Implementation Phase

Implementation will be done in 2 phases

- **Virtual Implementation** (Scope of this presentation)
- Physical Implementation

Virtual Implementation

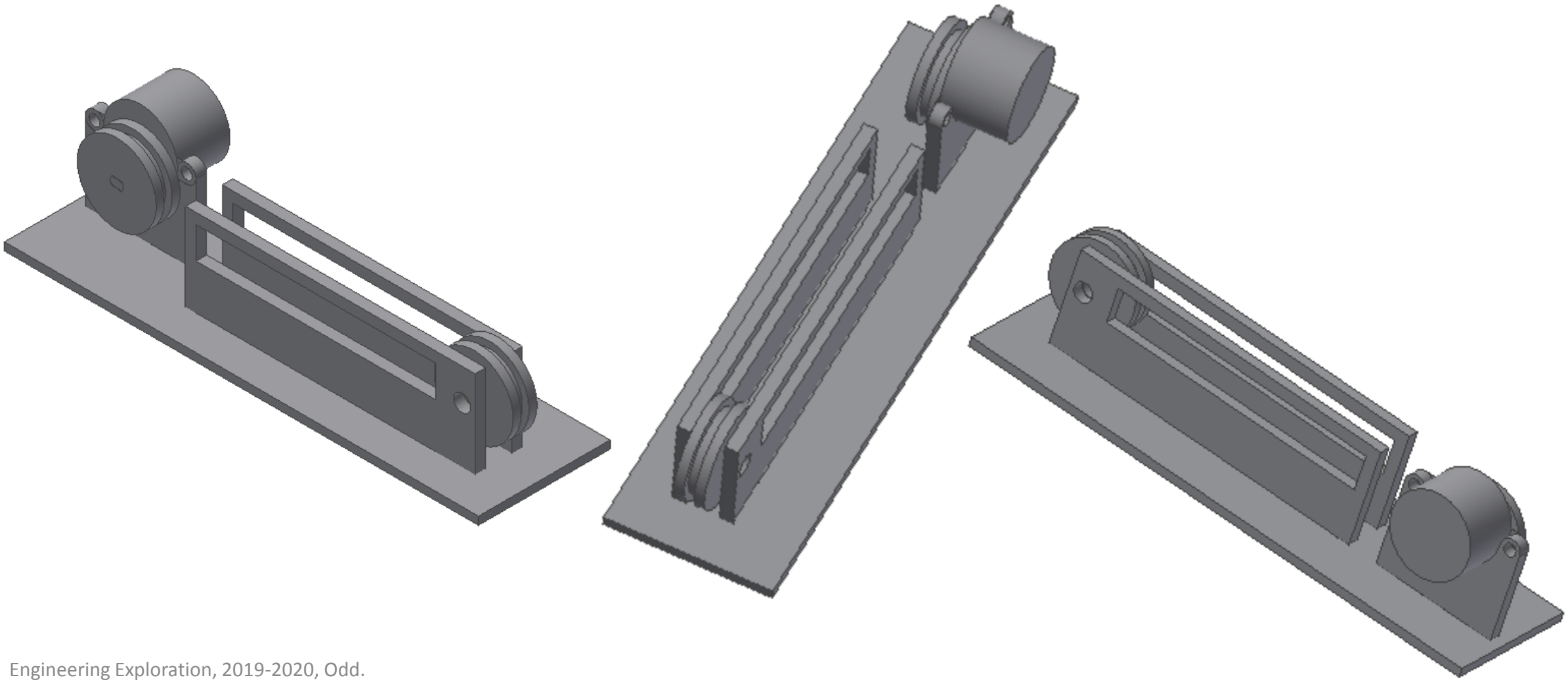
- Please note that this phase is an Individual Task
- Each student will work on subsystem assigned to him/her and produce the following artefacts
    1. 3D modelling of the sub-System
    2. Flow chart
    3. Circuit Diagram
    4. Bill of materials

❖Note that before starting this task, planning and discussion is necessary with guide and team members.

