GOPAL KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY

GOURAHARI VIHAR, PO: RANIPUT, JEYPORE – 764 005

LESSON PLAN

Name of the Subject: METAL CUTTING AND MACHINING(MCM)
Name of the Faculty: Er. AMAR GOUTAM BISWAL
Subject Code:MEPC3003
Course Structure:3-0-0
Semester: 5th Semester **Branch:Mechanical**
Semester From: July to November **No. of Weeks:** 15 Weeks

Week	Day	Theory / Practical Topics	Classes
1		**Unit 1 – Fundamentals of Metal Cutting**	**6**
	1	Introduction to metal cutting and machining	1
	2	Tool geometry: ASA and ORS systems	1
	3	Effect of tool geometry on cutting forces and surface finish	1
2	4	Mechanics of chip formation	1
	5	Merchant's theory	1
	6	Force and velocity relationships	1
		Unit 2 – Cutting Tool Materials and Tool Wear	**6**
3	7	Cutting tool materials	1
	8	Tool wear: flank and crater wear	1
	9	Tool wear measurement	1

Week	Day	Theory / Practical Topics	Classes
4	10	Temperature in metal cutting	1
	11	Cutting fluids and their effects	1
	12	Numerical/problem-solving (Module-I)	1
		Unit 3 – Tool Life, Machinability and Economics of Machining	**9**
5	13	Machinability criteria	1
	14	Tool life and Taylor’s equation	1
	15	Factors affecting tool life	1
6	16	Surface finish considerations	1
	17	Measurement of cutting forces	1
	18	Dynamometers: lathe and drill	1
7	19	Economics of machining: minimum cost	1
	20	Maximum production rate	1
	21	Maximum profit rate	1
8	22	Revision and numerical problems (Module-II)	1
	23	Tutorial session	1
	24	Doubt clearing	1
		Unit 4 – Conventional Machine Tools and Operations	**12**

Week	Day	Theory / Practical Topics	Classes
9	25	Turning process and lathe machine	1
	26	Drilling and drilling machines	1
	27	Shaping and planing	1
10	28	Milling process	1
	29	Grinding process	1
	30	Machine tool specifications	1
11	31	Tool holding methods	1
	32	Job holding devices	1
	33	Types of surfaces generated	1
12	34	Production machines: capstan and turret lathes	1
	35	Single and multi-spindle automatics	1
	36	CNC machine tools: basics	1
		Unit 5 – Non-Traditional Machining Processes	**12**
13	37	Introduction to non-traditional machining	1
	38	Ultrasonic machining	1
	39	Electrochemical machining	1
14	40	EDM and wire EDM	1
	41	Abrasive jet machining	1

Week	Day	Theory / Practical Topics	Classes
	42	Plasma arc machining	1
15	43	Laser beam machining	1
	44	Applications of non-traditional processes	1
	45	Revision of Module-V	1
16	46	Comprehensive revision	1
	47	Problem-solving session	1
	48	Doubt clearing and exam preparation	1

Books Recommended

1. Metal Cutting Principles by M.C. Shaw
2. Manufacturing Science by Ghosh and Mallik
3. Production Technology by P.C. Sharma
4. Modern Machining Processes by P.K. Mishra

NPTEL Lectures

1. https://nptel.ac.in/courses/112105126
2. https://nptel.ac.in/courses/112107144/