

S.V.S'.S Dadasaheb Rawal College, Dondaicha.

Department of Chemistry

Date: 29 July, 2021

To,

The Principal,
S. V. S'.S Dadasaheb Rawal College,
Dondaicha, Dist.:- Dhule.

Applicant: Dr. R. K. Chaudhari
Associate Prof., Department of Chemistry
Subject: Proposal for Certificate Course in 'Water Analysis.'

Respected Sir,

With reference to the above mentioned subject, I am submitting herewith the proposal to conduct certificate course in "Water Analysis" by the department of Chemistry of our college from this academic year 2021-22. This course will be helpful to open new conceptual ideas and practical knowledge about the study for Water Analysis, among the Undergraduate students of our college. Hope you will consider my application and I kindly request you to sanction the same.



Yours Faithfully

Enclosure:

- 1) Proposal
- 2) Curriculum and design for the course
- 3) Rules and regulations for the course.



Head
Dept. of Chemistry
Dadasaheb Rawal College
Dondaicha Dist Dhule



Swoddharak Vidyarthisanstha's

Dadasaheb Rawal College, Dondaicha

Dadasaheb Rawal Knowledge city, Mandal road, Dondaicha, Dist. Dhule. (M.S.) Pin-425408.

Phone: - 02566-299346.

Affiliated to K. B. C. North Maharashtra University, Jalgaon

NAAC- Accredited 'A' grade (CGPA. 3.30)

Email: - sysasc@rediffmail.com Web: <http://www.dadasahebrawalcollege.ac.in>

Department of Chemistry

Notice

Session 2021-2022

All the students from T. Y. B. Sc. Chemistry class are here by informed that, Department of Chemistry is going to organize Certificate course in "Water Analysis" from this academic year 2021-22. The course will be very beneficial for students in future, because it will cover the theory as well as practicals. This will help to develop the analytical skill of the students. Those who are interested to join the program they should register their name with Teacher incharge.

ACTING PRINCIPAL
Swoddharak Vidyarthi Santha's
Dadasaheb Rawal College,
Dondaicha, Dist. Dhule



S.V.S'.S Dadasaheb Rawal College, Dondaicha.

Department of Chemistry

Proposal for conducting Short term Certificate Course

1. Basic information about the applicant:

- | | |
|---|--|
| i. Name of the College | S. V. S'. S Dadasaheb Rawal College,
Dondaicha. Dist.- Dhule. |
| ii. Complete Postal Address of College: | S. V. S'. S Dadasaheb Rawal College,
Dondaicha, Dist.- Dhule, Pin Code- 425401. |
| iii. Name of the Department | Chemistry |

2. Details of the Course Proposed:

- | | |
|-------------------------------------|--------------------------------------|
| i) Name of the Course | Certificate course in Water Analysis |
| ii) Target Group | Undergraduate students |
| iii) Duration of the Course | One Month |
| iv) Medium of Instruction | English |
| v) No. of candidates to be admitted | 30 (Thirty) |

3. Details of the Faculty for Course:

- | | |
|---|---|
| i. Whether College has Any Degree/ Diploma related to the Proposed course | Yes (U. G. Degree in B. Sc. Offers Chemistry as elective Subject) |
| ii. Whether the course is prepared by Experts from related field | Yes (By Departmental Faculty) |

iii) Information of Course Coordinator (To be appointed for the course):


Name	Department	Qualification	Experience
Dr. R. K. Chaudhari	Inorganic Chemistry	M. Sc. B. Ed. Ph.D.	29 Years

iv. Information of faculty Members (To be appointed for the course): (If Any)

Sr	Name of the faculty	Qualification	Topics	Experience
01	Dr. P. D. Girase	M. Sc. Ph.D.	Organic Chemistry	31 Years
02	Dr. R. K. Chaudhari	M. Sc. B. Ed. Ph.D.	Inorganic Chemistry	29 Years

4. Details of the Physical Infrastructure Needed/ Available for the Course:

- (i) Classroom : Available
- (ii) Books/ Reading Material : Yes available in the Central Library and department
- (iii) Equipments : Necessary equipments for practical are available in the laboratory.
- (iv) Any other : The College has its own Computer Laboratory with 30 Computers and accessories which can fulfill the requirement of the course.


Head
Dept. of Chemistry
Dadasaheb Rawal College
Gandakha Dist Dhule



Swoddharak Vidyarthisanstha's

Dadasaheb Rawal College, Dondaicha

Dadasaheb Rawal Knowledge city, Mandal road, Dondaicha, Dist. Dhule. (M.S.) Pin-425408.

Phone: - 02566-299346.

Affiliated to K. B. C. North Maharashtra University, Jalgaon

NAAC- Accredited 'A' grade (CGPA. 3.30)

Email: - sysasc@rediffmail.com Web: <http://www.dadasahebrawalcollege.ac.in>

DEPARTMENT of CHEMISTRY

ADD-ON COURSE

Academic Year 2021 - 22

"Water Analysis"

Silent Features of add on Course:

Objectives

- 1) To acquire basic knowledge and skills in applied branches of Chemistry.
- 2) To equip the students with self-employment capabilities.
- 3) To provide scientific knowledge of Water testing analysis.
- 4) . To understand the parameters required for maintaining quality of water.

