

PCMF4301 MATERIALS DEFORMATION PROCESSES (3-1-0)

MODULE I (16 hours)

INTRODUCTION TO METAL FORMING: Classification of Forming Processes - Temperature in Metal working - Hot and Cold working - Introduction to the theory of Plastic Deformation.

THEORY AND PRACTICE OF BULK FORMING PROCESSES :Analysis of plastic deformation in Forging, Rolling, Extrusion and rod/wire drawing processes - Effect of friction, calculation of forces, work done - Process parameters, equipment used - Defects - applications - Recent advances in Forging, Rolling, Extrusion and drawing processes - Experimental techniques of evaluation of friction in metal forming.

MODULE II (14 hours)

SHEET METAL FORMING: Conventional processes - H.E.R.F. techniques - Super plastic forming techniques - Principles and process parameters - Advantages, limitations and applications.

SPECIAL FORMING PROCESSES: Orbital forging - Isothermal forging - Hot and cold Isostatic pressing - High speed extrusion - Rubber pad forming - Water hammer forming - Fine blanking.

MODULE III (10 hours)

POWDER METALLURGY FORMING: Overview of P/M technique - Advantages - applications - Powder perform forging - powder rolling - Tooling and process parameters.

TEXT BOOK

1. George E. Dieter, Mechanical Metallurgy, McGraw Hill International Book Company, 1988.

REFERENCES

1. Schuler - Metal forming hand book - Springer verlag publication, 1998.
2. Hosford, WF and CAD Dell, R.M. - Metal forming : Mechanics and Metallurgy, Prentice Hall, Englewood Cliffs, 1993.
3. Narayanasamy,R - Theory of Metal Forming Plasticity, Narosa Publishers, New Delhi Nagpal,G.R - Metal Forming Processes, Khanna Publishers, 1988.
4. Chakrabarthy,J - Theory of Plasticity, McGraw Hill Co, 1987.
5. Altan T - Metal Forming - Fundamentals and applications - American Society of Metals.