A brief report on innovations by the faculty in teaching and learning

1. **Name of the Innovative Activity in Teaching and Learning:** Case Study and it's presentation.
2. **Course code and Course Name:** 2MEBS101, Applied Chemistry
3. **Program and Class:** F.Y.,B.Tech. (Mechanical)
4. **Name of the faculty member:** Mr. Z. D. Sande
5. **Introduction-**

In order to make the students more environmental conscious, at department of Basic Sciences a water testing facility is started in Applied Chemistry laboratory. First year students bring the water samples from their surrounding area; they analyze it in Applied Chemistry Laboratory under faculty guidance and prepare a report containing suggestions from observed values. They submit a copy of report to the client and discuss them about water quality. All students participated with full enthusiasm and presented their case study also.

6. **Motivation / Purpose of the innovative technique –**

The intention behind this activity is that the students as well as society will recognize the importance of clean drinking water. Good quality water as a part of environmental concerns is one of the basic needs of society.

7. **Correlation of the technique with the course content**

Applied Chemistry course involves study of water testing and purification methods. Along with it there is analytical chemistry part which involves study of various instruments required for chemical analysis. This activity fulfilled the use of water testing as well as chemical analysis using various instruments.

8. **Procedure followed**

Students completed this activity as a case study. They did all work with great enthusiasm and involvement as per following steps:

- Do collection of water samples from your area pair wise as instructed in a labeled bottle. Water samples would be like: Industrial waste water/ Effluents, Drinking water (From any school/college), Borewell water, Irrigation water (From a farmer), Well water (From a farmer), River water, etc.
- Do testing of water samples in applied chemistry lab using required instruments and titration methods during practical hours. After testing the samples, prepare the report of your case study in two copies as per format attached.
- Provide one copy of water testing report to the client (Person from whom you collected the sample) and take their received signs with name on second copy. Submit the second copy in applied chemistry laboratory.
- Each member should participate actively.
- A presentation of your activity will be conducted based on procedure followed and findings. Marks would be allocated strictly according to rubrics.

9. Evaluation / Assessment process followed-

Rules followed during this activity were discussed with the students as below:

a. Do collection of water samples from your area pair wise as instructed during classes, in a labeled bottle. Water samples should be like:
   - Industrial waste water/ Effluents,
   - Drinking water (From any school/college),
   - Borewell water,
   - Irrigation water (From a farmer),
   - Well water (From a farmer),
   - River water, etc.

b. After testing the samples, prepare the report of your case study in 2 copies as per given format.

c. Provide one copy of water testing report to the client (Person from whom you collected the sample) and take their received signs with name on second copy. Submit the second copy to me upto October end.

d. Each member should participate actively.

e. A presentation of your activity will be conducted based the Unit No. 1, 2 and 3.

f. Marks would be allocated strictly according to rubrics.

Rubric used for the evaluation of activity-

Name of the Student:				**Roll No.**	**Class:**				
Performance Criteria	**Sub-Criteria**	**Excellent**	**Average**	**Poor**	**Excellent**		**Average**	**Poor**	
					5	**4**	**3**	**2**	**1**
Knowledge	• Ability to apply water testing principles to identify water quality parameters and methods of water softening using fundamental laws.(CO1)	Excellent understanding of various water testing principles and methods of water softening.	Good understanding of various water testing principles and methods of water softening.	Need to focus on basic knowledge and its application part.					
	• Ability to classify fuels and analytical methods to identify their characteristics using basic principles of chemistry (CO2)	Excellent understanding of various analytical methods required in water testing.	Good understanding of various analytical methods required in water testing.	Need to focus on basic knowledge and its application part.					
Skills	• Involvement in the presentation • Individual and team work • Communication	Performed effectively as an individual or a team member and clearly communicated the presentation and the content using appropriate grammar in both oral and written form.	Performed appropriately as an individual or a team and communicated the presentation and content using grammar with mistakes in both oral and written form.	Need to work on communication skills, team/ individual work and confidence level.					
Attitude	• Confidence • Body language • Q&A	Excellent display of body language and gave clear answers of all the questions	Adequate display of body language and answered some of the questions.	Need to work on body language and practice of giving answers to questions clearly.					
			Total Marks (Out of 20)						
Sign of Faculty									

