RGIT's ROBOTICS CLUB

Report of AY 2021-22
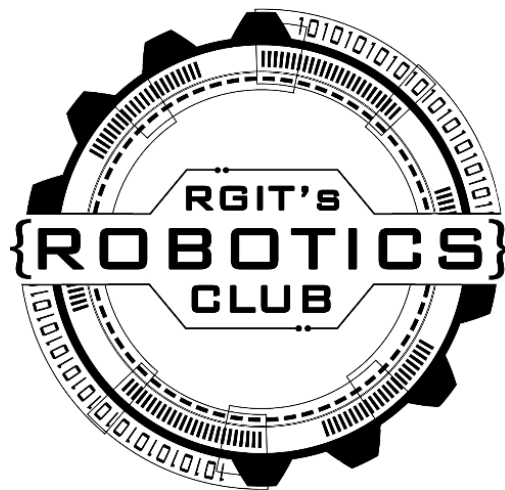
Established in July 2018, RGIT's Robotics Club is the very first official Robotics committee of the institute. We abide by the mission to acquaint students of our institute with the currenttrends of Robotics and Automation in the Industries by providing sufficient practical exposure and opportunities, which will enhance their knowledge along with developing technical as well as soft skills thus in creating skilled individuals for the betterment of the society and country.

Today, Robotics is a rapidly growing field, as we continue to research, design and build new robots that serve various practical purposes including domestic, commercial and military. The RGIT Robotics Club strives to stimulate interest in robotics among the students of the institute. Besides making a serious endeavour to spread knowledge on Robotics and its diverse applications, it also stands by the subtle acronym of TEAM - 'Together Everyone Accomplishes More'. Well defined goals, an organized and disciplined work structure and motivated members are the features of the club.

Website: www.rgitsroboticsclub.com

Email ID: rgitsroboticsclub@gmail.com

Conveners: Dr. A.V. Gotmare

Program Outcomes (PO) Engineering Graduates will be able to:

PO1   **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2   **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3   **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4   **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5   **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6   **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7   **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8   **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9   **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10   **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11   **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12   **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Department of Mechanical Engineering

Vision

To create competent technical professionals in Mechanical Engineering with ethical behaviour and environment consciousness.

Mission

1. To provide contemporary and cutting-edge technical education in Mechanical Engineering.
2. To provide an ambience which nurtures research ideas in futuristic domains of Mechanical Engineering.
3. To initiate project based learning and practical exposures in the area of Mechanical Engineering.
4. To direct faculties in research and consultancy / advisory roles.
5. To establish strong linkages with well-known national and international technical institutes.
6. To promote the culture of imbibing environmental care and eco-friendly designs.
7. To become a department of aspiration & choice.

Program Educational Objectives (PEOs)

PEO1: To prepare the stakeholder to exhibit leadership qualities with demonstrable attributes in lifelong learning to contribute to the societal needs.

PEO2: To make ready the stakeholder to pursue higher education for professional development.

PEO3: To help the stakeholder to acquire the analytical and technical skills, knowledge, analytical ability attitude and behavior through the program.

PEO4: To prepare the stakeholders with a sound foundation in the mathematical, scientific and engineering fundamentals.

PEO5: To motivate the learner in the art of self-learning and to use modern tools for solving real life problems and also inculcate a professional and ethical attitude and good leadership qualities.

PEO6: To prepare the stake holder to able to Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Program Specific Outcomes (PSOs)

PSO1:Successful Career and Entrepreneurship: Graduates will be able to understand the social-awareness and environmental wisdom along with ethical responsibility to have a successful career and to sustain passion and zeal for real-world applications using optimal resources as an entrepreneur.

PSO2: Hobbies and Career: Graduates have nurtured their hobbies which are useful in their specific chosen career.

