



# POWDER METALLURGY

## **PROF. RANJIT BAURI**

Department of Metallurgical Engineering and Materials Sciences  
IIT Madras

**PRE-REQUISITES :** Basics of Materials Science & Engineering

**INTENDED AUDIENCE :** Any Interested Learners

**INDUSTRIES APPLICABLE TO :** Saint Gobain, Murugappa, Ashok Leyland, BHEL, Sandvik Asia Ltd,  
Avartana Metal Powders

### **COURSE OUTLINE :**

Powder Metallurgy is a very useful manufacturing process which is being practiced in variety of industries for decades. It is a versatile process that can produce a solid, a component or a product in net shape or near net shape starting from a loose mass of powder. This course will not only provide a broad overview of the P/M process but will also deal with the relevant concepts in detail. The objective is to learn about the process and understand it in a scientific and systematic manner.

### **ABOUT INSTRUCTOR :**

Prof. Ranjit Bauri is a Professor in the Dept. of Metallurgical and Materials Engineering, IIT Madras. He has more than a decade of experience in teaching and research. The broad areas of his expertise include Powder Metallurgy, Ceramics, Composite materials, Energy Materials, Aluminum alloys, Friction stir welding and processing, and Microscopy.

### **COURSE PLAN :**

**Week 1:** Introduction to Powder Metallurgy, Definition, Why Powder Metallurgy

**Week 2:** Powder Fabrication: Mechanical & Chemical fabrication

**Week 3:** Powder Fabrication: Electrolytic fabrication & Atomization

**Week 4:** Microstructure control, Powder Characterization

**Week 5:** Powder Characterization: Particle size measurement, BET surface area, Interparticle friction

**Week 6:** Powder packing, mixing and blending

**Week 7:** Shaping and Compaction

**Week 8:** Slurry techniques, Cold Isostatic Pressing (CIP)

**Week 9:** Sintering: Sintering theory, Solid state sintering

**Week 10:** Activated and Liquid phase Sintering

**Week 11:** Full density processing

**Week 12:** Hot Isostatic Pressing (HIP), Spark Plasma Sintering (SPS)