

K. K. Wagh Education  
Date: 30/03/2022

To,  
The Principal  
K. K. Wagh College of Agriculture,  
Nashik

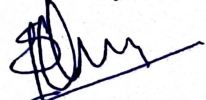
Subject Regarding permission for Certificate Course.....

Respected Sir,

On behalf of the Department of Soil Science and Agril.Chemistry, we humbly request permission to initiate a Certificate course titled "**Analytical Instrumentation**". This course is scheduled from 4/4/2022 to 9/4/2022 and will involve approximately 18 final-year students. It is anticipated that this course will greatly benefit our students in enhancing their knowledge about the principle and working of various analytical instruments. We kindly ask for your approval for the implementation of this course.

Thanking You,

Yours faithfully,



(Prof.P.V.Shinde.)

Course Coordinator

Permission granted

30/3



K. K. Wagh Education Society's  
K. K. Wagh College of Agriculture,  
(Affiliated to Mahatma PhuleKrishiVidyapeeth, Rahuri)  
Saraswati Nagar, Panchavati, Nashik- 422 003. Maharashtra  
College Code:11135 AISHE Code: C-50690

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Certificate course in  
**“Analytical Instrumentation”**  
Academic Year 2021-22

**Syllabus Committee**

Sr no	Name of teacher	Designation	Department	Role in course
1	Prof. P.V.Shinde.	Assistant Professor	Soil Science and Agril. Chemistry	Course coordinator
2	Prof. S.S.Bairagi	Assistant Professor	Soil Science and Agril.Chemistry	Committee member

**Course Coordinator**

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Date: 31/03/2022

Academic Year 2021-22

## Department of Soil Science and Agril. Chemistry

### Minutes of the Board of Studies Meeting for the Short-Term Certificate Course

A meeting of the Board of Studies for the Short-term Certificate Course in “Analytical Instrumentation” was convened on 31 March 2022, at 02:00pm in the Department of Soil Science and Agril. Chemistry. The meeting was attended by the following Syllabus Design Committee members:

Sr no	Name of the expert	Designation	Sign
1	Dr. S. M. Hadole	Principal	
2	Prof. P.V.Shinde.	Course Coordinator	
3	Prof. S.S.Bairagi	Member	

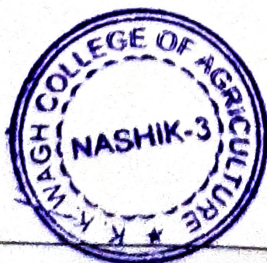
### Minutes of Meeting

The Board of Studies convened a meeting on 31 March 2022, at 02:00 pm in the Department of Soil Science and Agril. Chemistry to address various aspects concerning the Short-Term Certificate Course in “Analytical Instrumentation”. The meeting focused on the following key points:

- Syllabus Formation:** Members deliberated on developing a syllabus that emphasizes on relevant knowledge and skills in “Analytical Instrumentation”.
- Dissemination of Work:** Strategies for effectively teaching “Analytical Instrumentation” were discussed to aid students in the course.
- Encouragement of Students:** The meeting stressed the importance of offering guidance and motivation to students. “Analytical Instrumentation” was recognized as an effective approach which provide hands on experience and enable students operate the analytical instruments.
- Examination of Short-Term Course:** The examination structure and assessment methods for the short-term course were reviewed. The board explored ways to ensure fair and comprehensive evaluations that accurately assess students.

The meeting concluded with a commitment to refine the course and its delivery methods to better meet the needs of students enrolled in the Certificate Course in “Analytical Instrumentation”.

Course coordinator



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## Department of Soil Science and Agril. Chemistry

### Certificate course in "Analytical Instrumentation"

Academic Year 2021-22

#### Syllabus Outcomes:

1. The students will be able to understand the working principle of various analytical instruments.
2. The students will be able to handle and operate the scientific instruments.
3. The students will be able to use the analytical instruments for practical applications
4. The students will be know the Analytical Testing and its Scope.

