

Project work/field work/ internships  
Name of Course: ARDUINO (PROJECT TYPE)  
Code: SEC B1  
DEPT: Physics  
2022-2023

# Criteria 1.3.2



## Serampore Girls College

13, T.C. Goswami Street,  
Serampore, Hooghly – 712201, West Bengal  
Re- Accredited by NAAC : Grade B (2nd Cycle)  
Email: [serampore\\_girls\\_college@yahoo.co.in](mailto:serampore_girls_college@yahoo.co.in)  
Website: [www.seramporegirlscollege.org](http://www.seramporegirlscollege.org)

# Serampore Girls' College

13, T.C. Goswami Street Serampore Hooghly - 712201 West Bengal

## NAAC Criteria 1.3.1



## PROJECT WORK REPORT 2022-2023

### REPORT ON PROJECT WORK OF Arduino SEC B -1 (PHYSICS)

Academic Session: 2022-2023

SEMSTER: IV ( GEN)

Name of Course: ARDUINO (PROJECT TYPE)

Code: SEC B1

**Location:** Serampore Girls' College, WEST BENGAL

**Course Objective:**

Students will learn

- 1. LED Blinking and fading. 2. Measurement of voltages (Below 5 V and above). 3. Interfacing 7 Segment display. 4. Construction of thermometer using LM35 or Others

**Date of report submission:** 25/06/2023 to 27/06/2023

**Duration:** 6 months ( 1 semester)

**students enrolled:** 4

**Student submitted:** 4

**Guided by:**

Dr. Sandip Majumdar ( Department of Physics, Serampore Girls' College)

**Course Outcome:**

- Students were able to learn basic projects using Arduino Uno kit.

*Sandip Majumdar*  
Head of the Department  
Department of Physics

*Soma Roy.*  
Principal  
Serampore Girls' College  
Serampore, Hooghly

## SEC B -1 (Technical Skill)

### 4.2 Arduino (Project type)

#### 4.2.1 Arduino

Paper PHS-A-SEC-B-TH	Credit 1
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##### 1. Introduction to Arduino

2 Lectures

Brief history of the Arduino; open-source electronics prototyping.

##### 2. Basic ideas

3 Lectures

Basic ideas of Arduino, Familiarize the Arduino board, Setting up the arduino board. Installation of IDE in PC/ laptop for Arduino programming(Sketch)

##### 3. Arduino Programming:

10 Lectures

###### (a) Program structure:

data types, variables and constants, operators, control statements, loops, functions, string.

###### (b) Interfacing:

serial communication, digital and analog input/output, getting input from sensors(e.g. temperature sensor, ultrasonic sensor etc)

##### Books and references

1. Arduino Cookbook, Michael Margolis, O'Reilly Media (2011)
2. Getting Started with Arduino, Massimo Banzi, O'Reilly Media(2009)
3. Arduino as a tool for physics experiments, Giovanni Organtini 2018 J. Phys.: Conf. Ser. 1076 012026
4. <https://www.arduino.cc/en/Guide/HomePage>
5. Physics Today 66, 11, 8 (2013); <https://doi.org/10.1063/PT.3.2160>
6. The Physics Teacher 52, 157 (2014); <https://doi.org/10.1119/1.4865518>

#### 4.2.2 Practical Projects

Paper PHS-A-SEC-B-PR	Credit 1
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1. LED Blinking and fading.

2. Measurement of voltages (Below 5 V and above).

3. Interfacing 7 Segment display.

4. Construction of thermometer using LM35 or Others.

5. Construct the experimental set up for studying simple pendulum and hence determine the acceleration's due to gravity.

6. Construct data logger for studying charging and discharging of RC circuit.

**NOTE: Software required: Arduino Integrated Development Environment, Hardware required: Arduino Uno**

## SEC B -2 (Knowledge Skill)

### 4.3 Electrical Circuits and Network skills (Theory)

PHS-A SEC-B -TH

Credit 2

#### 1. DC generator :

**10 Lectures**

(a) EMF generated in the armature for simplex lap and wave winding, concept of pole, Methods of Excitation, Armature reaction, Dc motor : Torque equation of D.C motor, speed & torque Operating Characteristics of separately excited, Shunt, Series & Compound motors with emphasis on application areas.

(b) Three phase generator, concept of stator and rotor, star and delta connections – their current voltage relationships (both line and phase current & voltage).

#### 2. Transformer :

**5 Lectures**

Types of transformer, basic emf equation, no load current, leakage inductance, Magnetising current and equivalent circuit of single phase transformer on no-load and on load, idea of star/star, star/delta, delta/star, and zig-zag connection of 3 phase transformer, 3 phase to 2 phase transformation, Scott T connection.

