

CERTIFICATE COURSE ON WATER ANALYSIS AND TREATMENT

Programme Coordinator : Dr. A. SEKAR
Associate and Head of the Chemistry

Course Teacher : Dr. A. SEKAR.,
Associate and Head of the Chemistry

Number of Student attended : 29

Class Hours & Timing : Weekly two hours & 3.30-4.30 pm

Syllabus

NEHRU MEMORIAL COLLEGE (Autonomous)
(Nationally accredited with 'A' grade by NAAC)
PUTHANAMPATTI

M. S.
15/2/2017

PG & RESEARCH DEPARTMENT OF CHEMISTRY
CERTIFICATE COURSE ON WATER ANALYSIS AND TREATMENT
STRUCTURE & SYLLABI
(CBCS)
(OPEN TO ALL)
2016-2017 onwards

15/2/2017



COURSE TITLE	CODE	INSTRUCTION Hrs./SEMESTER	CREDITS	EXAM HOURS	TOTAL MARKS
PAPER - I-Water Treatment	16YCER01	20	04	03	100
PAPER - II - Industrial and sewage Treatment	16YCER02	20	04	03	100
Lab III - Water analysis	16YCER03 L				
	Total	60	12		300

CERTIFICATE COURSE FOR B.SC., CHEMISTRY

WATER ANALYSIS AND TREATMENT

PAPER – I - WATER TREATMENT

Unit: I Characteristics of water – uses of water – water for industry – sources of water - Quality of natural water – water in Human body – water as a solvent – main quality characteristics of water – alkalinity –Hardness – Total solids – oxidation – Transparency – silica content.

Unit II: Purification water – potability of water – Removal of coarse, dissolved and colloidal impurities from water – coagulation of water – flocculants.

Unit III: Sterilization and Disinfection of water – precipitation method – Ozonisation – silver ion method – chlorination – Bleaching powder method – Dechlorination – physical methods of sterilization.

Unit IV: Softening of water – clark's process – lime soda process – modified lime soda process – permutit or zeolite process – Ion exchange process.

Unit V: Demineralization of water – Determination of Hardness – calorimetric method – Titration method – soap method - complexometric method. Some calculations

Reference Books:

1. Dr. B. K. Sharma Industrial Chemistry Goel publishing House 2013.
2. Jain, p. C. And jain, m. *Engineering chemistry*, 10th ed.; dhanpat rai and sons: Delhi, 1993
3. Kamaraj, P.; jeyalakshmi, R. And Narayanan, V. *Chemistry in engineering and technology*; sudhandhira publications: chennai, 2001.
4. Kuriakose, j. C. And rajaram, j. *Chemistry in engineering and technology. Vol 2.*; Tata mcgraw hill: new delhi, 1988.

PAPER – II-INDUSTRIAL AND SEWAGE WATER TREATMENT

Unit I: Industrial water treatment – removal of iron –removal of silica – Removal of dissolved oxygen – removal of slime and algae from water- removal of smack and odour from water. Deaeration and Deoxygenation of water. Chemical deoxygenation of water – Removal of gas from water.

Unit II: Sea water as a source of drinking water – desalting – the freezing method – electrochemical desalting – Electro dialysis method – Reverse osmosis method.

Unit III: Formation deposits in boiler units and heat exchangers. Disadvantages of scale formation in boiler units – Methods of preventing deposit formation – Phosphate treatment of boiler water – Treatment of boiler water with complexing agents.

Unit IV: Water analysis – chemical and physical examination of water. Turbidity, odour, Temperature, pH, electrical conductivity, dissolved solids – acidity – total acidity – alkalinity – free carbon dioxide – free chlorine –calcium.

Unit V: Sewage water – its composition – purpose of sewage treatment – Methods of sewage treatment – Removal of phosphorous and nitrogen from waste water. Analysis sewage water – physical test – chemical test – Biological or bacteriological tests.

Reference books:

1. Dr. B. K. Sharma Industrial Chemistry Goel publishing House 2013.
2. **Gosain, A. K** (2010) Indian Water Resource Management: A Scientist's Analysis, Science in India Achievements and Aspirations, (Eds.) H. Y. Mohan Ram and P.N. Tandon, Indian National Science Academy, Pp 257-272
3. Jain, p. C. And jain, m. *Engineering chemistry*, 10th ed.; dhanpat rai and sons: Delhi, 1993

PAPER- III – PRACTICAL – WATER ANALYSIS

1. Determination of Dissolved Oxygen content of water sample by Winkler's method
2. Determination of chloride content of water sample by Argentometric method
3. Determination of alkalinity in water sample
4. Determination of total, temporary & permanent hardness of water by EDTA method
5. Estimation of copper content of the given solution by EDTA method.

References:

1. V.Venkateswaran, R.Veerawany and A.R.Kulandaivelu, basic principles of practical chemistry sultan chand & sons, New Delhi, second Edition (1977).
2. Arthur I. Vogel, Elementary practical chemistry Quantitative analysis, CB publishers and distribution.
3. Jugal, Kishore, Agrawal, *Practicals in Engineering Chemistry*; Oxford and IBH Publishing Co., New Delhi, 1976.



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Puthanampatti – 621 007, Tiruchirappalli District,
Tamil Nadu, INDIA.



CERTIFICATE

*This is to certify that SELVARAJ, A. (CU16Y0036)
has successfully completed the Certificate Course on
“WATER ANALYSIS and TREATMENT” conducted in April 2017.*


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CERTIFICATE

*This is to certify that RANJITH, S. (CU14Y339)
has successfully completed the Certificate Course on
“**WATER ANALYSIS and TREATMENT**” conducted in April 2017.*


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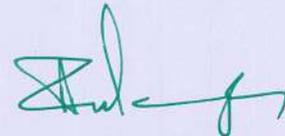


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*This is to certify that SINDHUJA, R. (CU14Y332)
has successfully completed the Certificate Course on
“**WATER ANALYSIS and TREATMENT**” conducted in April 2017.*


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CERTIFICATE

*This is to certify that JEEVA, S. (CU15Y0012)
has successfully completed the Certificate Course on
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CERTIFICATE

*This is to certify that SURESH, R. (CU15Y0035)
has successfully completed the Certificate Course on
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