10. Photograph of the event-

Water Samples were analyzed by Students in Applied Chemistry Laboratory
[F.Y.,B.Tech. (Mechanical) Sem-I, 2023-24]

Water Testing Reports Prepared by Students in Chemistry Laboratory
[F.Y.,B.Tech. (Mechanical) Sem-I, 2023-24]

Sant Dnyaneshwar Shikshan Sanstha's

Annasaheb Dange College of Engineering & Technology, Ashta

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University Kolhapur)

An Autonomous Institute

Department of Basic Sciences

Certificate of Analysis of Water Sample

Date:4/10/2023

Name of the client: - Grampanchayat Bagani.

Sample Description: - Industrial waste water/ Effluents, Drinking water (From school/college), Borewell water, Irrigation water, Well water, River water, R.O. Water, etc.

Sample collected by: -. Ayyan Vasim Chougule, Ved Uday Kushire

Sample analyzed by: - Ayyan Vasim Chougule, Ved Uday Kushire

Sr. No.	Parameters Checked	Observations	Limits as per IS 10500: 2012
1.	pH (Using pH meter)	6.06	6.5 – 8.5
2.	Electrical conductivity (Using conductivity meter)	1.092 ms	700 µS
3.	TDS	600.6 ppm	<500 ppm
4.	Total Alkalinity	172 ppm	--
5.	Chloride Content	110.5 ppm	<250 ppm
6.	Total Hardness (As CaCO3)	54 ppm	<100 ppm
7.	Acidity	--	<100 ppm
8.	Colour	Colour less	Not objectionable
9.	Odour and Taste	Odour less	Not objectionable

Remarks/ Conclusions:

1. The analysis shows all the results are not in limits of standard values.
2. Hence, the water sample is/ not useful for …Drinking direct… applications.
3. Parameters showing observations out of limit (if any): a) ..pH.....---.....
   b) ..TDS.....---.....
4. Suggestions (if any related to use of water purification/ softening processes): By using R.O. Water can be used for drinking

Roll Nos.	Name of Students	Signs
104	Ayyan Vasim Chougule	
113	Ved Uday Kushire	

04/10

(Mr. Z.D. Sande)

Course Teacher Name & Sign.:

(Prepared By)

(Mr. F.A. CHOUGULE)

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Applied Chemistry Laboratory

Sant Dnyaneshwar Shikshan Sanstha's

Annasaheb Dange College of Engineering & Technology, Ashta

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An Autonomous Institute

Department of Basic Sciences

Certificate of Analysis of Water Sample

Date: 06/10/2023

Name of the client: - ADPS, Ashta

Sample Description: - Industrial waste water/ Effluents, Drinking water (From school/college), Borewell water, Irrigation water, Well water, River water, R.O. Water, etc.

Sample collected by: - Gayatri Pawar

Sample analyzed by: - Shreya Patil& Gayatri Pawar

Sr. No.	Parameters Checked	Observations	Limits as per IS 10500: 2012
1.	pH (Using pH meter)	7.32	6.5 – 8.5
2.	Electrical conductivity (Using conductivity meter)	0.428	700 µS
3.	TDS	235.4ppm	<500 ppm
4.	Total Alkalinity	96ppm	--
5.	Chloride Content	48pp	<250 ppm
6.	Total Hardness (As CaCO3)	48ppm	<100 ppm
7.	Acidity	-	<100 ppm
8.	Colour	No objection	Not objectionable
9.	Odour and Taste	No objection	Not objectionable

Remarks/ Conclusions:

1. The analysis shows all the results are in limits/ ~~not in limits~~ of standard values.
2. Hence, the water sample is/ ~~not~~ useful for .....Drinkable..... applications.
3. Parameters showing observations out of limit (if any): a) .....—.....
   b) .....—.....
4. Suggestions (if any related to use of water purification/ softening processes):..... —.....
   .....

Roll Nos.	Name of Students	Signs
201	Shreya Patil	

Recieved

Annasaheb Dange Public School & Junior College, ASHTA ESTD. 2002

26/10/2023

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Applied Chemistry Laboratory

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Department of Basic Sciences

Certificate of Analysis of Water Sample

Date:04/10/2023

Name of the client: - **Patil Sunil Ramchandra** .

