

## ME 423: Machine Design

**Course Instructor** : **Prof. Ramesh Singh**  
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**Office Hours** : Fridays 4:00 pm -5:00 pm  
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**Teaching Assistant** : **Mr. Suraj Kumar**  
**Office** : Machine Tools Lab  
: [214100013@iitb.ac.in](mailto:214100013@iitb.ac.in)  
: Thursdays 3:00 pm – 5:00 pm

**Class Timing** : Slot 6: Wednesday: 11:05 AM - 12:30 PM  
Friday: 11:05 AM - 12:30 PM

### Course Objectives:

- Basics of Engineering Design
- Selection of Engineering Materials for Mechanical Design
- Analysis of Machine Elements
- Synthesis, Design, Modeling, Fabrication, and Characterization of a complete system or a product (proposed and executed by each group of 8 students)

### Scheme of assessment

Assignments + Quizzes	15%
Midterm	25%
Project	35% (15% In-sem in form of reports, presentations, stage-wise prototype) + 20% Evaluation at the semester end of the final product)
End semester exam	25%
Total	100 %

Please note:

1. Lecture notes and home works will be posted on the course website
2. Homework will be individual and will be **due on Moodle on the day of submission. No late homework accepted.**
3. Any form of uncanny similarity or copying on the homework **will be severely penalized.**
4. Group project is an important part (35%) and it will be self-selected group of 10.
5. Surprise quizzes will be an in-class test for 15-20 minutes.
6. **No cellphones on the desk. Cell phones should be either in your bag or pocket in silent mode.**

### Text Book:

- *Shigley's Mechanical Engineering Design, R.G. Budynas,, J.K. Nisbett; Tata Mcgraw-Hill Publishing Co. Ltd., 2012*

- *Machine Design: An integrated approach, R.L. Norton; Pearson Education Inc. (India), 2nd edition, 2000*

#### References:

- *Materials Selection in Mechanical Design, M.F. Ashby; Elsevier, 2010*
- *Engineering Design: A project based approach*
- *Fundamentals of Machine Component Design, R.C. Juvinall, K.M. Marshek, John Wiley & Sons, 3rd edition, 2000*

#### Schedule of Lectures, Assignments, and quizzes

Lecture No.	Date	Schedule of Assignments & quizzes	Lecture No.	Date	Schedule of Assignments & quizzes
1.	31.08.24 Wed	Design Intro I	19.	11.10.24 Fri	Actuators II
2.	02.08.24 Fri	Mechanics Review 1	20.	16.10.24 Wed	Actuators II
3.	07.08.24 Wed	Mechanics Review II	21.	18.10.24 Fri	Gears I
4.	09.08.24 Fri	Mechanics Review III (HW 1)	22.	23.10.24 Wed	Gears II (HW 4)
5.	14.08.24 Wed	Materials Selection I	23.	25.10.24 Fri	Miscellaneous
6.	16.08.24 Fri	Materials Selection II	24.	30.10.24 Wed	Miscellaneous
7.	21.08.24 Wed	Materials Selection III	25.	01.11.24 Fri	Quiz II
8.	23.08.24 Fri	Fatigue I	26.	06.11.24 Wed	Project Presentations
9.	28.08.24 Wed	Fatigue II	27.	08.11.24 Fri	Project Presentations
10.	30.08.24 Fri	Shafts (HW 2)		<b>(11-23). 11.24</b>	<b>End-Sem Exam</b>
11.	04.09.24 Wed	Quiz 1			
12.	06.09.24 Fri	Welding and Fastening I			
13.	11.09.24 Wed	Welding and Fastening II			
14.	13.09.24 Fri	Lubrication and Bearings I			
	<b>(14-22).09.24</b>	<b>Mid-Sem Exam</b>			
15.	25.09.24 Wed	Lubrication and Bearings II			
16.	27.09.24 Fri	Lubrication (HW3)			
17.	04.10.24 Fri	Flexible Mechanical Elements			
18.	09.10.24 Wed	Actuators I			