

Syllabus and Lecture Schedule: MM1504: Powder Metallurgy and Ceramics (3-1-0)

UNIT-I: (8 Lectures)

Powder Production (Chemical Methods, Electrolytic Methods, Atomization, Mechanical Methods)

UNIT-II: (5 Lectures)

Powder Characterization (Chemical Composition and Structure, Particle Size and Surface Topography, Pyrophorocity and Toxicity)

UNIT-III: (12 Lectures)

Powder Compaction, Phenomenological Aspects of Sintering, Solid State Sintering, Analytical Approach to Sintering, Non Isothermal Sintering, Microstructural Evolution

UNIT-IV: (12 Lectures)

Liquid Phase Sintering, Stages of Liquid Phase Sintering, Super solidus Sintering, Activated Sintering, Pressure Assisted Sintering, Microwave Sintering, Select Case Studies.

UNIT-V: (13 Lectures)

General overview of Ceramics: Structure and properties of ceramics, Types according to various applications; Various consolidation methods, casting of ceramics, conventional and advanced sintering processes for ceramics

Text Books:

1. Powder Metallurgy Science, 2nd ed R.M. German.
2. Powder Metallurgy: Science, Technology and Materials by A. Upadhyaya, G.S. Upadhyaya,
3. ASM Handbook, Volume 7: Powder Metal Technologies & Applications (1998)
4. Introduction to Ceramics by Kingery W.D, Bowen H. K., Uhlmann D.R