3D printing technology, also known as additive manufacturing, revolutionizes traditional manufacturing processes by creating objects layer by layer from digital designs. This transformative technology offers advantages such as rapid prototyping, cost-effectiveness for small-batch production, and the ability to create intricate designs that were previously impossible with conventional manufacturing methods. From plastics and metals to ceramics and biomaterials, the materials used in 3D printing continue to expand, enabling diverse applications across industries such as aerospace, automotive, healthcare, and consumer goods. As 3D printing advances, it promises to further innovate product development, supply chains, and customization capabilities, shaping the future of manufacturing. It encompasses a wide range of techniques and materials, allowing for the production of complex geometries and customizable .products