Sample Description: - Industrial waste water/ Effluents, Drinking water (From school/college), **Borewell water**, Irrigation water, Well water, River water, R.O. Water, etc.

Sample collected by: - **Patil Pushkar Vinayak** .

Sample analyzed by: - **Patil Dhairyashil Chandrakant** .

Sr. No.	Parameters Checked	Observations	Limits as per IS 10500: 2012
1.	pH (Using pH meter)	6.26 PH	6.5 – 8.5
2.	Electrical conductivity (Using conductivity meter)	1.105 MS	700 µS
3.	TDS	552.5 PPM	<500 ppm
4.	Total Alkalinity	220 PPM	--
5.	Chloride Content	74.55 PPM	<250 ppm
6.	Total Hardness (As CaCO3)	100 PPM	<100 ppm
7.	Acidity	NIL	<100 ppm
8.	Colour	NOT OBJECTIONABLE	Not objectionable
9.	Odour and Taste	NOT OBJECTIONABLE	Not objectionable

Remarks/ Conclusions:

1. The analysis shows all the results are ~~in limits~~/ not in limits of standard values.
2. Hence, the water sample ~~is~~/ not useful for **DOMASTIC** Applications.
3. Parameters showing observations out of limit (if any): a) **PH(using PH meter)** b) **TDS**
4. Suggestions (if any related to use of water purification/ softening processes**): They should use reverse osmosis process.**

Roll Nos.	Name of Students	Signs
240	Patil pushkar vinayak	
248	Patil dhairyashil chandrakant	

(Prepared By)

(Sunil R. Patil)

MR.Z.D.SANDE

Course Teacher Name &

Applied Chemistry Labor

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Department of Basic Sciences

Certificate of Analysis of Water Sample

Date: 6/10/20

Name of the client: - Grampanchayat Parle, karad.

Sample Description: - Industrial waste water/ Effluents, Drinking water (From school/college), Borewell water, Irrigation water, Well water, River water, R.O. Water, etc.

Sample collected by: - Vedang Mahesh Khambe

Sample analyzed by: - Varadraj Dilip Patil

Sr. No.	Parameters Checked	Observations	Limits as per IS 10500: 201
1.	pH (Using pH meter)	7.04	6.5 – 8.5
2.	Electrical conductivity (Using conductivity meter)	0.210 ms	700 µS
3.	TDS	134.4 ppm	<500 ppm
4.	Total Alkalinity	60 ppm	--
5.	Chloride Content	42.6 ppm	<250 ppm
6.	Total Hardness (As CaCO3)	40 ppm	<100 ppm
7.	Acidity	Nill	<100 ppm
8.	Colour	Not objectionable	Not objectionable
9.	Odour and Taste	Not objectionable	Not objectionable

Remarks/ Conclusions:

1. The analysis shows all the results are in limits/ ~~not in limits~~ of standard values.
2. Hence, the water sample is/ ~~not~~ useful for .Domestic..... applications.
3. Parameters showing observations out of limit (if any): a) .....
   b) .....
4. Suggestions (if any related to use of water purification/ softening processes):.....

Roll Nos.	Name of Students	Signs
147	Varadraj Dilip Patil	
151	Vedang Mahesh Khambe	

(Prepared By)

Course Teacher Name & Sign.:

Applied Chemistry Labora

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Water Testing Reports Were Distributed to Clients by

F.Y.,B.Tech. (Mechanical) Sem-I, 2023-24 Students

11. Outcomes of the technique-

Because of this activity following skills are developed among students:

1. Professional Ethics
2. Problem Solving Skills
3. Innovative Ideas
4. Team Work
5. Leadership
6. Verbal Communication
7. Written Communication

12. References:

[01] https://aqua-lab.in/index.html
[02] An Introduction to Water Quality Analysis, DOI: 10.31786/09756272.18.9.2.214
[03] Water quality analysis of Urun-Islampur City, https://doi.org/10.1007/s13201-020-1178-3

Mr. Z. D. Sande
Course Coordinator: