MANUFACTURING PROCESS TECHNOLOGY I

SWAYAM Prabha Course Code- M20

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COURSE OUTLINE	This is an introductory level course in Manufacturing Process Technology and is mostly meant for Undergraduate engineers. At the heart of any manufacturing system is a set of processes which change the size, shape and form of raw materials into the desirable thus giving an industrial nation the power of growing. This course is an introductory course for engineering professionals who would like to take up careers in manufacturing particularly at the process level and also for professionals who are already in manufacturing careers and would like to see the technological changes that the manufacturing processes have witnessed in the last about 5 decades.

COURSE DETAILS

S. No	Module ID/ Lecture ID	Lecture Title/Topic
1	M1L1	Introduction to Manufacturing Process Technology
2	M1L2	Structure of Matter (Bonding of Solids,Crystal Structures)
3	M1L3	Brief introduction of non-conventional machining processes
4	M1L4	Structure of matters (bonding of solids, crystal structures)
5	M1L5	Elastic and Plastic Deformation
6	M1L6	Crystal imperfaction and dislocation
7	M2L1	Plastic Deformation
8	M2L2	Material Properties , Stress Strain Diagram for differnt types of materials

9	**M2L3**	Friction and Wear, Solid solutions
10	**M2L4**	Equilibrium Phase Diagram
11	**M2L5**	Iron-carbon equilibrium phase diagram
12	**M2L6**	Control of material properties (Alloying and heat treatment), Mechanical properties and Recrystallization
13	**M3L1**	Introduction To Casting Process
14	**M3L2**	Pattern and Mold Design
15	**M3L3**	Mold Making Procedures
16	**M3L4**	Fundamentals of Melting and Furnaces & Pouring and Gating Design
17	**M3L5**	Vertical and Bottom Gating Systems Edit Lesson
18	**M3L6**	Numerical Estimation To Find Mold Filling Time and Mold Design
19	**M4L1**	Effects of friction and velocity distribution in time of filling
20	**M4L2**	Numerical design of gating systems using frictional and bending losses
21	**M4L3**	Principle of cooling and solidification in single and multiphase systems
22	**M4L4**	Estimation of rate of solidification
23	**M4L5**	Principles of cooling and solidification of casting
24	**M4L6**	Modeling of Solidification Rates of Thin Casting in a Metal Mold
25	**M5L1**	Solidification with Predominant Interface Resistance
26	**M5L2**	Solidification with Constant Casting Surface Temperature
27	**M5L3**	Solidification of Casting with Predominant Resistance in Mold and Solidified Metal
28	**M5L4**	Solidification Time for Permanent Mold Casting
29	**M5L5**	Solidification with Constant Casting Surface

30	**M5L6**	Riser Design and Placement
31	**M6L1**	Riser Design and Placement Part 2
32	**M6L2**	Riser Design and Placement Part 3
33	**M6L3**	Introduction of Machining Processes
34	**M6L4**	Review of Basic Machining Processes and the Mechanics of Chip Formation
35	**M6L5**	Estimation of Cutting Ratio and Shear Angle
36	**M6L6**	Merchant's Force Analysis
37	**M7L1**	Merchant Theory (Cutting Forces Analysis)
38	**M7L2**	Merchant Theory (Force analysis) Part-2
39	**M7L3**	Lee Shaffer's Solution
40	**M7L4**	Specific Energy Model for Cutting
41	**M7L5**	Modeling of Heat Generation and Cutting Tool Temperature
42	**M7L6**	Temperature in Cutting and Builtup Edge Formation
43	**M8L1**	Metal Cutting Operation
44	**M8L2**	Tool life and Tool wear
45	**M8L3**	Economics of Machining
46	**M8L4**	Joining Process
47	**M8L5**	Principle of Solid State Welding
48	**M8L6**	Numerical Design of Welding Power Sources in Arc Welding

References if Any: