CHOOSING YOUR MISSION

CanSat (NYARKOA) Sensors

i. MPL3115A2
ii. MPU6050
iii. DS3231M RTC
iv. GPS
v. Buzzers
vi. Electromagnetic Ejector
vii. LoRa module (5Km)
viii. ESP32
ix. SD Card
x. 16 bit resolution ADC
xi. Battery manager

Mission 1: Environmental Data Collection

Problem to Solve: Xavier Space Solutions has noticed unusual variations in microclimates within the Ashanti region, affecting local agriculture. Deploy a CanSat to investigate these microclimates, collect accurate environmental data, and identify the causes of these variations

Sensors: MPL3115A2 and DHT11

Objective: Record temperature, humidity, and altitude data, and transmit this data to the ground station for real-time analysis.

Mission 2: Atmospheric turbulence

Problem to Solve: Ghana frequently experiences severe weather events, including floods, which can lead to significant property damage and loss of life. To enhance disaster preparedness and response efforts, there is a need for precise and real-time flight orientation data for aerial rescue operations and situational awareness. Design a CanSat mission using the MPU6050 and DS3231M RTC sensors to continuously monitor and record roll, pitch, and yaw angles during flight, along with corresponding timestamps. The collected orientation data will be vital for improving disaster preparedness and response strategies during potential flood incidents.

Sensors: MPU6050 and DS3231M RTC

Objective: Continuously monitor the roll, pitch, and yaw angles of the CanSat and record timestamps for orientation data.

Mission 3: Vertical temperature profiling

Problem to Solve: Ghana's forest cover is rapidly decreasing due to deforestation and illegal logging. To combat this issue, deploy a CanSat to study the impact of deforestation in a specific region. Use sensors to gather environmental data and detect deforested areas. The collected data can help local authorities implement conservation measures.

Sensors: MPL3115A2 and DS3231M RTC

Objective: Record altitude measurements and timestamps, and correlate them to create an accurate altitude-time profile. How can you leverage CanSat technology to contribute to reforestation efforts and protect the ecosystem?

Mission 4: Environmental and Altitude Monitoring

Problem to solve: Accra, Ghana's capital, faces challenges related to urban heat islands, resulting in increased temperatures in densely populated areas. Deploy a CanSat to measure vertical temperature variations within 100m from ground surface on ascent. The data collected will assist city planners in making informed decisions for urban development and temperature regulation.

Sensors: **MPL3115A2 and DHT11**

Objective: Simultaneously monitor environmental factors (temperature, humidity) and altitude data to analyze how these variables change with increasing altitude. How can you design a CanSat mission to investigate and combat the urban heat island effect in Accra?

CANSAT GHANA ELEMENTARY CAMPAIGN 2023 – Finals

Program Schedule

Day / **Saturday, 28th October 2023**	**9:00AM GMT:** Teams arrive in Afua Kobi Ampem Girls' SHS, Kumasi.
	10:00AM GMT: Teams suited in auditorium/assemble hall for introduction etc.
	11:00 AM GMT: Mission activities on the field (launch spot: Canopy on field): • Opening, • Pre-launch technical activities by CanSat team: -Replace dummy library with actual libraries -Link CanSat system to WIFI -Payload integration with CanSat Shield • Review of the rules, • Technical inspection of CanSat's by Jury, • Teams interviewing and promoting their products (if any) through LIVE STREAM/Media, • Assembling circuits and parachutes to the balloons by student teams, • Deployment/launch of CanSat's and recovery, • End of launch
	1:00PM GMT: LUNCH
	2:00 PM GMT: Post launch activities • Presentations/Technical Reports about mission's results (post-flight analysis) by one representative of each team • Preparation of CanSat Report (CR) by the rest of the team and submission
	3:00PM GMT: • Declaration of winners(s) / Prizes ceremony

	• Meetings/discussions/socializing • Project evaluation activities
	4:00 PM GMT: • Teams depart

After the launch of CanSats ALL teams must prepare and submit their CanSat Report (CR). The CR should be limited to a maximum of 10 pages and must summarize the work done before and during the launch of CanSats, with a special focus on the results obtained (data analysis etc.). All CRs then will be published by the CanSat Ghana and its Consortium to the international community. The CanSat Report (CR) must be submitted to the CanSat Ghana Team representative by the end of the day, 3:00 PM via USB flash drive or email (the email: cansatghana@gmail.com), stating the name of the team and high school (e.g., "TeamName_School_CR"). The document should be in a pdf format, using the following file name format: TeamName_HighSchool_CR.pdf. The form of the CR is defined by each team independently (free form). The content of the CR is not scored but its submission is mandatory! A team that does not submit a CR will be disqualified!

SCHOOLS AND MISSIONS

SCHOOLS	**MISSIONS**
OPOKU WARE SCHOOL	Mission 1: Environmental Data Collection
KOFI AGYEI SHTS	Mission 2: Atmospheric turbulence
METHODIST TECHNICAL INSTITUTE	Mission 3: Vertical temperature profiling
AFUA KOBI AMPEM GIRLS SENIOR HIGH SCHOOL	Mission 4: Environmental and Altitude Monitoring
OKUAPEMMAN SCHOOL	Mission 3: Vertical temperature profiling
SERWAA NYARKO GIRLS SHS	Mission 1: Environmental Data Collection

SCHOOLS AND TEAMS

SCHOOLS	**TEAMS**
OPOKU WARE SCHOOL	1. Gideon Oppong Kwabena 2. Ransford Paa Kofi Otoo 3. Emery Godspeed Nkrumah 4. Kelvin Adusei 5. George Asante Ansah
KOFI AGYEI SHTS	1. Sarkodie Lawrence 2. Ilham Mohamed 3. Anita Asare 4. Kwakye John Gyabaah 5. Amoah kelvin
METHODIST TECHNICAL INSTITUTE	1. Obeng Anokye Eugene 2. Sampana Yimbe 3. Adu Fosu Richmond

	4. Acheampong Akwasi Alex 5. Moro Razark
AFUA KOBI AMPEM GIRLS SENIOR HIGH SCHOOL	1. Ellen Ofori Mensah 2. Franklina Nyarko Ennin 3. Jessica Asuako 4. Davina Adomah Gyamfi 5. Issabella Amanie
OKUAPEMMAN SCHOOL	1. Gonyui Bismark 2. Omeri Manasseh Sasu 3. Nana Danso Asiam 4. Agyeman Kofi Agyapong 5. Nichole Eyram Dogbe
SERWAA NYARKO GIRLS SHS	1. Davida sackey 2. Christabel serwaa Amponsah 3. Ali Angela 4. Paulina Gyiwa 5. Sandra Obeng

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