Aided Manufacturing And Rapid Prototyping</td>
<td>15</td>
</tr>
<tr>
<td>III</td>
<td>CNC Machine And Components</td>
<td>15</td>
</tr>
<tr>
<td>IV</td>
<td>Part Programming</td>
<td>15</td>
</tr>
<tr>
<td>V</td>
<td>FMS, Integrated Material Handling And Robot</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Revision And Test</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>80</strong></td>
</tr>
</tbody>
</table>

RATIONALE:

As per the latest requirements in the Industries this enables to learn the assistance of computer in the field of design and manufacturing areas. It’s able to learn the latest manufacturing concepts of in the shop floors and manufacturing methods like RPT. They are able to know about the working of principles of CNC machines and programming techniques are included. The application of material handling equipments and robots are learnt based on the automation in the industries.

OBJECTIVES:

- Understand the concept and requirement of the integration of the design and manufacturing.
- Acquire knowledge about the computer assistance in the design process and analysis.
- Understand the concepts of manufacturing with computer assistance in the shop floor.
- Learn the principle and working of the CNC machines.
- Understand the principle of latest manufacturing machines like EDM and RPT.
- Learn the method of CNC programming with international codes.
- Acquire the knowledge in the material handling equipment and robot.
## COMPUTER INTEGRATED MANUFACTURING
### DETAILED SYLLABUS

**Contents: Theory**

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<th>Unit</th>
<th>Name of the Topic</th>
<th>Hours</th>
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<tr>
<td>I</td>
<td>INTRODUCTION CIM AND COMPUTER AIDED DESIGN &amp; ANALYSIS</td>
<td>15 Hrs</td>
</tr>
<tr>
<td>II</td>
<td>COMPUTER AIDED MANUFACTURING AND RAPID PROTOTYPING</td>
<td>15 Hrs</td>
</tr>
</tbody>
</table>
      | Product Development Cycle – Sequential engineering – Concurrent engineering.  
| III  | CNC MACHINE AND COMPONENTS | 15 Hrs |
      | **Components of CNC machine.**  
### IV
**PART PROGRAMMING**


<table>
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<tr>
<th>15 Hrs</th>
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### V
**FMS, INTEGRATED MATERIAL HANDLING AND ROBOT**


| 15 Hrs |

**Text Books :**
1) CAD/CAM/CIM , R.Radhakrishnan, S.Subramanian, New Age International Pvt. Ltd.
2) CAD/CAM , Mikell P.Groover, Emory Zimmers, Jr.Prentice Hall of India Pvt., Ltd.

**Reference Books :**
PART A – Answer any fifteen questions. All Questions carry Equal marks. 15 x 1 = 15

1. Define CAD.
2. List the benefits of CIM.
3. What is translation?
4. Mention the advantages of FEA.
5. Define CAM.
6. What is process planning?
7. What is concurrent engineering?
8. Mention the applications of RPT
9. Define NC.
10. Differentiate between NC and CNC.
11. What is encoder?
12. Mention the types of slide ways.
13. Mention the different formats of part program.
14. What is reference points?
15. Mention the different shapes of tool inserts.
16. What is NC dimensioning?
17. List the benefits of FMS.
18. What is AGV?
20. List the robot programming methods.

PART B: Answer all questions Marks 5 x 12=60

21 a. Mention the basic steps of FEA. 4
   Explain the activities of CAD in design process. 8

(OR)

b. Compare the wire frame modeling with surface modeling. 2
   Explain the constructive solid geometry modeling technique. 10

22 a. Write briefly about Enterprise Resource Planning. 4
   What is GT? Explain the optiz system of coding. 8

(OR)

b. Write briefly about the Shop Floor Control. 4
   Explain the computer integrated production management system. 8

23 a. Explain the working of ATC. 4
   Explain the working principle of turning centre. 8

(OR)

b. What is the feedback device? 2
   Explain the working of linear and rotary transducers. 10

24 a. Write briefly about conversational programming. 4
   Explain about the APT programming language. 8

(OR)

b. Write the procedure to create CNC manual part program. 4
   Write a part program to create a mirroring image in a CNC milling machine using a sub program.
25 a. Explain the working principle of AGV.  
Write briefly about ASRS.  

(OR)

b. Write briefly on intelligent manufacturing system.  
Explain the different types of FMS.
PART A – Answer any fifteen questions. All Questions carry Equal marks. 15 x 1 = 15

1. List the benefits of CAD.
2. What is graphic workstation?
3. What is concatenation?
4. What is the need of graphic standard?
5. List the benefits of CAM.
6. What is capacity planning?
7. List the advantages of CAPP.
8. What is sequential engineering?
9. What are the advantages of CNC machine?
10. What are the purposes of CMM?
11. What are the requirements of slide ways?
12. What is the purpose of ATC?
13. What is NC part programming?
14. What is tool offsets?
15. What is linear interpolation?
16. What is sub program?
17. What is FMS?
18. What is virtual machining?
19. List the types of sensors used in robot.
20. List the benefits of AGV

PART B: Answer all questions Marks 5 x 12=60

21 a. Write briefly about the cost involved in design process. 4
     Explain the Shigley’s design process. 8
     (OR)

   b. What is graphic standard? 2
      Explain the IGES graphic standard. 10

22 a. Write briefly about Material Requirement Planning. 4
     What is CAPP? Explain the generative method of CAPP. 8
     (OR)

   b. Write briefly about the product development cycle. 4
      What is RPT? Explain the working of stereo lithography. 8

23 a. Write briefly about adaptive control system. 4
     Explain the working principle of CNC system. 8
     (OR)

   b. Write briefly about the linear motion bearing. 2
      Explain the working principle of CMM. 10

24 a. Write briefly about tool inserts. 4
     Write a part program to make M20 X 1.5 thread in CNC lathe. 8
     (OR)

   b. Explain the types of motion control in CNC machine. 4
      Write a part program for stock removal in turning. 8

25 a. Explain the FMS components. 8
     Explain the FMS layout with sketches. 4
     (OR)

   b. Write briefly about the basic robot motion. 4
      Explain the different industrial applications of robot. 8
rationale definition: 1. the reasons or intentions that cause a particular set of beliefs or actions: 2. the reasons or intentions for a particular set of thoughts or actions: 3. the set of reasons that are given to explain a particular decision, action, etc.

Learn more.