Rayat Shikshan Sanstha's

S.S.G.M. College, Kopargaon, Dist- Ahmednagar

Department of Chemistry

2020-21

CERTIFICATE COURSE IN INSTRUMENTAL METHODS IN CHEMICAL ANALYSIS

Board of Studies (BOS)

Department of Chemistry have decided to start Certificate Course in Instrumental Methods in Chemical Analysis . For framing the Syllabus of said course, committee was constituted as follow.

Board of Studies Member (BOS)

1. Prin. Dr. Thopte S.S. : **Chairman**
2. Mr. Deshmukh A.K. :**HOD of Chemistry**
3. Prof. JadhavAjit :**Placement Officer**
4. Dr. Malpure N. V. :IQAC- **Coordinator**
5. Dr. Konda Rakesh :**Professional Expert**
6. Mr. MAITRIYA A D. :**Director of Shodh Advantech,Aurangabad**

Aims andObjectivesof thecourse:

1)To provide an adequate knowledge of the principles

2)instrumentationand applications of commonanalytical techniques

3)includingatomic and molecular absorption spectroscopy

4) electrochemical andseparationmethods

5)Understand the operational framework for best practices in Company .

S.S.G.M. COLLEGE KOPARGAON DIST. A'NAGAR

HEAD
Deptt. Of Chemistry
S. S. G M. College, Kopargaon

रयत शिक्षण संस्था, सातारा

Rayat Shikshan Sanstha's
Shri Sadguru Gangageer Maharaj Science, Gautam Arts & Sanjivani Commerce College Kopargaon-423601
Dist-Ahmednagar, State: Maharashtra (India)
Internal Quality Assurance Cell (IQAC)

Syllabus Approval Letter

2020-2021

The IQAC committee has approved the submitted syllabus of short term /Certificate course planned to be conducted by the Department of Chemistry .

Sr.NO	Name of Course	Type of Course
01	Instrumental Methods in Chemical Analysis	Short term course

HOD OF Chemistry Department may Proceesd accordingly .

Date :- 11/09/2020

Place :- Kopargaon

IQAC Coordinator

IQAC-Coordinator
S.S.G.M.College,Kopargaon

S.S.G.M.COLLEGE KOPARGAON DIST. AHMEDNAGAR

Head

HEAD
Department of Chemistry

Deptt. Of Chemistry
S.S.G.M. College, Kopargaon

Instrumental Method Of Chemical Analysis

(2020-2021)

Co-Ordinate by:-	**Assit.Prof.Narode.A.M**
Class :-	**T.Y.B.Sc**
Batch Capacity :-	**23**
No.of students Admitted :-	**23**
Duration of the Course :-	**3 month**
Fee of Course :-	**200/-**
Lecture and Pratical Started :-	**December , January ,February,**
Tentative date of Examination :-	**1st week of March**
Tentative date of examination :-	**2nd week of March**
Syllabus :-	**4 Credits (Theory +Pratical)**

Co-Ordinator

S.S.G.M.COLLEGE KOPARGAON DIST. AHMEDNAGAR

Head
Department of chemistry
S.S.G.M COLLEGE KOPARGAON
Dist-Ahmednagar

Dept. Of Chemistry
S. S. G. M. College, Kopargaon

Rayat Shikshan Sanstha's

S.S.G.M. College, Kopargaon

Short Term Course

INSTRUMENTAL METHODS IN CHEMICAL ANALYSIS

INDEX

S.S.G.M College Kopargaon
Department of Chemistry
Class- T.Y.B.Sc
Short Term Course :- A Certificate course in Instrumental Method of Chemical Analysis
Credits :- 4
Co-Ordinator :- Assit.Prof. Narode .A.M

Aim of course :-

The students will acquire excellent knowledge of analytical chemistry and sound analytical skill which help them for their bright prospects for research ,self employment and excellent Opportunities for job.

Skills and Opportunities :-

Instrumental methods of chemical analysis technique is concerned primarily withy quantitative analysis technique and includes discussion of how to design an analytical method which depends on what information in neede in first year Course of "Certificate course in Instrumental methods of chemical analysis .

The student will get basic knowledge of analytical chemistry and different analytical technique .The students will get Familiar with basic principles of colorimeter ,conductivity water ,potentiometer ,ph meter ,from this course students will becomes more eligible to work in all type of research and industrial laboratories in the future it will also help them for getting employment.

