ROBO HACK

MECHANICAL HACKATHON

Participants can select only one topic from the following:

➢ Robotic Arm

A company is planning to install a Robotic Arm. You as a Senior Design Engineer need to develop a manually controlled robotic arm capable of gripping, lifting and placing objects.
Dimension specifications: 1200mm×1000mm×1000mm (Length×Breadth×Height)

➢ Origami Based Solar Panels

With the increasing demand for new sources of energy, solar power has become an attractive solution for the current energy crisis. However, despite the numerous advantages of solar technology, the energy conversion efficiency of solar panels is low. Since these panels are stationary, they are also difficult to deploy and transport. To tackle this problem, you need to build a portable system that can deploy the solar panels easily and retract them with minimal effort based on the origami folding patterns and mechanical rotation of the panels.

➢ Advanced Wheel Steering Mechanism

Due to large number of cars and constrained spaces, the parking of car has always been a difficult process. Normally during the parallel parking, the turning radius of car creates a huge problem which is the most frequently used type of steering. In small parking area, it is really difficult to steer and park. To overcome this difficulty, you need to design a new steering system which can steer the carin perpendicular direction to its plane of symmetry.

➢ Driverless E-Vehicle Design

Technological advances are pacing in an unmanageable manner. We have reached a time wherein we can automate our menial tasks like driving. These vehicles use sensors that can be impeded in heavy rainfall or snow. So as a design engineer, build a driverlesselectric vehicle with a seating capacity of 5 person and number of wheels must not be less than 3.

➢ Coronavirus Mask

Mask is the most demanding thing these days due to the outbreak of COVID-19. But the problem with current masks is that they leave behind dark redscars on the face. Also, they are not much capable like normal surgical mask and if we go for better masks like N-95 or N-98 peoples have breathing problems in them. Companies are looking forward to find an

appropriate solution for this. As an engineer and a responsible citizen, design a mask that can overcome these problems and can be an asset to beat this deadly disease.

Event Timeline:

Event registration starts –25 March
Event registration ends – 27 March
Last day of submission – 29 March

Event Guidelines:

1. The tasks must be completed and submitted individually.
2. No submission would be considered after the deadline.
3. No plagiarism allowed, if found the team would be disqualified.
4. All designs must be submitted in .iges/.step with original CAD files.
5. Any CAD/CAE/CFD software can be used.

Evaluation Criteria:

1. CAD model and design justifications: **40 points**
2. Design simulations/ motion/ animation: **30 points**
3. Novelty of Idea and its implementation: **30 points**

Remember:

1. Keeping in mind the current health emergency condition, AMURoboclub highly discourages any type of movement of participants from their places. **Its strongly advised to be at home**.
2. Any decision made by AMURoboclub will be final and it is not obligated to give any reasons on any matter during and after the event.