

Shri Balaji Sansthan Deulgaon Raja's

# SHRI VYANKATESH ARTS, COMMERCE & SCIENCE COLLEGE

Deulgaon Raja - 443 204, Dist. Buldana (M.S.)

NAAC RE-ACCREDITED AT 'B' LEVEL

■ Affiliated to SGBAU, Amravati ■ College Code No. 309 ■ UGC Recog. U/S 2 (F) & 12 (B)

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E-mail : svcollege3@rediffmail.com / svacc309@sgbau.ac.in Website : www.svcdraja.org

CELEBRATED GOLDEN JUBILEE YEAR  
1967-2017



PRINCIPAL'S  
CONTACT

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E-mail : drgbjadhao@rediffmail.com

**Dr. G.B. Jadhav**

(M.A., M.Phil., Ph.D.)

PRINCIPAL

Outward No. SVC / .....

## MEMORANDUM OF UNDERSTANDING (MoU)

### BETWEEN

SHRI VYANKATESH ARTS, COMMERCE & SCIENCE COLLEGE, DEULGAON RAJA.

AND

SHRI SHIVAJI SCIENCE AND ARTS COLLEGE, CHIKHALI.

This Memorandum of Understanding entered into on date 10/10/2018 between Dept. of Microbiology, Shri Vyankatesh Arts, Commerce & Science College, Deulgaon Raja and Dept. of Microbiology, Shri Shivaji Science And Arts College, Chikhali. Herewith agree to work together for collaborative activities with aims and objectives mentioned below.

1. Cooperate in the exchange of information relating to their activities in teaching and research and in the fields of mutual interests.
2. The teaching faculty would be exchanged as per the requirement to impart academic information in related subject.
3. The departmental library facility and other resources would be made available to the faculty and students of the both institutes concerned.
4. Deliberation with undergraduate students regarding career avenues and personality development.
5. Arranging special talks.

The MoU shall remain effective for five years from the date of inception and then shall be renewed thereafter as per the needs.

Witnesses:

Sr. No.	Name of Witness	Designation	Signature
01	Dr.A.M.Garode	Professor & Head	
02	Mr.S.N.Mendhe	Associate Professor	
03	Mr.P.B. Pawar	Assistant Professor & Head	
04	Mr. D. M. Shimbre	Assistant Professor	

Principal

PRINCIPAL  
Shri Vyankatesh Arts, Comm &  
Science College, Deulgaon Raja  
Dist. Buldana, Pin-443204



Principal

Principal  
Shri Shivaji Science & Arts College  
(Dist. Buldana)

Add on Course



**Shri Shivaji Science & Arts College,  
Chikhli, Dist. - Buldana**



# Department of Microbiology

**Report**

**Online Add on Course**

**on**

**Bacteriological Analysis of Water**



Duration: 18/05/2022 to 25/05/2022

Time: 10.00 to 4.00 P.M.

**Academic year: 2021-22**




# Brochure of the Course

 **Shri Shivaji Education Society Amravati's**  
**Shri Shivaji Science and Arts**  
**College, Chikhli.**  
NAAC Reaccreditation B++ With 2.82 CGPA 


**Department of Microbiology**

Cordially invite you to join  
**One Week Add on Course**  
on  
**Bacteriological Analysis of Water**  
**18 May to 24 May 2022**  
Time : 10 AM