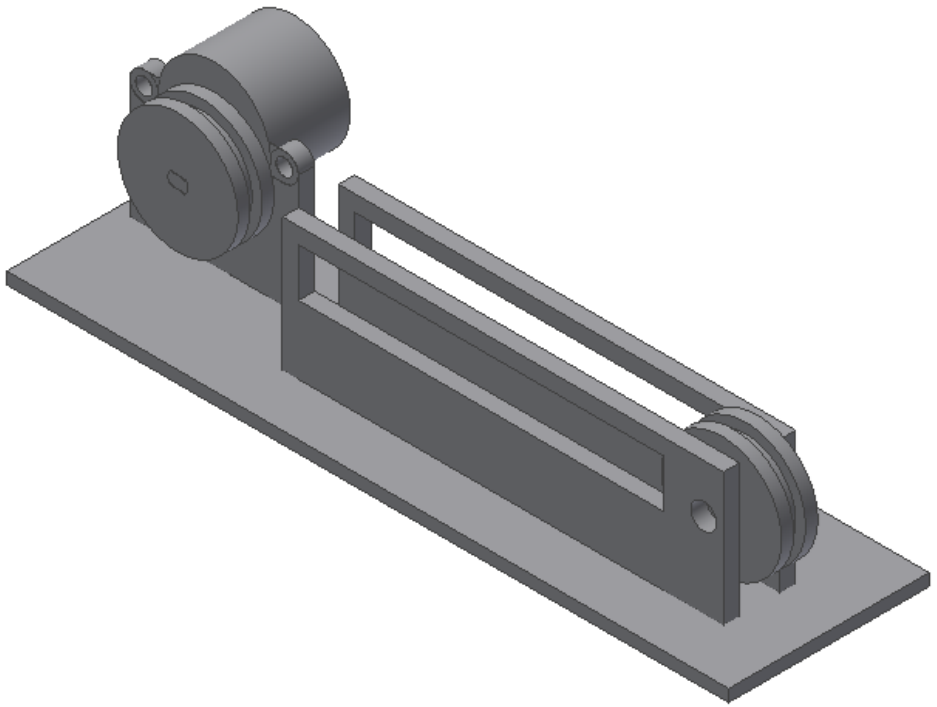
❖Sub system has to be built by keeping integration aspect in mind- Failing to do so will result in failure of the system and loss of marks

❖Deadline— 12/10/2019

3D model of the Sub System

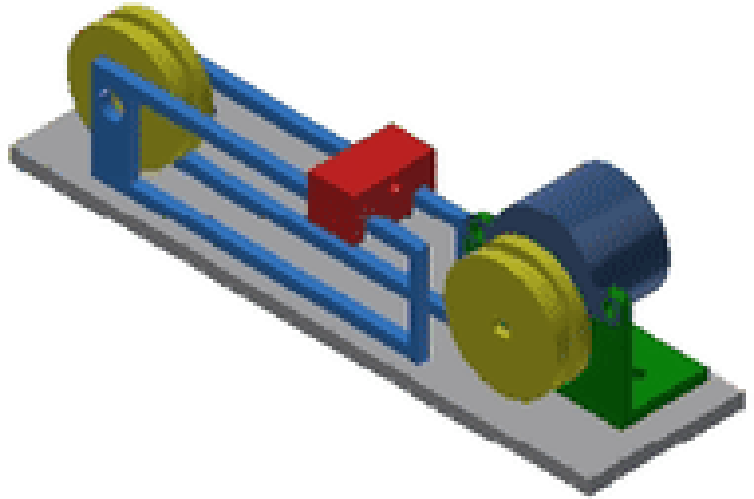


3D model of the Sub System



3D model for each sub system is expected. This will give you a fare idea about how your prototype may look like. While modelling also have brief idea about with what material you are going to fabricate each part.

Note that Model shall be an Assembly of various part models and not a single part model.



