Important Announcement

IIM
Metallurgy
Materials Engineering

To All members appearing at Part II AMIIM Examinations

Dear Members,

This is to inform you that on recommendation of IIM Examinations & Education Committee your Council has approved Inclusion of **Materials Processing** as compulsory paper in Part II AMIIM Exam Syllabus by combining three existing papers like Foundry Metallurgy, Welding Metallurgy and Powder Metallurgy which will be effective from June 2016.

Syllabus of MATERIALS PROCESSEING (208)

(Effective from June 2016 AMIIM Examinations)

Introduction to metal casting processes, moulding methods, material and processes with special references to patterns, sands and binders. Solidification of short & long freezing range alloy castings, segregation during casting: its effect and remedial measures; gating and feeding/ risering of castings. Melting practices for ferrous and non-ferrous alloys- melting in cupola, rotary furnace, induction furnace and crucible furnace; Choice of refractory for melting furnace. Melt treatment – degassing, grain refining, filtration etc. Introduction to cast alloys – classification, microstructure and properties of cast irons, plain carbon and Hadfield Manganese steels, Aluminum based and Mg based alloys. Heat treatment of cast alloys. Casting defects and remedies,comparison of casting methods. Special casting processes, such as, Squeeze casting, Thixo-casting etc.

Introduction to metal joining processes: Principles to Soldering, Brazing and Welding. Types of fusion welding processes, gas welding, solid state welding, special welding processes, such as friction stir welding, electron beam welding and ultrasonic welding. Metallurgical principles involved in welding of carbon, alloy steels and important nonferrous alloys such as aluminum and magnesium based alloys. Welding defects and their remedies: micro-structural features of Heat Affected Zone (HAZ) and their effect on mechanical properties.

Production of metal powders, recent developments in powder production, mechanical alloying. Development of nanostructures and composite materials via powder processing route. Characteristics of powders. Compaction in rigid dies, hot and cold isostatic compaction. Mechanisms involved in sintering of metal powders; application of powder metallurgy products.

Text Books:

1. R. W. Heine. , C. R. Loper, and P. C. Rosenthal: Principles of Metal Casting, 2nd Ede. , Tata-Mc-Graw Hill, 1983.
2. S. C. Panigrahi and B. K. Dhindaw: Testing Measurement and Evaluation in Metal Casting, Oxford and IBH, 1986.
3. O. P. Khanna: A Textbook of Welding Technology, Dhanpat Rai Publication (P) Ltd. , New Delhi ,2004
4. R. L. Little: Welding and Welding Technology, Tata Mc-Graw Hill, New Delhi, 1976
5. A. Upadhaya, G.S. Upadhaya, Powder Metallurgy- *Science, Technology and Materials*, University Press-IIM series,2011
6. R .M. German: Powder Metallurgy Science, 2nd Edition, MPIF, 1994.

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