

*Rayat Shikhan Sanstha's*  
**D. P. Bhosale College, Koregaon**  
**Department of Physics**  
**Skill Based Course -2019-2020**  
**Laboratory Equipment Training**  
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Head  
Department of Physics  
D. P. Bhosale College, Koregaon

*Rayat Shikhan Sanstha's*  
**D. P. Bhosale College, Koregaon**  
**Department of Physics**  
**Skill Based Course -2019-2020**  
**Laboratory Equipment Training**

Date :- 09/12/2019

To,  
The Principal,  
D.P. Bhosale College, Koregaon

Subject : - About Skill Based Course

Respected Sir,

The department of Physics is going to run Skill Based Course on  
“Laboratory Equipment Training” in academic year 2019-2020.

The course will be implemented according to university norms.

Thanking you.



Yours faithfully,

  
Head  
Department of Physics.

*Rayat Shikhan Sanstha's*

**D. P. Bhosale College, Koregaon**

**Department of Physics**

**Skill Based Course -2019-2020**

*Autonomous (Self Financed) Skill Based course.*

*Laboratory Equipment Training*

**Objectives of the course :**

- To understand and describe the efficient management of the laboratory, including personnel, facilities, equipment, supplies and reagents.
- To describe the importance of lab management protocols and written procedures in lab work.
- To distinguish the basics of the ideal laboratory practices vs the best laboratory management principles.
- To understand the need to keep good lab documentation: raw data, final reports and archives in the laboratories.
- To distinguish the quality assurance in the laboratory work environment and management.
- To build the understanding and capacity of laboratory equipments.
- To understand the general safety of electricity.
- Able to Understand the general safety of electrical tools.
- Able to Soldering & disordering .
- Able to Identify different electrical & electronic components.

**Outcome of the course -**

- Laboratory Appliances Technician

### Reference Books:-

1. Essentials Of Physics Laboratory Training : Rajesh B. Khaparde
2. Training in Experimental Physics through Demonstrations and Problems : Rajesh B. Khaparde
3. Theraja, B. L., "A text book in Electrical Technology", S. Chand and Co., India, 2005, 23e.
4. Sawhney, A. K., "Electrical and Electronic Measurements and Instruments", Educational and Technical Publishers, India, 1983, 4e.
5. Sudhakar, A., Palli, S.S., "Circuits and Networks: Analysis and Synthesis", McGraw Hill, India, 2015, 5e.
6. Ghosh, A.K., "Introduction to Measurements and Instrumentation", PHI Learning Pvt. Ltd., India, 2009, 3e.
7. Workshop, B.L., Flint, H.T., "Advanced Practical Physics for Students", Methuen & Co., Ltd., London, 1962, 9e.
8. Prakash, I. & Ramakrishna, "Text Book of Practical Physics", Kitab Mahal, India, 2011, 11e

### Board of Studies-

1. Dr. R. K. Nimat (Babasaheb Desai College, Patan)
2. Dr. S. H. Mujawar (Yashwantrao Chavan Institute of Science, Satara)
3. Dr.V. S. Jamadade
4. Miss. A. B. Khandare
5. Mr.S. L. Jadhav



*Rayat Shikhan Sanstha's*  
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**Department of Physics**  
**Skill Based Course -2019-2020**

*Autonomous (Self Financed) Skill Based Course.*  
*Laboratory Equipment Training*

- |                           |   |
|---------------------------|---|
| 1. Eligibility            | : XII std. pass.  |
| 2. Duration of Course     | : 3 Month.  |
| 3. No. of Students        | : 20  |
| 4. Admission fee          | : Rs.- 500 /-(Five hundred )  |
| 5. Examination            | : Theory (50 marks),<br>: Practical (40 marks)<br>For Practical- Journal – 10 marks.<br>: Total 100 marks.        |
| 6. Faculty                | : Dr. V.S. Jamadade<br>: Mr. Jadhav. S.L<br>: Mr. Kadam. P. S.<br>: Miss. Khandare A.B.<br>: Mrs. Bhandekar S. S. |
| 7. Coordinator            | : Mrs. Bhandekar S. S.  |
| 8. Co-Coordinator         | : Miss. Khandare A.B.   |
| 9. Head of the Department | : Dr. V. S. Jamadade  |
| 10. Director              | : Principal, D. P. Bhosale College, Koregaon.   |



*[Signature]*  
Head  
Department of Physics  
D. P. Bhosale College, Koregaon

*Rayat Shikhan Sanstha's*  
**D. P. Bhosale College, Koregaon**  
**Department of Physics**  
**Skill Based Course -2019-2020**  
**Laboratory Equipment Training**  
**Student Admission List**

