

ME 323: Thermal and Chemical Processing of Materials

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/ Mr. Sutonu Oraon/ Mr. Rajesh Gorai**
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: Thursdays 3:00 pm – 5:00 pm

Class Timing : Slot
1A: Monday: 08:30 AM - 09:25 AM
1B: Tuesday: 09:30 AM - 10:25 AM
1C: Thursday: 10:35 AM - 11:30 AM

Course Objectives:

- Learn the fundamentals of solidification processing (casting, welding, and additive manufacturing), polymer and composite processing, coatings, non-conventional machining (EDM, ECM, ECDM, EBM, laser machining, and FIB machining) and powder 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

Class participation	10%
Assignments + Quizzes	20%
Midterm	20%
Project	25% (10% pre-midsem + 15% post midsem)
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 **uploaded**
3. Any form of uncanny similarity or copying on the homework **will be severely penalized.**
4. Group project is an important part (25%) and it will be **self-selected group of 4. One can also do individual project if he wishes to.**
5. Surprise quizzes will be an in-class test for 15-20 minutes.

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.*

Schedule of Lectures, Assignments, and quizzes

Lecture No.	Date	Schedule of Lectures, assignments & quizzes	Lecture No.	Date	Schedule of Assignments & quizzes
1.	28.07.25 Mon	-----		(13-21). 09.25	Midsem Exam
2.	29.07.25 Tue	Introduction	22.	22.09.25 Mon	Polymer Processing I
3.	31.07.25 Thu	Casting I	23.	23.09.25 Tue	Polymer Processing II
4.	04.08.25 Mon	Casting II	24.	25.09.25 Thu	Polymer Processing III
5.	05.08.25 Tue	Casting III	25.	29.09.25 Mon	Polymer Processing IV
6.	07.08.25 Thu	Casting IV (HW 1)	26.	30.09.25 Tue	Quiz 3
7.	11.08.25 Mon	Joining I	27.	06.10.25 Mon	Powder Processing I
8.	12.08.25 Tue	Joining II	28.	07.10.25 Tue	Powder Processing II
9.	14.08.25 Thu	Joining III (HW2)	29.	09.10.25 Thu	Powder Processing III
10.	18.08.25 Mon	Joining IV	30.	13.10.25 Mon	Powder Processing IV
11.	19.08.25 Tue	Quiz 1	31.	14.10.25 Tue	Non-conventional Machining I
12.	21.08.25 Thu	Additive Manufacturing (AM) I	32.	16.10.25 Thu	NCM II
13.	25.08.25 Mon	AM II	33.	21.10.25 Tue	NCM III
14.	26.08.25 Tue	AM III	34.	23.10.25 Thu	NCM IV (HW 5)
15.	28.08.25 Thu	AM IV	35.	27.10.25 Mon	NCM V
16.	01.09.25 Mon	AM V (HW3)	36.	28.10.25 Tue	NCM VI
17.	02.09.25 Tue	Coatings I	37.	30.10.25 Thu	Quiz 4
18.	04.09.25 Thu	Coatings II	38.	03.11.25 Mon	Project Presentations
19.	08.09.25 Mon	Coatings III	39.	04.11.25 Tue	Project Presentations
20.	09.09.25 Tue	Quiz 2	40.	06.11.25 Thu	Project Presentations
21.	11.09.25 Thu	Recapitulation session		(10-22). 11.25	Endsem Exam