

# **Project Proposal**

## **Floor Cleaning Robot (VBot210)**

Name of the Student : Vatsal N Shah  
Roll No. : IU1241090055  
Branch : Electronics & Communication  
Semester : 7th  
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Project Mentor : Abhishek Vaghela

**Indus Institute of Technology and Engineering**  
**Indus University**  
**Rancharda, Via Thaltej**  
**Ahmedabad-382 115**

## Definition and Objectives of the Project:

The purpose of this project is to design and implement a semi-automated Floor cleaning robot (VBot210). It will have several criteria that are efficient, organized and user-friendly, which meets human needs.

The system requires to:

1. Remove the debris and large particles from the floor.
2. Wet clean the floor with fresh water.
3. Remove the dirty water and leave the floor as dry as possible.
4. Deliver a working prototype, which demonstrates the cleaning strategy.
5. Control Autonomous and using Phone application.

## Scope of Project:

The scope of this project is to develop fully functioning product. System is semiautonomous, which is control by phone Application or Autonomously. Light will be turn on in the system, if there is darkness. Display time, day and name functionality is on the bot. Its limitation is, it can't be climb any obstacles. If, Bin will be full it can't detect on its own.

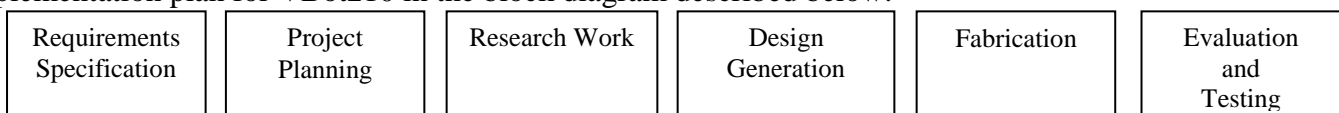
## Design Specifications:

Technical Details	VBot 210
Automatic Charging	Yes
Automatic shutdown if robot is picked up	No
Battery description.	14.4V 6.6 A-hr. NiMH
Bin Availability	Yes
Charging Time	4 [H]
Cleaning Area	100 [m <sup>2</sup> ]
Climb Obstacle	n/a
Control	Automatic/ Mobile App
Dimensions (DXH)	400X150 [mm]
Dim Light sensing	Yes
Full Bin Indicator	No
Low voltage beeping indicator.	No
Linear speed	0.3 m/sec
Run Time	100 [min]
Scheduled Cleaning	Yes
Side Brushes	No
Suction Power	No [W]
Weight	6 [kg]
Water Tank	Yes (0.6l)

**Table1: Design Specification**

## Implementation Plan

Implementation plan for VBot210 in the block diagram described below:



**Fig1: Block diagram**

- To implement the project, starts with the research work and generation of the design and concept.
- The design work of VBot210 will be designed in AutoCAD software, mechanical tool.
- Vacuum mechanism and defined its specifications
- Test charging and discharging time
- Programming for different sensors as described below will be test using microcontroller.
  1. To convert one mode to another mode using switch case
  2. Ultrasonic sensor/IR Sensor testing with wheels
  3. LCD Display programming for display on the VBot210.
  4. To change the speed using PWM
  5. LDR Sensor programming
  6. Check Bluetooth module with controller

## Design Details

Here is the design, top view and bottom view of Vbot210.

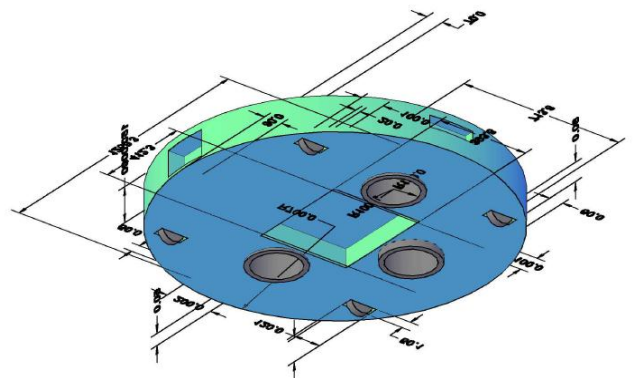
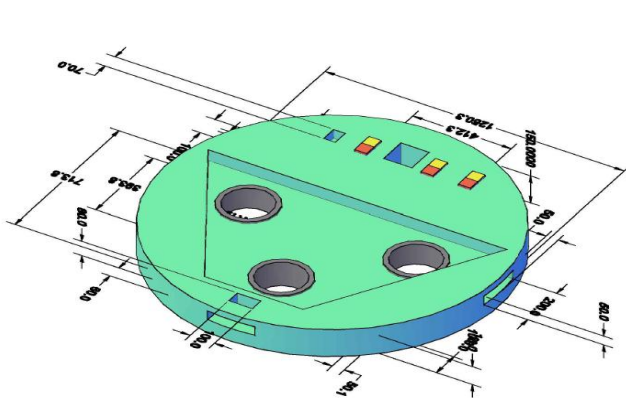
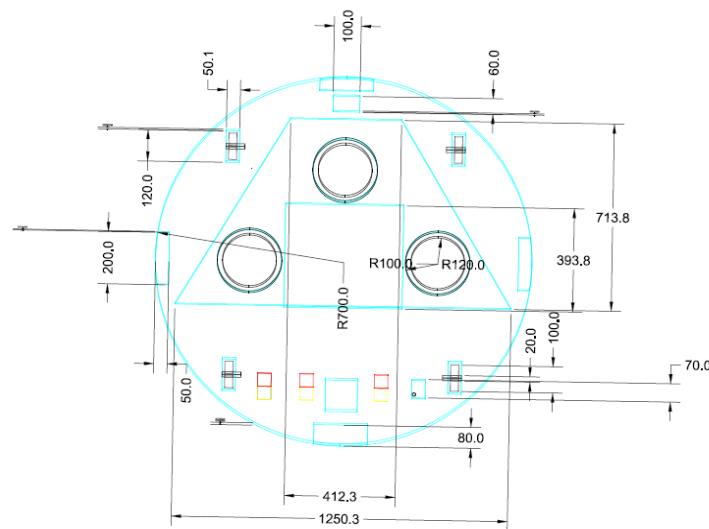


