

Vehicle guidance and routing, System management, Quantitative analysis of AGV's with numerical problems and application.

8 Hours

#### UNIT - 6

**Computerized Manufacturing Planning System:** Introduction, Computer Aided Process Planning, Retrieval types of process planning, Generative type of process planning, Material requirement planning, Fundamental concepts of MRP inputs to MRP, Capacity planning.

6 Hours

#### UNIT - 7

**Cnc Machining Centers:** Introduction to CNC, elements of CNC, CNC machining centers, part programming, fundamental steps involved in development of part programming for milling and turning.

6 Hours

#### UNIT - 8

**Robotics:** Introduction to Robot configuration, Robot motion, programming of Robots end effectors, Robot sensors and Robot applications.

6 Hours

#### TEXT BOOKS:

2. **Automation, Production system & Computer Integrated manufacturing**, M. P. Groover Person India, 2007 2<sup>nd</sup> edition.
3. **Principles of Computer Integrated Manufacturing**, S. Kant Vajpayee, Prentice Hall India.

#### REFERENCE BOOKS:

1. **Computer Integrated Manufacturing**, J. A. Rehg & Henry. W. Kraebber.
2. **CAD/CAM** by Zeid, Tata McGraw Hill.

### DESIGN OF MACHINE ELEMENTS – II

Sub Code	: 10ME 62	IA Marks	: 25
Hrs/week	: 04	Exam Hours	: 03
Total Lecture Hrs	: 52	Exam Marks	: 100

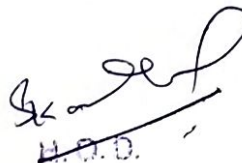
#### PART - A

##### UNIT - 1

**Curved Beams:** Stresses in curved beams of standard cross sections used in crane hook, punching presses & clamps, closed rings and links

**Cylinders & Cylinder Heads:** Review of Lame's Equations; compound cylinders, stresses due to different types of fits, cylinder heads, flats.

08 Hours



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**UNIT - 2**

**Belts Ropes and Chains:** Flat belts: Length & cross section, Selection of V-belts, ropes and chains for different applications.

05 Hours

**UNIT - 3**

**Springs:** Types of springs - stresses in Helical coil springs of circular and non-circular cross sections. Tension and compression springs, springs under fluctuating loads, Leaf Springs: Stresses in leaf springs. Equalized stresses, Energy stored in springs, Torsion, Belleville and Rubber springs.

08 Hours

**UNIT - 4**

**Spur & Helical Gears:** Spur Gears: Definitions, stresses in gear tooth: Lewis equation and form factor, Design for strength, Dynamic load and wear load. Helical Gears: Definitions, formative number of teeth, Design based on strength, dynamic and wear loads.

07 Hours

**PART - B****UNIT - 5**

**Bevel and Worm Gears:** Bevel Gears: Definitions, formative number of teeth, Design based on strength, dynamic and wear loads. Worm Gears: Definitions, Design based on strength, dynamic, wear loads and efficiency of worm gear drives.

07 Hours

**UNIT - 6**

**Clutches & Brakes:** Design of Clutches: Single plate, multi plate and cone clutches. Design of Brakes: Block and Band brakes: Self locking of brakes: Heat generation in Brakes.

05 Hours

**UNIT - 7**

**Lubrication and Bearings:** Lubricants and their properties, Mechanisms of Lubrication bearing modulus, coefficient of friction, minimum oil film thickness, Heat Generated, Heat dissipated, Bearing Materials, Examples of journal bearing and thrust bearing design.

07 Hours

**UNIT - 8**

**IC Engine Parts:** Design of piston, connecting rod and crank shaft.

05 Hours

**DESIGN DATA HANDBOOK**

1. **Design Data Hand Book**, K. Lingaiah, McGraw Hill, 2<sup>nd</sup> Ed.
2. **Data Hand Book**, K. Mahadevan and Balaveera Reddy, CBS Publication

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3. **Design Data Hand Book**, H.G. Patil, I. K. International Publisher, 2010.

### TEXT BOOKS

1. **Mechanical Engineering Design**, Joseph E Shigley and Charles R. Mischke. McGraw Hill International edition, 6<sup>th</sup> Edition 2003.
2. **Design of Machine Elements**, V. B Bhandari, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2<sup>nd</sup> Edition 2007

### REFERENCE BOOKS

1. **Machine Design**, Robert L. Norton, Pearson Education Asia, 2001.
2. **Design of Machine Elements**, M. F. Spotts, T. E. Shoup, L. E. Hornberger, S. R. Jayram and C. V. Venkatesh, Pearson Education, 2006.
3. **Machine Design**, Hall, Holowenko, Laughlin (Schaum's Outlines series) Adapted by S.K. Somani, Tata McGraw Hill Publishing Company Ltd., New Delhi, Special Indian Edition, 2008.
4. **Machine Design, A CAD Approach**: Andrew D DIMAROGONAS, John Wiley Sons, Inc, 2001.

## HEAT AND MASS TRANSFER

Sub Code	: 10ME 63	IA Marks	: 25
Hrs/week	: 04	Exam Hours	: 03
Total Lecture Hrs	: 52	Exam Marks	: 100

### PART - A

#### UNIT - 1

**Introductory Concepts And Definitions:** Modes of heat transfer: Basic laws governing conduction, convection, and radiation heat transfer; Thermal conductivity; convective heat transfer coefficient; radiation heat transfer; combined heat transfer mechanism. Boundry conditions of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Kind

**Conduction:** Derivation of general three dimensional conduction equation in Cartesian coordinate, special cases, discussion on 3-D conduction in cylindrical and spherical coordinate systems (No derivation). One dimensional conduction equations in rectangular, cylindrical and spherical coordinates for plane and composite walls. Overall heat transfer coefficient. Thermal contact resistance.

07 Hours

  
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