

20FM010 PRODUCTION TECHNOLOGY FOR MACHINERY COMPONENTS

Hours Per Week :

L	T	P	C
4	-	-	4

Total Hours :

L	T	P	WA/RA	SSH/HSB	CS	SA	S	BS
-	-	-	-	-	-	-	-	-

Course Description & Objective:

To equip with awareness on the methodology related to production aided manufacturing and its technology.

Course outcomes:

1. Promote, implement and maintain procedures that support safety, health, the environment, quality and risk management.
2. Prepare for and set-up production machines in an automotive or related environment.
3. Troubleshoot machine functioning in an automotive components environment. Discuss the importance of changing and setting tooling for production machines

SKILLS:

Knowledge on various production processes

Manufacturing of simple machine components

UNIT I

Elasticity-forms - Stress and strain relationship in engineering materials - Deformation mechanism -Strengthening material - Strain hardening, alloying, polyphase mixture, martensitic precipitation, dispersion, fibre and texture strengthening - iron carbon diagram.

UNIT II

Powder metallurgy process, process variables, Manufacture of friction lining materials for clutches and brakes – plastics-raw material –automobile components – molding – injection, compression and blow – PU foam molding - Machining of plastics. Forging materials - process flow chart, forging of valves, connecting rod, crank shaft, cam shaft, propeller shaft, transmission gear blanks, steering column.

UNIT III

Extrusions: Basic process steps, extrusion of transmission shaft, housing spindle, steering worm blanks, piston pin and valve tappets. Hydro forming - Process, hydro forming of manifold and comparison with conventional methods- Hydro forming of tail lamp housing – forming of wheel disc and rims. Stretch forming - Process, stretch forming of auto body panels –Super plastic alloys for auto body panels.

UNIT IV

Sand casting of cylinder block and liners - Centrifugal casting of flywheel, piston rings, bearing bushes, and liners, permanent mould casting of piston, pressure die casting of carburetor other small auto parts. Machining of connecting rods - crank shafts - cam shafts - pistons - piston pins - piston rings - valves - front and rear axle housings - fly wheel - Honing of cylinder bores - Copy turning and profile grinding machines.

UNIT V

Powder injection molding - Production of aluminum MMC liners for engine blocks - Plasma spray coated engine blocks and valves - Recent developments in auto body panel forming – Squeeze Casting of pistons - aluminum composite brake rotors. Sinter diffusion bonded idler sprocket – gas injection molding of window channel – cast con process for auto parts.

Text books:

1. Kalpakjian, "Manufacturing Engineering and Technology", 4th ed., Pearson ducation, 2005.
2. P.C. Sarma, "Production Technology", 3rd ed., S. Chand, 2009.

Reference books:

3. M.P. Groover, "Automation, Production Systems and Computer Integrated Manufacturing", 3rd ed., PHI Publications, 2008.
4. Kodgire UD, "Material Science & Matellurgy", 12thed., Eve rest Publishing House.
5. William D. Callister, " Materials Science and Engineering an Introduction", Eighth edition - John Wiley & Sons, Inc. 2005.
2. P.C. Sarma, "Production Technology", 3rd ed., S. Chand, 2009.

ACTIVITIES:

o Manufacturing of connecting rods.

o Production of different types of nuts, bolts and studs