



# University of Alexandria

## Faculty of Engineering

*Division of Communications & Electronics*

**Subject Name:** Introduction to Robotics

**Lecturer:** Dr. Nayera Sadek

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## Manipulators

### Instructions to Students

- Students are working in groups (at most 10).
- All the three projects should be distributed equally.
- The projects will be reserved as First-Reserve-First-Get
- The requirement is to build a manipulator: RRP, PRR or RPR.

### 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 two 10-min videos.

The first video shows the main parts of the electrical parts.

The second video shows the mechanical parts and the demonstration.

The videos 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 links of the videos.

#### 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](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%3Dihub>
- 4-