PIXATHON

Coordinator- Ayush Mani Chaudhary

Clix, the photography club of IIT Bhubaneswar is organizing an online photography competition, PIXATHON for the Innovation Challenge 2019.

Rules and Regulations:

- The theme will be declared on Sunday, 10th of March, 2019
- The pictures should be clicked inside the campus only and after the declaration of the theme.
- Only one picture is allowed per participant.
- The picture should be in jpg format only.
- The picture should also have a suitable caption.
- The deadline for submission is 15:00hrs 17th of March, 2019.
- Post processing(editing) the picture is mandatory.
- You have to mail both the images, i.e., the original and the edited pictures.
- The pictures have to be mailed to clix.photosoc@iitbbs.ac.in with the subject Pixathon_NAME_ROLL NO.
- PLAGIARISM is strictly prohibited, if the entry is found to be plagiarized, the participant will be disqualified.

Judging Criteria:

- Originality and content- 50%
- Relevance to the theme- 20%
- Post Processing-20%
- Caption- 10%

STAR CLUSTER ANALYSIS

Coordinator: Atharva Kulkarni

Nakshatra, the Astronomy Society of *IIT Bhubaneswar* is organizing this event as the part of the Innovation Challenge'19. This event would be testing the students' skills in applying coding and data analysis skills in the field of astronomy.

Rules and Regulations:

- The problem will involve data analysis and inference from the dataset(s) for a globular star cluster. The dataset(s) would be given on the spot and will contain coordinates, color index (for different wavelengths) and magnitude of every star in the cluster.

- The task would involve using the datasets appropriately to analyze the globular cluster to determine some parameters and peculiarities of the same. Theoretical information necessary for understanding the cluster dynamics will be provided during the hackathon, and the teams are expected to be well versed with different kinds of astronomical notations used to represent star clusters (different coordinate systems, intensities, etc.). Usage of internet is allowed upto a certain extent.

- You may use Python or MATLAB for solving the questions, and the usage of all packages of Python is allowed. No additional software or plugins are allowed, and usage of software that can give parameters of a cluster is strictly not allowed.

- A team of 2 to 4 members shall work on the dataset on the day of the event. You are allowed to use the internet during the event. Do know that we will be checking for any kind of plagiarism, and those who are caught will be removed from the event.

Judging Criteria:

- Points will be awarded on the basis of the method used and on the accuracy of the answers.

CASE STUDY

Coordinator: Jatin Khare

Nakshatra, the Astronomy Society of *IIT Bhubaneswar* is organizing a case study as the part of the Innovation Challenge'19. This event would be testing the students' analytical as well as verbal skills.

Rules and Regulations:

1. **Team Size**: The maximum number of members in a participating team is 3.
2. **Time Limit**: The presentation should not exceed 10 minutes.
3. **Judging Criteria**: After the presentation, our professor **Dr. Chandrasekhar Bhamidipati** (Judge), the judging team and other participants will ask questions to the presenting team. Also, marks will be awarded to the teams that ask relevant questions.
   Marking Scheme: (out of total 20 marks)
   PPT content - 5 marks
   Presentation - 5 marks
   [The presentation should be in Microsoft Powerpoint format (.pptx, .ppt) and the teams are instructed to mail the presentation to secysnt.sg@iitbbs.ac.in a day before the event.]
   Question and Answer session - 5 marks
   Report submission - 5 marks
   [Each team has to submit a report (not more than 2 pages and with font size 12-14) as a hardcopy, on the day of presentation]

Each team can choose one of the following topics, and each presentation must contain at least the points mentioned in the topic.
(Additional content may be added, but keeping the Rule 2 in mind)

1. **The Twin Paradox**
   - The Statement
   - Earth's perspective
   - Travelers' perspective
   - The Flat Spacetime
   - Conclusion

2. **Cosmic Microwave Background Radiation**
   - The Origins
   - The Anomaly
   - Polarization
   - Conclusion

3. **Milankovitch Cycles**
    - What are Milankovitch Cycles?
    - The 3 Factors
    - Climate prediction
    - Conclusion