Theory Topics (2Credit)- 3 month

Instrumental methods of chemical analysis

1)General Introduction

A)Analysis – What is mean by analysis ?
Types of analysis : Qualitative and quantitative analysis
Quatitative –Volumetric / gravimetric analysis .

B)What is analytical chemistry ?

C)Sampling

D) Classification of Instrumental Methods

E)Electromagnetic radiation and properties

F)Numerical Problems

2) Conductivity

A) Ohm's law
B) Resistance
C) Specific resistance
D)Conductance
E)Specific conductance
F)Equivalent Conductance
G) Wheatstone bridge
H) Conductivity cells
I) Cell Constant
J) Numerical Problems

3)Colorimeter

A) Colors

B) Colors comparators

C) Visual comparators

D) Fundamental laws of colorimeter

E) Lambert's Law

F) Beer's law

G) Lambert's – Beer's law

H) Terminology

I) Schematics diagram of colorimeter and instrumentation

J) Beer's Law

K) Numerical Problem's

4)Potentiometer

A)Electrolytes and non electrolytes

B)Arrhenius theory

C)Electromotive force

D)Electrochemical cells

E) Voltaic cell

F)Galvanic cell

G)Poggendorffs compensation principle

H)Standardization of potentiometer

I)Western standard cells

j) Nernst Equation

K) Numerical Problem

5) ph Meter

A) Defination of ph and poH

B)Operational definition of ph

C) Electrodes – glass electrodes ,calomel electrode

D) ph meter's :- Potentiometric ph meter

E) Buffer and buffer action

F) Numerical Problem

6)Chromatography

A) Introduction to Chromatography

B) Classification of chromatography

C) Paper Chromatography

D) Types of Paper Chromatography

E)Experimental details for qualitative analysis – choice of proper Chromatographic techniques ,Choice of filters ,Paper ,Proper developing solvent ,Preparation of samples ,spotting ,physical metrhods ,calculation of RF Values ,Experimental details of quatitative analysis .

7)Thermal Methods

7)Thermal Methods

A) Introduction to thermal methods of analysis

B) Thermal analysis techniques

C) Thermogravimetry

D)Results ,information from TG CURVE

E) Factors affecting thermogravimetric curve

F)Instrumentation of thermogravimetry

G) Application of thermogravimetry

8) Solvent Extraction

A)Introduction

B) Principles of solvent extraction

C) Distribution Law , efficiency of extraction

D)Sequence of the extraction process

E) Extraction techniques

F) Numerical Problems

Practicals :-

Part-A-

1)Use of electronic balance
2)Measurement of conductance of electrolytes
3)Determination of cell constant
4)Determination of ph of given solution by ph meter

Part-B-

1) Introduction and understanding of working of conductivity meter ,colorimeter.

Part-C-

1) Determination of maximum wavelength of potassium permanganate .
2) Variation of absorbance with concentration of potassium dichromate.

Part-D-

1) Determination of e.m.f of calomel electrode
2) Determination of ph of given solution by potentiometer.
3) Determination of maxium wavelength of Copper sulphate
4) Determination of maximum wavelength of Potassium Dichromate

Part-E-

1)Determine partition coefficient of 12 in CCl_4 and H_2O.

2)Identify radicals from given mixture

3) Identify radicals by using paper chromatography

4)Determine the Rf value of given organic compound

Part-F

1) Introduction and understanding of working of potentiometer ,ph meter
2) Use of electronic balance
3) Determination of cell constant
4) Determination of ph of given solution by ph meter.
5) Variation of absorbance with concentration of potassium dichromate .

References :

1)Instrumental Methods of Chemical Analysis – Gurudip Chatwal ,Sham Anand

2)Introduction to Instrumental Analysis –Robert Braun

3) Fundamental of Analytical Chemistry – D.A.Skoog ,D.M .West ,F.J.James

4) Principles of physical chemistry -4th Edition Prutton and Marron.

5)Basic concept of analytical chemistry – 2nd Edition ,S.M.Khopkar

6) Instrumental Methods of Chemical analysis 6th Edition ,Willard,Merritt,Dean

7) Vogel's Textbook of Quantitative analysis -4th Edition – S.M Khopkar

Rayat Shikshan Sanstha's

SSGM College, Kopargaon

Short term Course – Instrumental Methods of Chemical Analysis

Class: T.Y.B.Sc. (2020-2021)

List of Enrolled Students Fees: 200 Rs

Sr. No	Name of Students	Amount	Sign
1	Dawange Anil Mohan	200/-	
2	Shewale Laxman	200/-	
3	Gite Bharat Narayan	200/-	
4	Mule Harshada Mahadev	200/-	
5	Jadhav Pallavi Ramesh	200/-	
6	Wavare Pooja Devendra	200/-	
7	Divekar Pooja subhash	200/-	
8	Jangam Vaishnavi Vilas	200/-	
9	Dube Durga Vasant	200/-	
10	Dhawade Vaishnavi Mahesh	200/-	
11	Bhagure Swapnil Ramesh	200/-	
12	Kapadnis Tejas Bharat	200/-	
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21	Chandgude Pragati santosh	200/-	
22	Dokhe Vrushali Kishor	200/-	
23	Ulekar Shubham Manik	200/-	

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Rayat Shikshan Sanstha's

SSGM College, Kopargaon

Class: T.Y.B.Sc. Date: 11/09/2020

Academic Year: 2020-2021

Short Term Course- A Certificate Course in instrumental Method of Chemical Analysis

Notice

All students of T.Y.B.Sc. Class informed that Department of Chemistry will be conducting the Short Term Course entitled "Instrumental Method of Chemical Analysis". All the Students should submit their names to Asst. Prof. P. D. Kashid .

Course Fees: 200/-

Co-ordinator,

S.S.G.M.COLLEGE KOPARGAON DIST. A.NAGAR

Head,

Department of Chemistry

Deptt. Of Chemistry
S. S. G M. College, Kopargaon

Rayat Shikshan Sanstha's

SSGM College, Kopargaon

Department of Chemistry,

Class- T. Y. B.Sc.

2020-2021

Short Term Course- A Certificate Course in Instrumental Methods of Chemical Analysis

Notice

Date: 11/09/2020

All Students of T.Y. B.Sc. Class who haved enrolled for Short Term Course "Instrumental Methods of Chemical Analysis" will have their lectures from 03-12-2020 at 2.30 pm. The attendance to the lectures are compulsory.

Venue: Hall No. :– A-102

Course Co-ordinator,

Head,
Department of Chemistry.

S.S.G.M. COLLEGE KOPARGAON DIST. AHMEDNAGAR

HEAD
Dept. Of Chemistry
S. S. G. M. College, Kopargaon

2020-2021

Rayat Shikshan Sanstha's
S.S.G.M. College, Kopargaon
Dist: Ahmednagar.

Short term Course- Admission form

Name	Dokhe Vrushali kishor
Class	TYBSc
Address	Mahadeva mandir kadeakl kopargaonme.
Mobile No	9922543742.

To,
The Principle,
SSGM College, Kopargaon, Dist: Ahemednagar.

Sub: Request to an admission in the following short term course

"..... Instrumental Method and Chemical Analysis

Respected sir,

I, the undersigned have been admitted in T.Y.B.Sc./M.Sc II (Analytical) Chemistry class in our college, I wish to complete above short term course run by our college. Kindly do me a favour by granting admission

Yours Faithfully
Sign: Dokhe V.K
Name: Dokhe Vrushali kishor

Recommended for an admission in the short term course.

Chairman
Short term course

Course Co-ordinator

Head of Department
Deptt. Of Chemistry
S.S.G.M. College

S.S.G.M.COLLEGE KOPARGAON DIST. AHMEDNAGAR

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Rayat Shikshan Sanstha's
S.S.G.M. College, Kopargaon
Dist: Ahmednagar.

2020-2021

Short term Course- Admission form

Name	More Pranav Ravindra
Class	T.Y. BSc
Address	At. Nategaon post: Yesgaon Tal. Kopargaon.
Mobile No	8180825187

To,
The Principle,
SSGM College, Kopargaon, Dist: Ahemednagar.

Sub: Request to an admission in the following short term course

"..... Instrumental method and Chemical Analysis ....."

