



Dempo Charities Trust's

DHEMPE COLLEGE OF ARTS & SCIENCE  
Miramar, Panaji-Goa

Determination of Physico-chemical and Microbiological parameters in drinking Water

### **CourseObjective:**

To enable students to acquire knowledge and to estimate the different Physico-chemical and biological parameters in drinking water so as to determine whether water is hygienically safe and fit for consumption. Students are encouraged to bring water samples from their locality for analysis.

### **CourseContents:**

- 1) Orientation course/ introduction to microbiological parameters of water.
  - 1.1 Water quality of drinking water
  - 1.2 Water quality standards
  - 1.3 Study of E.coli, Pseudomonas aeroginasa, and Salmonella Typhimurium
  - 1.4 Effect of micro-organisms on human health.(1.1,1.2-1hr and 1.3,1.4-1hr)
- 2) Microbiological techniques (practicals)
  - 2.1 Sterilization techniques-Autoclaving, drying of apparatus, making cotton plugs, Laminar air flow, traditional way b/w burner—6 hrs
  - 2.2 Preparation of nutrient broth, Agars-control and samples----7 hrs
  - 2.3 Inoculation of sample, incubation time and detection of presence---8 hrs
- 3)Introduction to chemical parameters of water:
  - 3.1 Sources of water supply
  - 3.2 Water standards for domestic use-physical characteristics such as turbidity, colour, and odour.
  - 3.3 Chemical characteristics such as pH, chlorides, hardness, phosphates, nitrates, total dissolved solids ,DO, total Fe content, Acidity, Alkalinity, sulphates, free CO<sub>2</sub> ,electrical conductivity.
  - 3.4 Aspects of water pollution.
  - 3.5 Treatment of water for domestic use.(3.1, 3.2, 3.3-----1 hr and 3.4, 3.5-1 hr)

4) Chemistry practicals:

4.1 –Determination of colour, odour, taste, pH, turbidity and total dissolved solids—2 hrs

4.2 Total Acidity, total Alkalinity, chlorides and free CO<sub>2</sub>—2 hrs

4.3 Total hardness, calcium content, sulphates and nitrates —2 hrs

4.4 Total Fe content, total phosphorous —2 hrs

**Course outcome:** Students after completing this course gain adequate knowledge to conduct analysis of water samples in their locality to test the potability of water and thus serve the community in the larger interests.

**References: ---**

1)--Handbook of Water and waste water analysis by Kanwaljit Kaur

2)-Physico-Chemical Examination of water, sewage and Industrial effluents

by N. Manivasakam

## NON CONVENTIONAL COURSE

### DETERMINATION OF PHYSICO-CHEMICAL AND MICROBIOLOGICAL PARAMETERS IN DRINKING WATER (CHEMISTRY & ZOOLOGY)

#### ATTENDANCE SHEET (Lecture)

13/04/17 (1 hour) 12:30-1:30pm

9:30-10:30am  
18/04/17

12:00 to 1:30p  
18/04/17

Sr. No	Name of student		
1	Rukmini Chimoji	<i>Rukmini</i>	<i>Rukmini</i>
2	Deva Kumari Devalota	<i>A</i>	<i>A</i>
3	Soniya Salgaonkar	<i>Salgaonkar</i>	<i>Salgaonkar</i>
4	Priya Suroji	<i>Priya</i>	<i>Priya</i>
5	Akshada Khandeparkar	<i>Akshada</i>	<i>Akshada</i>
6	Saishree Kotkar	<i>Saishree</i>	<i>Saishree</i>
7	Shradha Walavalkar	<i>Shradha</i>	<i>Shradha</i>
8	Karishma Kalangutkar	<i>A</i>	<i>Karishma</i>
9	Amrita Naik	<i>A</i>	<i>Amrita</i>
10	Sybil Pereira	<i>Sybil</i>	<i>Sybil</i>
11	Adisha Narvekar	<i>Adisha</i>	<i>Adisha</i>
12	Sunidhi Kurtikar	<i>Sunidhi</i>	<i>Sunidhi</i>
13	Gigi Fernandes	<i>Gigi</i>	<i>Gigi</i>
14	Sherin Saji	<i>Sherin</i>	<i>Sherin</i>
15	Prathmesh Fal Dessai	<i>Prathmesh</i>	<i>Prathmesh</i>
16	Alisha A. Naik	<i>Alisha</i>	<i>Alisha</i>
17	Mamidi Dayamani	<i>Mamidi</i>	<i>Mamidi</i>
18	Arti M. Gaude	<i>A</i>	<i>Arti</i>
19	Manjusha R. Madkaikar	<i>Manjusha</i>	<i>Manjusha</i>
20	Rohini R. Bhikoji	<i>Rohini</i>	<i>Rohini</i>
21	Gautami Khandeparkar	<i>Gautami</i>	<i>Gautami</i>

