

7TH SEMESTER

PCMF4401 NON TRADITIONAL MACHINING (3-0-0)

MODULE -I (11 hours)

INTRODUCTION: History, Classification, comparison between conventional and Non-conventional machining process selection. Ultra sonic machining (USM): Introduction, equipment, tool materials & tool size, abrasive slurry, cutting tool system design:- Effect of parameter: Effect of amplitude and frequency and vibration, Effect of abrasive grain diameter, effect of applied static load, effect of slurry, tool & work material, USM process characteristics: Material removal rate, tool wear, Accuracy, surface finish, applications, advantages & Disadvantages of USM.

MODULE –II (12 hours)

ABRASIVE JET MACHINING (AJM): Introduction, Equipment, Variables in AJM: Carrier Gas, Type of abrasive, size of abrasive grain, velocity of the abrasive jet, mean number. Applications, advantages & Disadvantages of AJM. Water Jet Machining: Principal, Equipment, Operation, Application, Advantages and limitations of water Jet machinery

ELECTROCHEMICAL MACHINING (ECM): Introduction, study of ECM machine, elements of ECM process: Cathode tool, Anode work piece, source of DC power, Electrolyte, chemistry of the process, ECM Process characteristics – Material removal rate, Accuracy, surface finish, ECM Tooling: Applications such as Electrochemical turning, Electrochemical Grinding, Electrochemical Honing, deburring, Advantages, Limitations.

MODULE –III (12 hours)

ELECTRICAL DISCHARGE MACHINING (EDM): Introduction, machine, mechanism of metal removal, dielectric fluid, spark generator, EDM tools (electrodes) Electrode feed control, Electrode manufacture, Electrode wear , EDM tool design choice of machining operation electrode material selection, under sizing and length of electrode , machining time. Application EDM accessories / applications, electrical discharge grinding, Traveling wire EDM.

PLASMA ARC MACHINING (PAM): Introduction, equipment non-thermal generation of plasma, selection of gas, Mechanism of metal removal, PAM parameters, process characteristics. Safety precautions, Applications, Advantages and limitations. LASER BEAM MACHINING (LBM): Introduction, equipment of LBM mechanism of metal removal, LBM parameters, Process characteristics, Applications, Advantages & limitations.

TEXT BOOKS:

1. Advanced machining processes / VK Jain/ Allied Publishers

REFERENCE BOOKS:

1. Modern Machining Process / Pandey P.C. and Shah H.S./ TMH
2. New Technology / Bhattacharya A/ the Institution of Engineers, India 1984