

III Year I Semester

L T P C

Code: 20ME5765

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HYBRID MACHINING APPROACHES

Course Objectives:

The Students will acquire the knowledge:

1. To interpret the hybrid machining processes.
2. To discuss the assisted hybrid machining.
3. To outline the systematic understanding of knowledge in assisted hybrid machining.
4. To discuss about the combined hybrid machining.
5. To summarize the controlled application of process mechanisms.

UNIT-I INTRODUCTION

Classification of hybrid machining processes – Assisted hybrid machining, Combined hybrid machining, Controlled application of process mechanisms, Design principle and methodology for hybrid machining processes.

UNIT-II ASSISTED HYBRID MACHINING I

Laser assisted machining, Vibration assisted machining, Fluid assisted machining, magnetic field assisted machining, abrasive assisted machining.

UNIT-III ASSISTED HYBRID MACHINING II

External electric field assisted machining, heat assisted machining, Media assisted – cryogenic fluid, gas, carbon nano-tube assisted machining.

UNIT-IV COMBINED HYBRID MACHINING

Electrochemical discharge, Laser electrochemical machining, Electrochemical grinding, EDM-ER fluid assisted polishing, Mechano-electrochemical machining.

UNIT-V CONTROLLED APPLICATION OF PROCESS MECHANISMS

Hybrid abrasive water jet and milling process, Grind hardening, ED-EC milling.

REFERENCES:

1. Hybrid Machining Processes: Perspectives on Machining and Finishing - Kapil Gupta, Neelesh K. Jain, R. F. Laubscher - Springer, 07-Nov-2015 - Technology & Engineering
2. Nontraditional Machining Processes: Research Advances- J. Paulo Davim Springer Science & Business Media, 14-Jun-2013 - Technology & Engineering
3. **Advanced Machining and Manufacturing Processes-** Kaushik Kumar, Divya Zindani, J. Paulo Davim-Springer, 17-Apr-2018 - Technology & Engineering
4. Non-traditional Micromachining Processes: Fundamentals and Applications - GolamKibria, B. Bhattacharyya, J. Paulo Davim-Springer, 07-Mar-2017 - Technology & Engineering

Course Outcomes:

At the end of the course, the student will be able to:

1. Recite the hybrid machining processes.
2. Narrate the assisted hybrid machining.
3. Explain the assisted hybrid machining.
4. Illustrate combined hybrid machining.
5. Integrate the knowledge of controlled application of process mechanisms.