

# GUJARAT TECHNOLOGICAL UNIVERSITY

## B.E. SEMESTER : VIII

### MECHATRONICS ENGINEERING

Subject Name: **DESIGN OF MECHANISMS II**

Sr. No.	Course Contents	Total Hrs
1	<b>System Design Approach:</b> Ergonomic and Aesthetic considerations in design, Design synthesis, Design for reliability.	03
2	<b>Design of Power Transmission Mechanism:</b> Type of coupling, Muff coupling, Split Muff coupling, Flange coupling, Bush pin type coupling, Flat belts and CI pulley.	06
3	<b>Design of Simple and Band Brakes:</b> Energy equation, Block brake with short shoe and long shoe, Pivoted block brake with long shoe, Simple band brake, Differential band brake.	04
4	<b>Design of Spur Gear :</b> Gear terminology, speed ratio and number of teeth, Force analysis, Tooth stresses, Dynamic effects, Fatigue strength, Factor of safety, Gear material, Module and Face width, Power rating calculation based on strength and wear calculation.	06
5	<b>Design of Journal bearing and Selection of Rolling contact bearings:</b> Method of lubrication, Hydrodynamic, Hydrostatic boundary, Minimum film thickness, Thermal equilibrium, Selection of antifriction bearing for different loads and load cycle.	08
6	<b>Design of curved beam:</b> Stress distribution in curved beam for different cross sections.	02
7	<b>Design of hoisting mechanism:</b> Design of crane hook, wire rope and sheaves, Design of tackle and pins.	06
8	<b>Design for cyclic loading:</b> Types of cyclic load, Stress concentration, Endurance limit, Low cycle and high cycle fatigue, Notch sensitivity, Reversed stresses, Design for finite and infinite life, Cumulative damage, Soderberg criteria, Modified Goodman criteria, Gerber criteria, Design for infinite life under fluctuating load.	05

- Necessary data/equation/table/chart should be provided in the examination.

#### Text Books:

- Bhandari V. B.  
Design of Machine Elements  
Tata McGraw Hill

#### Reference Books:

- Shigley J. E  
Mechanical Engineering Design  
McGraw Hill
- Robert L. Norton  
Machine Design: An Integrated Approach  
Pearson Education Publication
- Machine design Data book  
PSG Coimbtore