Respected sir,

I, the undersigned have been admitted in T.Y.B.Sc./M.Sc II (Analytical) Chemistry class in our college, I wish to complete above short term course run by our college. Kindly do me a favour by granting admission

Yours Faithfully
Sign:
Name: More Pranav Ravindra

Recommended for an admission in the short term course.

Chairman
Short term course

Course Co-ordinator

Head of department
HEAD
Deptt. Of Chemistry
S. S. G. M. College, Kopargaon

S.S.G.M.COLLEGE KOPARGAON.DIS. AHMEDNAGAR

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Rayat Shikshan Sanstha's
S.S.G.M. College, Kopargaon
Dist: Ahmednagar.

2020-2021

Short term Course- Admission form

Name	Dhanavate Shraddha Subhash
Class	T.Y B Sc
Address	Puntamba, Tal - Rahata. Dist - A.nagar
Mobile No	8421056934

To,
The Principle,
SSGM College, Kopargaon, Dist: Ahemednagar.

Sub: Request to an admission in the following short term course

"..... Instrumental method and chemical Analysis ....."

Respected sir,

I, the undersigned have been admitted in T.Y.B.Sc./M.Sc II (Analytical) Chemistry class in our college, I wish to complete above short term course run by our college. Kindly do me a favour by granting admission

Yours Faithfully
Sign: Dhanavate
Name: Dhanavate Shraddha Subhash

Recommended for an admission in the short term course.

Chairman
Short term course

Course Co-ordinator

Head of department
Deptt. Of Chemistry
S. S. G. M. College, Kop

S.S.G.M.COLLEGE KOPARGAON DIST. A.NAGAR

Rayat Shikshan Sanstha's

SSGM College ,Kopargaon

Short Term Course –A certificate course Instrumental Methods of Chemical Analysis

Class:-T.Y.B.Sc (Chemistry)

Time table:- 2020-2021

December 2020

Monday (Theory)	Tuesdady (Theory)	Wednesday (Theory)
02/12/20 (AMN)	03/12/20 (AMN)	04/12/20 (DNG)
09/12/20 (DMS)	10/12/20 (DMS)	11/12/20 (DMS)
16/12/20 (NMC)	17/12/20 (NMC)	18/12/20 (NMC)
23/12/20 (AMN)	24/12/20 (PDK)	-

January 2021

Monday (Theory)	Tuesdady (Theory)	Wednesday (Theory)
06/01/2021 (DNG)	07/1/2021 (AMN)	08/01/2021 (AMN)
13/01/2021 (AMN)	14/01/2021 (DMS)	15/01/2021 (DMS)
20/01/2021 (NMC)	28/01/2021 (NMC)	29/01/2021 (NMC)

February 2021

Monday (Practical)	Tuesdady (Practical)	Wednesday (Practical)
3/2/2021 (PDK)	4/2/2021(DNG)	5/2/2021 (AMN)
10/2/2021 (DNG)	11/2/2021 (PDK)	12/2/2021(DNG)
17/2/2021 (AMN)	18/2/2021 (AMN)	-

S.S.G.M. COLLEGE KOPARGAON, DIST. AHMEDNAGAR

Rayat shikshan Sanstha's
SSGM College, Kopargaon
Short term Course: Instrumental Methods of chemical Analysis
Class: T.Y.B.Sc. Attendance: 2020-2021 Theory

Sr No	Name of Students	Date:				
		1	2	3	4	5
1	Dawange Anil Mohan					
2	Shewale Laxman					
3	Gite Bharat Narayan					
4	Mule Harshada Mahadev					
5	Jadhav Pallavi Ramesh					
6	Wavare Pooja Devendra					
7	Divekar Pooja subhash					
8	Jangam Vaishnavi Vilas					
9	Dube Durga Vasant					
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13	Vahadne Nutan Sanjay					
14	Dhanwate Shradha Subhash					
15	Nehe shubhangi somnath					
16	Kashid Shubham suresh					
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18	Shirsath Rahul Balasaheb					
19	More Pranav Ravindra					
20	Pawar Janvi Yogesh					
21	Chandgude Pragati santosh					
22	Dokhe Vrushali Kishor					
23	Ulekar Shubham Manik					

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SSGM College, Kopargaon
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Rayat shikshan Sanstha's
SSGM College, Kopargaon
Short term Course: Instrumental Methods of chemical Analysis
Class: T.Y.B.Sc. Attendance: 2020-2021 Practical

