

Syllabus for the PhD Entrance Exam (2021 Autumn)

MME Department

Core Syllabus (30 Questions)

1. An introduction to Metallurgy, Classification of Engineering Materials based on Engineering properties.
2. A general discussion on other engineering materials plastics, rubber, polymers, ceramics, refractories, glasses, composites.
3. A brief discussion on important ferrous and non-ferrous materials, Introduction of Nano-technology; its importance and applications,
4. Bonding in solids, crystal structure & imperfections.
5. Yield strength, tensile strength and rupture strength. Ductility and malleability, toughness and hardness of material.
6. General introduction to phase rule and phase diagrams (Binary systems). Heat treatment (annealing, normalizing, quenching, tempering and precipitation hardening).
7. An overview of iron-carbon equilibrium diagram. Brief discussion on plastic deformation & Strain Hardening.

Allied Syllabus (15 Questions)

1. Manufacturing processes-surfaces, tribology, metal casting, fluid flow and heat transfer, bulk deformation processes, sheet metal forming processes.
2. Introduction to metal powders, ceramics and glasses.

General Aptitude (15 Questions)

1. Verbal aptitude- basic English grammar, tenses, articles, adjectives.
2. Quantitative aptitude- Data interpretation, data graphs, numerical computation and estimation, permutation and combination
3. Analytical aptitude- Deduction and analogy, numerical reasoning