

<b>6<sup>th</sup> Semester</b>	<b>Design of Machine Components</b>	<b>L-T-P 3-0-0</b>	<b>3 Credits</b>
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**MODULE – I**

**(09 HOURS)**

Review of axial, bending and torsional stresses in machine parts; Theories of Failure, Applications in practical problems. Variables stresses (Fatigue), Endurance limit, S-N curve, Fatigue stress concentration factor, Goodman, Gerber and Soderberg criteria, Application to design and practical problems. Design of Pressure vessels: Thin cylindrical and spherical shells, Design of end closures, Thick cylindrical shells, Application to practical problems.

**MODULE – II**

**(09 HOURS)**

Design of clutch: Friction clutch, Cone clutch and Centrifugal clutch,  
Design of Brake: Block & Band brake, Internal expanding shoe brake.

**MODULE – III**

**(09 HOURS)**

Design of belt drive and power screw: Design of belt drive and pulley, Power screw design with square thread such as screw jack  
Levers, classification, Design of Foot levers, Hand lever, cranked lever, Lever of lever loaded – safety - valve. Design of belt and pulley Power screw design with square thread, such as screw jack. Illustrative problems with solutions.

**MODULE – IV**

**(09 HOURS)**

Design of straight and Helical spur gears, bevel gears.  
Design of Engine components: Piston, Connecting Rod, Crank Shaft, Flywheel, Illustrative problems with solutions.

**DESIGN DATA HAND BOOKS:**

1. Design Hand Book by S.M. Jalaluddin ; Anuradha Agencies Publications
2. P.S.G. Design Data Hand Book, PSG College of Tech Coimbatore
3. Machine Design Data Book, K.Lingaiah, Tata Mcgraw Hill

**BOOKS:**

- [1] Design of Machine Elements, V.B. Bhandari, Tata McGraw Hill Publishing Company Ltd., New Delhi, 4<sup>th</sup>Edition.
- [2] A Text Book of Machine Design, R.S.Khurmi and J.K.Gupta, S.Chand Publication, 4<sup>th</sup>Edition.
- [3] Mechanical Engineering Design, J. E. Shigley, C.R.Mischke, R.G.Budynas and K. J.Nisbett, TMH
- [4] Design of Machine Elements, M.F.Spotts,
- [5] Machine Design, P.C.Sharma and D.K.Agrawal, S.K.Kataria & Sons
- [6] Machine Design, Robert L. Norton, Pearson Education Asia, 2001
- [7] Fundamentals of Machine Component Design, Robert C. Juvinall and Kurt M Marshek, Wiley
- [8] Machine Design, P.Kanaiah, Sciotech Publications

**Digital Learning Resources:**

Course Name: Design of Machine Elements-I  
 Course Link: <https://nptel.ac.in/courses/112/105/112105124/>  
 Course Instructor: Prof. B. Maiti, Prof. G. Chakraborty, Prof. S.K. Roychowdhury,  
 Department of Mechanical  
 Engineering, IIT Kharagpur