GEOBOTICS

DESCRIPTION:-

Mining is a profession which has transformed its way right from manual working's to the most mechanized way. Incessantly increasing production demand is forcing the industry to go for mechanization in its full phase.

This event provides the students from different stream all over India to showcase their skills in Automation and Robotics. In this event students have to build a manual robot which will be effective and efficient in both ways Production & Cost.

PROBLEM STATEMENT:-

Geological description of mine: Arena is based on Room and pillar mining where the seam is dipping at an angle of 11 degree. There are three grades of ore- namely Grade-A1, Grade-A2 and Grade-A3 present at three different loading bays. A **grizzly** is located near Loading Bay-I where the dumpers are supposed to unload the ore.

Loading Bay	Distance from Grizzly*	Ore Grade
I	105	A3 (39%)
II	150	A2 (49%)
III	195	A1 (59%)

*All dimensions are in cm and based on approximate estimation (for arena purpose).

The loading bays (ore loading points) are accessed by the galleries (roadways) and strike drives of width 45cm (for arena purpose). The galleries are also full of hurdles such as mud, gravel, sand and stones and also inclined at some angle as per the dip of seam. The bot has to complete the loading with minimum lateral damage and disturbances to existing systems.

Task:

The participants have to go through the gallery overcoming all the obstruction and load the ore material from the loading bays and unload it in the grizzly. The team with higher efficiency ratio (E) will be declared winner. **Efficiency E** is the ratio of Ore to time taken (Q/ (T+P)).

Q- Weight score of ore dumped

T- Time taken.

P- Penalty

Time T will remain same for each team, i.e. **8 minutes**. The extra penalty time will be added at last to find E.

BOT SPECIFICATIONS:

1) Maximum allowable dimension of the bot will be 30cm x 30cm x 25cm (l x b x h), the bot can be smaller than specified dimension.

2) According to task mentioned below the bot will contain a picking mechanism and a bucket for dumping the materials in it.

3) The bot can be manual or semi-autonomous.

4) The weight of the robot should not exceed 5 kg. This includes the weight of all external control devices.

5) The speed of the motors used must not exceed 500 RPM.

6) We will not provide any form of regulated supply i.e. 12V or 5V. We will directly provide 230V supply. Please come with your own adapter arrangement.

7) Teams can also use batteries for power supply. In that case the maximum allowed battery voltage is 12 volts.

8) Use of an IC engine in any form is not allowed.

RULES:
1) The bot will be disqualified if it fails to fulfil the given 'Bot Specifications'.
2) Flying of bot using air foil, helium balloons, ornithopters, etc. is not allowed.
3) Any robot destroying the arena will be disqualified immediately.
4) All the control should be electronics and hydraulics are allowed.
5) The organizers reserve the right to change any or all of the above rules as they deem fit.
6) The decision of organizers will be final and binding on all.
7) In case of tie the team with maximum Weight score (Q) will be the winner.

Hurdles and Obstruction:
As you will go down the incline, the obstructions in the road will be as given below-
1. Stone
2. Sand
3. Gravel
4. Mud
5. Cog Supports

Scoring Criteria:
Let,
W1- Weight of A1 grade Ore dumped into the grizzly
W2- Weight of A2 grade Ore dumped into the grizzly
W3- Weight of A3 grade Ore dumped into the grizzly

All Penalties are given below and all these penalty will add up to your total time taken.
1. Handling – 20 sec (no restriction)
2. Skipping a hurdle- 10 sec (no restriction)
3. Touching the pillar/cog supports – 10 sec

