Unit Wise Real Time Applications/Live Examples

Department: Mechanical Engineering **Semester: I** **Academic Year:** 2021–2022

Class: SE **Div.:**

Course: Manufacturing Process

Unit No. -Name	Real life Applications
1- **Casting Processes**	Sand casting is able to make parts of almost any alloy, but it's especially used to cast materials with high melting temperatures, including steel, nickel, and titanium. The most common materials made by this process are: ▪ Aluminium alloys ▪ Brass alloys ▪ Cast iron ▪ Cast steel One of advantages of sand castings is that have a wide range of production dimensions, it can range in size from very small to extremely large. Some examples of items manufactured in modern industry by sand casting process are cylinder heads, valves, engine blocks, pump housings, machine tool bases, pulleys, engine manifolds, bearings, gears, bushings, brush holders, brackets, lever arms, electrical contact parts, hardware, machinery parts, nuts, landing gear parts, flanges, clamps, fittings, pumps, pipe plugs, tructural parts, just to name a few.

Unit No. -Name	Real life Applications
	
2- **Metal Forming Processes**	• **Rolling Process** • Rods, seamless hollow tubes are made by rolling. • Rolling is used to producing cross-section of large sections. • Rolling is used to cutting the gears on the gear blank. • The threaded parts, bolts, screws, etc. which have mass production is made by the rolling process. • In automotive industries, various parts are manufactured by the rolling process. • The rolling process is used to made plates, steel sheets, etc. • Bearing, Turbines rings are rolling products. • AUTOMOTIVE & TRUCK • **Forging process** The characteristics of forged parts strength, reliability and economy are what makes them ideal for vital automotive and truck applications. Forged components are commonly found at points of shock and stress such as wheel spindles, kingpins, axle beams and shafts, torsion bars, ball studs, idler arms, pitman arms and steering arms. Another common application is in the powertrain, where connecting rods, transmission shafts and gears, differential gears, drive shafts, clutch hubs and universal joints are often forged. Although typically forged from carbon or alloy steel, other materials such as aluminium and micro alloyed steels are seeing great advances in forged auto and truck applications. AGRICULTURAL MACHINERY & EQUIPMENT

Unit No. -Name	Real life Applications
	Strength, toughness and economy are also important in farm implements. In addition to engine and transmission components, key forgings subjected to impact and fatigue range from gears, shafts, levers and spindles to tie-rod ends, spike harrow teeth and cultivator shafts. VALVES, FITTINGS, OIL FIELD APPLICATIONS Because of their superior mechanical properties and freedom from porosity, forgings are often associated with the high pressure applications of the valve and fitting industry. Corrosion and heat-resistant materials are used for flanges, valve bodies and stems, tees, elbow reducers, saddles and other fittings. Oil field applications include rock cutter bits, drilling hardware, and high-pressure valves and fittings. HAND TOOLS & HARDWARE Forged has traditionally been the mark of quality in hand tools and hardware. Pliers, hammers, sledges, wrenches and garden tools, as well as wire-rope clips, sockets, hooks, turnbuckles and eye bolts are common examples. Surgical and dental instruments are also often forged. Special hardware for electrical transmission and distribution lines such as pedestal caps, suspension clamps, sockets and brackets are commonly forged for strength, dependability and resistance to corrosion. A few products of the rolling process  Fig. 2a

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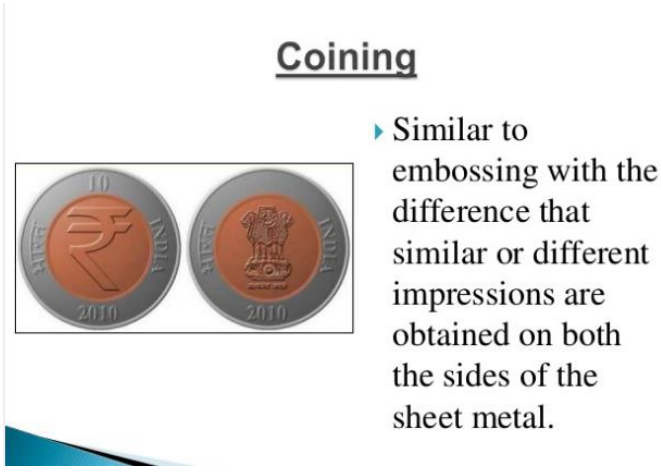
3- **Sheet Metal Forming**	• BIW  
4- **Welding Processes**	Welding processes are commonly used across a range of industries including aerospace, automotive, energy and construction amongst others. Used to join metals, thermoplastics or wood for a variety of applications, it is also used to create artwork by a growing community of artists.

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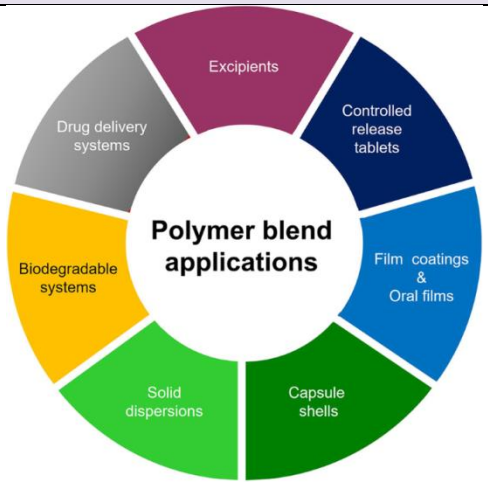
5- **Processing of polymers**	
6- **Manufacturing of Composites**	Composite materials are generally used for buildings, bridges, and structures such as boat hulls, swimming pool panels, racing car bodies, shower stalls, bathtubs, storage tanks, imitation granite and cultured marble sinks and countertops. They are also being increasingly used in general automotive applications.

Course faculty