

ME 220: Theory of Machines and Machine Design (2 1 0 6)
Instructor: B. Seth, Professor of Mechanical Engineering (Extn. 7504)
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Motivation:

Machines are essentially an assemblage of bodies that can be used to transfer motion and forces. Machines are indispensable in all engineering branches. Apart from the fact that Material Scientists and Metallurgists encounter machines for material production as well as testing, a certain understanding of theory of machines is expected from all engineers. This course aims at equipping you to be able to understanding the essential elements of machines and how they are analyzed and designed.

Topics:

Kinematics of linkages, cams and gear trains. Velocity and static force analyses. Geometry of gear teeth. Spur, helical, worm and bevel gears. Belt and chain drives, couplings, clutches, and brakes. Design considerations-material selection, allowable stresses and deflections, fatigue and factor of safety. Design of welded joints. Keys, splines and cotters. Design of shafts. Bearing selection. Considerations in pressure vessel design.

Text books:

1. J.E.Shigley and J.J.Uicker, Theory of Machines and Mechanisms, McGraw-Hill, 1980.
2. M.F.Spotts, Design of machine elements, Prentice Hall of India, 1991.
3. Thomas Bevan, Theory of Machines, CBS Publishers and Distributors, 1984.

Assessment:

End semester examination:	50%
Mid semester examination:	25%
In-semester evaluation*:	25%

Teaching Assistants:

1. Rajdeep Dewangan (05310015)
2. Kantha Rao (05310011)
3. Arun Kumar (06310014)
4. Punna Prasad (05310025)

* Tutorial sessions will be used to clarify doubts or hold in-class tests (quizzes). Home work assignments will be given regularly to assist your understanding of the course material. Typically, quizzes will also have questions similar to the assignments. Home work assignments will not be collected and the in-semester evaluation will be based on the performance in the quizzes.