



# PRINCIPLES OF CASTING TECHNOLOGY

## **PROF. PRADEEP KUMAR JHA**

Department of Mechanical & Industrial Engineering  
IIT Roorkee

**INTENDED AUDIENCE :** Any Interested Learners

**INDUSTRIES APPLICABLE TO :** Casting Industries like BHEL, Tata Steel, Jindal Steel, Foundry units of medium and large sizes

### **COURSE OUTLINE :**

The course focuses on understanding the basics of science and technology of casting processes. Metal casting industries have evolved during the past hundred years because of advancements in technologies. The properties of the cast metals significantly depends upon the type of molding, melting, solidification and post treatment practices. This needs to be understood by the young students as well as practicing shop floor engineers so that products with superior qualities can be cast. The basic purpose of this course is to provide a sound understanding of concepts and principles of casting technology so as to enable them to be conversant with advances in these methods in the long run towards increasing the productivity of casting industries.

### **ABOUT INSTRUCTOR :**

Prof. Pradeep Kumar Jha is presently working as Associate Professor in the Department of Mechanical & Industrial Engineering at IIT Roorkee. He has been teaching the courses related to manufacturing technology and theory of production processes to undergraduate and postgraduate students for more than 12 years. He is actively involved in research work related to production processes, tundish steelmaking process, mold solidification in continuous casting etc.

### **COURSE PLAN :**

**Week 1:** Introduction to Casting technology, Solidification analysis for metals and alloys

**Week 2:** Technology of patternmaking, study of molding sands and their testing methods

**Week 3:** Technology of mouldmaking and coremaking, Special sand moulding processes

**Week 4:** Principles of gating design for castings

**Week 5:** Principles of risering design for castings

**Week 6:** Special casting methods, Melting furnaces

**Week 7:** Melting and pouring practices for production of Cast Iron family, steel and non-ferrous metals and alloys

**Week 8:** Fettling and Heat treatment of castings, Casting defect and its diagnostic methods