MCT 331 Design of Mechatronics 1
Fall 2022
Project Description

Project Objectives

The project should show students understanding to the steps of the designing a mechatronic system on both a micro and macro cycle level as well as incorporating the product design parameters such as materials utilization, Human machine interface and modular approach of components. The stations integration and safety aspects will be evaluated as well as the successful testing of the product according to the requirements of each station

Project details

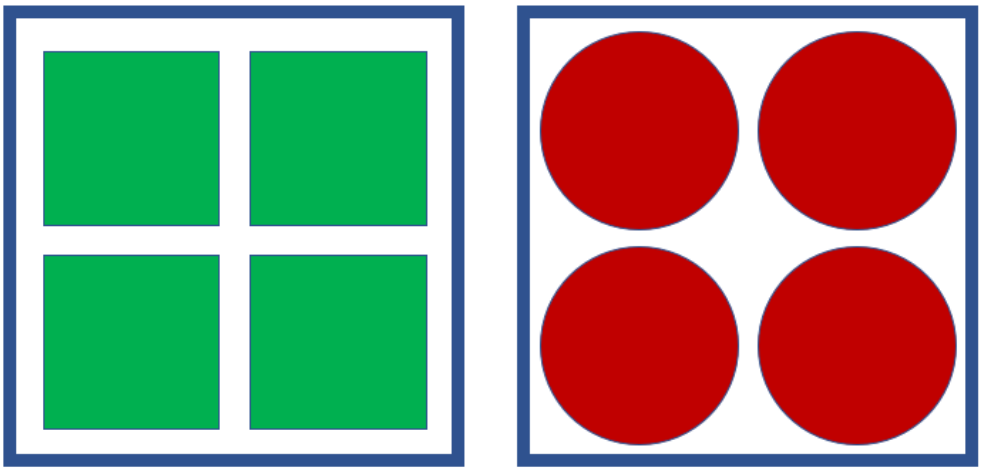
Every team need to design a production line to be designed according to the Design of Mechatronics Systems standard VDI 2206. The main purpose of the production line is to handle cuboid or cylindrical shaped products and sort them based on shape or material then each sorted product category is packed into its package. The production line stages will be assigned to a group of three students.

Project Requirements

I. Cuboid products dimensions are 4 cm x 4 cm x 3 cm with deviation of +/- 10% and is made of any plastic material. Cylindrical products dimensions are 5 cm diameter and 4 cm height with deviation of +/- 10% and is made of any material.

II. The products should be stored at the beginning of the operation in either vertical or horizontal magazines, the products shouldn't be sorted in the magazines. Then should be fed and transported to the sorting place, then after sorting stored in either category A package or category B package.

III. For the sorted products, the production line shall store them in a square shaped container such that 4 of them fit in one container as shown the figure below



IV. The production line must have one or multiple **control boxes** that contains all electronic/electrical components {Micro-controllers, valves, Motor drivers…}, in addition the production line should provide a **User Interface** {e.g. LCD screen} that displays any statistics to the user.

V. Implementation should also include **Ethernet communication** between the micro-controllers to accomplish any integration task. In addition software development for each micro-controller doing several tasks should include usage of a **Real-time Operating system** to handle tasks scheduling.

VI. The final implementation constrain is that the project must include a 3-Degree of freedom robotic arm {**can be a cartesian robot**} that can do several tasks or at least one task.