

5074 – NON-CONVENTIONAL PRODUCTION PROCESSES															
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)										
Lectures	Practical	Credit			Theory					Practical Ex.			Total		
3	2	5	25	25	3Hrs.		100		0			150			
Pre-requisite		Source	USER	1	2	3	4	5	6	7	10	11	12	13	14
Nil		PRD		15	16	20	21	22	24	28	29	34	35	36	

RATIONALE: - The designation 'Non conventional production processes' or 'Non traditional machining ' is applied to a wide variety of mechanical, electrical, thermal and chemical removal processes. In general Non-conventional processes have higher power consumption and lower stock removal rate compared to conventional processes, although these are of secondary importance. The user can select a particular process to overcome a problem, which an unusual part may present in conventional method. Non conventional processes are usually employed when conventional methods are incapable, impractical or uneconomical because of special material properties, work piece complexities or lack of inherent rigidity. The purpose of this subject is to present a discussion of the more commonly used non-conventional processes and how they can be used as alternate manufacturing processes.

COURSE CONTENTS	Hrs	Mks
1. MECHANICAL PROCESSES Water-jet machining - Fundamental principles, equipment, advantages and application.	3	6
2. ABRASIVE JET MACHINING (AJM) Fundamental principles, machining unit, tool materials and tool size, USM process characteristics and application.	3	8
3. ULTRASONIC MACHINING Fundamental principles, machining unit, tool materials and tool size, USM process characteristics and applications.	6	10
4. ELECTROCHEMICAL PROCESS (Electrochemical machining). ECM principle, machining structure, electrolyte and electrolyte system, ECM process characteristics, ECM tooling, applications -- electrochemical turning and electrochemical drilling.	6	12
5. ELECTROCHEMICAL GRINDING (ECG) Principles, wheels and electrolyte for ECG, operating parameters and applications.	2	6
6. CHEMICAL PROCESSES [Chemical machining (CHM)]. Chemical Blanking-Process steps for chemical blanking, accuracy and application of chemical blanking. Chemical milling - Process steps for chemical milling, accuracy, surface finish and application.	4	8
7. THERMAL PROCESSES Electrical Discharge Machining -Principles of operation, machine set-up, dielectric fluid and Spark generator-Relaxation generator and pulse generator. EDM tools (electrodes)- Electrode wears, Electrode feed control, Flushing methods, EDM process characteristics and applications.	8	12
8. ELECTRICAL DISCHARGE WIRE CUTTING Operating parameters, equipment and applications.	2	6
9. ELECTRICAL DISCHARGE GRINDING Process parameters, equipment and applications.	2	4
10. LASER BEAM MACHINING Principles of operation, equipment, types of lasers, process characteristics, laser safety, advantages, limitations and applications.	4	8
11. ELECTRON BEAM MACHINING Principles of operation, equipment, process characteristics, applications, advantages and limitations.	3	8
12. PLASMA ARC MACHINING (PAM) Plasma, principle of operation, equipment, PAM parameters and applications.	3	8
13. EXPLOSIVE FORMING Principles of operation and application.	2	4
Total	48	100

TERM-WORK Record of class notes and reports of industrial visits.

REFERENCE BOOKS

1. Manufacturing High Technology Hand book. Edited by Donates Tijuhelis and Keith Mckee
2. Modern Machining Processes, P. C. Pande, H. S. Shan, Tata McGraw - Hill.
3. Production Technology, HMT, Tata McGraw-Hill.
4. Production Technology, R. K. Jain and S. C. Gupta, Khanna Publishers.