

IC240 Mechanics of Rigid Bodies

Credit: 1.5-1.5-0-3

Prerequisite: Consent of the faculty member

Students intended for: B.Tech

Elective or Core: Core

Semester: Even/Odd

Course objective: Students learn to analyze the interactions of rigid bodies and be able to apply the principles in practical situations

Course content:

- **Two-dimensional force systems:** Rectangular components, moment, couple, resultants. [4 Lectures]
- **Equilibrium:** System isolation and the free body diagram, equilibrium conditions [10 Lectures]
- **Structures:** Introduction, plane trusses, method of joints and method of sections, frames and machines. [4 Lectures]
- **Kinematics of Rigid Bodies:** Introduction, rotation, absolute motion, relative velocity, instantaneous centre of zero velocity, relative acceleration, motion relative to rotating axes. [10 Lectures]
- **Kinetics of Rigid Bodies:** Introduction, general equations of motion, translation, fixed axis rotation, general plane motion, Work-energy relations, virtual work, Impulse momentum equations. [14 Lectures]

Text Books:

J. L. Meriam, L.G. Kraige; Engineering Mechanics: Statics; Willey India Pvt. Ltd.

J. L. Meriam, L.G. Kraige; Engineering Mechanics: Dynamics; Willey India Pvt. Ltd.

References:

Beer, Johnston, Eisenberg, Sarubbi; Vector Mechanics for Engineers Statics and Dynamics; McGraw Hill Company

S.P. Timoshenko, D.H. Young; *Engineering Mechanics*, McGraw-Hill Book Company.

R.C. Hibbeler; Engineering Mechanics Statics, Prentice Hall.