Sr No	Name of Students	Date:					
		1	2	3	4	5	6
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4	Mule Harshada Mahadev						
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SSGM College, Kopargaon
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S.S.G.M. COLLEGE KOPARGAON DIST. AHMEDNAGAR

Rayat Shikshan Sanstha's
S.S.G.M. College, Kopargaon, Dist- Ahmednagar
Department of Chemistry
2020-21

CERTIFICATE COURSE IN INSTRUMENTAL METHODS IN CHEMICAL ANALYSIS

Question Paper

Mark :- 50 Mark

Q.1.Multiple Choice Questions & Answers (MCQs) Each Carry 2 Mark

1. Spectroscopy deals with interaction of electromagnetic radiation with matter. What is the speed of this radiation in vacuum in m/s?
a) 6×10^8
b) 5×10^8
c) 7×10^8
d) 3×10^8

2. Which type of Quantum Transition takes place in Ultra Violet and Visible spectroscopy?
a) Rotation of molecules
b) Nuclear
c) Bonding electrons
d) Spin of nuclei in a magnetic field

3. Which of the following is not a property or parameter of electromagnetic radiation?
a) Wavelength
b) Voltage
c) Wave number
d) Amplitude

4. Which of the following is not a type of Spectroscopy?
a) Gamma ray
b) X ray
c) Nuclear magnetic resonance
d) Sound

5. Which of the following is the wavelength of microwave radiation?
a) 10 – 780nm
b) 0.78 – 30μm
c) 0.6 – 10 m
d) 0.75 – 3.75 mm

6. Which of the following is the principle of Flame emission photometers?
a) Radiation is absorbed by non-excited atoms in vapour state and are excited to higher states
b) Medium absorbs radiation and transmitted radiation is measured
c) Colour and wavelength of the flame is measured
d) Only wavelength of the flame is measured

7. In Flame emission photometers, the measurement of _____ is used for qualitative analysis.
a) Colour
b) Intensity
c) Velocity
d) Frequency

S.S.G.M. COLLEGE KOPARGAON DIST. AHMEDNAGAR

8. Which of the following is not a detector used in Flame emission photometers?
a) Photronic cell
b) Photovoltaic cell
c) Photoemissive tube
d) Chromatogram
9. Which of the following is not a feature of carrier gas used in gas chromatography?
a) It must be chemically inert
b) It should be suitable for the detector employed
c) It should not be completely pure
d) It should be cheap
10. Which of the following is the commonly used support material for the packed column in gas chromatography?
a) Glass
b) Metal
c) Diatomaceous earth
d) Stainless steel
11. Which of the following is not a detector used in mid Infrared Spectrophotometer?
a) Thermopile
b) Thermistor
c) Pyroelectric cell
d) Golay cell
12. Which of the following is used as a source in the simple infrared analyzer for gas analysis?
a) Tungsten filament lamp
b) Nernst glower
c) Hot-wire spiral
d) Mercury arc lamp
13. Which of the following is the principle of Atomic Absorption Spectroscopy?
a) Radiation is absorbed by non-excited atoms in vapour state and are excited to higher states
b) Medium absorbs radiation and transmitted radiation is measured
c) Colour is measured
d) Colour is simply observed
14. In Atomic Absorption Spectroscopy, which of the following is the generally used radiation source?
a) Tungsten lamp
b) Xenon mercury arc lamp
c) Hydrogen or deuterium discharge lamp
d) Hollow cathode lamp
15. Which of the following is the function of the Flame or Emission system in Atomic Absorption Spectroscopy?
a) To split the beam into two
b) To break the steady light into pulsating light
c) To filter unwanted components
d) To reduce the sample into atomic state
16. Which of the following is not a fuel used in flame photometry?
a) Acetylene
b) Propane
c) Hydrogen
d) Camphor oil

