PR XX MICRO MANUFACTURING L T P C 3 0 0 3

OBJECTIVES:

- To understand the principles of various basic micro manufacturing process
- To realize basic machine tools, and developments in the micro manufacturing process
- To recognize research trends in the area of micro manufacturing process.

Mechanical Micro machining – Ultra Sonic Micro Machining – Abrasive Jet Micro Machining – Water Jet Micro Machining – Abrasive Water Jet Micro Machining – Micro turning – Chemical and Electro Chemical Micro Machining – Electric discharge micro machining.

Beam Energy based micro machining – Electron Beam Micro Machining – Laser Beam Micro Machining – Electric Discharge Micro Machining – Ion Beam Micro Machining – Plasma Beam Micro Machining – Hybrid Micro machining – Electro Discharge Grinding – Electro Chemical spark micro machining – Electrolytic in process Dressing.

Abrasive Flow finishing – Magnetic Abrasive Finishing – Magneto rheological finishing – Magneto Rheological abrasive flow finishing - Magnetic Float polishing – Elastic Emission Machining – chemo-mechanical Polishining.

Micro extrusion – Micro and Nano structured surface development by Nano plastic forming and Roller Imprinting – Micro bending with LASER – LASER micro welding – Electron beam for micro welding.

Metrology for micro machined components – Ductile regime machining– AE based tool wear compensation– Machining of Micro gear, micro nozzle, micro pins – Applications.

Evaluation Scheme:
Term Tests 40 Assignments 10 Final Examination 50 Marks

Course Outcomes:

1. State of Art in Micro Manufacturing
2. Tooling and Inspection for Micro Manufacturing
3. Facing the challenges in Micro manufacturing

REFERENCES:

1. Jain V. K., Micro Manufacturing Processes, CRC Press, Taylor & Francis Group, April 2016
2. Fassi, I., Shipley, D. "Micro-Manufacturing Technologies and Their Applications: A Theoretical and their application" Springer 2017 ISBN: 978-3-319-39650-7.
3. Bharat Bhushan, Handbook of nanotechnology, springer, Germany, 2017
4. Bandyopadhyay. A.K., Nano Materials, New age international publishers, New Delhi, 2008, ISBN:8122422578.
5. Mcgeoug.J.A., Micromachining of Engineering Materials, CRC press 2001, ISBN10:0824706447.

To be placed in senate 92

HOD/PE