

A. TEXTBOOK :

- “Engineering Mechanics” by P. C. Dumir, S. Sengupta and S. V. Veeravalli, Universities Press.

B. REFERENCE BOOKS :

- “Vector Mechanics for Engineers, Statics & Dynamics” by F. P. Beer et al. McGraw Hill.
- “Engineering Mechanics, Statics and Dynamics” by I. H. Shames, Prentice Hall.

Please use these reference books for problems only — the notations used and development of the theory is very different from those used in the text book.

C. COURSE CONTENTS :

1. **Introduction & Kinematics:** Moving point in different coordinate systems; Rigid bodies; Translation and Rotation; Relative motion for translating systems; Angular velocity; General motion of a rigid body; General relative motion; Examples.
2. **Axioms and Force Systems:** Mass and centre of mass; Resultant force systems; centre of parallel forces; Work, power and kinetic energy; Euler’s Axioms; Equations of Equilibrium; Impulse and Angular Impulse; Impulse-momentum relations; Dry friction; Free body diagrams; Belt friction, thrust bearing & clutch; Conservative forces; workless forces; Gravitational force.
3. **Dynamics of a Rigid body:** Inertia tensor; Principal axes; Angular Impulse-momentum relations; general equations of motion of a rigid body; motion of a rigid body with a fixed axis; Euler’s equations; work-energy relation; Balancing of rotors; Plane motion with examples; Centre of percussion; Impact of rigid bodies.
4. **Statics:** Equations of equilibrium; static determinacy; frames, mechanisms and constraints; Friction and impending motion (rolling and tipping); Journal bearing; Bars, beams and trusses.

D. Tutorials :

Tutorial sheets will usually be uploaded at least a week in advance. Please try the problems given in them **BEFORE THE TUTORIAL CLASSES**. *It is mandatory to have text book, tutorial sheets and calculator for all tutorial sessions.*

E. ASSESSMENT :

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| a. Minor | : | 30 % |
| b. Major | : | 40% |
| c. Quizzes (usually 3-4) | : | 30% |

F. ATTENDANCE POLICY :

The attendance policy in the courses of study document for IITD will be implemented.

G. PARTICIPATING FACULTY :

Lectures	Arjun Sharma, Gaurav Singh
Tutorials	Arjun Sharma, Gaurav Singh, Badri Prasad Patel, Sawan Suman Sinha, Murali R. Cholemari, Vamsi Chalamalla, Amitabh Bhattacharya, Vikrant Tiwari

(Course Co-ordinators)