

PCPR 4201 Manufacturing Processes- I

Module-I

Types of Production and production processes, Product configuration and manufacturing requirements. Pattern making, allowances and core making.

Casting processes of ferrous and non-ferrous metals including die casting, investing casting, centrifugal casting, loan moulding, transfer moulding. Solidification Principles, design of moulds, risering, sprues and gating system, casting defects.

Module-II

Metal joining processes: Soldering, brazing, fusion and non-fusion welding processes, various modern welding processes like TIG, MIG, Submerged Arc welding, friction welding. Welding defects.

Fundamentals of hot and cold working processes- Forging, extrusion and rolling.

Module-III

1. Basic Joining Process Types of welding –gas welding –arc welding –shielded Metal arc welding, GTAW, GMAW, SAW, ESW-Résistance welding (sport, seam , projection , percussion , flash type) –Atomic hydrogen arc welding –thermit welding –shouldering , brazing and braze welding ,

2. Design of Weldments Welding symbol – position of welding –joint and groove design – weld stress –calculation – design of weld size-estimation of weld dilution, heat input and preheat and post heat temperature – computer application in weld design .

3. Special welding process Electron Beam and Laser beam welding –plasma arc welding – stud welding- friction welding- explosive welding- ultra sonic welding h-under water welding - roll bonding – diffusion bonding – cold welding –welding of plastic, dissimilar metal.

Text: 1. Khanna O.P., “A Welding Technology”, Khanna Publishers.

2. Manufacturing Technology: Foundry, Forming and Welding by P.N. Rao, TMH.

References

1. Principles of manufacturing Materials and processes, by James S. Campbell, TMH.
2. Welding Metallurgy by G.E. Linnert, AWS.
3. Production Engineering Sciences by P.C. Pandey and C.K. Singh, Standard Publishers Ltd.
4. Manufacturing Science by A. Ghosh and A.K. Mallick, Wiley Eastern.