**Chief Organizer**



**Dr. O. S. Deshmukh**  
**Principal**



**Prof. S. N. Mendhe**  
**Head,**  
**Department of Microbiology**

**Activity: Online Value Added Course on Online Value Added Course on Bacteriological Analysis of Water.**

**Aim:** To aware the importance of bacteriological analysis of water and train the students for analysis.

**Notice:** Leaflet and schedule of certificate course is attached with this report.

**Organizer:** Dr. O.S. Deshmukh

**Name of Convener:** Prof. S. N. Mendhe

**Name of organizing Secretary:** Prof. S. N. Mendhe

**Organizing Committee:** Prof. D. L. Gavande

**Number of Registered Students for Course -**

**Activity Taken:** Department of Microbiology, Shri Shivaji Science & Arts College Chikhli, organized Add on Course on Bacteriological Analysis of Water during duration 18/05/22 to 25/05/22. We have prepared syllabus of theory and practical. We also prepared schedule of 30 hours for conducting theory and practical. As per Schedule of Certificate course, certificate course started on 18/05/22 on 10.00 A.M. with brief introductory speech of Prof. S. N. Mendhe, Head of Department. Detailed related to conduction of certificate course, Schedule, Time table, Examination pattern, Passing Criteria explained by Prof. S. N. Mendhe. At 11.00 A. M. classes of Certificate course started. According to Schedule on each day 5 Hours workload is allotted to carry out Theory and Practical sessions. The course ended on 25/05/22 by completion of 30 Hours session. After Completion of Course, Examination of 40 Marks containing Theory, Practical and Assignment base conducted on 25/05/22 by online mode. On the basis of evaluation, students who have passed examination and filled feedback form allotted e-Certificate.

## Add on Course

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### About Institution

The college is established in 1967. Dr. Panjabrao Deshmukh & Dalitmitra Pandharinath Patil come together under the banner of Shri Shivaji Education Society, Amravati. It has upgraded itself with introduction of Arts and Commerce stream at UG & PG level. The research programs Ph.D. are added in Science, Arts & Commerce. Other than research facility YCMOU center, NCC & NSS Units are also available. Also new subject Home Economics is added at degree level. UGC Sponsored career Oriented Program & NSQF courses are key courses running to develop skill in students.

### Objective of the course

1. To develop basic understanding regarding contamination of water in the students.
2. To develop ability for testing bacteriological quality of water.
3. To enhance their skills about bacteriological analysis of water.

### Learning Outcome

As a result of participating in the value added course on “Bacteriological Assessment of Water” students will be able to learn and understands bacterial contamination of water. Students get knowledge to bacterial load of water and how to enumerate it and they may give suggestion to drinking water supplying agencies such as Nagar Parishad, Grampanchayat to apply measure for purification of water.

### Theory Syllabus

**Module 01:-** • Collection and Handling of water sample from various sources (02 Lectures)

**Module 02:-** • Indicators of excretal pollution. (01 Lecture)

**Module 03:-** • Multiple tube Dilution technique (MPN). (03 Lectures)

- IMViC classification of coliforms. (01 Lectures)

**Module 04:-** • Membrane Filter technique for Coliforms and Faecal Streptococci. (01 Lecture)



## Add on Course

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**Module 05:** - • ICMR and WHO standards of drinking water. (01 Lecture)

- Significance of bacteriological analysis of water. (01 Lecture)

### **Practical Syllabus**

1. Bacteriological analysis of water by Standard Plate Count Method. (06 Lectures)
2. Bacteriological analysis of water by Multiple Tube Dilution Technique for Coliforms (MPN) Presumptive test, Confirmatory test and Completed test. (06 + 06 + 06 Lectures)
3. Classification of Coliforms from water on the basis of IMViC classification. (06 Lectures)
4. Bacteriological analysis of water by Multiple Tube Dilution Technique for Faecal Streptococci. (06 Lectures)
5. Enumeration of Coliforms organisms by Membrane Filter Technique. (06 Lectures)

**Course Structure Course Name: - Bacteriological Analysis of Water.**

Number of Modules: 05

Number of Theory (Hours): 10

Number of Practical (Hours): 30

### **Examination Scheme**

Internal Marks: 20

Theory Marks: 40

Practical Marks: 40

Total Marks: 100

**Eligibility:** XII science/any graduate and post graduate Students can apply for the course.

**Course Fee: Not Applicable**

### **Important Instructions:**

- Registration is mandatory for enrol for this course.
- Lectures will be conducted on Zoom /Google meet platform.
- For the successful completion course it is mandatory for each participant to submit assignments on Google Classroom.
- At the end of course exam will be conducted.
- Each participant should score a minimum of 40% in total to avail course completion certificate.