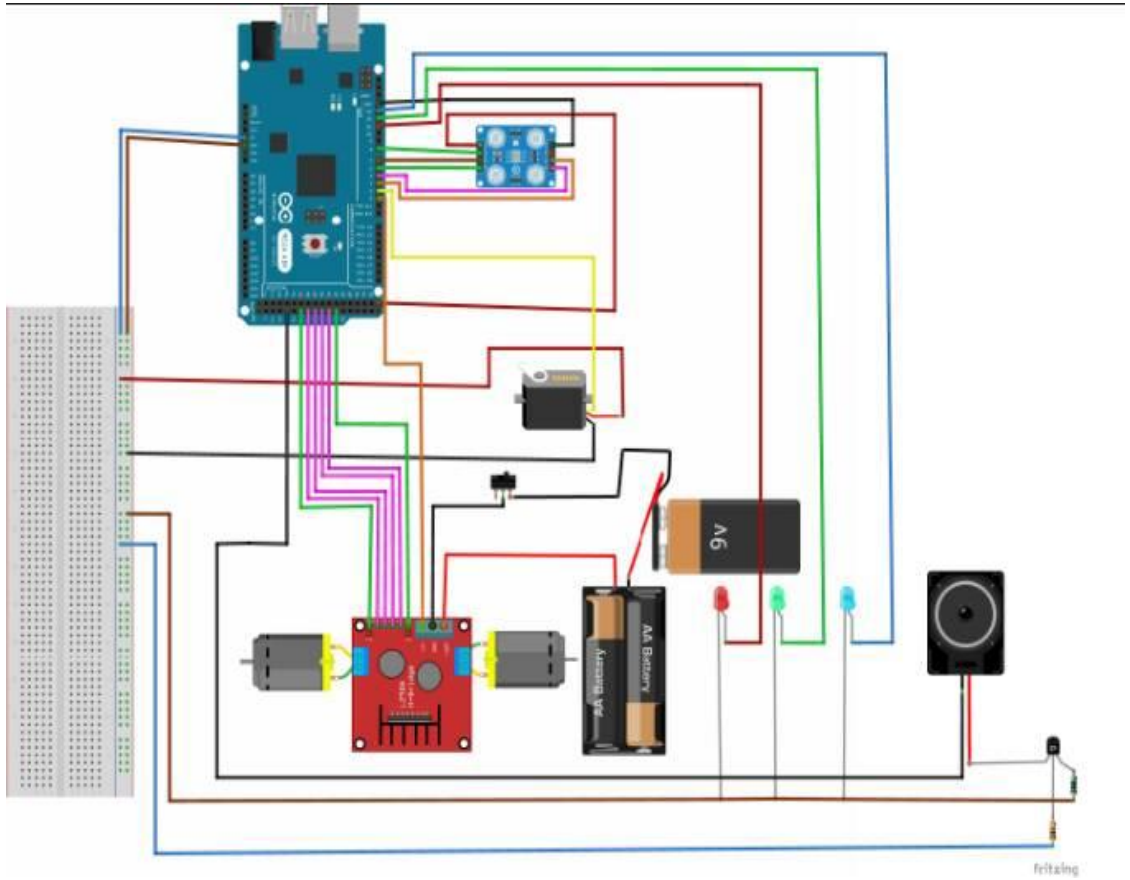
Bill of Materials (BOM)

Bill of Materials is list of all components needed for your design. Aside is an example table of Bill of Materials. Similarly create Bill of Materials of Sub System Identified. Try including each and every component, no matter how small they are. Include even the number of washers, nuts and screws.

