

## NON-TRADITIONAL MACHINING

Sub Code	: 10ME 665	IA Marks	: 25
Hrs/week	: 04	Exam Hours	: 03
Total Lecture Hrs	: 52	Exam Marks	: 100

## PART - A

## UNIT - 1

**Introduction:** History, Classification, comparison between conventional and Non-conventional machining process selection.

05 Hours

## UNIT - 2

**Ultrasonic 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.

08 Hours

## UNIT - 3

**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. abrasive particles per unit volume of the carrier gas, work material, stand off distance (SOD), nozzle design, shape of cut. Process characteristics-Material removal rate, Nozzle wear, Accuracy & surface finish. Applications, advantages & Disadvantages of AJM. Water Jet Machining: Principal, Equipment, Operation, Application, Advantages and limitations of water Jet machinery

07 Hours

## UNIT - 4

**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: ECM tooling technique & example, Tool & insulation materials, Tool size Electrolyte flow arrangement, Handling of slug, Economics of ECM, Applications such as Electrochemical turning, Electrochemical Grinding, Electrochemical Honing, deburring, Advantages, Limitations.

06 Hours



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**PART - B****UNIT - 5**

**Chemical Machining (Chm):** Introduction, elements of process, chemical blanking process : Preparation of work piece, preparation of masters, masking with photo resists, etching for blanking, accuracy of chemical blanking, applications of chemical blanking, chemical milling (contour machining): process steps –masking, Etching, process characteristics of CHM: material removal rate, accuracy, surface finish, Hydrogen embrittlement, advantages & application of CHM.

**06 Hours****UNIT - 6**

**Electrical Discharge Machining (Edm):** Introduction, 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. Flushing; pressure flushing, suction flushing, side flushing, pulsed flushing synchronized with electrode movement, EDM process characteristics: metal removal rate, accuracy, surface finish, Heat Affected Zone. Machine tool selection, Application, EDM accessories / applications, electrical discharge grinding, Traveling wire EDM.

**08 Hours****UNIT - 7**

**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.

**05 Hours****UNIT - 8**

**Laser Beam Machining (Lbm):** Introduction, equipment of LBM mechanism of metal removal, LBM parameters, Process characteristics, Applications, Advantages & limitations.

**Electron Beam Machining (Ebm):** Principles, equipment, operations, applications, advantages and limitation of EBM.

**07 Hours****TEXT BOOKS:**

1. **Modern machining process**, Pandey and Shan, Tata McGraw Hill 2000
2. **New Technology**, Bhattacharya 2000

**REFERENCE BOOKS:**

1. **Production Technology**, HMT Tata McGraw Hill. 2001

  
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2. **Modern Machining Process**, Aditya. 2002
3. **Non-Conventional Machining**, P.K.Mishra, The Institution of Engineers (India) Test book series, Narosa Publishing House – 2005.
4. **Metals Handbook: Machining Volume 16**, Joseph R. Davis (Editor), American Society of Metals (ASM)

### KNOWLEDGE MANAGEMENT

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#### PART - A

##### UNIT - 1

**Knowledge Influences : Introduction**, External influences on organizations, Changing nature of management, Types of organizations, Strategic management in organizations, Knowledge management, Knowledge management an emerging concept, Model of strategic knowledge management.

07 Hours

##### UNIT 2

**Introduction to Key Concepts** : What is Management? Knowledge Management and business strategies, Knowledge intensive firms and Knowledge workers, Learning and Knowledge Management

06 Hours

##### UNIT 3

**Knowledge Creation and Loss** : Innovation dynamics and knowledge processes, characterizing innovation processes, innovation as an interactive process, knowledge creation and Nonaka, the social dynamics of innovation networking processes, forgetting and unlearning knowledge

07 Hours

##### UNIT 4

**Developing and Managing Knowledge Repositories** : Effective knowledge repositories, mapping the content structure, repository quality control, case studies (not for examination)

06 Hours

  
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