*Sundhi*  
13/04/17

*[Signature]*  
Course Coordinator

*[Signature]*

## NON CONVENTIONAL COURSE

### DETERMINATION OF PHYSICO- CHEMICAL AND MICROBIOLOGICAL PARAMETERS IN DRINKING WATER (CHEMISTRY & ZOOLOGY)

ATTENDANCE SHEET (Chemistry Practical) 2 hrs 12:30 — 2:30 pm

15/04

Sr. No	Name of student	
1	Rukmini Chimoji	<i>[Signature]</i>
2	Deva Kumari Devalota	Absent
3	Soniya Salgaonkar	<i>[Signature]</i>
4	Priya Suroji	<i>[Signature]</i>
5	Akshada Khandeparkar	<i>[Signature]</i>
6	Saishree Kotkar	<i>[Signature]</i>
7	Shradha Walavalker	<i>[Signature]</i>
8	Karishma Kalangutkar	<i>[Signature]</i>
9	Amrita Naik	<i>[Signature]</i>
10	Sybil Pereira	<i>[Signature]</i>
11	Adisha Narvekar	<i>[Signature]</i>
12	Sunidhi Kurtikar	Absent
13	Gigi Fernandes	<i>[Signature]</i>
14	Sherin Saji	<i>[Signature]</i>
15	Prathmesh Fal Dessai	<i>[Signature]</i>
16	Alisha A. Naik	<i>[Signature]</i>
17	Mamidi Dayamani	<i>[Signature]</i>
18	Arti M. Gaude	<i>[Signature]</i>
19	Manjusha R. Madkaikar	<i>[Signature]</i>
20	Rohini R. Bhikoji	<i>[Signature]</i>
21	Gautami Khandeparkar	Absent

In Audi 15/04/17

Mrs Deepa M. Audi

*[Signature]*  
Course Coordinator

NON CONVENTIONAL COURSE

DETERMINATION OF PHYSICO-CHEMICAL AND MICROBIOLOGICAL PARAMETERS IN DRINKING WATER (CHEMISTRY & ZOOLOGY)

17/04

ATTENDANCE SHEET (Chemistry Practical)

2hrs

Time 12.15 - 2.15 pm (2hrs)

Sr. No	Name of student	
1	Rukmini Chimoji	Present
2	Deva Kumari Devalota	Absent
3	Soniya Salgaonkar	Salgaonkar
4	Priya Suroji	Present
5	Akshada Khandeparkar	Present
6	Saishree Kotkar	Present
7	Shradha Walavalkar	Present
8	Karishma Kalangutkar	Present
9	Amrita Naik	Present
10	Sybil Pereira	Present
11	Adisha Narvekar	Present
12	Sunidhi Kurtikar	Present
13	Gigi Fernandes	Present
14	Sherin Saji	Present
15	Prathmesh Fal Dessai	Present
16	Alisha A. Naik	Present
17	Mamidi Dayamani	Present
18	Arti M. Gaude	Present
19	Manjusha R. Madkaikar	Present
20	Rohini R. Bhikoji	Present
21	Gautami Khandeparkar	Absent

Present

17/04/17 Mrs Deepa M. Aidi

Deepa  
Course Coordinator

NON CONVENTIONAL COURSE

DETERMINATION OF PHYSICO-CHEMICAL AND MICROBIOLOGICAL PARAMETERS IN DRINKING WATER (CHEMISTRY & ZOOLOGY)

18/04/17

ATTENDANCE SHEET (Chemistry Practical)

10:30 - 11:30 (hr) 11:30 - 12:30 (hrs)