Sl. No	Part Name	Material with which the part is made up of	Description about part	Quantity required	Fabrication Process if needed
1	Reservoir	Acrylic sheet	Tough, high strength (20X20X30)cm	1	Cutting and Bending
2	Container	Acrylic sheet	(10X10X10)cm	4	Cutting and Bending
3	Blades	Plastic rod	15 cm long, 2 cm wide, 1 cm thick	3	Cutting
4	Housing of micro controller	Acrylic sheet	(10X10X10)cm	1	Laser Cutting
5	Conveyor belt	Rubber sheet	30 cm long and 5 cm width with high strength and rough surface	1	Stitching
6	Rubber bands	--	Small	50	--
7	DC geared Motor	--	12 V, 10 rpm	2	--
8	Micro Servo motor	--	5 gm-cm, 360°	1	--
9	Micro controller	Arduino mega	AT2560	1	--
10	Motor driver	--	L298N	1	--
11	RGB Sensor	--	Forward voltage(RGB)(2.0,	1	--

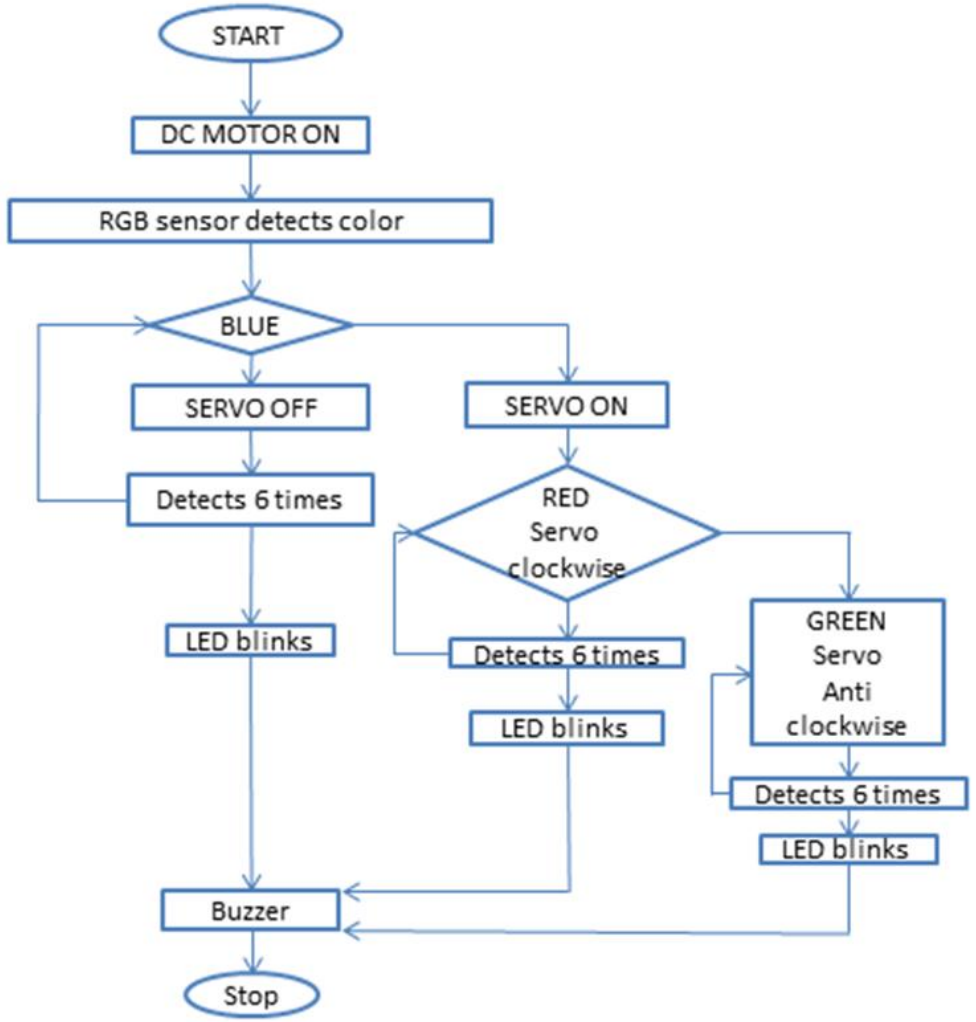
Electronic Circuit Diagram

Draw a **general electric circuit diagram** indicating how will be the various connections of motors, sensors, Arduino and any other devices. You can refer to www.tinkercad.com/circuits for putting the circuit diagram online. Or there are many open source software which can be downloaded on to your system and circuit diagram can be created. Some of the software also give you the flexibility of simulation. One such example is **Fritzing**. Aside is an example of the circuit diagram created in Fritzing. No hand drawn electronic or electric circuits are entertained.