4. **Death of Kepler**
    - What are Exoplanets?
    - Kepler's methods
    - The reason behind Kepler's death
    - Other ground methods for Exoplanet Detection

5. **Science behind Interstellar**
    - Plot Overview
    - The Wormhole
    - The Gargantua
    - 4th and 5th Dimension
    - The Climax

CODING HACKATHON

Coordinator: Rishab Gupta

Neuromancers', and Web and Design Societies of *IIT Bhubaneswar* are organizing this event as the part of the Innovation Challenge'19. This task in this event will be product development.

Rules and Regulations:

It will be an on-spot hackathon. Details of the problem will be released during the event. Teams with a maximum size of 4 shall compete for 6 hrs at a stretch in the hackathon. It is a development based event.

Judging Criteria:

Judging will be done based on the application of the product developed and the way in which it is developed.

CODING CHALLENGE

Coordinator: Vatsalya Chaubey

Neuromancers', and Web and Design Societies of *IIT Bhubaneswar* are organizing this event as the part of the Innovation Challenge'19. It will be a one day contest hosted on the Hackerrank platform on 16th March 2019. The contest will test the participant's algorithmic thinking and implementation skills.

Rules and Regulations:

● The contest will begin at 9 AM on 16th March 2019 (Saturday) and end at 9 AM on 17th March 2019 (Sunday). The timings of the contest may change if the need arises. Any changes made will be intimidated before the start of the contest.
● The contest will have 8 questions with every level of difficulty from easy to hard. Each question will have a predefined score which will be mentioned along with the question.
● Each question will have many test cases and for achieving the perfect score each test case must pass within the time limit. Partial scoring will also be there for some questions.
● A participant's score depends on the number of test cases a participant's code submission successfully passes.
● If a participant submits more than one solution per challenge, then the participant's score will reflect the highest score achieved.

Judging Criteria:

● Participants are ranked by score. If two or more participants achieve the same score, then the tie is broken by the total time taken to submit the last solution resulting in a higher score.
● Plagiarism will be strictly checked. If the code of two participants are found to be similar then both the participants would be disqualified.
Each participant securing a position on the leaderboard would be presented with a certificate.

ARDUINO HACKATHON

Coordinator: S. Sai Teja

Robotics and Intelligent Systems Club, the Robotics Society of *IIT Bhubaneswar* is organizing this as the part of the Innovation Challenge'19. This event would be testing the students' coding skills on the arduino platform.

INTRODUCTION

Be prepared for the unexpected. It is an Arduino based Extempore Hardware Programming event in which you will be provided with a task for which you have to program according to the situation. Do you like surprises?

RULES AND REGULATION

- Maximum number of participants allowed is 3 per team.
- Submissions after the deadline will not be accepted.
- Decision of coordinator will be final and binding under all circumstances.
- All the participants coming must bring their laptops with Arduino IDE, Proteus/ Eagle CAD installed.

TASKS

The participating teams are required to code as stated in problem statement which will be released at the time when the event starts. No internet access will be allowed. Teams are supposed to have required basic sensor and motor driver packages installed with their softwares. If needed will be given a limited amount of time to download them. Judging Parameters in detail will be released with the release of Problem Statement.

PREREQUISITE KNOWLEDGE

- Arduino Programming.
- PCB design platform(eg. Eagle CAD, Proteus etc)
- Sensors like IR,Ultrasound etc.

JUDGING PARAMETERS

- Design is expected to use least resources without compromising accuracy.
- The solution and efficiency of the code will also be taken as parameters in awarding scores.
- Simulating using any platform will be rewarded with bonus score.

TAKE OFF

Coordinator: G. Geeth Nischal

Robotics and Intelligent Systems Club, the Robotics Society of *IIT Bhubaneswar* is organizing this as the part of the Innovation Challenge'19. The goal of this event is to make a water water rocket.

