KALASALINGAM
ACADEMY OF RESEARCH & EDUCATION
(DEEMED TO BE UNIVERSITY)
Under sec. 3 of UGC Act 1956. Accredited by NAAC with "A" Grade
Anand Nagar, Krishnankoil - 626126. Srivilliputtur (Via), Virudhunagar (Dt), Tamil Nadu | info@kalasalingam.ac.in | www.kalasalingam.ac.in

School of Freshmen Engineering

Freshman Induction Programme - 2023-24

STUDENT ACTIVITIES FOR COMPETITION TRACK – I

(SMACE)

RC Car Design & Race Competition

Materials Needed:

- RC Car (Department will be Provided)
- Foam Board (Department will be Provided)
- Sliding knife (Department will be Provided)
- 743 Gum (Department will be Provided)
- Measuring Scale (Student's team must bring)
- Drawing Instruments (Student's team must bring)
- Color Sketches (Student's team may bring it, if needed)

Rules & Evaluation Guidelines

- Team members should be nominated a team head for leading their team
- Team should be identified a member who going to drive a car in the completion
- Three hours will be allotted for designing the chassis part.
- There will be obstacles and upward slopes in the track, the team should focus on the vehicle weight to succeed in the race.
- During the racing, the car should not go away from the track, if crossed it will be considered as a foul.
- Maximum of three fouls will be permitted, if exceed the team will be disqualified
- The following parameters will be considered for ranking
  - Design and build quality of the chassis
  - Performance of the car at upward slope conditions
  - No of fouls
  - Time taken for completing the lap

Event Video : https://www.youtube.com/watch?v=y1FR7hYm89c

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STUDENT ACTIVITIES FOR COMPETITION TRACK – II

(SEET)

Sustainable Smart Home Design Challenge

(Each Team contain 6 members, 10 teams per section)

Date & Time: 22.08.23 to 01.09.23 & 9:30am- 4.00pm	Section: All Sections	Venue: Polytechnic Block IV

Task 1: Design of Sustainable Smart home - Team will have to build a sustainable home in a smart & creative way

Materials Needed:

- Foam Board (Will be Provided)
- Glue, Scale, Cutter (Will be Provided)
- Arduino with sensors, Components, wires, etc (Will be Provided)

Objective 1:

- **Usage of maximum Natural light resources & Reduce electric source using given components**

S. No	Name of the component	Specification	Max. No of analog pin needed in Arduino uno	Max. No of digital pin needed in Arduino uno	Suggested place of component	No of quantity required/Batch
1	LDR Sensor	50mm	4 (For Maximumof 4 Room) or 1 (If LDR Placed intop of thehouse)	0	Inside each room orTop of the house	4 (For Maximum of 4 Room) or 1 (IfLDR Placed intop of the house)
2	Resistor	4.7 kohm	-	-	Inside each room orTop of the house	

Objective 2: Automatic turning on/off of lights/fan based on person availability

Option 1: Using Ultrasonic sensor Components

S. No	Name of the component	Specification	Max. No of analog pin needed in Arduinouno	Max. No of digital pin needed in Arduino uno	Suggested place of component	No of quantity required/ Batch
1	Ultrasonic sensor	HC-SR04	16 (For Maximumof 4 Room)- Each Room: 2*2	0	Inside each room.	8 (For Maximumof 4 Room)- Each Room: 2

Option 2: Using IR Sensor

S. No	Name of the component	Specification	Max. No of analog pin needed in Arduino uno	Max. No of digital pin needed in Arduino uno	Suggested place of component	No of quantity required/Batch
1	IR Sensor	EC-0141	-	4 (For maximum of 4 Room)- Each Room: 1	Inside each room.	4 (For Maximum of 4 Rooms)- Each Room: 1

Evaluation Criteria:

Idea (Max. 5 Marks)	Home Architecture (Max - 10 Marks)	Use of components (Max - 10 Marks)	Fixing of Hardware inside the house (Max - 10 Marks)	Smart Home demonstration (Max - 10 Marks)	Students Knowledge / involvement on model development (Max - 10 Marks)	Marks by Mentor (Max - 10 Marks)	Total (Max - 50 Marks)

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STUDENT ACTIVITIES FOR COMPETITION TRACK – III

(SAS)

1. Popsicle Stick Bridge

(Each Team contain 6 members, 10 teams per section)

Date & Time: **22.08.23 & 10.00 am-4.00pm** **Section: B9-B12** **Venue:** **Polytechnic Block**

Materials Needed:

1. Popsicle sticks (will be provided by the Department)
2. Wood glue (will be provided by the Department)

Rules & Evaluation Guidelines:

1. Each team will work with approximately 50 Popsicle sticks
2. The finished bridge shall be built from a maximum of 50 wooden Popsicle sticks using glue.
3. We recommend that the bridge must be at least 4 stick long (45 cm), minimum 1 stick height and 1 stick width.
4. Duration 2 hrs.
5. A load (1 or 2 or more Bricks) is applied at the top of the bridge, near the center.
6. Longest bridge with more stability will be considered as winner