Course Duration: Duration of the Course is only 30 Hours conducting throughout the year.

Proposed Schedule: From 15th February 2022 to 25th March 2022.

Timing: 4.00 PM to 5.00 PM

Eligibility- Any Undergraduate enrolled Student of our college.

Student Intake- 30 Students.

Criteria of Certification- 80 % attendance is mandatory for both Classroom teaching and fieldwork/practical.

Coordinator

Head
Dept. of Chemistry
Dadasaheb Rawal College
Dondaicha Dist Dhule

S.V.S'.S Dadasaheb Rawal College, Dondaicha.

Department of Chemistry

Syllabus for Certificate Course in Water Analysis (Non-Semester)

(With effect from the academic year 2021-22)

1. The theory Paper is divided in 05 Units and available numbers of lectures are 08 per unit.
 2. The Practical Syllabus includes 06 experiments and available number of lectures is 12.
- Syllabus for Theory: (08 Lectures/ Unit)

Unit: 1 Water Composition analysis

Composition, Hardness testing, Chromatographic analysis, pH, Salinity testing, Ionic composition, Minerals, Pollutants, Dissolved Oxygen, BOC, Chemical Oxygen demand, Electrical Conductance, Nutrient Parameters, Portability of Water.

Unit: 2 Water Qualities

Water quality parameters and their interaction, physical and chemical characteristics, turbidity, colour, temperature, chemical constituents, taste, color, acidity, alkalinity, CO₂, hardness, pH, Conductance, Methods of testing.

Unit: 3 Municipal and sewage and Waste Industrial effluent

Primary treatment, Screening, equalization, coagulation, etc. Secondary treatment, Trickling Filter, Activated sludge process, Aerobic and Anaerobic treatment, Sludge treatment and Disposal Tertiary Treatment, Evaporation, Reverse Osmosis, Dialysis, Ion Exchange, Biofilter, Adsorption and Absorption.

Unit: 4 Environmental Pollution

Water pollution, Causes, Industrial and Domestic effluents, Pesticides, Health Hazards, Control measures.

Unit: 5 Treatment Method

Waste water composition, Characteristics, COD, BOD, Turbidity, Microbial contamination, Physical unit operation, Chemical precipitation and Biological treatment, Physical unit operation, Screening, Grit and Detritus removal, Solid removal through sedimentation.

Syllabus for Practicals:

- 1) Testing of Hardness of Water
- 2) Testing of pH
- 3) Testing of BOD and COD.
- 4) Estimation of Zn (II) by complexometric titration.
- 5) Chromatographic analysis of water

6) To determine the strength of unknown Calcium salt solution by complexometric titration.

7) To determine the conductance and TDS.

Books for Reference:

1. A textbook of Environmental Chemistry- O. D. Tyagi and M. Mehra, Anmol publication pvt. Ltd.(2000).
2. Chemistry in Aqueous and Non-aqueous solvents-Y. Mido and S. Taguchi, Discovery publication House, 1st edition
3. Water Pollution-V. P. kudesia, Pragati prakashan, 2011.
4. Outlines of Biochemistry-E. E. Conn, Willy Eastern Ltd., 4th edition.
5. Encyclopedia of experiments in Chemistry-Satyaprakash Mohanty, Campus Book, 2009.
6. Environmental Chemistry-A. k. De, New Age International, 7th Edition.
7. Hydrology- Principles, analysis and design-H. M. Raghunath, New age International publications (1996).
8. Ocean Management, Rakesh Kapoor-Book Enclave (2002).
9. Marine Environment-Ravi Mishra, Anmol publications (2002).
10. Low cost waste water treatment technologies-R. K. Trivedy and Siddharth Kaul.
11. Pollution and Bioremediation-P. C. Trivedi
12. An Introduction to Environmental pollution-B. K. Sharma and H. Kaur.
13. Chemical Toxicology-Zulfikar S. Patel, Dominant Publishers and Distributors (2011).
14. Principles and practice of Analytical Chemistry-Fifield and Kealey, Blackwell publishers.
15. Kurita Handbook of Water Treatment, Kurita Publications (1999).
16. Principles of Water Quality control, 5th Edition, T. H. Y. Tebbutt (2002).
17. Handbook of Environmental Analysis, Pradyot Patnaik (1997).



Head
Dept. of Chemistry
Dadasaheb Rawal College
Nondaicha Dist Dhule

S.V.S'.S Dadasaheb Rawal College, Dondaicha.

Department of Chemistry

Certificate Course in Water Analysis

Unit Test-I Session 2021-2022 (Question Paper) Marks 10

(All Questions are compulsory.)