#### 3. AC motor

**6 Lectures**

(a) Single phase AC motor – double field revolving theory, slip-speed characteristics,

(b) Construction of 3 phase induction motor and its action using rotating field theory, equivalent circuit of induction motor, Speed control by V/f control of induction motor (block diagram only).

#### 4. Measurements and faults

**9 Lectures**

(a) Measurement of three phase power by two and three wattmeter method, theory of induction type wattmeter and its use as energy meter in domestic house. Megger.

(b) Unsymmetrical faults in distribution system, Common switchgear equipments like relay, circuit breakers and fuses, Simple oil circuit breaker and SF6 circuit breaker, Construction of protective relay in distribution bus-bar system, Block diagram of a utility distribution sub-station.

#### Reference Books

1. Text book on Electrical Technology (vol 1 & 2), Thereja and Thereja
2. Power System, V. K. Meheta
3. Electrical Machines, S. K. Bhattacharya

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## NAAC Criteria 1.3.1



### NOTICE FOR PROJECT ASSIGNMENTS

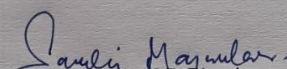
#### NOTICE FOR PROJECT PRACTICAL ASSIGNMENT

SEM IV Paper: Arduino

Code: SEC-B1

Subject : Physics

SI	Name	Roll	Name of the Project
1	Asiya Parvin	21344	LED Blinking and fading.
2	Moshahida	21351	Measurement of voltages (Below 5 V and above).
3	Shana Shahid	21366	Interfacing 7 Segment display
4	Nishu Bhagat	21355	Construction of thermometer using LM35 or Others

  
Signature of HOD Physics

College/Centre : SERAMPORE GIRLS COLLEGE (614)

Subject : PHSG

Course : SEC-B1

Subject Category : GENERAL

Assessment Type : Practical

Course Name : ARDRUINO

Foil No. : 1886

Srl No.	Roll Numbers	Registration Numbers	Signature of Candidates	[FM 60]	
				Marks Obtained	
				Examiner	Scrutineer
1	213614-12-0004	614-1211-0726-21	Nishu Bhagat		
2	213614-12-0015	614-1211-0739-21	Moshakida Tabassum		
3	213614-12-0036	614-1215-0747-21	Asiya Farvin		
4	213614-12-0037	614-1215-0749-21	Shana Sahid		

Signature of Internal Examiner(s)

Signature of Scrutineer(s)

Signature of Principal/TIC/OIC/HE with date &amp; seal

# PROJECT REPORT ON

## ARDUINO

Subject: Physics  
Paper: SEC  
Paper code: B1

Presented by:

NISHU BHAGAT  
CU Roll: 213614-12-0004  
Registration no:- 614-1211-0726-21  
College roll no;- 21355  
Semester: 4<sup>TH</sup>

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# PROJECT REPORT ON

LED Blinking and fading

Subject : Physics

Paper : Arduino

Paper : **PHSG**

Presented by,

**ASIYA PARVIN**

CU Roll No. : 213614-12-0036

Registration No. : 614-1215-0747-21

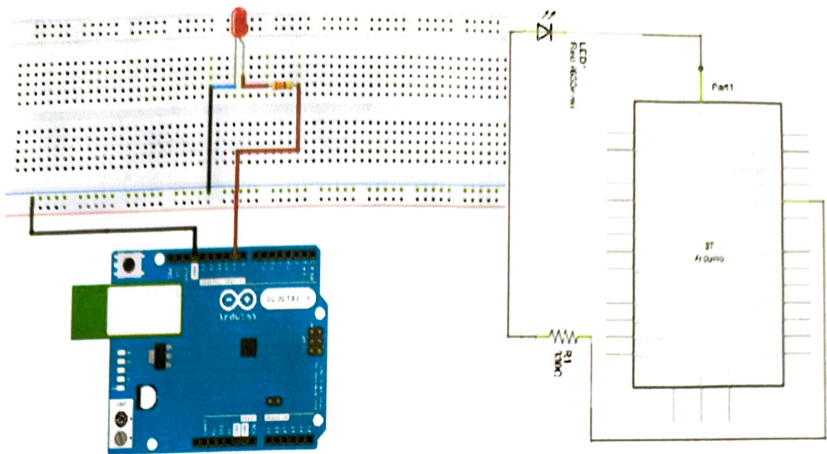
College Roll No. : 2130144

Semester : 4<sup>th</sup>

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NOTE - To find out the polarity of an LED, look at it closely. The shorter of the two legs, towards the flat edge of the bulb indicates the negative terminal.

Components like resistors need to have their terminals bent into 90° angles in order to fit the breadboard sockets properly. We can also cut the terminals shorter.

