Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE III Year (Mechanical Engineering) (Part Time)			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
MEP6C1 **PRODUCTION ENGINEERING**	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
	2	**1**	**1**	**2**	**1**	**1**	**4**
Duration of Theory Paper: 3 Hours							

Learning Objectives:
The basic objectives of the subject are:

1. To understand fundamentals of Machining Processes.
2. To understand the applications of production processes for manufacturing industry.

Prerequisites: Material Science, Workshop Practice and Manufacturing Processes.

COURSE CONTENTS

UNIT-I
Theory of Metal Cutting: Introduction, mechanics of metal cutting, oblique and orthogonal cutting, shear angle, rake angle and strain relationships, force and power relationships, heat generation and temperature rise in metal cutting, Machinability: criteria for evaluating machinability, factors affecting machinability, tool life and tool wear, variables influencing tool life, economics of metal cutting
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UNIT-II
Theory of Metal Forming: Introduction, plastic deformation and yield criteria, temperature and friction in metal forming, overview of metal forming, processes mechanics of forming processes, rolling, forging, drawing, deep drawing, bending, extrusion, punching-blanking, defects in metal forming, advantages & limitations of hot & cold forming.

UNIT-III
Unconventional Machining Processes: Introduction, electric discharge machining (EDM), electrochemical machining (ECM), ultrasonic machining (USM), abrasive jet machining (AJM), laser beam machining (LBM), electron beam machining (EBM), plasma arc machining (PAM)

UNIT-IV
Surface Finish Measurement and Surface Treatment: Introduction, elements of surface roughness, evaluation and representation of surface roughness, effect of surface finish on functional properties, measurement of surface roughness, surface clearing surface treatment, diffusion and ion implantation, surface coating and deposition processes: surface plating ,conversion coating, physical vapour deposition, chemical vapour deposition, organic coating, porcelain enameling and other ceramic coatings.

UNIT-V
Processing of Particulate Metals, Ceramics-Composites and other Special Processing Technologies: Introduction, Basic processes, powder manufacture testing and blending, compacting, sintering, hot pressing, other techniques to produce high-density powder metallurgy products, properties of P/M products, advantages and limitation of powder metallurgy; processing of traditional ceramics, processing of new ceramics and cermets.
Shaping processes for Plastics and polymer matrix composites; processing of integrated circuits and micro fabrication technologies.

Learning Outcomes:

Upon Completing the Course, Student will be able to:

1. Develop the ability to apply the basic principles of production processes in manufacturing industries..
2. To understand the basic concepts of Metal Cutting.
3. Equipment used in non conventional machining processes.

BOOKS RECOMMENDED:

[1]. Sharma P. C., *Production Technology, Production Engineering*, S.Chand and Co, New Delhi, 1996.
[2]. Pandey & Singh *Production engineering and science* Standard, Publ. & Distribution
[3]. HMT *Production Technology*, Tata McGraw-Hill Publishing Company Ltd, 1993.
[4]. Amitabh Ghosh & Ashok Mullick *Manufacturing sciences* East west Pvt. Limited, New Delhi
[5]. Mikell P Groover *Fundamentals of modern manufacturing*, John Wiley & Sons, Inc, 2000

LIST OF PRACTICAL ASSIGNMENT

1. Measurement of various features of tool geometry of a given single point tool using tool makers microscope.
2. Measurement of various features of tool geometry of a drill bit and an end mill cutter using tool makers microscope.
3. Measurement of a component features using a profile projector.
4. Study of constructional features of the Lathe and to machine a job as per given dimensions on it.
6. Study of EDM machine.
7. Machining of a work part as per given drawing on EDM machine.
8. Machining of a work part as per given drawing on CNC lathe machine.