Sr no	Topic	Description	No of Lectures
1	Introduction	1. Introduction to Soil, Plant, Water Analysis. 2. Analytical Testing and its Scope	03 hours
2	Spectro-photometry / Colorimeter	Introduction to Spectro-photometry / Colorimeter, Principle, instrumentation, sample preparation and analysis. Introduction to UV-Vis spectrophotometry, principles, instrumentation, sample preparation and analysis, , interpretation of Graph	06 hours
3	Flame photometry	Introduction to Flame photometry, Principle, instrumentation, sample preparation and analysis , interpretation of Graph	06 hours
4	Atomic Absorption Spectrophotometer (AAS)	Introduction to Atomic Absorption Spectrophotometer (AAS) , Principle ,instrumentation, sample preparation and analysis.	06 hours
5	Nitrogen analyzer	Introduction to Nitrogen analyzer, Principle, instrumentation, sample preparation and analysis.	05 hours
6	pH meter and Electrical conductivity meter	Introduction to pH meter and Electrical conductivity meter, Principle instrumentation, sample preparation and analysis.	04 hours
7	Muffle Furnace and Hot air oven	Introduction to Muffle Furnace and Hot air oven Principle, instrumentation, sample processing	06 hours
<b>Total</b>			<b>36 hours</b>

  
Course Coordinator



  
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Date: 1/04/2022

## Student Notice

All the students of B. Sc. (Hons.) Agriculture final year are informed that for the academic year 2021-22 the Certificate Course on “Analytical Instrumentation”. is starting from 4/4/2022 to 9/4/2022. For this certificate course students should submit their names to the Certificate Course Coordinator Assistant Prof. P. V. Shinde up to 3/4/2022.

**Duration:** 36 Hrs., 4/4/2022 to 9/4/2022

**Time: Morning Session:** 10.00 am to 1.00 pm

**Afternoon session:** 2.00pm to 5.00 pm

Note: This course is free of cost to all students.

Course Coordinator

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Department of Soil Science and Agril. Chemistry  
Certificate course in  
"Analytical Instrumentation"  
Academic Year 2021-22

Enrolled Student List

SR NO	REGISTRATION NO	NAME OF STUDENT
1	AKN/D-2019/001	Asware Yogita Dnyaneshwar
2	AKN/D-2019/002	Bendkule Harshada Manohar
3	AKN/D-2019/005	Deokar Pratiksha Bhausahab
4	AKN/D-2019/008	Gangurde Dhananjay Bhimrao
5	AKN/D-2019/014	Rode Ajit Kailas
6	AKN/D-2019/015	Salve Rushikesh Ratnakar
7	AKN/D-2019/016	Shinde Akash Raghunath
8	AKN/D-2019/017	Shinde Atul Jayram
9	AKN/D-2019/018	Shinde Omkar Vasanttrao
10	AKN/D-2019/019	Shinde Pranjal Ravindra
11	AKN-2017/064	More Monika Sanjay
12	AKN-2018/002	Aher Pratiksha Anil
13	AKN-2018/003	Aklade Nikhil Prakash
14	AKN-2018/005	Ate Nikhil Amardeep
15	AKN-2018/007	Bachhav Sujal Sanjay
16	AKN-2018/010	Bhamare Yash Gautam
17	AKN-2018/011	Bhise Rahul Komal
18	AKN-2018/012	Bhor Snehal Ravsaheb

Course Coordinator



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## STUDENT REGISTRATION FORM

Academic Year: 2021-2022

(Department of Soil Science and Agril. Chemistry)

CERTIFICATE COURSE

Affix recent  
passport size  
photograph  
(colour)

### "Analytical Instrumentation"

For Department Use Only

Registration No.: AKN-2019/001.....

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Student ID:

Name of the Student: Aswate Yogita Dnyaneshwar.....

Mother's Name: Sonali Aswate.....

