

Syllabus
Advanced Manufacturing Systems (TMM204 / MSD205)
M.Tech. (2nd Semester)/ Ph.D., Spring -2020

UNIT I

- Advanced manufacturing system concepts
- Manufacturing automation
- Automation types
- Programmable and hard automation.
- Design for manufacturing and assembly.
- Flexible manufacturing Systems
- Group Technology
- Additive Manufacturing
- Rapid Prototyping, (Stereolithography, Selective laser sintering, Fused Deposition Modelling, Laminated objected manufacturing, Polyjet technology)
- Robots, their classifications and applications.
- Introduction to Robot/CNC programming.

UNIT II

- Introduction to Micro/ Nano machining,
- Abrasive Micro machining.
- Diamond Micro- grinding/turning.
- Ultrasonic Micromachining.
- Electro-discharge Micro-machining,
- Laser Micro-machining,
- Electrochemical Micro-machining,
- Chemical Micro-machining,
- Ion Beam Machining,
- Electron Beam Machining,
- Abrasive flow finishing,
- Magnetic Abrasive finishing,
- Magneto rheological abrasive flow finishing,
- Magnetic float polishing

UNIT III

- Introduction to Micro fabrication,
- High resolution lithography
- Diffusion and Ion Implantation.
- IC Packaging
- Etching Metallization and testing,
- Micro fabrication process,
- LIGA Process
- Measuring techniques for micro features,
- Measuring techniques for nano features,
- Microhardness tester
- Laser scanners,
- Factories of future

Reference books:

1. *Nano and Micromachining* by J. Paulo Davim and Mark J. Jackson, Wiley Publication.
2. *Fundamentals of Modern Manufacturing: Materials, Processes, and Systems* by Mikell P. Groover, 5th Edition, Wiley Publication
3. *Non-traditional Micromachining Processes Fundamentals and Applications* edited by Golam Kibria, B. Bhattacharyya and J. Paulo Davim, Springer.
4. *Micromanufacturing Processes* edited by V. K. Jain, CRC Press