

DARBHANGA COLLEGE OF ENGINEERING

COURSE FILE OF NON CONVENTIONAL MANUFACTURING (02 1617)



Mr. Rajat Gupta

Assistant Professor

Department of Mechanical Engineering

College Name	Darbhanga College of Engineering		
Program Name	B.Tech Mechanical Engineering		
Course Name	Non Conventional Manufacturing		
Course Code	02 1617	Course Credit	4
Lecture/Tutorial Per Week	03/01		
Course Coordinator Name	Mr. Rajat Gupta		

1. Scope and Objectives of the Course

In this course students will probably start with basic understanding of non conventional manufacturing process. Several types of non-traditional machining processes have been developed to meet extra required machining conditions. The aim of the course is to develop a basic understanding for common non conventional manufacturing process.

On successful completion of the course, the student will be able to,

- i. Classify the various non-traditional machining processes.
- ii. Identify important process parameters associated with various non-traditional machining processes.
- iii. Explain the effect of process parameters on performance characteristics like material removal rate and surface finish etc.
- iv. To understand the applications of different processes.

2.Text Books

TB 1 : Manufacturing Technology ,Volume 2; P.N.Rao, Tata McGraw-Hill Private limited, 2009.

TB 2 : Production Technology; R.K.Jain, Khanna Publishers, 2009.

3. Reference books

RB 1: Advanced Machining Processes; V. K. Jain, Allied Publishers, 2009.

RB 2: Manufacturing Science; Amitabha Ghosh and Asok Kumar Mallik, East- West Private limited, 2007.

RB 3: Welding Principle and Practices; Edward R. Bohnart, McGraw-Hill Private limited, 2005.

RB 4: Non traditional Manufacturing Processes; Gary F. Benedict, Taylor & Francis, 1987.

3. Other readings and relevant websites :

S. No.	Link of websites
1	http://nptel.ac.in/courses/112105126/36
2	https://youtu.be/A0dTv_f_Q8BA

4. Course Plan

Lecture No.	Date of Lecture	Topics	Web links for video lectures	Text Books, Reference Books and other reading materials	Page numbers of the text books
1- 2		Introduction			
		Limitation of conventional manufacturing process, Need of unconventional manufacturing process and it's classification		TB1, TB2,RB1, RB2	TB1: 293-294 TB2: 342
		Assignment 1			
3- 14		Unconventional machining process			
		Principle and working and applications of unconventional machining process such as electro – discharge machining, electrochemical machining, ultrasonic machining, abrasive jet		TB1, RB1, RB2	TB1: 295-334 TB2: 343-370

		machining			
		Assignment 2 Tutorial 1, 2, 3 &4			
15- 26		Unconventional welding process			
		Principle and working and applications of unconventional welding processes such as laser beam welding, electron beam welding, ultrasonic welding, plasma arc welding.		TB2,RB3	TB2: 272-312
		Assignment 3 Tutorial 5,6 & 7			
27-30		Explosive welding			
		cladding etc. under water welding, metallising		TB2, RB3	TB2: 303-307
Tutorial 8, Assignment 4					
31- 42		Unconventional forming processes :			

		Principle, working and applications of high energy forming processes such as explosive forming, electromagnetic forming, electro-discharge forming, water hammer forming, explosive compaction etc		TB2, RB4	TB2: 367-380
Tutorial 9,10 & 11, Assignment 5					

5. Evaluation Scheme

Component 1	Mid semester examination	20
Component 2	class test	5
Component 3	TA	5
Component 4	End Semester Examination	70
Total		100

6. Syllabus

Topics	No. of lectures	Weightage
Introduction: Limitation of conventional manufacturing process, Need of unconventional manufacturing process and	2	6%

it's classification		
Unconventional machining process: Principle and working and applications of unconventional machining process such as electro – discharge machining, electrochemical machining, ultrasonic machining, abrasive jet machining	12	28%
Unconventional welding process: Principle and working and applications of unconventional welding processes such as laser beam welding, electron beam welding, ultrasonic welding, plasma arc welding.	12	28%
Explosive welding: Cladding etc. under water welding, metallising	4	10%
Unconventional forming processes: Principle, working and applications of high energy forming processes such as explosive forming, electromagnetic forming, electro-discharge forming, water hammer forming, explosive compaction etc	12	28%

7. This document is approved by

Designation	Name	Signature
Course Co-ordinator	Rajat Gupta	
HOD	Mr. Vishnu Singh	
Principal	Prof. Achintya	