Sr. No	Name of student		
1	Rukmini Chimoji	<i>[Signature]</i>	<i>[Signature]</i>
2	Deva Kumari Devalota		
3	Soniya Salgaonkar	<i>[Signature]</i>	<i>[Signature]</i>
4	Priya Suroji	<i>[Signature]</i>	<i>[Signature]</i>
5	Akshada Khandeparkar	<i>[Signature]</i>	<i>[Signature]</i>
6	Saishree Kotkar	<i>[Signature]</i>	<i>[Signature]</i>
7	Shradha Walavalkar	<i>[Signature]</i>	<i>[Signature]</i>
8	Karishma Kalangutkar	<i>[Signature]</i>	<i>[Signature]</i>
9	Amrita Naik	<i>[Signature]</i>	<i>[Signature]</i>
10	Sybil Pereira	<i>[Signature]</i>	<i>[Signature]</i>
11	Adisha Narvekar	<i>[Signature]</i>	<i>[Signature]</i>
12	Sunidhi Kurtikar		
13	Gigi Fernandes	<i>[Signature]</i>	<i>[Signature]</i>
14	Sherin Saji	<i>[Signature]</i>	<i>[Signature]</i>
15	Prathmesh Fal Dessai	<i>[Signature]</i>	<i>[Signature]</i>
16	Alisha A. Naik	<i>[Signature]</i>	<i>[Signature]</i>
17	Mamidi Dayamani	<i>[Signature]</i>	<i>[Signature]</i>
18	Arti M. Gaude	<i>[Signature]</i>	<i>[Signature]</i>
19	Manjusha R. Madkaikar	<i>[Signature]</i>	<i>[Signature]</i>
20	Rohini R. Bhikoji	<i>[Signature]</i>	<i>[Signature]</i>
21	Gautami Khandeparkar	<i>[Signature]</i>	<i>[Signature]</i>

*[Signature]*

*[Signature]*

Mrs Deepa M. Acharya

*[Signature]*  
Course Coordinator

## NON CONVENTIONAL COURSE

### DETERMINATION OF PHYSICO-CHEMICAL AND MICROBIOLOGICAL PARAMETERS IN DRINKING WATER (CHEMISTRY & ZOOLOGY)

9-30-11-30am  
19/04/17 2hrs 20/04/17 2hrs 9-30-11-30am  
**ATTENDANCE SHEET (Chemistry Practical)**

Sr. No	Name of student		
1	Rukmini Chimoji	<del>Chimoji</del>	<del>Chimoji</del>
2	Deva Kumari Devalota	ABS	A
3	Soniya Salgaonkar	S. Salgaonkar	S. Salgaonkar
4	Priya Suroji	<del>Priya Suroji</del>	<del>Priya Suroji</del>
5	Akshada Khandeparkar	<del>Akshada Khandeparkar</del>	<del>Akshada Khandeparkar</del>
6	Saishree Kotkar	<del>Saishree Kotkar</del>	<del>Saishree Kotkar</del>
7	Shradha Walavalkar	<del>Shradha Walavalkar</del>	<del>Shradha Walavalkar</del>
8	Karishma Kalangutkar	<del>Karishma Kalangutkar</del>	<del>Karishma Kalangutkar</del>
9	Amrita Naik	<del>Amrita Naik</del>	<del>Amrita Naik</del>
10	Sybil Pereira	<del>Sybil Pereira</del>	<del>Sybil Pereira</del>
11	Adisha Narvekar	<del>Adisha Narvekar</del>	<del>Adisha Narvekar</del>
12	Sunidhi Kurtikar	ABS	A
13	Gigi Fernandes	<del>Gigi Fernandes</del>	<del>Gigi Fernandes</del>
14	Sherin Saji	<del>Sherin Saji</del>	<del>Sherin Saji</del>
15	Prathmesh Fal Dessai	<del>Prathmesh Fal Dessai</del>	<del>Prathmesh Fal Dessai</del>
16	Alisha A. Naik	<del>Alisha A. Naik</del>	<del>Alisha A. Naik</del>
17	Mamidi Dayamani	<del>Mamidi Dayamani</del>	<del>Mamidi Dayamani</del>
18	Arti M. Gaude	ABS	A
19	Manjusha R. Madkaikar	<del>Manjusha R. Madkaikar</del>	<del>Manjusha R. Madkaikar</del>
20	Rohini R. Bhikoji	<del>Rohini R. Bhikoji</del>	<del>Rohini R. Bhikoji</del>
21	Gautami Khandeparkar	ABS	A