17. Which of the following is not true about Fourier Transform Infrared (FTIR) spectrometer?
a) It is of non-dispersive type
b) It is useful where repetitive analysis is required
c) Size has been reduced over the years
d) Size has increased over the years
18. Which of the following is not the advantage of Fourier Transform Spectrometers?
a) Signal to noise ratio is high
b) Information could be obtained on all frequencies
c) Retrieval of data is possible
d) Easy to maintain
19. In Michelson's interferometer, the frequency of the detector output can be determined by translating the _____ of movable mirror and the _____ of monochromatic radiation.
a) Velocity, wavelength
b) Thickness, intensity
c) Length, velocity
d) Angle, intensity
20. Which of the following is the formula for pH calculation?
a) log10[H+]
b) -log10[H+]
c) log2[H+]
d) -log2[H+]
21. pH meters can be considered as voltage sources with which of the following internal resistances?
a) Very low resistance
b) Moderate resistance
c) Very high resistance
d) No resistance
22. Which of the following is not a failure in pH meters?
a) Defective electrodes
b) Defective input circuitry
c) Defective electronic circuitry
d) Defective calibration
23. Which of the following is the simplest of pH meters?
a) Null-detector type pH meter
b) Direct reading type pH meter
c) Digital pH meter
d) Modern pH meter
24. Fourier transform NMR spectrometer has which of the following characteristics?
a) Increased sensitivity, long time to obtain data
b) Decreased sensitivity, long time to obtain data
c) Increased sensitivity, reduced time to obtain data
d) Decreased sensitivity, reduced time to obtain data
25. Only _____ percent of the effluent of the liquid chromatography must be introduced in the mass spectrometer.
a) 1-2 %
b) 1-5 %
c) 1-20 %
d) 1-15 %

S.S.G.M. College Kopargaon

Short Term Course of Instrumental Methods of Chemical Analysis 2020-21

Mark list of students

Sr.No.	Name of the Student	Marks	Result
1.	Borde Nikita Balasaheb	28 / 50	Pass
2.	Bhagure Swapnil Ramesh	30 / 50	Pass
3.	Chandgude Pragati Santosh	30 / 50	Pass
4.	Dawange Anil Mohan	34 / 50	Pass
5.	Dhawade Vaishnavi Mahesh	26 / 50	Pass
6.	Dhanwate Shradha Subhash	32 / 50	Pass
7.	Divekar Pooja Subhash	32 / 50	Pass
8.	Dokhe Vrushali Kishor	38 / 50	Pass
9.	Dube Durga Vasant	24 / 50	Pass
10.	Gite Bharat Narayan	30 / 50	Pass
11.	Jadhav Pallavi Ramesh	28 / 50	Pass
12.	Jangam Vaishnavi Vilas	32 / 50	Pass
13.	Kapadnis Tejas Bharat	26 / 50	Pass
14.	Kashid Shubham Suresh	36 / 50	Pass
15.	More Pranav Ravindra	32 / 50	Pass
16.	Mule Harshada Mahadev	34 / 50	Pass
17.	Nehe Shubhangi Somnath	24 / 50	Pass
18.	Pawar Janvi Yogesh	26 / 50	Pass
19.	Shewale Laxmann	32 / 50	Pass
20.	Shirsath Rahul Balasaheb	36 / 50	Pass
21.	Ulekar Shubham Manik	32 / 50	Pass
22.	Vahadane Nutan Sanjay	26 / 50	Pass
23.	Wavare Pooja Devendra	34 / 50	Pass

S.S.G.M. COLLEGE KOPARGAON DIST. AHMEDNAGAR

Rayat Shikshan Sanstha's
S.S.G.M.College, Kopargaon
Dist.-Ahmednagar

Certificate Course

Feedback Form (Year 2020-21)

How you like this activity?

(Please tick (√)on the appropriate option)

Criteria's	Excellent	Very Good	Good	Average	Poor
Content of the curriculum	✓				
Quality of Lectures		✓			
Quality of Practical's		✓			
Arrangement of Tour and hands on training collaboratively organized		✓			
Is the course is applicable for entrepreneurship development in your future life			✓		
Overall Evaluation of the Course		✓			
Is the course is beneficial for students & Parents as far as environment & Crop production is concerned				✓	
Any Suggestions:					

Name of the Students: Harshada Mahadev Mule

Class: T.Y (B.Sc)

Signature:

S.S.G.M.COLLEGE KOPARGAON DIST.A.NAGAR

Rayat Shikshan Sanstha's
S.S.G.M.College, Kopargaon
Dist.-Ahmednagar

Certificate Course

Feedback Form (Year 2019-20)

How you like this activity?

