PROJECT ANNOUNCEMENT
Fall 2025

Title: EDUCATIONAL ROBOTIC ARM WITH SERVO MOTORS

Ref Code: CPC_ERAS_F25

Type: Group

Status: New

Availability: 2

Project Description:
A small-scale robotic arm with **servo motor actuators** will be designed and built to demonstrate the **basic concepts of robotic arms** such as kinematics, actuation, and instrumentation. The arm will be equipped with **easily detachable end-effectors** (gripper or tool heads) so that it can perform different tasks such as gripping, writing, or drawing simple paths. A control interface (microcontroller + PC GUI or direct microcontroller commands) will allow students to command joint positions and visualize motion.
The project's main aim is to **develop a reusable testbed** for the department that can be used in instrumentation, robotics, and control courses, serving as a hands-on learning platform for future students.

Work Description:

- Design of robotic arm structure (3D printed or laser-cut)
- Selection and integration of servo motors for actuation
- Design of modular, detachable end-effectors
- Microcontroller programming for servo control
- Development of a simple PC interface for motion commands and visualization
- Testing and demonstration with different tasks (pick-and-place, drawing path, etc.)

Required Qualifications and Skills:

- Basic knowledge of electronics and Arduino/microcontroller programming
- Ability to design and assemble mechanical structures (3D printing or machining)
- Interest in robotics and mechatronics systems
- Willingness to document and calibrate the system for long-term reuse

Related UN Sustainable Development Goals:

- **Goal 4: Quality Education** (provides reusable teaching infrastructure)
- **Goal 9: Industry, Innovation and Infrastructure** (encourages applied engineering design and prototyping)

Difficulty:	high ( )	medium (X)	low ( )
Time commitment:	high (X)	medium ( )	low ( )

Estimated expense: 2000 TL