Father's Name: Dnyaneshwar Aswate Year: 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup>

E-Mail ID: aswateyoi2000@gmail.com.....

Address: k.k. Wagh college of agriculture, Near the Dharmak photo Nashik.....

State: Maharashtra PIN Code: 422102.....

Mobile No: 7709605771 Alternate contact number: 9022067519.....

Gender: Male  Female  Other  Religion:

Date of Birth: 05/07/2001.....

Educational Qualification (at the time of admission):

HSc. .... Other .....

AHD  
Signature of Student

Place: k.k. Wagh college of Agriculture, Nashik

Date:





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## STUDENT REGISTRATION FORM

Academic Year: 2021-2022

(Department of Soil Science and Agril. Chemistry)

CERTIFICATE COURSE

Affix recent  
passport size  
photograph  
(colour)

### "Analytical Instrumentation"

For Department Use Only

Registration No.: AKN 2018/005

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Student ID:

Name of the Student: Bachhav Sujal Sanjay

Mother's Name: Teela

Father's Name: Sanjay Bachhav Year: 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup> ✓

E-Mail ID: Sujalbachhav123@gmail.com

Address: Manak Bagh Gayanon Maharaj Nagar, Bhusaad Dist Jalgaon

State: Maharashtra PIN Code:

Mobile No: 8180031451 Alternate contact number: 8087659740

Gender: Male  Female  Other  Religion:

Date of Birth: 25/10/2000

Educational Qualification (at the time of admission):

HSc ..... Other .....

*Sujal Bachhav*  
Signature of Student

Place:

Date:







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## Department of Soil Science and Agril. Chemistry

### Certificate course in "Analytical Instrumentation" Academic Year 2021-22

#### Schedule of the course

Sr no	Topic	Description	Name of the teacher	Department
1	Introduction	1. Introduction to Soil, Plant, Water Analysis. 2. Analytical Testing and its Scope	Prof. P. V. Shinde	SSAC
2	Spectro-photometry / Colorimeter	Introduction to Spectro-photometry / Colorimeter, Principle, instrumentation, sample preparation and analysis. Introduction to UV-Vis spectrophotometry, principles, instrumentation, sample preparation and analysis, , interpretation of Graph	Prof. S. S. Bairagi	SSAC
3	Flame photometry	Introduction to Flame photometry, Principle, instrumentation, sample preparation and analysis, interpretation of Graph	Prof. P. V. Shinde	SSAC
4	Atomic Absorption Spectrophotometer (AAS)	Introduction to Atomic Absorption Spectrophotometer (AAS), Principle, instrumentation, sample preparation and analysis.	Prof. S. S. Bairagi	SSAC
5	Nitrogen analyzer	Introduction to Nitrogen analyzer, Principle, instrumentation, sample preparation and analysis.	Prof. P. V. Shinde	SSAC
6	pH meter and Electrical conductivity meter	Introduction to pH meter and Electrical conductivity meter, Principle instrumentation, sample preparation and analysis.	Prof. S. S. Bairagi	SSAC
7	Muffle Furnace and Hot air oven	Introduction to Muffle Furnace and Hot air oven Principle, instrumentation, sample processing	Prof. P. V. Shinde	SSAC

Course Coordinator



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## Department of Soil Science and Agril. Chemistry

