GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: VI

Metallurgical Engineering

Subject Name: **Powder Metallurgy**
Subject Code: **162103**

Teaching Scheme				Evaluation Scheme		
Theory	**Tutorial**	**Practical**	**Total**	**University Exam (Theory) (E)**	**Mid Sem Exam (Theory) (M)**	**Practical (I)**
3	1	2	6	70	30	50

Sr. No	Course Content	Total Hrs.
1	**Introduction** Historical and modern developments in P/M. Advantages limitations and applications of P/M	02
2	**Characteristics of metal powder** Particle size, shape and size distribution, Characteristics of powder mass such as apparent density, tap density, flow rate, friction conditions. Properties of green compacts and sintered compacts	06
3	**Important methods of powder production** Machining, milling, atomization, electrodeposition, reduction from oxide, carbonyl process, production of alloy powders, New development	12
4	**Powder Characterization** Powder conditioning, fundamentals of powder compaction, density distribution in green compacts, types of compaction presses, compaction tooling and role of lubricants, Single and double die compaction, isostatic pressing, hot pressing	10
5	**Powder Forming** Powder rolling, powder forging, powder extrusion and explosive forming technique	04
6	**Sintering** Definition, stages, effect of variables, sintering atmospheres and furnaces, Mechanism, liquid-phase sintering, infiltration process	10
7	**Sintered Products** Study of sintered bearings, cutting tools, and metallic filters, Study of friction and antifriction parts and electrical contact materials	10

Text Book:

1. Introduction to Powder Metallurgy :- A.K.Sinha

Reference Books:

1. Powder Metallurgy :- W.D.Jones
2. Principles of Powder Metallurgy :- T.Shukerman
3. Handbook of Powder Metallurgy :- H.H.Hausner
4. Powder Metallurgy, ASM Handbook, Vol-VII.
5. Powder Metallurgy Technology, Gopal S. Upadhyaya- Cambridge International SciencePublishing, Cambridge