INTRODUCTION

No fuel. No resources. Go through the basic textbook principles of Aerodynamics and Physics and guess how water can help you sail through this. Get a bottle and water and let's see how far it goes? Create a water rocket and make it fly across the vast lands because where nothing helps, H2O does!

PROBLEM STATEMENT

Design and Build a water rocket which can be launched at any angle with respect to the horizontal. The teams will be participating in two rounds and the winners will be decided on the basis of rules given below.

ROCKET SPECIFICATION

- Only plastic soft drink bottles are to be used for the rocket body.
- The nose cone and fins should not be made of metal or any sharp surface. The rocket should be launched using a string from a safe distance.
- The water rocket must use only compressed ambient atmospheric air as its source of energy. Only tap water shall be used in the rocket, and the water shall be provided by the organizers. Water brought by the team shall not be allowed in the rockets.
- The amount of water to be filled in the rocket body is left to the choice of the team.
- The pressure inside the container (rocket body) before launch should not exceed 60 psi.
- Launchers and pressure compressors will NOT be provided by the organizers.
- The launcher to be constructed by the team should be fitted with an air compression device or pump for pressurizing the contents of the rocket body. A pressure-gauge having a minimum range of 0-100 psi to display the pressure of air in the water-rocket has to be attached to it too (the pump may have the pressure gauge).
- Rocket must be launched from a stationary position on a fixed launcher. (Slingshots, trebuchets, catapults, cannons, and all other forms of launcher boost assists are forbidden). In other words, the internal pressure of the rocket must be the only source of energy for the rocket.
- The rocket may or may not split into two or more parts only during the flight, in such cases the range of the farthest part will be considered.
- The teams may bring as many rockets as they wish but it should comply with the rules given above.

- Decision of Organizing team will be final.

RULES AND REGULATION

- Team Size: A team for Lift-off can have a maximum of 4 members.
- The rocket must have a variable launching angle capability.
- Burst Testing: All rockets will be tested to a pressure of 60 psi before they can be allowed to enter the competition. Teams are therefore advised to test their rockets to a pressure of 60 psi beforehand and also bring substitute rockets with them.
- If a team's rocket fails the Burst Test, ONLY ONE extra rocket shall be allowed to be burst tested. If that rocket fails the burst test too, then no points will be awarded to the team.
- Once a rocket passes the burst test, it shall be allowed only one attempt for launch.
- Participants are allowed to use multistage water rocket.
- In case of multistage water rocket maximum of 2 litres water is allowed inside the rocket.
- The rules are subject to change.
- In case of disputes, the decision of the organizing team is final and binding.

TASKS

- The participants have to launch the rocket from the launching point and the rocket should land in the launch arena.
- The range of flight is the distance between the point of launch and the point of first impact with the ground after launch.
- In case of multi-stage water rocket range of flight will be calculated as the distance between the point of launch and impact of 2 nd rocket with the ground.

JUDGING PARAMETERS

Round 1

- Participants are scored primarily on the basis of their range of their flight. Greater the range, greater will be the points earned.
- Only half points will be awarded if the rocket lands on the border.

Round 2

- Top 6 teams of round 1 will advance to round 2.
- The problem statement of round 2 of lift off will be disclosed on the day of the event.

Events Schedule

The below events schedule will be followed for the innovation challenge to be conducted.

Event Name	Saturday (16/03/2019)	Sunday (17/03/2019)	Location	Coordinator
Star Cluster Analysis	3:00pm to 6:00pm	-	SES-014	Atharva Kulkarni
Coding Challenge	Whole day	-	Online event	Vatsalya Chaubey
Coding Hackathon	-	1:00pm to 7:00pm	SES-014	Rishab Gupta
Arduino Hackathon	6:00pm to 8:00pm	-	SES-014	S. Sai Teja
Water Rocket Challenge (Lift Off)	5:00pm to 7:00pm	-	Open area (front of SES)	G. Geeth Nischal
Case Study (Astronomy)	9:00am to 11:00am	-	SES-014	Jatin Khare
Online Photography	Whole Day	-	Entire campus (Online Submission)	Ayush Mani Chaudhary