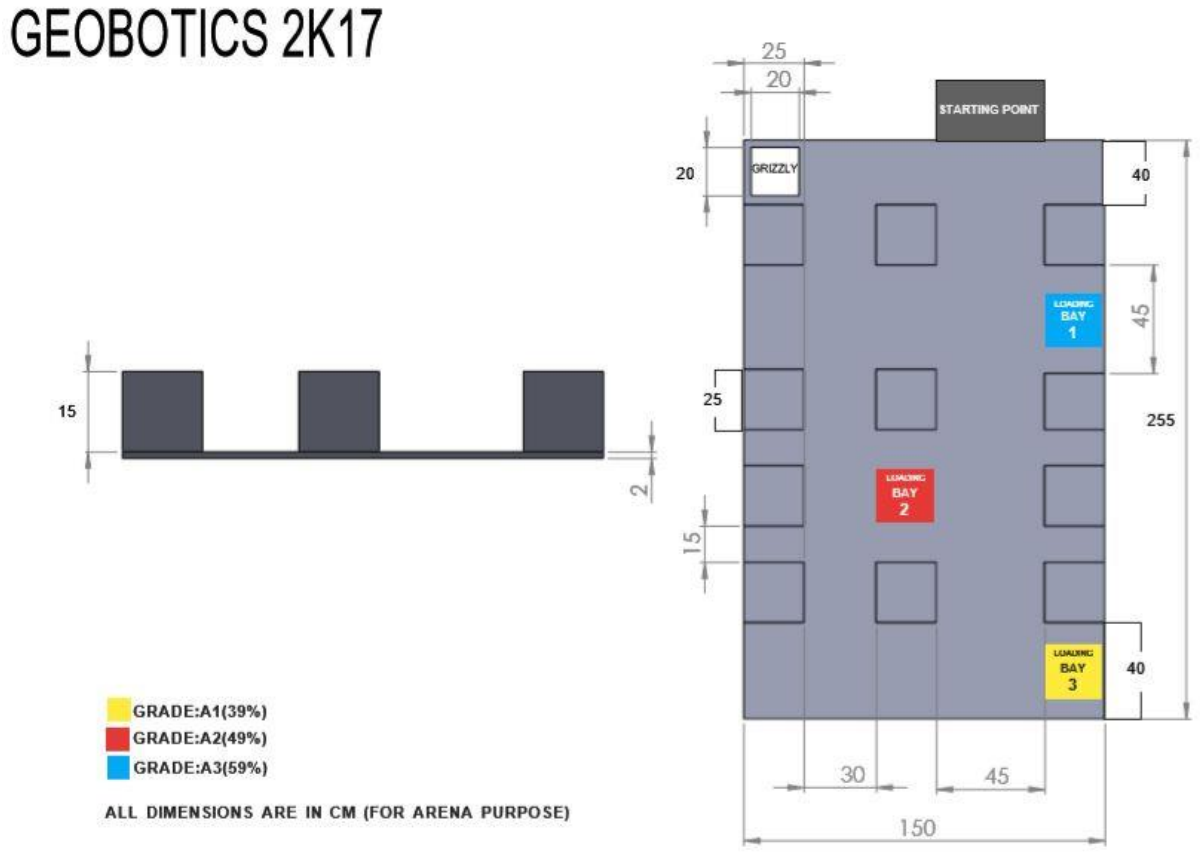
Let Q be the total weight score i.e. Q = [(W1 x A1) + (W2 x A2) + (W3 x A3)]
Let E be the efficiency ratio i.e. E= Q/ (T+P) (Final Score)

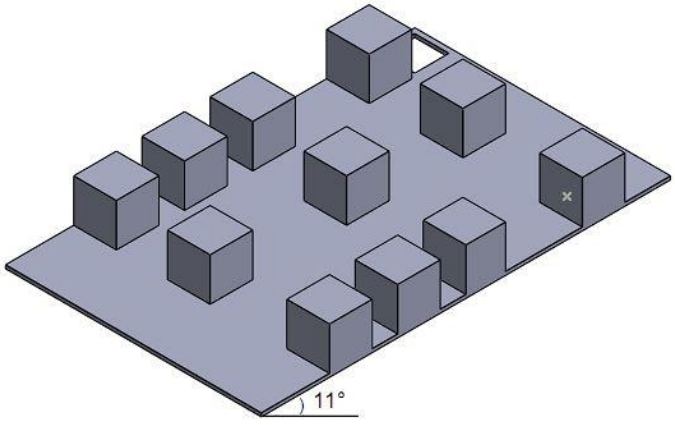
ELIGIBILTY:-
The participant students must be currently pursuing education (undergraduate or postgraduate) in a recognized institute.
The participants may be asked to furnish the institute ID card as to prove the fore mentioned criteria.

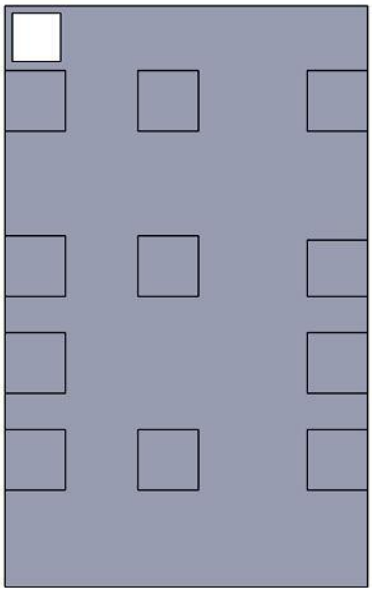
STRUCTURE
1. The competition will be organized at NIT ROURKELA during MINARE.
2. Details of arena is mentioned below.

RULES
1. Only teams who have registered online would be able to participate.
2. Students from different colleges can form a single team.
3. Each team can contain a maximum of THREE (3) participants.
4. The decision of the judges would be final and binding.
5. Only Top three teams will get certificate of merit. However other teams would get a certificate of participation.

DETAILS OF ARENA







Prize Money:

1st prize: 7000

2nd prize: 5000

3rd prize: 3000