DA

DA

*[Signature]*  
Course Coordinator

## NON CONVENTIONAL COURSE

### DETERMINATION OF PHYSICO-CHEMICAL AND MICROBIOLOGICAL PARAMETERS IN DRINKING WATER (CHEMISTRY & ZOOLOGY)

#### ATTENDANCE SHEET (Microbiology Practical)

Sr. No	Name of student	10:30-12 15/4/17	9:30-12 17/4/17	3:00-5:30 17/4/17	1:00-2:00 18/4/17	2:30-5:30 18/4/17	12:30-5:30 19/4/17	12:30-5:30 20/4/17	1:30-2:00 21/4/17
1	Rukmini Chimoji	<i>Chimoji</i>	<i>Chimoji</i>	<i>Chimoji</i>	<i>Chimoji</i>	<i>Chimoji</i>	<i>Chimoji</i>	<i>Chimoji</i>	<i>Chimoji</i>
2	Deva Kumari Devalota	A	A	A	A	A	A	A	A
3	Soniya Salgaonkar	<i>Salgaonkar</i>	<i>Salgaonkar</i>	<i>Salgaonkar</i>	<i>Salgaonkar</i>	<i>Salgaonkar</i>	<i>Salgaonkar</i>	<i>Salgaonkar</i>	<i>Salgaonkar</i>
4	Priya Suroji	<i>Suroji</i>	<i>Suroji</i>	<i>Suroji</i>	<i>Suroji</i>	<i>Suroji</i>	<i>Suroji</i>	<i>Suroji</i>	<i>Suroji</i>
5	Akshada Khandeparkar	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>
6	Saishree Kotkar	<i>Kotkar</i>	<i>Kotkar</i>	<i>Kotkar</i>	<i>Kotkar</i>	<i>Kotkar</i>	<i>Kotkar</i>	<i>Kotkar</i>	<i>Kotkar</i>
7	Shradha Walavalker	<i>Walavalker</i>	<i>Walavalker</i>	<i>Walavalker</i>	<i>Walavalker</i>	<i>Walavalker</i>	<i>Walavalker</i>	<i>Walavalker</i>	<i>Walavalker</i>
8	Karishma Kalangutkar	<i>Kalangutkar</i>	<i>Kalangutkar</i>	<i>Kalangutkar</i>	<i>Kalangutkar</i>	<i>Kalangutkar</i>	<i>Kalangutkar</i>	<i>Kalangutkar</i>	<i>Kalangutkar</i>
9	Amrita Naik	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>
10	Sybil Pereira	<i>Pereira</i>	<i>Pereira</i>	<i>Pereira</i>	<i>Pereira</i>	<i>Pereira</i>	<i>Pereira</i>	<i>Pereira</i>	<i>Pereira</i>
11	Adisha Narvekar	<i>Narvekar</i>	<i>Narvekar</i>	<i>Narvekar</i>	<i>Narvekar</i>	<i>Narvekar</i>	<i>Narvekar</i>	<i>Narvekar</i>	<i>Narvekar</i>
12	Sunidhi Kurtikar	A	A	A	A	A	A	A	A
13	Gigi Fernandes	<i>Fernandes</i>	<i>Fernandes</i>	<i>Fernandes</i>	<i>Fernandes</i>	<i>Fernandes</i>	<i>Fernandes</i>	<i>Fernandes</i>	<i>Fernandes</i>
14	Sherin Saji	<i>Saji</i>	<i>Saji</i>	<i>Saji</i>	<i>Saji</i>	<i>Saji</i>	<i>Saji</i>	<i>Saji</i>	<i>Saji</i>
15	Prathmesh Fal Dessai	<i>Dessai</i>	<i>Dessai</i>	<i>Dessai</i>	<i>Dessai</i>	<i>Dessai</i>	<i>Dessai</i>	<i>Dessai</i>	<i>Dessai</i>
16	Alisha A. Naik	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>	<i>Naik</i>
17	Mamidi Dayamani	<i>Dayamani</i>	<i>Dayamani</i>	<i>Dayamani</i>	<i>Dayamani</i>	<i>Dayamani</i>	<i>Dayamani</i>	<i>Dayamani</i>	<i>Dayamani</i>
18	Arti M. Gaude	<i>Gaude</i>	<i>Gaude</i>	<i>Gaude</i>	<i>Gaude</i>	<i>Gaude</i>	<i>Gaude</i>	<i>Gaude</i>	<i>Gaude</i>
19	Manjusha R. Madkaikar	<i>Madkaikar</i>	<i>Madkaikar</i>	<i>Madkaikar</i>	<i>Madkaikar</i>	<i>Madkaikar</i>	<i>Madkaikar</i>	<i>Madkaikar</i>	<i>Madkaikar</i>
20	Rohini R. Bhikoji	<i>Bhikoji</i>	<i>Bhikoji</i>	<i>Bhikoji</i>	<i>Bhikoji</i>	<i>Bhikoji</i>	<i>Bhikoji</i>	<i>Bhikoji</i>	<i>Bhikoji</i>
21	Gautami Khandeparkar	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>	<i>Khandeparkar</i>