Registration link: <https://forms.gle/kgKu8Tch2RXLcgVr8>

WhatsApp group link:

<https://chat.whatsapp.com/Kcl8W7huoEAKt1BExxHvpm>

Examination Link: <https://forms.gle/JxMnVEDVYDPq8HSf9>

Feedback Link: <https://forms.gle/9EpGR7ECrzFqLALw6>

Certificate Link: [drive-shares-dm-noreply@google.com](mailto:drive-shares-dm-noreply@google.com)

**Activity: Online Value Added Course on Online Value Added Course on Bacteriological Analysis of Water.**

**Aim:** To aware the importance of bacteriological analysis of water and train the students for analysis.

**Notice:** Leaflet and schedule of certificate course is attached with this report.

**Organizer:** Dr. O.S. Deshmukh

**Name of Convener:** Prof. S. N. Mendhe

**Name of organizing Secretary:** Prof. S. N. Mendhe

**Organizing Committee:** Prof. D. L. Gavande

**Number of Registered Students for Course -**

**Activity Taken:** Department of Microbiology, Shri Shivaji Science & Arts College Chikhli, organized Add on Course on Bacteriological Analysis of Water during duration 18/05/22 to 25/05/22. We have prepared syllabus of theory and practical. We also prepared schedule of 30 hours for conducting theory and practical. As per Schedule of Certificate course, certificate course started on 18/05/22 on 10.00 A.M. with brief introductory speech of Prof. S. N. Mendhe, Head of Department. Detailed related to conduction of certificate course, Schedule, Time table, Examination pattern, Passing Criteria explained by Prof. S. N. Mendhe. At 11.00 A. M. classes of Certificate course started. According to Schedule on each day 5 Hours workload is allotted to carry out Theory and Practical sessions. The course ended on 25/05/22 by completion of 30 Hours session. After Completion of Course, Examination of 40 Marks containing Theory, Practical and Assignment base conducted on 25/05/22 by online mode. On the basis of evaluation, students who have passed examination and filled feedback form allotted e-Certificate.



## Add on Course

### Participants:

### Number of Registered Students for Course - 11

The screenshot displays a Google Forms interface for a course registration form titled "Registration form for Add on Course on Bacteriological Analysis of Water". The form is currently in the "Responses" tab, which shows 11 responses. A red banner at the top of the response area indicates "Not accepting responses" with a toggle switch. Below this, there is a "Message for respondents" section. The interface includes tabs for "Questions", "Responses" (11), and "Settings". At the bottom, there are tabs for "Summary", "Question", and "Individual". A table titled "Who has responded?" is visible, with one entry showing the email "shubhamingke939@gmail.com". The Windows taskbar at the bottom shows the date as 18/05/2022 and the time as 2:40 PM.

### Day 1: Wednesday

18/05/2022

The online one week certificate course was inaugurated by the IQAC Coordinator of the college, Dr. V. U. Pochhi madam. In her inaugural address, he emphasized the importance of water quality of drinking water and its portability. The introduction of the resource person given by Prof. S. N. Mendhe, Head, Department of Microbiology. In this course there are two lectures per day and offline practical demo for the students.

### Lecture 1:

11:00 - 12:00 p.m.

The first lecture is delivered by the HOD of Microbiology Department, Shri Vyankatesh Science, Commerce and Arts College, Deulgaon Raja. He explained about MPN for Coliforms Presumptive test, Confirmatory test and Completed test.

## Add on Course

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### **Lecture 2:**

**11:00 - 01:00 p.m.**

The Second lecture is delivered by the HOD of Microbiology Department, Shri Shivaji Science and Arts College, Chikhli. He explained about the Collection, Handling, transportation and labeling of water samples.

### **Practical session:**

**2:00 - 4:30 p. m.**

Prof. S. N. Mendhe, Demonstrated how to collected water sample from different sources and Show the video of collection of water sample to the student about the practical work and students collected water sample from college campus for practical Bacteriological analysis of water by Standard Plate count Method. In this practical collected water samples are serially dilutes and last 03 dilutions are plated on Nutrient agar plate and allow to solidify and incubated at 37 °C for 24 hrs. After incubation no colonies are developed on Nutrient agar plate. It was concluded that tested water samples are free from bacterial contamination.

