

## COMMAND FOR THE CATASTROPHE

presented by EESA

### OVERVIEW

Internet of Things (IoT) is an ecosystem of connected physical objects that are accessible through the internet. The 'thing' in IoT could be a person with a heart monitor, or an automobile with built-in-sensors, i.e., objects that have been assigned an IP address and have the ability to collect and transfer data over a network without manual assistance or intervention. The embedded technology in the objects helps them to interact with internal states or the external environment, which in turn affects the decisions taken. (Reference: [IoT Info](#))

Internet of Things can connect devices embedded in various systems to the internet. When devices/objects can represent themselves digitally, they can be controlled from anywhere. The connectivity then helps us capture more data from more places, ensuring more ways of increasing efficiency and improving safety and IoT security.

IoT is transformational forces that can help companies improve performance through IoT analytics and **IoT Security** to deliver better results. Businesses in the utilities, oil & gas, insurance, manufacturing, transportation, infrastructure and retail sectors can reap the benefits of IoT by making more informed decisions, aided by the torrent of interactional and transactional data at their disposal.

Watch a short video on IoT: [Fundamentals of the Internet of Things \(IoT\)](#)

### Basics about the form of competition:

The main feature of Arduino is that it provides many low level libraries, so while programming, you only have to think of the application part of your project. When doing a project on IoT, you obviously need some hardware to connect to Internet. We give participants the choice of their hardware, for example:

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2017

6<sup>th</sup> - 7<sup>th</sup> OCTOBER



K.J. Somaiya College of Engineering,  
Vidyavihar, Mumbai-77  
(Autonomous College, Affiliated to University of Mumbai)

- Any Arduino board (Arduino Uno or Mega recommended) & WIFI shield.
- Any Arduino board (Arduino Uno or Mega recommended) & ESP8266 module.
- Any Arduino board (Arduino Uno or Mega recommended) & GSM shield. (Note: check specifications of GSM Module before hand & this is least preferred)
- Stand-alone ESP8266 chip (Lua Script with NodeMCU firmware or Micro Python)
- NodeMCU ESP8266 (programming with Arduino IDE(C++)). (Tutorials for the same: [Quick start to NodeMCU](#)) (Highly Recommended)

*Note: Other than Arduino, you can also use any micro-controller, IDE of your choice to program it, and any form of hardware to connect to internet, provided it should fall under the category of above mentioned devices. If you don't have your hardware, we will provide you with the NodeMCU ESP8266 compatible with the Arduino IDE (Option 5). ETHERNET shield is not recommended, as we cannot provide you with wired LAN connection.*

## **RULES**

The competition is all about using IoT to complete a task given to you, in limited time, given on the spot at the time of event. You will be given points based on your innovation and how effectively you use IoT to complete the given task. Points will also be given on the basis of:

- How many different platforms you explore and use in your project in given amount of time. (For example: Using ThingSpeak, or any Phant server, sending notifications on smart phone, etc.). The more you add different platforms, obviously to support your given task, the more points you gain.
- You can use different Arduino Libraries, open source projects, refer the internet, but everything within the given time only.
- We will arrange a final common setup, where you can test your project, but number of attempts to test your project on the final setup will be limited, and use of more number of attempts will cause reduction in your scored points. But, we will provide you with individual LEDs, Switches, Wires and Bread Board, which will be with you throughout the event and you can use it to test your project or as a debugging tool, and here the number of attempts will not be limited! You can use it how much ever you want.

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- If you are able to achieve a two-way control, (for example: getting a notification when an event occurs, and controlling something remotely from a smartphone) then maximum points will be awarded.

### Note:

- Team cannot exceed 3 members.
- The decision given by referee will be final and no interference will be tolerated.

### Prerequisites:

- You should be aware of basic coding in Arduino & basics of IoT using Arduino.

### Basic of NodeMCU:

NodeMCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term "NodeMCU" by default refers to the firmware rather than the dev kits. The firmware uses the Lua scripting language. It is based on the eLua project, and built on the Espressif Non-OS SDK for ESP8266. It uses many open source projects, such as lua-cjson and spiffs.

As Arduino began developing new MCU boards based on non-AVR processors like the ARM/SAM MCU and used in the Arduino Due, they needed to modify the Arduino IDE so that it would be relatively easy to change the IDE to support alternate tool chains to allow Arduino C/C++ to be compiled down to these new processors. They did this with the introduction of the Board Manager and the SAM Core. A "core" is the collection of software components required by the Board Manager and the Arduino IDE to compile an Arduino C/C++ source file down to the target MCU's machine language. Some creative ESP8266 enthusiasts have developed an Arduino core for the ESP8266 Wi-Fi SoC that is available at the GitHub ESP8266 Core webpage. This is what is popularly called the "ESP8266 Core for the Arduino IDE" and it has become one of the leading software development platforms for the various ESP8266 based modules and development boards, including NodeMCUs. For more information on all things ESP8266, check out the ESP8266 Community Forum on GitHub.

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Arduino core for ESP8266 WiFi chip project brings support for ESP8266 chip to the Arduino environment. It lets you write sketches using familiar Arduino functions and libraries, and run them directly on ESP8266, no external microcontroller required. ESP8266 Arduino core comes with libraries to communicate over WiFi using TCP and UDP, set up HTTP, mDNS, SSDP, and DNS servers, do OTA updates, use a file system in flash memory, work with SD cards, servos, SPI and I2C peripherals.

**Registration fee:** Rs. 120/- (Team of 3 or less)

**Prizes Worth:** Rs. 8000/-

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