Sr.No.	Class	Full Name	Mobile
1	B.Sc-III	Awale Pooja Sanjay	8829193838
2	B.Sc-III	Barge Madhuri Sharad	9499196983
3	B.Sc-III	Barge Snehal Sudhir	9422023342
4	B.Sc-III	Bhosale Sanika Dashrath	7038809705
5	B.Sc-III	Bhosale Sanjeevani Prakash	7776838805
6	B.Sc-III	Chavan Akshay Rajendra	9137756199
7	B.Sc-III	Desai Rajat Vinayak	9773714714
8	B.Sc-III	Gadhane Vaibhavi Vishram	7559129622
9	B.Sc-III	Ghorpade Prerana Anandrao	7499577411
10	B.Sc-III	Ghorpade Rutuja Ananda	8999006360

11	B.Sc-III	Gogawale Bharati Sudam	8975007565
12	B.Sc-III	Jadhav Vikrant Shrikant	7058151060
13	B.Sc-III	Kadam Akash Namdeo	945864867
14	B.Sc-III	Pawar Kiran Tukaram	7754684646
15	B.Sc-III	Shinde Monali Prakash	705644454



  
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 Department of Physics  
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*Rayat Shikhan Sanstha's*  
**D. P. Bhosale College, Koregaon**  
**Department of Physics**  
**Skill Based Course -2019-2020**  
**Laboratory Equipment Training (30 Hrs.)**  
**Syllabus (Theory)**

**1. BASICS OF MEASUREMENTS:**

Need for instrumentation, General instrumentation system, Static and dynamic characteristics of instruments, loading effects of series and shunt connected instruments, Calibration of instruments, Errors in measurements.

**2. ANALOG AND DIGITAL INSTRUMENTS**

DC galvanometer, voltmeter, ammeter, PMMC and moving iron instruments, AC millivoltmeter, DC potentiometer, Digital Multi-meter, Specifications of a multimeter and their significance, Specifications of an Electronic Voltmeter, Comparison of analog and digital instruments.

**3. BRIDGE CIRCUITS AND VIRTUAL INSTRUMENTATION**

DC bridges: Current sensitive and voltage sensitive bridges, Null type and deflection type bridge circuits, Applications of DC bridges. AC bridges (Qualitative treatment), Detectors for AC bridges, Applications of AC bridges. Introduction to virtual instrumentation.

## Syllabus (Practical)

Sr. No.	Title of Experiments
1	Conversion of ammeter into voltmeter.
2	Assemble simple DC circuit containing resistors and voltage source. Use a digital multi-meter to measure the voltage, current and resistance across various components. Predict the loading effect caused by the use of a DC voltmeter and a DC ammeter
3	Calibration of galvanometer into ammeter and voltmeter.
4	To design a multirange ammeter and voltmeter.
5	To measure unknown voltage using DC potentiometer.
6	To design a Wheatstone bridge.
7	To determine an unknown Low Resistance using Carey Foster's Bridge.
8	To compare capacitances using de Sauty's bridge.

*Rayat Shikhan Sanstha's*  
**D. P. Bhosale College, Koregaon**  
**Department of Physics**  
**Skill Based Course -2019-2020**  
**Laboratory Equipment Training**  
**Schedule of the Course**

Sr. No.	Day & Date	Time	Title of Theory/Experiment	Faculty Name
1	Thursday 12/12/2019	10:00 a:m to 12:00 a:m	Basics Of Measurements	Mr. Jadhav. S.L
2	Friday 13/12/2019	10:00 a:m to 12:00 a:m	Conversion of ammeter into voltmeter.	Mrs. Bhandekar S. S.
3	Thursday 19/12/2019	10:00 a:m to 12:00 a:m	Basics Of Measurements	Mr. Jadhav. S.L
4	Friday 20/12/2019	10:00 a:m to 12:00 a:m	Assemble simple DC circuit containing resistors and voltage source. Use a digital multi-meter to measure the voltage, current and resistance across various components. Predict the loading effect caused by the use of a DC voltmeter and a DC ammeter	Dr. V. S. Jamadade
5	Thursday 26/12/2019	10:00 a:m to 12:00 a:m	Analog And Digital Instruments	Miss. Khandare A.B.
6	Friday 27/12/2019	10:00 a:m to 12:00 a:m	Calibration of galvanometer into ammeter and voltmeter.	Mrs. Bhandekar S. S.
7	Thursday 02/01/2020	10:00 a:m to 12:00 a:m	Analog And Digital Instruments	Miss. Khandare A.B.