### **Day 2: Thursday**

**19/05/2022**

### **Lecture 1:**

**10:00 - 11:00 a. m.**

The first lecture is delivered by the Mr. G. G. Dhage, Microbiology Department, Shri Vyankatesh Science, Commerce and Arts College, Deulgaon Raja. He explained about the Treatment of Drinking water and Sewage water.

## Add on Course

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### **Lecture2:**

**11:00 – 12:00 p. m.**

The second lecture was delivered by Mr. S. N. Mendhe, Department of Microbiology, Shri Shivaji Science and Arts College, Chikhli. He explained about Sources of contamination of water, and Indicators of fecal pollution of water.

**Practical session: 2:00 - 4:30 p. m.**

Prof. S. N. Mendhe took a practical of MPN test for determination of contamination of water (Presumptive test).

At last vote of thanks was given by the Mr. D. L. Gawande and end of the Second day of the course.

**Day 3: Friday**

**20/05/2022**

### **Lecture 1:**

**10:00 – 11:00 a. m.**

The first lecture was delivered by Mr. S. N. Mendhe, Department of Microbiology, Shri Shivaji Science and Arts College, Chikhli. He explained about Multiple Tube Dilution techniques.

### **Lecture 2:**

**10.00 – 2.00**

The second lecture was delivered by Mr. S. N. Mendhe, Department of Microbiology, Shri Shivaji Science and Arts College, Chikhli. He explained about IMVic Classification of Fecal and non-fecal coliforms.



## Add on Course

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### **Practical session: 2:00 - 4:30 p. m.**

Prof. S. N. Mendhe took a practical MPN confirmatory test. In this practical the tubes which are positive in MPN presumptive test they are inoculated in BGLB broth tube and incubated at 37 °C for 24 hours.

This was the end of the Third day of the course.

### **Day 4: Saturday**

21/05/2022

#### **Lecture 1:**

**10.00 - 11.00 a. m.**

The first lecture is delivered by Dr. Amol S. Jadhao, Department of Microbiology, Shri Vyankatesh Science College, Deulgaon (Raja). He explained about Case study on Bacteriological analysis of water by MPN and H<sub>2</sub>S Method, Advantage and disadvantages of both the methods.

#### **Lecture 2:**

**11.00 – 12.00 p. m.**

The Second lecture is delivered by Mr. S. N. Mendhe, Department of Microbiology, Shri Shivaji Science and Arts College, Chikhli. He explains about MPN for fecal Streptococci.

### **Practical Session - 2:00 - 4:30 p. m.**

Prof. S. N. Mendhe took a practical MPN Completed test. In this practical the tubes which are positive in BGLB broth tube of confirmatory test they are inoculated on E. M. B. Agar plate and incubated at 37 °C for 24 hours after that if the Dark centered colonies with greenish metallic sheen appears on the medium then it is confirmed that the tested water sample is contaminated with fecal matter of human origin. If the colonies on the medium Reddish pink appears on E. M. B. Agar then tested water sample was contaminated with non-fecal coliforms.

In this practical we tested 10 water samples from students houses and found that, all water samples showed presence of non-fecal coliforms and MPN of ranges from 11

## Add on Course

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bacteria/ 100 ml. to 2400 bacteria / 100 ml. Tested water sample are found to be non-potable for drinking purpose.

This was the end of the Fourth day of the course.

### **Day 5: Monday**

23/05/2022

#### **Lecture 1:**

10.00 – 11.00 a. m.

The first lecture is delivered Mr. R. N. Ganbas, Department of Microbiology, Shri Vyankatesh Science College, Deulgaon (Raja). He explained about MFT method for Enumeration of Coliforms from Drinking water.

#### **Lecture 2:**

11.00 – 12.00 p. m.

The Second lecture is delivered by Mr. S. N. Mendhe, Department of Microbiology, Shri Shivaji Science and Arts College, Chikhli. He explains about MFT for fecal Streptococci.

#### **Practical Session: 2.00 to 4.30 p. m.**

Prof. S. N. Mendhe took practical of IMViC Classification of coliforms. In this practical four different media are prepared i. e. Trypton broth, MR – VP broth and Citrate agar slant and they are inoculated with bacterial culture which is obtained from MPN completed test. 10 sets are inoculated with cultures obtained from 10 water sample tested. It was found that all bacterial culture is non-fecal in origin.