*Alisha Fernandes*  
ALISHA FERNANDES  
SUBJECT TEACHER

*Alisha Fernandes*  
Course Coord



## NON CONVENTIONAL COURSE

### DETERMINATION OF PHYSICO- CHEMICAL AND MICROBIOLOGICAL PARAMETERS IN DRINKING WATER (CHEMISTRY & ZOOLOGY)

#### ATTENDANCE SHEET ( Lecture)

Sr. No	Name of student	15/4/17 (09:30 - 10:30 a.m)	21/4/17 (12:30 - 1:30 p.m)
1	Rukmini Chimoji	<u>Rukmini</u>	<u>Rukmini</u>
2	Deva Kumari Devalota	A	A
3	Soniya Salgaonkar	<u>Salgaonkar</u>	<u>Salgaonkar</u>
4	Priya Suroji	<u>Priya</u>	<u>Priya</u>
5	Akshada Khandeparkar	<u>Akshada</u>	<u>Akshada</u>
6	Saishree Kotkar	<u>Kotkar</u>	<u>Kotkar</u>
7	Shradha Walavalkar	<u>Shradha</u>	<u>Shradha</u>
8	Karishma Kalangutkar	<u>Kalangutkar</u>	<u>Kalangutkar</u>
9	Amrita Naik	<u>Amrita</u>	<u>Amrita</u>
10	Sybil Pereira	<u>Sybil</u>	<u>Sybil</u>
11	Adisha Narvekar	<u>Narvekar</u>	<u>Narvekar</u>
12	Sunidhi Kurtikar	A	A
13	Gigi Fernandes	<u>Gigi</u>	<u>Gigi</u>
14	Sherin Saji	<u>Sherin</u>	<u>Sherin</u>
15	Prathmesh Fal Dessai	<u>Prathmesh</u>	<u>Prathmesh</u>
16	Alisha A. Naik	<u>Alisha</u>	<u>Alisha</u>
17	Mamidi Dayamani	<u>Mamidi</u>	<u>Mamidi</u>
18	Arti M. Gaude	<u>Arti</u>	<u>Arti</u>
19	Manjusha R. Madkaikar	<u>Manjusha</u>	<u>Manjusha</u>
20	Rohini R. Bhikoji	<u>Rohini</u>	<u>Rohini</u>
21	Gautami Khandeparkar	A	A

*A.F.*  
ALISHA FERNANDES  
SUBJECT TEACHER

*A.F.*

*A.F.*

*Sakshi*  
Course Coordinator



**Dempo Charities Trust's  
Dhempe College of Arts and Science  
Panaji, Goa**

**Department Of Chemistry**

Report of the long term non-conventional course entitled “**Determination of physicochemical and microbiological parameters in drinking waters**” for the academic year 2016-17.

The department of chemistry conducted a long term integrated (faculty of Chemistry and Bio-technology) value added non-conventional course entitled “Determination of physicochemical and microbiological parameters in drinking waters” for SY BSC students.

Duration of the course is of 33 hours which comprises of 4 sessions of lectures of one hour each and 29 hours of practical sessions. The intake capacity for the course is 25 students with a fee of Rs 1000/- per student. This year 21 students were enrolled for the course .

The course syllabus includes introduction to microbiological and chemical parameters of drinking water, in addition there are practical sessions of determination of microbiological as well as physical and chemical parameters of drinking waters. Course objective is to equip students with practical knowledge of determination of water quality so as to qualify whether water is hygienically safe and fit for consumption.



Mrs Varsha Virginkar  
Course Coordinator