Procedure:

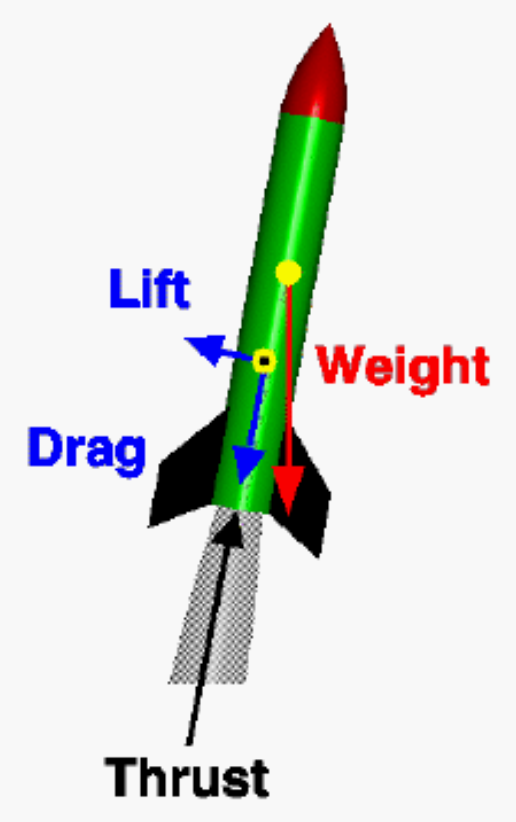
- ✓ Step 1: Design Your Bridge using Popsicle sticks
- ✓ Step 2: Construction **(Refer video link)**
- ✓ Step 3: Start Small
- ✓ Step 4: Get Bigger
- ✓ Step 5: Add MORE sticks for Support
- ✓ Step 6: Finish It Off

Video Link: https://youtu.be/s3HZievz_3Y

2. Launching Alcohol Rocket - Challenge

(Each Team contain 6 members, 10 teams per section)

Date & Time: 23.08.23 & 10.00 am-4.00pm **Section: B5-B8** **Venue:** Polytechnic Block



Materials Required:

- 1 or 1.5 L dry PET carbonated drinks bottle
- Nails to make a hole on the cap
- Ethanol (flammable)

Procedure:

- Have a dry 1L or 1.5 L water bottle/PET bottle
- Make a hole in the cap of the water bottle/Pet bottle
- Pour 5 mL of 95% ethanol or isopropanol (Will be provided in lab)
- Swirl it with ethanol and pour back the remaining ethanol to the ethanol bottle
- Close the bottle with the hole made cap
- Place the bottle in a slanting position (60^o angle)
- Ignite the cap slowly and the bottle fly away from the base
- Measure the distance and evaluate the student

Students Role:

- Students have to bring the pet bottle
- Additional design of the PET bottle can be done for achieving long distance
- The design of launch pod is also student's team work with any type of material as they wish

Video Link 1: https://www.youtube.com/watch?v=Ynv8qq-tO3g

Video Link 2: https://www.youtube.com/watch?v=V1TZTJUPMZw

Evaluation Guidelines:

- Appropriateness in designing the launching pod to achieve distance – 20 Marks
- Distance of travel by the rocket (only distance not the height) – 30 Marks

3. Super Tall Straw Tower

(Each Team contain 6 members, 10 teams per section)

Date & Time: **24.08.23 & 10.00 am-4.00pm** **Section: A9-A12** **Venue:** **Polytechnic Block**

Materials Needed:

- ✓ 1 roll of masking tape (will be provided by the Department)
- ✓ Non-bendy straws (will be provided by the Department)
- ✓ Cardboard sheet **(Participating team must bring)**
- ✓ 1 small binder clip **(Participating team must bring)**

Rules & Evaluation Guidelines:

1. Tower must be freestanding.
2. Tower must be above 60 cm height.
3. Duration 2 hours.
4. Stability will be checked by adding weight at the top of the tower.
5. Highest tower with more stability will be considered as winner

Procedure:

- ✓ Step 1: Get your uprights ready by placing half a piece of tape on a straw, leaving the other half hanging off.
- ✓ Step 2: Start building using the uprights technique to secure straws to your cardboard base. Start with as many as you like—probably at least four, or more for extra stability. **(Refer video link)**
- ✓ Step 3: Add crossbeams between your uprights. These horizontal supports will help stabilize the upright straws, building a strong foundation for a super-tall tower!
- ✓ Step 4: Build your tower taller than — as high as minimum two straw lengths. Add triangular supports, or trusses, throughout your tower to keep it upright and strong.

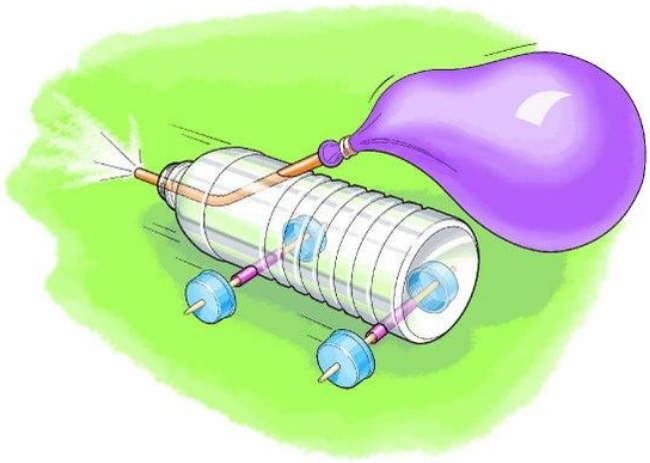
Video Link: https://youtu.be/TSty455vF50

4. Balloon-Powered Car Challenge

(Each Team contain 6 members, 10 teams per section)

Date & Time: **25.08.23 & 10.00 am-4.00pm** **Section: B1-B4** **Venue:** **Polytechnic Block**

Materials Needed:



- ✓ Plastic Bottle 1**(Participating team must bring)**
- ✓ Bottle caps (4) **(Participating team must bring)**
- ✓ 2 Wooden pencils, **(Participating team must bring)**
- ✓ Balloons, (will be provided by the Department)
- ✓ Straws (will be provided by the Department)

Rules & Evaluation Guidelines:

1. The car should be sturdy and not fall apart when in use.
2. The car should go straight.
3. The car should go as far as possible.
4. Duration for the preparation 2 hrs.
5. Car which travel longer distance will be considered as winner

Procedure:

- ✓ Construct the balloon car **(Refer video link)**
- ✓ Inflate the balloon (by blowing through the straw, if you attached it to a straw).
- ✓ Pinch the end of the balloon shut, or put your finger over the end of the straw, to prevent air from escaping.
- ✓ Put your car down on the floor, and let go of the balloon.

Video Link: https://youtu.be/mCT-LGuuL24

& https://youtu.be/STl3JCwdOIY

5. Long Polymer making challenge

(Each Team contain 6 members, 10 teams per section)

Date & Time: **28.08.23 & 10.00 am-4.00pm** **Section: A5-A8** **Venue:** **Polytechnic Block**

Materials Required:

- Beakers
- Distilled Water
- Thermocole
- Acetone
- Glass rod

Procedure:

- Take required quantity of thermocole and dissolve it in acetone
- Use a glass rod to make it a long string

Video Link: https://www.youtube.com/watch?v=6S4zfMdjQxY&t=48s

Evaluation Guidelines:

- Proficiency in making lengthy Styrofoam chain (long Single chain) – 25 Marks
- Team effort in making greater length without damage – 25 Marks

6. Egg Drop Competition

(Each Team contain 6 members, 10 teams per section)

Date & Time: **30.08.23 & 10.00 am-4.00pm** **Section: A1-A4** **Venue:** **Polytechnic Block**

Materials Needed:

- ✓ Eggs (will be provided by the Department)
- ✓ Tape (will be provided by the Department)
- ✓ Scissors (will be provided by the Department)
- ✓ 1-2 200 ml paper/plastic cups (will be provided by the Department)
- ✓ Newspaper **(Participating team must bring)**
- ✓ Insulation material of choice: (bubble wrap, foam, sponge, toilet paper, etc.) **(Participating team must bring)**
- ✓ Other optional materials: (balloons, coffee filter, string, popsicle sticks, pipe cleaners, etc.) **(Participating team must bring)**

Rules & Evaluation Guidelines:

1. One egg will be provided to each team.
2. Duration for the preparation of setup is 2 hours.
3. Initial drop will be 10 feet height, and then selected team will be sent for second stage (20 feet height to drop the egg).
4. If no breakage of egg at maximum height, then that team will be considered as winner

Procedure:

- ✓ Gather all needed materials.
- ✓ You have to begin construction on the interior of egg protection device using your choice of materials at the competition area. **(Refer video link)**
- ✓ Place egg inside your device and construct the exterior of your device.
- ✓ Once completed with construction, test out your device by dropping it into the testing area.
- ✓ Open your device to check the status of the egg - did it "survive" the impact without a scratch

Video link: https://www.youtube.com/watch?v=_Ou_q_Lw3Lo

& https://youtu.be/IYCY6s-GmQA

7. Giant bubble making Challenge

(Each Team contain 6 members, 10 teams per section)

Date & Time: **31.08.23 & 10.00 am-4.00pm** **Section: A13-A16** **Venue:** **Polytechnic Block**

Materials Required

- Agar gum
- Dish wash liquid
- Baking powder
- Distilled water
- Sticks
- Cotton rope
- Rings

Procedure:

- Mix the ingredients Agar gum, dish wash liquid, baking powder and distilled water
- Set up the sticks and rope for making large bubble
- Appropriate ratio of mixing alone will give a bubble

Video Link: https://www.youtube.com/watch?v=rg2Zj8gGp8o

https://www.youtube.com/watch?v=eX_Tn8a5ybo

Evaluation Guidelines:

- Probability of making large bubble – 20 Marks
- Total number of large bubbles – 10 Marks
- Team effort in solution making and setting up the bubble shape – 20 Marks