



# CANSAT SATELLITE DESIGNING WORKSHOP, COMPETITION AND LAUNCHING ASSOCIATION WITH



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### 1. Scope

This document provides the rules for the 2017 Team America Rocketry Challenge.

### 2. Mission

We planned to provide nourishing and nurturing support to and a platform for students in a dual track and approach to make Science, Technology and Innovation exciting for students and encourage them to have an enduring interest both inside and outside classroom activities and to further the cause of progress, learning is forth coming time to come.

### 3. Vision

Transforming the nation into a developed country, by providing a realistic educational approach and create an innovative & creative minds for the growth of nation and realize the vision of developed nation. Hence the mode of this inspired vision will prove them a complete and successful innovation and put forward the pious sense of encouragement and solemn pride in their hearts and minds, permeated with pioneer ship and progress towards the path of their respective careers. Every generation is fascinated to explore about space and the endless mysteries of space science starting from planets, galaxies to the launching of satellites and various other space missions. The main aim of this workshop is to teach students about satellite designing followed by different subsystems used in satellite. In addition, we will teach students

about embedded system used in satellite, microcontroller, designing using software, different sensors and mechanical part. We designed the whole program so that students can start from basics to the high end development of satellite.

## **4. About CanSat**

A cansat is a small satellite having specific payload used to teach about space technology. It is similar to the technology used in miniaturized satellite. No Cansat has ever left the atmosphere, nor orbited the earth. The CanSat competition is a design-build-fly competition that provides teams with an opportunity to experience the design life-cycle of an aerospace system. The CanSat competition is designed to reflect a typical aerospace program on a small scale and includes all aspects of an aerospace program from the preliminary design review to post mission Review. The mission and its requirements are designed to reflect various aspects of real world missions including telemetry requirements, communications, and autonomous operations. Each team are scored throughout the competition on real-world deliverables such as Schedules, design review presentations, and demonstration flights.

## **5. Contest Rules**

The competition is in two phases.

### **PHASE -1**

#### **Team Allotment:**

Here in this workshop the team work play a very pivotal role. The team consists of a group of 5 members and working on different sub-systems. A team can share out their work as follows:-

- a) Circuit designing using Software - 1 Member
- b) Soldering the Circuits - 1 Member
- c) Programming the development board - 1 Member
- d) Parachute Making - 1 Member
- e) Assembly and Launching - 1 Member

#### **Task Allotment:**

##### ***Day 1 Task:-***

- Introduction
- Satellite Theory
- Electronics Theory
- Circuit Designing using Software, Gerber file and Problem statement
- Brain storming session
- Session on Rocketry
- Introduction about development board and Arduino

- Development Kit discussion
- CANSAT Circuit construction
- Soldering of circuit
- Interfacing of sensors
- Programming
- Parachute making
- Assembling

***Day 2 Task:-***

- Launching of Cansat using dropdown mechanism
- Retrieve of data (Post-Flight Review)

**PHASE-2**

Two winning team will get the chance to launch their Cansat through our Rocket(1km and 500mtrs) and Retrieve the data according to the problem statements given by The Cansat Committee Team.

***The Can-Sat will be judged based on the following parameters:-***

Question & Answers - Depending upon the question asked by trainers and answers given by teams

Software Designing – Accuracy in the Circuit designing and the problem statement

Soldiering – Perfection in the soldering of the circuit is the major parameter

Functionality – CANSAT must satisfy the objective

Launching – Perfect decent using parachute

Results – How accurate the results were after the landing.

The teams are required to follow these criteria while working on their Can-Sat models.

**6. Mission Objective**

The mission of the workshop would be to design a satellite that will be fit inside the small jar. The sensors should be outside the jar so that it can capture the environmental data and store the data in micro-controller. We can launch the satellite with the help of parachute using drop down mechanism. After receiving the CANSAT we can retrieve data from memory of micro-controller. Each CanSat will have a parachute with which it will descend at a velocity between 3 m/s to 5 m/s. The circuit has to be designed for the following objectives:-

- i. Temperature of Environment
- ii. Humidity in Environment
- iii. Light Intensity measure in Voltage
- iv. Object detection and distance measurement using IR sensor
- v. Data retrieving process- All circuitry has to fit into the CAN and all values will be stored in the EEPROM of the Micro-controller. The data packets should be stored in the EEPROM in