Advanced Manufacturing Lab

Overview:

The **Advanced Manufacturing Lab** is an essential part of Siemens Center of Excellence (COE) Patan. It is designed to train students and professionals in **CNC programming, virtual machining, and manufacturing process automation**.

By integrating **Siemens NX software**, this lab provides hands-on experience in **digital manufacturing**, enabling learners to **simulate and optimize machining processes** before actual production.

Key Features:

1. **CNC Programming & Virtual Machining**
   - Training on **Siemens SINUMERIK-controlled CNC machines**.
   - Hands-on experience in **G-code programming** and tool path optimization.
2. **Digital Manufacturing with Siemens NX**
   - Virtual simulations for **milling, turning, and multi-axis machining**.
   - **Collision detection and toolpath optimization** before physical machining.
3. **Manufacturing Process Automation**
   - Integration with **robotics and PLC-based automation**.
   - Smart manufacturing techniques aligned with **Industry 4.0** principles.
4. **Additive Manufacturing & Rapid Prototyping**
   - Exposure to **3D printing technologies** for complex part development.
5. **Hands-on Training & Industry Certification**
   - **Siemens-certified courses** on digital manufacturing and automation.
   - Real-world projects in **automotive, aerospace, and industrial applications**.

Expected Outcomes:

1. **Industry-Ready Professionals** – Graduates with skills in **CNC machining, digital simulation, and automation**.
2. **Optimized Manufacturing Processes** – Reduced errors, enhanced **efficiency, and cost savings**.
3. **Innovation & Research Support** – Facilities for **startups and researchers** to develop new technologies.

4. **Bridging the Skill Gap** – Aligning **academic training** with **industrial requirements**.

This lab plays a crucial role in **transforming traditional manufacturing into a smart, efficient, and digital-driven process**, helping students and industries **stay ahead in the competitive market**.