8	Friday 03/01/2020	10:00 a:m to 12:00 a:m	To design a multirange ammeter and voltmeter.	Dr. V. S. Jamadade
9	Thursday 09/01/2020	10:00 a:m to 12:00 a:m	Analog And Digital Instruments	Miss.Khandare A.B.
10	Friday 10/01/2020	10:00 a:m to 12:00 a:m	To measure unknown voltage using DC potentiometer.	Mr. Jadhav. S.L
11	Thursday 16/01/2020	10:00 a:m to 12:00 a:m	Bridge Circuits And Virtual Instrumentation	Mr. Kadam. P. S.
12	Friday 17/01/2020	10:00 a:m to 12:00 a:m	To design a Wheatstone bridge.	Miss.Khandare A.B.
13	Thursday 23/01/2020	10:00 a:m to 12:00 a:m	Bridge Circuits And Virtual Instrumentation	Mr. Kadam. P. S.
14	Friday 24/01/2020	10:00 a:m to 12:00 a:m	To determine an unknown Low Resistance using Carey Foster's Bridge.	Mr. Jadhav. S.L
15	Thursday 30/01/2020	10:00 a:m to 12:00 a:m	Bridge Circuits And Virtual Instrumentation	Mr. Kadam. P. S.
16	Friday 31/02/2020	10:00 a:m to 12:00 a:m	To compare capacitances using de Sauty's bridge.	Dr.V. S.Jamadade
17	Friday 20/03/2020	10:00 to 12:00 a:m	Offline Examinations	



*[Signature]*  
 Department of Physics  
 P. Bhosale College, Koregaon

*Rayat Shikhan Sanstha's*

**D. P. Bhosale College, Koregaon**

**Department of Physics**

**Question Paper - Theory**      **Marks:- 50**

**Name of Course :- Laboratory Equipment Training**

**Theory Exam : 2019-2020**

**Time :- 10:00 to 12:00 am**

**Date :-20/03/2020**

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**Question No. 1 – Choose the correct alternative from the following (18 marks)**

1. The desire to maintain a safe laboratory environment for all begins with\_\_\_\_\_?  
a. prevention                      c. microbiology  
b. ubiquity                         d. accidents
2. When a chemical splashes in the eye rinse for\_\_\_\_\_?  
a. 10 seconds                      c. 5 minutes  
b. 30 seconds                      d. 15 minutes
3. Which of the following type(s) of Personal Protective Equipment (PPE) is frequently used?  
a. Safety glasses                  d. Gloves  
b. Lab Coats                        e. All of the above  
c. Face Shields
4. Chemical, reagents or broth cultures should be pipetted by\_\_\_\_\_?  
a. mouth                            c. pipetter  
b. ear                                 d. nose
5. Good work practices include,  
a. smelling and tasting chemicals  
b. not washing hands before and after lab  
c. confining long hair and loose clothing  
d. using damaged equipment and glassware.

6. What is the name of the procedure performed under sterile conditions to eliminate contamination in hopes to obtain a pure culture of one type of microorganism?

- a. sterilization technique      c. disinfectant technique
- b. aseptic technique      b. pathogen technique

7. After a biohazard spill is covered with paper towels and disinfectant solution, it must sit for \_\_\_\_\_ minutes?

- a. 5      c. 60
- b. 30      d. 20

8. .... is needed as a source of nutrient for the growth and reproduction of microbes.

- a. pathogens      c. reagents
- b. bacteria      d. media

9 To prevent the contamination of microscopes and surrounding areas disinfect/clean used slides, prepared by student, with

- c. 70% ethanol and lens paper      b. acetone and lens paper
- d. 5% methylene blue and lens paper      d. water and lens paper

## Question No. 2: True/False

(18 marks)

1. Virulent strains of microorganisms are used in your laboratory?
2. You should always wash your hands before and after lab.
3. Food and drinks are allowed in the lab.
4. Lab coats must be taken off when exiting the lab and entering a non-laboratory area.
5. Good Laboratory Practice (GLP) is a method employed in a laboratory setting to prevent contamination, accidents and injuries.

6. Following Good Laboratory Practices should only be used when your instructor reminds the class to do so.

7. Cell phones can be used in lab if the instructor is not talking.

8. Students must know the location of all safety equipment.

9. It is good practice to carry the microscope with one hand.

**Question No. 3: Short Answer**

**(14 marks)**

1. What are the 3 most common ways accidents or incidents occur in the laboratory?

2. Identify **one** safety violation in the picture.



3. What type of solution(s) should be used to disinfect a bench top before and after lab?

4. The sign below indicates what type of safety hazard?



5. The sign below indicates what type of safety hazard?



6. Identify **one** safety violation in the picture.



7. Write down applications of material science.

*Rayat Shikshan Sanstha's*  
**D. P. Bhosale College, Koregaon**  
**Skill Based Course on**  
**Laboratory Equipment Training**  
**Examination Marksheet-2019-20**

