ME351: Design of Machine Elements
2016-17 Second Semester

Instructor: Shakti S Gupta, ssgupta@iitk.ac.in, Ph: +91-512-259 6110 (O),
Office: Nonlinear Mechanics Lab

Tutors: Prof. Ashish Dutta (adutta@iitk.ac.in)
Prof. Anurag Gupta (ag@iitk.ac.in)

TAs:

Mr. Jitendra Kumar, 13205069	Mr. Shubham Sonawane, 12807706
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Text Book: Shigley's Mechanical Engineering Design by R. G. Budynas, J.K. Nisbett, 9th Edition (SI Units)

Class Timings: Lectures: M, Tue: 2 to 3 PM, L2 ;Tutorial: Th: 10 AM to 12 Noon in Drawing Halls

Evaluation:
Tutorials*	:	15
Mid Semester	:	25
End Semester	:	35
Project**	:	15
Attendance	:	10

Course Outline

1. Introduction
2. Modes of failure and failure theories
   a. Failure under static loading: yield criteria
   b. Failure by instability: buckling
   c. Fatigue failure: Stress-Life, Strain Life, S-N diagram, Endurance Limit, Modification factors, Modified Goodman, Fluctuating loads and combined loading.
3. Design of Machine Components
   a. Bolted and welded joints
   b. Helical and leaf springs
   c. Spur and helical gears
   d. Rolling contact bearings
   e. Shafts
4. Probabilistic approach to design

* Tutorial problems will be given to you in the tutorial class. However, related topics will be announced in advance, for you to prepare for the tutorial class.

 ** Projects will be carried out in groups. Groups will be formed by the instructor in consultation with tutors and the details will be intimated to you by the mid of the semester. Project topics will be selected by the groups. Projects MUST have major activities related to the course. Before starting a project work each group will prepare; (i) one-page summary, discussing the selected project, (ii) deliverables, and (iii) time-line for executing the project. This one-page document will be evaluated by the instructor and tutors and then approval will be granted to start the project. Progress of projects will be monitored/evaluated by the instructor and tutors periodically.