ME 224 Kinematics of Machinery (2-1-0-6)

Prerequisite: ME 101 Engineering Mechanics or equivalent

Introduction to kinematics, planar mechanisms, pairs, kinematic chain, kinematic inversion, mobility (Kutzhbach and Grubler's criterion) and range of movements (Grashof's law); Displacement, velocity and acceleration analysis of planar mechanisms by graphical, analytical and computer aided methods; Dimensional synthesis for motion; function and path generation; Miscellaneous mechanisms: approximate and exact straight line generating mechanisms, intermittent motion mechanism; Introduction to Cam, Classification of followers and cams, Analysis of follower motion, Graphical and analytical approaches for cam profile synthesis; Gears: spur, helical, bevel and worm; gear trains: simple, compound and epicyclic.

Texts:

[1] K. J, Waldron and G. L Kinzel, Sunil K. Agrawal, Kinematics, Dynamics and Design of Machinery, 3rd Ed., Wiley Student Edition, 2016.
[2] A. Ghosh and A. K. Mallik, Theory of Mechanisms, and Machines, 3rd Ed., East West Press Pvt Ltd, 2009.
[3] J. J Uicker (Jr), G. R Pennock and J. E Shigley, Theory of Machines and Mechanisms, 3rd Ed., Oxford International Student Edition 2003.

References:

[1] H. H. Mabie and C. J. Reinholtz, Mechanisms and Dynamics of Machinery, John Wiley & Sons; 4th Edition edition 1987.
[2] S. S. Rattan, Theory of Machines, 4th Ed., Tata McGraw Hill, 2014.
[3] R. L. Norton, Kinematics and Dynamics of Machinery, Tata Mcgraw Hill, 2017.
[4] J. S. Rao, R. V. Dukkipati, Mechanism and Machine Theory, 2nd Ed., New Age International, 2008.
[5] A. G. Erdman, G. N. Sandor and Sridhar Kota, Mechanism Design, Analysis and Synthesis Volume 1, 4th Edition, Pearson, Inc., 2001.
[6] T. Bevan, Theory of Machines, 3rd Ed., CBS Publishers and Distributors, 2005.