Flow Chart

Since you will be doing your project on **Arduino, the program flow chart** is to be drawn before you start with writing the program in Arduino IDE. Flow chart gives you a better idea about how your project executes the different functions. Aside is an example for flow chart. It is very convenient to use MS PowerPoint for creating Flow charts. You can even refer to www.draw.io for creating flowcharts online and download them as image files. No hand drawn Flow charts are entertained. You should compulsorily follow the conventions used for putting flow charts learnt in programming lab.



Virtual Integration

- After all the sub systems are made ready virtually, integration of all into one single system will be achieved.

Virtual Integration Deliverables

- Following tasks to be submitted which will ensure Integration
- Please note that integration is a Team work

  - Assembly of the 3D modelling of entire system.
  - Circuit diagram of the entire system
  - Flow chart of the entire system
  - Bill of materials required for the entire system

- Deadline- 18/10/2019

Rubrics for Virtual Implementation phase in course project

$$Virtual\ Implementation = Planning + Integration$$

Assessment Criteria	Excellent	Average	Needs instructor intervention
3D modeling (4 marks)	All parts in the sub system created in 3D model (if needed) are feasible for fabrication for the sub-system identified. Student is able to identify the suitable process and materials needed for fabrication of each part. (4 marks)	All parts in the sub system created in 3D model (if needed) are feasible for fabrication for the sub-system identified, Student is able to identify the suitable process and materials needed for fabrication of each part. (3-2 marks)	All parts in the sub system created in 3D model (if needed) are not feasible for fabrication for the sub-system identified. Student is not able to identify the suitable process and materials needed for fabrication of each part. (1-0 marks)
Flowchart (2 marks)	Flowchart (if needed) is complete with all conditions, start and end points and inputs and outputs according to the sub-system need. Flowchart is created with standard notations. (2 marks)	Flowchart (if needed) is partially complete with all conditions, start and end points and inputs and outputs according to the sub-system need. Flowchart is created with standard notations. (1 marks)	Flowchart (if needed) is not complete with all conditions, start and end points and inputs and outputs according to the sub-system needed. Flowchart is created with standard notations partially. (0 marks)
Circuit Diagram (2 marks)	Circuit diagram (if needed) created is according to the sub-system need.(2 marks)	Circuit diagram (If needed) created is according to the sub-system need. (1 marks)	Circuit diagram (if needed) created is not according to the sub-system needed. (0 marks)
Integration (2 marks)	Student or student team is able to show all possible Material, Spatial and Data interactions with other sub systems. (2 marks)	Student or student team has missed few of the Material, Spatial or Data interactions with other sub systems. (1 marks)	Student or student team is not able to show identified integration aspects with other sub systems. (0 marks)

Rubrics for Project management in course project

On Time Submission	Excellent	Average	Needs instructor intervention
Virtual Implementation (2 marks)	Student team is able to complete planning and virtual integration on planned date with the tolerance of 2 days (2 marks)	Student team is able to complete planning and virtual integration on planned date with the tolerance of 4 days (1 marks)	Student team is able to complete planning and virtual integration beyond 4 days of planned date. (0 marks)
Physical Implementation (2 marks)	Student team is able to demonstrate the Sprint on planned date with the tolerance of 2 days (2 marks)	Student team is able to demonstrate the Sprint on planned date with the tolerance of 4 to 7 days (1 marks)	Student team is able to demonstrate the Sprint on or beyond 7 days of planned date. (0 marks)
Performance Test (1 marks)	Team is able to perform integration and performance testing on the prototype on planned date with the tolerance of 3 days (1 marks)		Student or student team is not able to perform integration and performance testing it on or beyond 3 days of planned date. (0 marks)

All The Best….