## Add on Course

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**Day 6: Tuesday**

24/05/2022

**Lecture 1:**

**10.00 - 11.00 a. m.**

The first lecture is delivered by Mr. Mayur J. Thakare, Department of Microbiology, Shri D. M. Burungle Science College, Shegaon. He explained about Chlorination of water.

**Lecture 2:**

**11.00 - 12.00 p. m.**

The Second lecture is delivered by Mr. S. N. Mendhe, Department of Microbiology, Shri Shivaji Science and Arts College, Chikhli. He explained about ICMR and WHO standards of Drinking water and Significance of bacteriological analysis of water

**Practical Session: 2.00 to 4.30 p. m.**

Prof. S. N. Mendhe took a practical for Enumeration of Bacterial Count of water sample by Membrane Filter technique.

**Day 6: Wednesday**

25/05/2022

**Lecture 1:**

**10.00 - 11.00 a. m.**

The first lecture is delivered by Dr. Prasad Deshmukh, Department of Microbiology, Shri D. M. Burungle Science College, Shegaon. He explained about H<sub>2</sub>S method for determination of potability of water.



## Add on Course

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### **Practical Session: 1.00 to 4.00 p. m.**

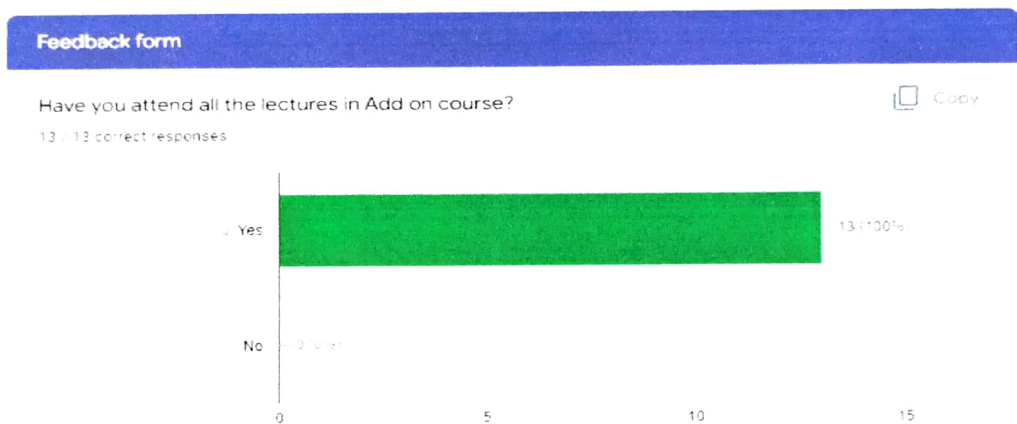
Mr. S. N. Mendhe took practical Determination of Residual chlorine by Orthotoludine reagent. In this practical different water samples are collected from different locality of Chikhli town and test Residual chlorine by OT test. All samples contain Permissible amount of Residual chlorine.

## Add on Course

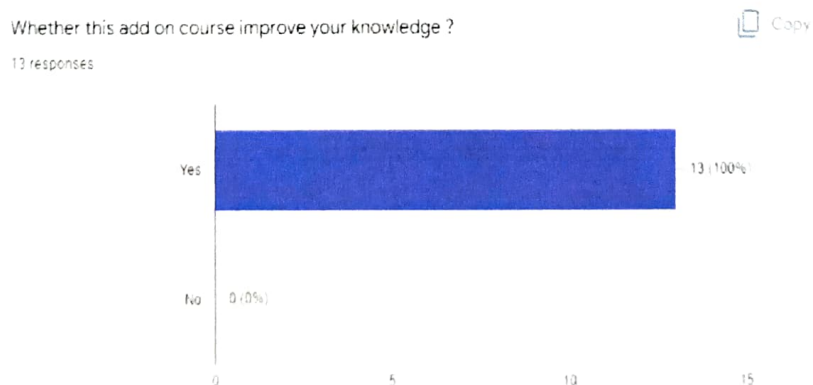
### Feedback Analysis

After completion of value added course feedback from all participant was collected through Google form. After the analysis of feedback form following observations were noted prominently

#### ❖ Overall Attendance of Students:



#### ❖ Whether Add on Course improve Knowledge:



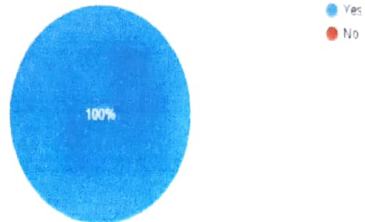
## Add on Course

### ❖ Effectiveness of Course content:

Whether course content are effective ?

