

LAB MANUAL

MATERIAL SCIENCE AND METALLURGICAL ENGINEERING DEPARTMENT

UIET; CSJMU KANPUR UNIVERSITY

POWDER PROCESSING OF MATERIALS; MSE-S-307

B.Tech III YEAR

B.Tech course in “Materials Science and Metallurgical Engineering” is an undergraduate Engineering Technology course. One of the courses in this Programme, there is a Lab of Principle of powder processing of materials in which ten experiments are designed to make a clear understanding of the properties, manufacturing of powder, their characterizations, and applications of powder metallurgy. The materials designers/engineers are concerned with tailoring various types of structure-property correlations for the application of P/M products in industries, households, institutions, corporate houses, and other places. Materials technologists may specialize in Manufacturing, characterization/testing and various secondary operations for working in industries engaged in the manufacture of tableware, fiber optics, bulbs, window panes, electronics ancillaries. Specialist in structural clay work in the manufacture of enameled articles and pipes, engine parts, tools artificial limbs, or cement used in construction or ceramic wares such as tiles, pottery, and bathroom, and kitchen fixtures.

Table 1: Total experiments in MSE-307 course

S.N.	Experiments	Titles
1	Experiment 1	To find the diameter of a given cylinder using Vernier Calipers
2	Experiment 2	To find the diameter of a given wire using Screw Guage
3	Experiment 3	To find the grain size of given microstructure by Image-J software
4	Experiment 4	To find the projected area of given object with precise error margin and discuss its significance
5	Experiment 5	To find the packing efficiency of given polygon by given filling 2-D or 3-D shapes and discuss its significance w.r.t. atomic packing fraction
6	Experiment 6	To find the particle size distribution of given powder material by using sieve analysis
7	Experiment 7	To estimate the size reduction and particle size distribution of the given coarse powder using Ball-Milling
8	Experiment 8	To find the geometrical green density of compacted powder using uniaxial hydraulic press and HSS die and punch
9	Experiment 9	To Study and draw the crystal models for simple cubic, body centered cubic, face centered cubic and hexagonal close packed structures by using Power Point Presentation
10	Experiment 10	Find the hardness of the various treated and untreated steels.

