Advanced Machining Processes

ME312: Manufacturing Technologies - II
Instructor: R K Mittal

Outline

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- Course Outline
- Text books/reference books

Contact Details

Prof. R K Mittal

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Contact Details

Teaching Assistants :

- Abhishek Punia (a.punia@iitg.ac.in)
- Debottam Bhowmik(b.debottam@iitg.ac.in)

Class Timings: Mondays 9:00 AM – 9:55 AM

Tuedays 9:00 AM – 9:55 AM

Thursdays 11:00 AM – 11:55 AM

Objective of Course

- Basics of non-conventional machining as well as hybrid machining processes
- Learn the principles of material removal mechanisms of non-conventional machining as well as hybrid machining processes
- Develop first order mathematical descriptions for selected processes
- Understand the advantages and limitations of various processes in terms of quality and productivity

Objective of Course

- Emphasis on understanding the physical principles underlying these processes
- Apply this knowledge to manufacturing process selection, design and part quality
- Encourage teamwork and group activity via group assignments and Project

Grading Policy

Quizzes	20%
Project	15%
Midterm	25%
End Semester Examination	40 %
Total	100 %

Attendance is not optional. FA grade will be awarded for attendance less than 75%

Important Instructions

- Lecture notes will be posted on the **course website or through shared folder**
- Any form of uncanny similarity or copying on the homework **will be severely penalized**.
- **Hands on projects** which involves experimental analysis will be considered.
- Students could opt for an analysis project either using Deform/commercial finite element code or analytical techniques.

Important Instructions

- **Surprise quizzes** may be there in classes.
- **No cellphones on the desk**. Cell phones should be either in your bag or pocket.
- It would be good if we all learn together – the more two-way interactions, the better for all of us. I will make mistakes, which you will be expected to correct, and vice versa!

Course Outline

- Introduction to Non-Conventional Machining Processes
- Mechanical Abrasive Processes
- Finishing Processes
- Chemical and Electrochemical processes
- Thermal processes

Textbooks and Reference Books

- V. K. Jain, Advanced Machining Processes, Allied Publishers,2009
- Hassan El-Hofy, Advanced Machining Processes, McGraw-Hill Prof Med/Tech, 2005
- Helmi Youssef, Non-Traditional and Advanced Machining Technologies, CRC Press, 2020
- Gary F. Benedict, Nontraditional Manufacturing Processes, Taylor & Francis, 1987
- Bijoy Bhattacharyya and Biswanath Doloi, Modern Machining Technology, Academic Press, 2019
- V. K. Jain, Introduction to Micromachining, Alpha Science International Limited, 2010
- J. A. McGeough, Micromachining of Engineering Materials, Taylor & Francis, 2001.
- P K Mishra, Non-Conventional Machining, Narosa India Publication, 1997.
- P. C. Pandey and H. S. Shan, Modern Machining Processes, Tata McGraw-Hill Education, 1980.
- James A. Brown, Modern Manufacturing Processes, Industrial Press, 1991.

Summary

- Focus on:
  - Physical principles and analysis of process
  - Process Capabilities
- Teamwork will be encouraged
  - Homework
  - Project