



University of Alexandria

Faculty of Engineering

Division of Communications & Electronics

Subject Name: Introduction to Robotics

Lecturer: Dr. Nayera Sadek

Spring 2024

Manipulators

Instructions to Students

- Students are working in groups (at most 10).
- The two projects should be distributed equally.
- The requirement is to build a manipulator: RP or PR.

The Procedures for submission:

1. Writing a report

The report should have the following main sections:

- Manipulator Type Title
- Names and ID of the team members.
- Applications of this type
- List of the used electrical and mechanical components
- Schematic of the manipulator.
- Forward and inverse Kinematics using any simulation tool.
- Budget of the project.
- Challenges that the team had and how to overcome them.
- References.

The report can include extra section(s) useful to support the project from the team's point of view. It should be submitted in PDF format. The file name is "group number_manipulator type"

2. Making and uploading Video

Every team records about 10-min videos to present the main parts of the electrical parts and the mechanical parts and the demonstration.

The video should be uploaded to youtube, google drive or any other drive so it can be accessed without permission.

3. Report and Video Link Submission:

A form will be announced to upload the report and the link of the video.

4. Project Discussion:

The project will be discussed as a team. On the discussion day, every team should bring:

- The manipulator ready to be demonstrated.
- Hardcopy of the report submitted .

The following are useful links to get more information about the manipulators:

- 1- <https://www.servomagazine.com/magazine/article/build-your-own-computer-controlled-three-axis-robotic-arm>
- 2- https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1665-64232019000200092
- 3- “Geometric design of RRP, RPR and PRR serial chains”
<https://www.sciencedirect.com/science/article/abs/pii/S0094114X05000212?via%3Diuhub>