Fig 2.0 Top View, Fig2.1 Side View, Fig 2.2 Bottom View

## Verification Plan:

To verified the working and functionality of prototype VBot210 for different category tools are listed as below:

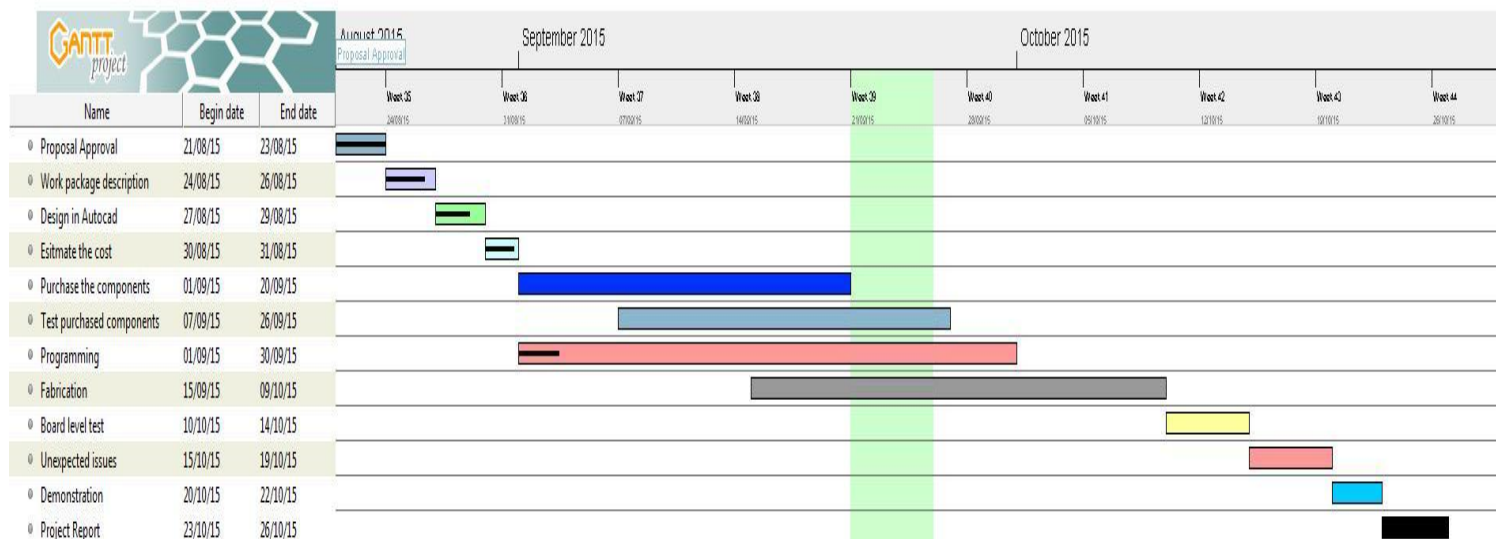
1. Design of Vbot210 – AutoCAD
2. Sensor testing – Proteus
3. Programming testing – Arduino microcontroller
4. Other measurements – Multimeter

**Cost:**

No.	Element	Quantity	Price (Rs.)	Total Price (Rs.)
1	IR/ Ultrasonic Sensor	3	200	600
2	Bluetooth Module HC – 06	1	500	500
3	Arduino Mega	1	1200	1200
4	Wheels	4	200	800
5	12V DC Motor for wheel	4	300	1200
6	Shaft for Motor	4	50	200
7	Battery (Rechargeable)	1	500	500
8	Charger for battery	1	500	500
9	Wires (Connection)	50	6	300
10	Body material (round shape)	1	200	200
11	Fabrication of all material	1	1500	1500
12	12V DC Vacuum tube	3	100	300
13	Motor for vacuum tube	3	200	600
14	LCD Display	1	200	200
15	Touch switch	3	100	300
16	H - bridge	2	300	300
17	LM7805 IC	5	10	50
18	LDR Sensor	1	200	200
19	5 Bright LEDS	5	10	50
20	Screw (all size)	100	500	500
Total				10000

**Table2: Costing****Schedule:**

Time schedule for the overall project in the form of a chart showing below:

**Deliverables:**

At the end of the project Design report, Hardware, Code files, and Project report. It will be functioning body.