Q. 1. Which is the most important Nutrient?

- a) Lipid b) Protein c) Minerals d) Water

Q. 2. Faecal streptococci are those streptococci generally present in faeces of-----

- a) Plants b) Humans and Animal c) Human Only d) All of above

Q.3 Salinometer is also called as-----

- a) Salinimeter b) Hydrometer e) Oxometer d) Testometer

Q. 4 Alkalinity is the capacity of water to resist-----

- a) Acidification b) Basification c) Turbidity d) Alkalinity

Q.5 What is the pH of Water?

- a) 7.5 to 8.5 b) 6.5 to 8.5 c) 2.5 to 5.5 d) 3.5 to 7.5

Q. 6 Every Reverse Osmosis Water system contain-----

- a) Sediment Filter and carbon filter. b) Carbon filter c) Membrane d) PP candle

Q.7 Dialysis is a procedure to remove waste products and excess fluid from-----

- a) Kidney b) Blood e) Stomach d) Liver

Q.8 The average range of Biochemical Oxygen demand (BOD) is-----


- a) 0.5 to 2.5 kg/t b) 0.5 to 1.5 kg/t c) 2.5 to 3.5 kgt d) 4.5 to 5.5

Q.9 Adsorption is which process?

- a) Complex process b) Surface process c) Simple Process d) Both a and b.

Q.10 The process of gas or liquid which penetrate into the body of adsorbent is commonly known as

- a) Adsorption b) Absorption c) Coagulation d) Precipitation


Head
Dept. of Chemistry
Dadasaheb Rawal College
Dondaicha Dist Dhule

S.V.S'.S Dadasaheb Rawal College, Dondaicha.

Department of Chemistry

Certificate Course in Water Analysis

Unit test-II, Marks 10

Session 2021-2022 (Question Paper)

(All questions are compulsory)

- 1) The indicator used in complexometric titration is-----
A) Phenolphthalein B) Methyl orange C) Eriochrome black-T D) Starch
- 2) Bond formed by donation of lone pair of electrons is called as-----
A) Covalent bond B) Ionic bond C) Metallic bond D) Coordinate bond
- 3) The apparatus used for measurement of conductance is -----
A) Conductivity cell B) Viscometer C) Stalagmometer D) Eudiometer
- 4) The solution which resists sudden changes in pH is called as-----
A) Indicator B) Buffer solution C) Catalyst D) Oxidizing agent
- 5) The unit of conductance is-----
A) Ohm B) Ampere C) Mhos D) Cm^{-1}
- 6) The long form of EDTA is-----
A) Ethoxy dithionic acid B) Ethylene diamine tetraacetic acid
C) Ethylene dithionic tetraacetic acid D) Ethylidene terphthallic acid
- 7) If the pH of a solution is 8, then the medium of solution is-----
A) Acidic B) Basic C) Neutral D) None of these
- 8) Permanent hardness of water is due to the-----salts.
A) CaCO_3 B) MgCO_3 C) CaCl_2 & MgCl_2 D) All of these
- 9) Temporary hardness in water can be removed by -----
A) Boiling B) Stirring C) Filtering D) Diluting
- 10) Deionized water can be prepared by----
A) Distillation B) Ion exchange Chromatography
C) Oxidation method D) Precipitation.

Head
Dept. of Chemistry
Dadasaheb Rawal College
Dondaicha Dist Dhule

S.V.S'.S Dadasaheb Rawal College, Dondaicha.

Department of Chemistry

Certificate Course in Water Analysis

Practical Examination Marks 10

Session 2021-2022 (Question Paper)

(All questions are compulsory)

- Q.1 The hardness that cannot be removed by boiling is called
- temporary hardness
 - permanent hardness
 - semi temporary hardness
 - semi permanent hardness
- Q.2 Permanent hardness of water is caused due to the presence of dissolved
- calcium hydrogen carbonates
 - magnesium hydrogen carbonates
 - chlorides of magnesium
 - Sulphates of magnesium
- 3) In alkalimetric titrations, the titrant is
- Iodine
 - EDTA
 - NaOH
 - Magnesium
- 4) Chromatography cannot be used to separate delicate products__
- True
 - False
- 5) In chromatography, the stationary phase can be supported on a solid.
- Solid or liquid
 - Liquid or gas
 - Solid only
 - Liquid only
- 6) Replacement titration is used for
- Calcium
 - Magnesium
 - Zinc
 - All of the above
- Q.7 Pure water is known to be which of the following?
- Weak electrolyte
 - Strong electrolyte
 - Neither weak nor strong
 - Not an electrolyte
- 8) Liquid chromatography can be performed in which of the following ways?
- Only in columns
 - Only on plane surfaces
 - Either in columns or on plane surfaces
 - Neither in columns nor on plane surfaces

Q. 9 The full form of BOD is

- A) Biodegradable Oxygen Demand
- B) Biological Oxygen Demand
- C) Biochemical Oxygen Demand
- D) Bandwidth on demand

Q.10 To test chemical oxygen demand (C.O.D.) of sewage, organic matter is oxidized by potassium dichromate in the presence of ____

- A) Hydrochloric acid
- B) Sulphuric acid
- C) Nitric Acid
- D) Citric Acid



Head
Dept. of Chemistry
Dadasaheb Rawal College
Nondaicha Dist Dhule