MANIPAL UNIVERSITY JAIPUR School of Automobile Mechanical and
Mechatronics Engineering
Department of Mechanical Engineering Course Hand-out
Design of Machine Elements - II | ME 1605 | 4 Credits | 4 0 0 4
Session: Jan 17 – May 17 | Faculty: Prof. Sasanka Sekhar Ghosh/ Mr. Rakesh Kumar
Session: Jan 19 – May 19 | Faculty: Prof. Sasanka Sekhar Ghosh/ Mr. Rakesh Kumar/Dr. Ashish
Srivastava/B.Tech VIth Semester

[ME 1605.1] Select the proper spring, spring arrangement and design various type of springs (Helical Compression, multileaf) for static and fluctuating load.

[ME 1605.2] Analyse load and design of Gear (spur, helical etc.)

[ME 1605.3] Compute equivalent radial loads for rolling contact bearing & select appropriate bearing for the application.

[ME 1605.4] Analyse the pressure distribution and design of journal bearing.

[ME 1605.5] Analyse and design of belt drives, rope drive and chain drive and apply the required skills in industrial applications.

A. Syllabus

Spring design: introduction and spring materials. Design of Helical springs for static and fluctuating loads, buckling of compression springs. Gear design: introduction, Gear manufacturing and Gear materials, load analysis on gear tooth, Calculation of Virtual number of teeth and Contact Ratio, Stresses on gears. Lubrication of Gearings. Bearing and Lubrication: Introduction of Bearings, Bearing load life at rated reliability and section of Antifriction Bearings. Lubrication for Antifriction Bearing, mounting and enclosures. Journal Bearing: Types of journal bearings and lubrications, Material combination in Journal bearings, Hydrodynamic lubrication theory, Design of Hydrodynamic bearings and Non-conforming Contacts. Design of Flexible Mechanical elements: Introduction, design of flat belt and V- belt, design of flywheel wire rope design. Design of chain drives.

B. TEXT BOOK:

i. J.E. Shigley and C.R. Mischke, Mechanical Engineering Design, McGraw Hill Publication, 7th Edition, 2003.

ii. V. B. Bhandari, Design of Machine Elements, McGraw Hill Education (India) Pvt. Ltd.

G. REFERENCE BOOKS:

i. R. L. Norton, Machine Design-An Integrated Approach, Pearson Publisher, 5th Edition, 2013.
ii. U.C. Jindal, Machine Design, Pearson publisher, 1st Edition, 2010.
iii. V. B. Bhandari, Machine Design Data book, McGraw Hill Education (India) Pvt. Ltd.