GLOBAL ROBOTICS CHALLENGE

GRC EXPO

For More Information:

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1. Technical Introduction:

The **"Global Robotics Challenge – GRC EXPO"** is an innovative platform that aims to integrate creativity with technology through a scientific and practical competition among participating teams. The competition focuses on developing skills in scientific research, engineering design, modeling, programming, and presentation, providing students with an integrated practical experience that simulates both industrial and academic reality.

The competition is not limited to robot design only, but also extends to include practical solutions to real-world problems through a scientific methodology that starts with identifying the problem, then developing the idea, and finally building and testing a prototype. It also encourages teams to use the latest technologies and software while highlighting the aspect of innovation and engineering imagination in every project.

The ultimate goal of the competition is to prepare a new generation of innovators capable of linking scientific research with practical application, and contributing to the development of technological solutions that create a real impact in society.

2. Team composition :

- **team members**: **2 to 4** Students guided by a Coach.

- **Age Categories**:

  - ❖ Discover Category: Ages **4 to 7** years.

  - ❖ Junior Category: Ages **8 to 12** years.

  - ❖ Senior Category: Ages **13 to 17** years.

  - ❖ Adult Category: Ages **18** years and above.

3. Areas of Development:

- **Research and Development**: Teams identify a real-world problem and propose an innovative robotic solution.
- **Prototyping**: Transform ideas into a functional prototype that solves the identified problem.
- **Technical Engineering**: Demonstrate engineering skills by using sensors, motors, and software to bring the solution to life.
- **Innovation**: Projects should reflect originality and creativity.
- **Presentation Skills**: Teams must effectively communicate their projects during a live presentation.

4. Themes:

No predefined theme: Teams can address any real-world problem of their choice. Projects must address real-world challenges.

5. Technical Specifications :

- Each team must bring **poster** for the project. The maximum size of the poster is **(100 cm width x 150 cm height).**
- The poster should include the following details:
  - ❖ **Project Name**.
  - ❖ **Key Points** : Highlight the main features and goals of the project.
  - ❖ **Basic Design Image** : A clear representation of the project's design.
  - ❖ **Functional Diagram** : A diagram explaining how the project works.
  - ❖ **Team Members** : Names and roles of the team members.
  - ❖ **Materials Used** : A list of materials and components used in the project
  - ❖ **Project Benefits** : The advantages or potential impact of the project.
  - ❖ **Future Plan** : Next steps or future developments for the project.

- **Robot Type:**
  - ❖ **No restrictions on the type of robot.**
  - ❖ **Teams are free to design and build any type of robot that suits their project, including fully autonomous, semi-autonomous, or remotely controlled systems.**
  - ❖ **Robots must be designed and developed by the team to solve a specific real-world problem.**
  - ❖ **While there are no size or type restrictions, robots must be able to function safely within the competition environment.**
- **Software and Programming:**
  - ❖ **No restrictions on the software or programming language used.**
  - ❖ **Teams can choose any software or programming language to control their robot.**

6. Special Rules for Discover & Junior Category:

- **Kits and Platforms:**
- **Allowed: Duplo ,WeDo, LEGO EV3, Spike Kits, NXT Kit, VEX.**
- **Themes:**
  No predefined theme: Teams can address any real-world problem of their choice. Projects must address real-world challenges.
- **Robot and Project Specifications:**
  - ❖ **Teams are encouraged to use simple sensors, motors, and LEGO components.**
  - ❖ **Robots should be functional and demonstrate a basic understanding of mechanics and programming.**
- **Presentation and Exhibition:**
  - ❖ **Teams must bring a poster as outlined in the general specifications.**
  - ❖ **Each team will present their project in a 15-minute presentation, including a demonstration of their robot.**
- **Scoring Criteria (Specific to Discover & Junior Category):**
  - ❖ **Creativity (30%): Level of innovation in idea and solution.**
  - ❖ **Technical Execution (20%): How well the robot functions.**
  - ❖ **Theme Relevance (20%): How well the project aligns with the chosen theme.**
  - ❖ **Presentation (30%): How clearly and confidently the team explains their project and demonstrates their robot.**

7. Competition Phases:

7.1 Before the Competition:

- **Research & Proposal**: Identify the problem and submit a written proposal explaining the solution.
- **Prototype & Development**: Build an effective prototype addressing the problem.
- **Technical Skills**: Demonstrate the use of sensors, motors, and other components.

7.2 Competition Day:

- **Presentation**: Teams present their project and perform a live demonstration in front of the judging panel.
- **Each team has**:
  - ❖ **10 minutes** for presenting the project with a live demo of the robot's functions.
  - ❖ **5 minutes** for answering the judges' questions.
- The project must remain displayed in the team's booth throughout the day for judges and visitors to review.
- The judging panel may visit the team **2 to 3 times** during the day to evaluate the project.

8. General Evaluation Criteria:

- **Project Proposal (10%)**: Clarity of the problem and solution.
- **Research & Development (20%)**: Depth of research and understanding of the problem.
- **Modeling & Technical Engineering (30%)**: Robot efficiency in terms of functions and execution.
- **Innovation (20%)**: Originality of the idea and solution.
- **Presentation Skills (20%)**: Ability to explain the project along with the live demo.

9. Submissions:

Before Competition Day (Discover & Junior):

• **Project Abstract.**

• **Video demonstrating the project work. Video duration should not exceed two minutes.**

Before Competition Day (Senior & Adult):

- **Teams must submit a technical report summarizing their research, development, and technical details.**
- **Teams must submit a project abstract.**
- **Teams must submit a digital copy of their presentation in PowerPoint format.**
- **Video demonstrating the project work. Video duration should not exceed two minutes.**

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Good Luck.