MME 405: Foundry Technology I

Introduction. Present status and scope of foundry in Nigeria. History and development of metal casting. Solidification metal flow principles; Alloying elements effect. Properties of fine and coarse grained steels. Pattern making: Differences between pattern and casting. Tolerance calculation in pattern making: method and economics. Patten types. Methods of pattern forming. Moulding and core making: properties of good molding sand. Types of moulding sands, moulding processes. CO_2 processes. Typical moulding problems and remedies. Moulding tools.

Introduction to castings processes: gravity die cast casting, squeeze casting, investment casting, sand casting, expanded polystyrene iron, steel and non-ferrous castings. Centrifugal casting, shell moulding, densification of metals. Introduction to metallurgy. Hardening of metals. Deformation and annealing of metals. Corrosion and oxidation phenomena. Alloy steels. Stainless, creep and heat resisting steels. Cast irons. Metallurgical aspect of metal joining electrical and magnetic alloys. Copper and its alloys. Alluminium and its alloys. Magnesium and light alloys. Titanium and its alloys. Refractory metals.