

ME 206 Manufacturing Processes – I

Course Instructor : Prof. Ramesh Singh
Office : Machine Tools Lab
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Office Hours : Fridays 4:00 pm -5:00 pm
Website : <https://www.me.iitb.ac.in/~ramesh/courses/ME206/me206.html>

Teaching Assistant : Mr. Sachin Alya (lead TA)/ Mr. Suraj Kumar/Mr. Prince Sahu
Office : Machine Tools Lab
: 4518
: Thursdays 3:00 pm – 5:00 pm

Course Objectives:

- Learn the fundamentals of casting, joining, deformation processes, polymer processing
- Develop first order mathematical descriptions for selected processes
- Understand the advantages and limitations of various processes in terms of quality productivity
- Apply this knowledge to manufacturing process selection, design and part quality

Scheme of assessment

Assignments	10%
Quizzes	10%
Midterm	25%
Group Project	20% (7.5% for Mid-sem & 12.5 for End-sem)
End semester examination	35%

Total	100 %

Please note:

1. Lecture notes and home works will be posted on the course website
2. Homeworks will be individual and are **due in class on the day of submission. No late homeworks accepted.**
3. Any form of uncanny similarity or copying on the homework **will be severely penalized.**
4. Students could opt for an **analysis project** either using Deform/commercial finite element code or analytical techniques. **Hands on projects** which involves experimental analysis will also be considered. Alternatively, a **research paper** on recent work in manufacturing could also be considered special conditions.
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 and on silent mode. (For Online Mode keep cellphones on silent)**

Schedule of Lectures, Assignments and quizzes

Lecture No.	Date	Schedule of Assignments & quizzes	Lecture No.	Date	Schedule of Assignments & quizzes
1.	03.01.2022 Mon	Introduction	Mid-Sem Exam 19.02.2022 Sat - 26.02.2022 Sat		
2.	04.01.2022 Tue	Casting process introduction	23.	28.02.2022 Mon	Sheet Metal Working
3.	06.01.2022 Thu	Dispensable and permanent mould processes	24.	03.03.2022 Thu	Loads, friction and lubrication
4.	10.01.2022 Mon	Analysis of melting, pouring and solidification phenomena	25.	07.03.2022 Mon	Forming Limits
5.	11.01.2022 Tue	Design of pattern, core, feeder and gating system	26.	08.03.2022 Tue	Forming defects and inspection
6.	13.01.2022 Thu	Casting defects and inspection (HW 1)	27.	10.03.2022 Thu	Introduction to polymers and composites
7.	17.01.2022 Mon	Joining processes introduction	28.	14.03.2022 Mon	Thermoplastics & thermosets
8.	18.01.2022 Tue	Fusion and solid-state welding	29.	15.03.2022 Tue	Elastomers & composites
9.	20.01.2022 Thu	Brazing and soldering	30.	17.03.2022 Thu	Processing of polymers a
10.	24.01.2022 Mon	Weld joint design, cooling rate, and joint properties	31.	21.03.2022 Mon	Analysis of Injection Molding I
11.	25.01.2022 Tue	Welding defects and inspection (HW 2)	32.	22.03.2022 Tue	Analysis of Injection Molding II
12.	27.01.2022 Thu	Quiz 1	33.	24.03.2022 Thu	Processing of composites
13.	31.01.2022 Mon	Bulk Deformation I	34.	28.03.2022 Mon	Additive Manufacturing
14.	01.02.2022 Tue	Bulk Deformation I	35.	29.03.2022 Tue	Additive Manufacturing
15.	03.02.2022 Thu	Bulk Deformation I (HW 3)	36.	31.03.2022 Thu	Powder Metallurgy
16.	07.02.2022 Mon	Bulk Deformation II	37.	04.04.2022 Mon	Powder Metallurgy
17.	08.02.2022 Tue	Bulk Deformation II	38.	05.04.2022 Tue	Free form fabrication (rapid prototyping)
18.	10.02.2022 Thu	Quiz 2	39.	07.04.2022 Thu	Advanced Topics I
19.	14.02.2022 Mon	Bulk Deformation II	40.	11.04.2022 Mon	Advanced Topics II
20.	15.02.2022 Tue	Bulk Deformation II	41.	12.04.2022 Tue	Project presentation
21.	17.02.2022 Thu	Sheet Metal Working			

Text Book:

- *Manufacturing Processes for Engineering Materials, S. Kalpakjian and S. R. Schmid, 5th edition; Prentice Hall, 2003.*
- *Manufacturing Science, Ghosh and Mallik, 2nd Edition, East-West Press Pvt Ltd*

References:

- *Introduction to Manufacturing Processes, J.A. Schey, 3rd edition. McGraw Hill Co., 2000.*

Class timings:

- ME 206 (section - S3) - Manufacturing Processes I
3A - Mon - - 10:35:00 - 11:30:00
3B - Tue - - 11:35:00 - 12:30:00
3C - Thu - - 08:30:00 - 09:25:00