(Please tick (√)on the appropriate option)

Criteria's	Excellent	Very Good	Good	Average	Poor
Content of the curriculum					
Quality of Lectures	✓				
Quality of Practical's		✓			
Arrangement of Tour and hands on training collaboratively organized			✓		
Is the course is applicable for entrepreneurship development in your future life		✓			
Overall Evaluation of the Course		✓			
Is the course is beneficial for students & Parents as far as environment & Crop production is concerned	✓				
Any Suggestions:					

Name of the Students: Bhagure Swapnil Ramesh.

Class: T.Y bsc

Signature: Bhagure

Rayat Shikshan Sanstha's
S.S.G.M.College, Kopargaon
Dist.-Ahmednagar

Certificate Course

Feedback Form (Year 2019-21)

How you like this activity?

(Please tick (√)on the appropriate option)

Criteria's	Excellent	Very Good	Good	Average	Poor
Content of the curriculum	✓				
Quality of Lectures	✓				
Quality of Practical's		✓			
Arrangement of Tour and hands on training collaboratively organized		✓			
Is the course is applicable for entrepreneurship development in your future life	✓				
Overall Evaluation of the Course			✓		
Is the course is beneficial for students & Parents as far as environment & Crop production is concerned		✓			
Any Suggestions:					

Name of the Students: Shewale Laxman Vijay.

Class: TY BSC

Signature: Shewale

Rayat Shikshan Sanstha's
S.S.G.M.College, Kopargaon
Dist.-Ahmednagar

Certificate Course

Feedback Form (Year 2020-21)

How you like this activity?

(Please tick (√)on the appropriate option)

Criteria's	Excellent	Very Good	Good	Average	Poor
Content of the curriculum	✓				
Quality of Lectures	✓				
Quality of Practical's		✓			
Arrangement of Tour and hands on training collaboratively organized		✓			
Is the course is applicable for entrepreneurship development in your future life			✓		
Overall Evaluation of the Course			✓		
Is the course is beneficial for students & Parents as far as environment & Crop production is concerned		✓			
Any Suggestions:					

Name of the Students: Dokhe Vrushali Kishor

Class: TYBSc

Signature: Dokhe.V.K

"Education Through Self - Help is our Motto" - Karmaveer

Rayat Shikshan Sanstha's

Shri Sadguru Gangageer Maharaj Science, Gautam Arts & Sanjivani Commerce College

Kopargaon, Dist. Ahmednagar (M.S.)

Short Term Course

CERTIFICATE OF COMPLETION

This is to Certify that Shri/Kum. _____

of Class _____ has Completed Short Term Course in _____

_____ conducted by the department of _____

during the academic year 201 /201

Course Co-ordinator **Co-ordinator** **Principal**

Rayat Shikshan Sanstha's

SSGM College, Kopargaon

Department of Chemistry **Class: T.Y. B.Sc.**

Date: 12/09/2020

Short Term Course- A certificate Course in Instrumental Method of Chemical Analysis

Minutes of Meeting

The meeting of the Short Term Course Committee has been conducted on 11/09/2020 at Department of Chemistry. In the meeting the following resolutions and decisions were made:

1. It was decided to revise the syllabus of Short term Course- A Certificate Course in Instrumental Method of Chemical Analysis.
2. For conducting the course the complete program of Theory and Practicals was designed.
3. As per the requirements of completion of the syllabus of the short term course the working hours were decided.

Course Co-ordinator,

S.S.G.M.COLLEGE KOPARGAON DIST. AHMEDNAGAR

Head
Department of Chemistry

HEAD
Dept. of Chemistry
S. S. G. M. College, Kopargaon

Rayat Shikshan Sanstha's
Shri Sadguru Gangageer Maharaj Science, Gautam Arts & Sanjivani Commerce College, Kopargaon. Dist-Ahmednagar-423601.

Report

The department of chemistry conducted a Short Term Course entitled **Instrumental Methods in Chemical Analysis.** Total 23 students of T.Y.B.Sc. Chemistry were admitted in the course. The duration of course was three months (1 Dec.2020 to 20 Mar.2021). The course was conducted satisfactorily by the Department of chemistry.

S.S.G.M. COLLEGE CHEMISTRY KOPARGAON, DIST. AHMEDNAGAR

Head,
Department of Chemistry,
S.S.G.M. College, Kopargaon.