Sr.No	Name of Student	Result	Grade
1	Awale Pooja Sanjay	PASS	B
2	Barge Madhuri Sharad	PASS	A
3	Barge Snehal Sudhir	PASS	A
4	Bhosale Sanika Dashrath	PASS	A
5	Bhosale Sanjeevani Prakash	PASS	A
6	Chavan Akshay Rajendra	PASS	A
7	Desai Rajat Vinayak	PASS	B
8	Gadhawe Vaibhavi Vishram	PASS	A
9	Ghorpade Prerana Anandrao	PASS	A
10	Ghorpade Rutuja Ananda	PASS	A
11	Gogawale Bharati Sudam	PASS	A
12	Jadhav Vikrant Shrikant	PASS	B
13	Kadam Akash Namdeo	PASS	A
14	Pawar Kiran Tukaram	PASS	A
15	Shinde Monali Prakash	PASS	A

  
Miss. Khondare A.B.



  
Head  
Department of Physics  
D. P. Bhosale College, Koregaon



Rayat Shikshan Sanstha's

**D. P. BHOSALE COLLEGE, KOREGAON**



## **SKILL BASED COURSE**

### **Certificate**

This is to certify that Mr./Miss. Awale. Pooja. Sanjay.....

CLASS : B.Sc. - III..... SUBJECT Physics.....

has successfully completed three months "**Skill Based Course**" in.....

..... Laboratory... Equipment... Training.....

From 2019..... to 2020..... and obtained A..... Grade.

  
Chairman





Course Co-ordinator



Principal



Rayat Shikshan Sanstha's

**D. P. BHOSALE COLLEGE, KOREGAON**



## **SKILL BASED COURSE**

### **Certificate**

This is to certify that Mr./Miss. Bhosale..Sanjeevani..Prakash.....

CLASS : .....BSc. - III.....SUBJECT.....Physics.....

has successfully completed three months "Skill Based Course" in.....

.....Laboratory...Equipment...Training.....

From .....2019.....to .....2020.....and obtained .....A..... Grade.

  
Chairman



  
Course Co-ordinator

  
Principal

# Skill Based Course

Laboratory Equipment

Rayat Shikshan

Class ..... Bsc. 3rd ..... Paper No- .....

D.P.BHOSALE

Name of the teacher- .

Training

**STUDENTS**

Month .... December ..... 2019

Roll No.	Name of the Student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Awale Pooja Sanjay												P	P				
2	Barge Madhuri Sharad												P	A				
3	Barge Snehal Sudhir												P	P				
4	Bhosale Sanika Dashrath												P	P				
5	Bhosale Sanjeevani Prakash												P	P				
6	Chavan Akshay Rajendra												A	P				
7	Desai Rajat Vinayak												P	P				
8	Gadhawe Vaibhavi Vishram												P	P				
9	Ghorpade Prerana Anandran												P	P				
10	Ghorpade Rutuja Ananda												P	A				
11	Gogawale Bharati Sudam												P	P				
12	Jadhav Vikrant Shrikant												P	P				
13	Kadam Akash Namdeo												P	P				
14	Pawar Kiran Tukaram												P	P				



**Head**  
Department of Physics  
D. P. Bhosale College, Koregaon

*Miss. Khondake A.B.*



1 Laboratory

## Equipment

## Training

December 2019

[illegible]

Skill Based course

Class Bsc. Biol. Paper No. 16

Name of the teacher-

Roll No. Name of the Student

- 1) Awale Pooja Sanjay
- 2) Barge Madhuri Sharad
- 3) Barge Snehal Sudhir
- 4) Bhasale Sanika Dhashrat
- 5) Bhasale Sanjeevani Pratik
- 6) Chavan Akshay Rajendra
- 7) Desai Rajat Vinayak
- 8) Gadhave Vaibhavi Vishu
- 9) Ghorpade Prerana Anant
- 10) Ghorpade Rutuja Anand
- 11) Gagawale Bharati Sudo
- 12) Tadhai Vikrant Shrikant
- 13) Kadam Akash Namde
- 14) Pawar Kiran Tukaram

Skill Based course

Laboratory Equipment Training

Month January 2020 Working Days Jan 2020

Month <u>January</u> 2010																Working Days <u>Jan 2010</u>																Total Present Days
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
								P	P													P	P						P	P		
								P	P													P	P						P	P		
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								P	P													P	P						P	P		
								P	P													P	P						P	P		

Miss. Khadare A. B.



Dep. Head of Physics  
D.P. BHOSALE COLLEGE, KOREGAON

Miss. Khadare A. B.



Dep. Head of Physics  
D.P. BHOSALE COLLEGE, KOREGAON

Hea

Head of the Department

Teacher