Sr No.	Activity Name	Type of Activity	Date	Remarks
1	All About Robotics	Webinar	19thAugust - 4th September 2021	Completed
2	Further studies after Engineering	Webinar	8thSeptember 2021	Completed
3	E-Yantra 2021-22	Competition	October 2021	Completed 2 Stages
4	Techfest 2021-22	Competition	October 2021- February 2022	Reached Final Stage
5	RoboCon 2021-22	Competition	November 2021 – May 2022	Completed 2 Stages
6	Robotic Arm	Internship Training Program	March 2022	Completed

EVENTS THROUGHOUT THE YEAR (2021-2022)

1. ALL ABOUT ROBOTICS

RGIT's Robotics Club started a series of online. sessions introducing the field of Robotics to all those interested. The first session was conducted on 19th August 2021. It began with a brief session giving the general idea of Robotics and the rising trends in the same. There were a few more sessions giving an insight into the design part of robotics and the electronics part conducted between 28th August and 4th September 2021. We had a total of around 60 participants for these sessions.
Hosts: Vaishnavi Wagh, Swagat Das, Aditya Auti , Prachit Yedre, Shravan Bangera, Bhavna Kolkondi
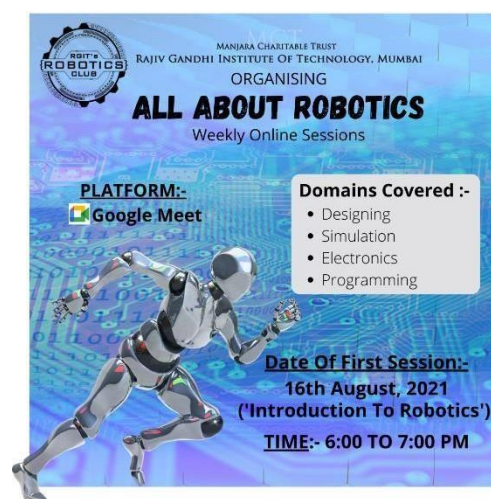
2. FURTHER STUDIES AFTER ENGINEERING

RGIT's Robotics Club conducted a webinar expatiating on further options one can explore after completing their engineering degree. The main focus of this webinar was GRE exam and abroad studies. There were 80+ participants who attended this webinar. The speaker was Mr. Abhinav Gogoi.

3. EYANTRA 2021-22

e-Yantra Robotics Competition (eYRC) is a unique annual competition by IITB. Selected teams are given a robotic kit complete with accessories and video tutorials to help them learn basic concepts in embedded systems and microcontroller programming. The team has completed the first two tasks of the theme "Agribots" which extensively used the intricacies of Robot Operating System (ROS) and IoT to control robots from a remote location. The competition is completely simulation based. We participated with only one team which was as follows,

| Sr. No.	Name	Year-Dept	Team
1.	Sahil Pilikandlu (Leader)	BE- MECH	Design & Manufacturing
2.	Vaishnavi Wagh	BE- MECH	Design & Manufacturing
3.	Utkarsh Kotecha	BE-MECH	Design & Manufacturing
4.	Prachit Yedre	TE-EXTC	Electronics

4. TECHFEST 2021-22

RRC has been participating in the National Level competitions of Techfest each year. This year we are participating in 4 competitions with around 30 participants. All teams successfully cleared the first stages of all competitions they participated in.
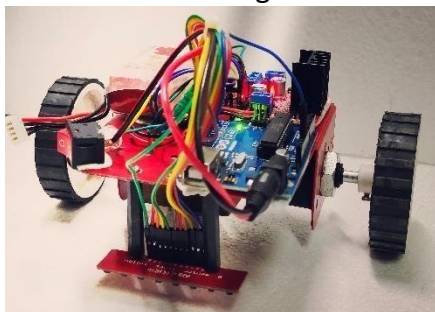
1) Meshmerize

Teams are supposed to design and manufacture a line following autonomous robot. The robot is supposed to be able to find its way through the maze on its second run. One team of four members is taking part in this competition. The leader of this team Aryan Bhalerao.
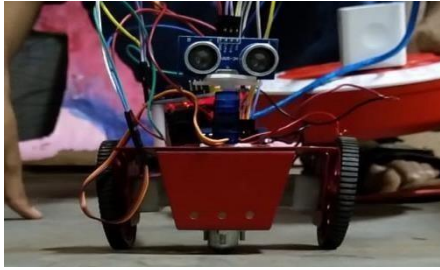
2) Micromouse

In this competition, the participants are expected to design and build an autonomous pathfinding robot. The Club has sent one team this year to participate here. The team leader is Aditya Auti.

3) Cozmo-Clench

This competition focuses on robots which can grip various objects and perform pick and place functions. This year we have sent 3 teams with four members each. The leaders of these teams are Suraj Pawar, Tejas Moolya and Rohit Shegokar. All 3 teams have cleared the technical documentation stage and have submitted the video for the second stage. All teams cleared the second stage and will be given participation certificates.