13 responses

Copy

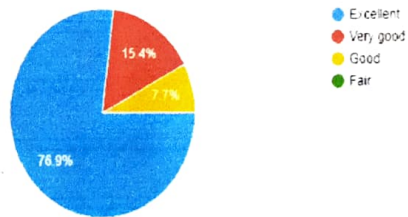


### ❖ About Speaker

Overall experience of speaker

13 responses

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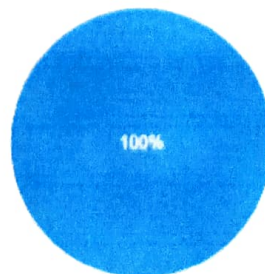


### ❖ Organization of Course

Whether course is well organized?

13 responses

Yes  
No



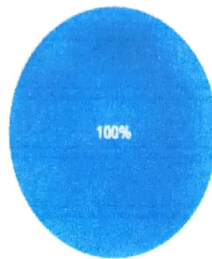


# Add on Course

Whether this add on course improves your skill in water analysis?

 Copy

13 responses

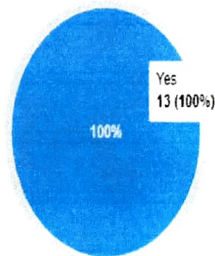


- Yes
- No
- Maybe

In future have you join such type of add on course?

 Copy

13 responses



- Yes
- No
- Maybe

### ❖ Action taken on Feedback Analysis

#### Suggestions, comments and Action taken:

- 1) We are improving our course content of certificate course as per student's feedback.
- 2) As per student feedbacks we have to plan organize such type events in future.
- 3) As per student request we have provide the course study material to students.
- 4) As per student suggestion we will organize course such course offline mode with practical approach.

Here I am submitting the brief **Activity Report** and **Action Taken Report** of Value Added Course on Bacteriological Analysis of Water.

**Registration link:** <https://forms.gle/kgKu8Tch2RXLcqVr8>

**WhatsApp group link:**

<https://chat.whatsapp.com/Kcl8W7huoEAKt1BExxHvpm>

**Examination Link:** <https://forms.gle/JxMnVEDVYDPq8HSf9>

**Feedback Link:** <https://forms.gle/9EpGR7ECrzFqLALw6>

**Certificate Link:** <drive-shares-dm-noreply@google.com>

## Add on Course



Shri Shivaji Education Society  
Amravati's  
Shri Shivaji Science and  
Arts College, Chikhli.  
Dist. Buldana.



Accredited by NAAC with B++ grade  
(CGPA 2.82)

Department of Microbiology  
Organized  
Add on Course on Bacteriological Analysis  
of Water

This is to certify that

{{Full Name}}

{{other identifiers}}

Has successfully participated in Add on Course on  
Bacteriological Analysis of Water. Organized by  
Department of Microbiology, Shri Shivaji Science and  
Arts College, Chikhli.

Certificate Issued on :  
{{date2}}

Certificate No:{{certificate ID}}

Prof. S.N. Mendhe  
Organizing Secretary  
Head, Microbiology

Dr. V.U. Pochhi  
Co-Convenor  
IQAC Coordinator

Dr. O.S. Deshmukh  
Convenor  
Principal

Course Coordinator

Prof. S. N. Mendhe  
Head  
Dept. of Microbiology  
Shri Shivaji Science & Arts College  
Chikhli, Dist. Buldana



Dr. Omraj S. Deshmukh  
Principal  
Shivaji Science & Arts College,  
Chikhli, Dist. Buldana