

# 15B1WCI832: Intelligent System Architecture and Design

**Course Credit: 3**

**Semester: VIII**

## **Introduction**

The Internet of Things (IoT) is a global network that links physical objects using Cloud computing, web applications, and network communications. It allows devices to communicate with each other, access information on the Internet, store and retrieve data, and interact with users, creating smart, pervasive and always-connected environments.

Despite the Internet of Things being a relatively new concept, there are already a few open platforms available that enable remote and seamless management and visualization of sensor data: Cosm, Nimbits, and Thing Speak are just a few examples. And Arduino works with all of them.

The Arduino is an incredibly flexible micro-controller and development environment that cannot only be used to control devices, but can also be used to read data from all kinds of sensors. Its simplicity and extensibility, in addition to its great success and adoption by users, has led to the development of a variety of hardware extensions and software libraries that enable wired and wireless communication with the Internet. Arduino is the ideal open hardware platform for experimenting with the world of the Internet of Things.

### **Course Objectives (Post-conditions)**

#### **Knowledge objectives:**

This course will provide students with all the information they need to design and create their own Internet of Things (IoT) applications using the Arduino platform.

More specifically, they will learn:

1. About the Internet of Things and Cloud Computing concepts

About open platforms that allow students to store their sensor data on the Cloud (like Cosm, Nimbits and many more)

2. The basic usage of Arduino environment for creating their own embedded projects at low cost
3. How to connect their Arduino with their Android phone and send data over the Internet
4. How to connect their Arduino directly to the Internet and talk to the Cloud
5. How to reprogram their Arduino microcontroller remotely through the Cloud

#### **Application objectives:**

Make your Arduino with Intel Galileo talk to the world!

### **Expected Student Background (Preconditions)**

Computer Architecture

#### **Topics Outline:**

S NO	Topics	Hrs
1	The Internet of Things	03

2	The Basics of Sensors and Actuators	03
3	The Arduino Microcontroller Platform	04
4	Reading From Sensors	04
5	Talking to your Android phone with Arduino	04
6	Connecting Your Arduino to The Internet	03
7	Introducing Cosm As A Cloud Service	04
8	Introducing The Nimbits Public Cloud Server	03
9	Reprogram Your Arduino Remotely From The Cloud	04
10	What One Can Connect to the Cloud: Project Ideas	04
11	Internet of Things with Intel Galileo	04
12	Mini computers for IoT	04
	Total	42

### **References**

1. Building Internet of Things with the Arduino: by CharalamposDoukas
2. Exploring Arduino: Tools and Techniques for Engineering Wizardry by Jeremy Blum
3. Getting Started with Intel Galileo by Matt Richardson

### **Evaluation Scheme:**

S.No	Examination	Marks
1	T-1	15
2	T-2	25
3	T-3	35
4	*Internal Marks	25

\*Internal Marks Breakdown:

Assignments            9 marks (3x3)

Quizzes                 12 marks (3x4)

Regularity             4 Marks