4) Automatathon

Participating teams must develop end-to-end RPA solutions using UiPath products. This includes Automation in Education, IoT and RPA and Technology integrations. There are two teams participating from our Club. The team leaders for these teams are Vaishnavi Wagh and Swagat Das. Both teams have cleared the first stage and submitted the second stage files. Team led by Miss. Vaishnavi Wagh ranked 3rd in the final rounds whereas team led by Mr. Swagat Das ranked 10th in the final rounds nation-wide.

5. DD ROBOCON 2021-22

DD-Robocon is a part of the Asia-Pacific Robot Contest (ABU Robocon). This event is aimed to build technical skills of under graduate engineering students of our country. IIT Delhi hosts DD-Robocon 2021-2022 on behalf of Doordarshan (DD).

The competition is divided into three stages at domestic level, where the first stage is submission of design file and documents specifying details of both robots. Currently, the team is done with the designing of both the robots and modelling of robots in CAD

software is completed. We submitted the technical design document for the first stage and got selected for the second stage with 89/100 marks. We also submitted the video demonstration of the working of our robot's mechanism for successful completion of the assigned tasks. We are waiting to hear the results of the second stage.

6. ROBOTIC ARM ITP
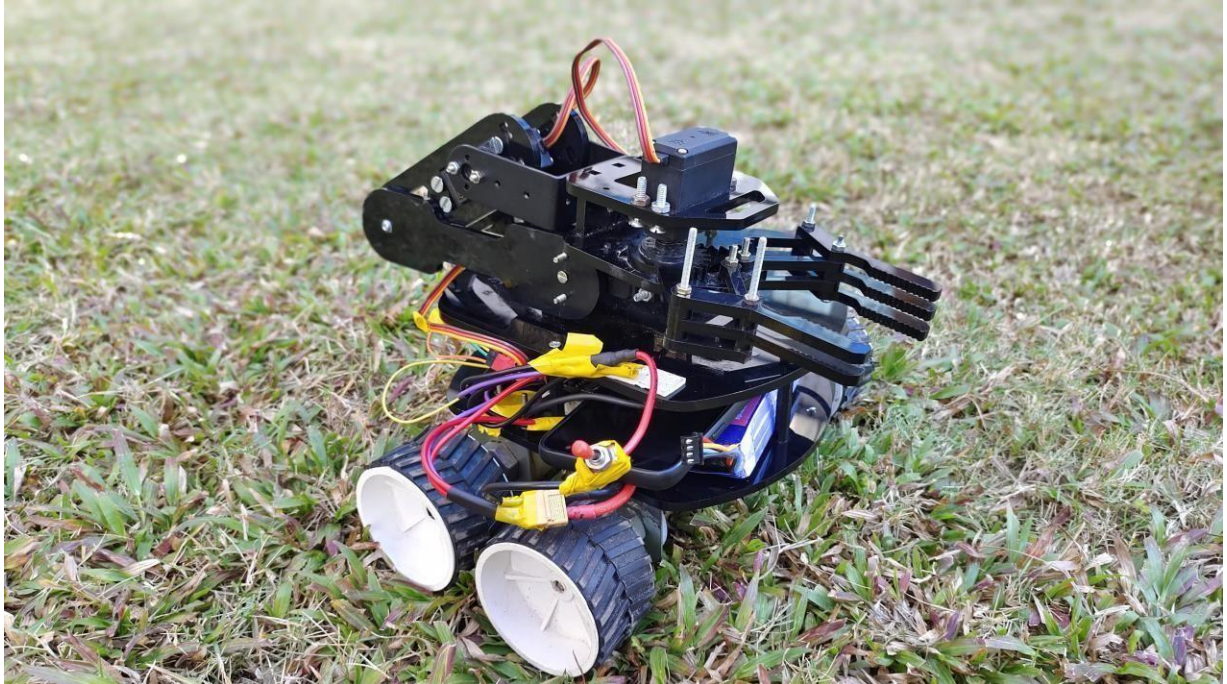
We conducted an offline internship training program on Robotic Arm. In this internship, we taught the participants designing the arm, simulation and coding a 4-DOF Mobile Robotic Arm from scratch. We provided the participants with a take-home kit for the same. A total of 18+ students participated in our ITP. We have also developed an android application to control our robotic arm which we gave to the students. The participants were also given a technical speech from a robotic-industry professional, Mr. Mohammed Javed Khan.