### Certificate course in "Analytical Instrumentation" Academic Year 2021-22

#### Time Table

Sr no	Date	Time		Topic
1	4/4/2022	10.00 am- 1.00 pm	1.00 pm - 05.00 pm	1. Introduction to Soil, Plant, Water Analysis. 2. Analytical Testing and its Scope 3. Introduction to pH meter and Electrical conductivity meter, Principle instrumentation, sample preparation and analysis.
2	5/4/2022	10.00 am- 01.00 pm	02.00 pm - 05.00 pm	Introduction to Spectro-photometry / Colorimeter, Principle, instrumentation, sample preparation and analysis. Introduction to UV-Vis spectrophotometry, principles, instrumentation, sample preparation and analysis, , interpretation of Graph
3	6/4/2022	10.00 am- 01.00 pm	02.00 pm - 05.00 pm	Introduction to Flame photometry, Principle, instrumentation, sample preparation and analysis , interpretation of Graph
4	7/4/2022	10.00 am- 01.00 pm	02.00 pm - 05.00 pm	Introduction to Atomic Absorption Spectrophotometer (AAS) , Principle ,instrumentation, sample preparation and analysis.
5	8/4/2022	10.00 am- 01.00 pm	02.00 pm - 05.00 pm	Introduction to pH meter and Electrical conductivity meter, Principle instrumentation, sample preparation and analysis.
6	9/4/2022	10.00 am- 01.00 pm	02.00 pm - 05.00 pm	Introduction to Nitrogen analyzer, Principle, instrumentation, sample preparation and analysis.

  
Course Coordinator



  
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K K WAGH COLLEGE OF AGRICULTURE, NASHIK  
 Department of Soil Science and Agril. Chemistry  
 Certificate course in "Analytical Instrumentation"  
 Academic Year 2021-22

Sr no	Registration no	Name of students	4/4/2022		5/4/2022		6/4/2022		7/4/2022		8/4/2022		9/4/2022	
			Date:	Time:	Date:	Time:	Date:	Time:	Date:	Time:	Date:	Time:	Date:	Time:
1	AKN/D-2019/001	Asware Yogita Dnyaneshwar	AYD	AYD	AYD	AYD	AYD	AYD	AYD	AYD	AYD	AYD	AYD	AYD
2	AKN/D-2019/002	Bendkule Harshada Manohar	Bha	Bha	Bha	Bha	Bha	Bha	Bha	Bha	Bha	Bha	Bha	Bha
3	AKN/D-2019/005	Deokar Pratiksha Bhausahab	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha
4	AKN/D-2019/008	Gangurde Dhananjay Bhimrao	Bganurde	Bganurde	Bganurde	Bganurde	Bganurde	Bganurde	Bganurde	Bganurde	Bganurde	Bganurde	Bganurde	Bganurde
5	AKN/D-2019/014	Rode Ajit Kailas	Rajit	Rajit	Rajit	Rajit	Rajit	Rajit	Rajit	Rajit	Rajit	Rajit	Rajit	Rajit
6	AKN/D-2019/015	Salve Rushikesh Ratnakar	R.R.Salve	R.R.Salve	R.R.Salve	R.R.Salve	R.R.Salve	R.R.Salve	R.R.Salve	R.R.Salve	R.R.Salve	R.R.Salve	R.R.Salve	R.R.Salve
7	AKN/D-2019/016	Shinde Akash Raghunath	Ashind	Ashind	Ashind	Ashind	Ashind	Ashind	Ashind	Ashind	Ashind	Ashind	Ashind	Ashind
8	AKN/D-2019/017	Shinde Atul Jayram	Atulshind	Atulshind	Atulshind	Atulshind	Atulshind	Atulshind	Atulshind	Atulshind	Atulshind	Atulshind	Atulshind	Atulshind
9	AKN/D-2019/018	Shinde Omkar Vasantao	Omkar	Omkar	Omkar	Omkar	Omkar	Omkar	Omkar	Omkar	Omkar	Omkar	Omkar	Omkar
10	AKN/D-2019/019	Shinde Pranjal Ravindra	P.	P.	P.	P.	P.	P.	P.	P.	P.	P.	P.	P.
11	AKN-2017/064	More Monika Sanjay	More	More	More	More	More	More	More	More	More	More	More	More
12	AKN-2018/002	Aher Pratiksha Anil	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha	Pratiksha
13	AKN-2018/003	Aklade Nikhil Prakash	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil
14	AKN-2018/005	Ate Nikhil Amardeep	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil	Nikhil
15	AKN-2018/007	Bachhav Sujal Sanjay	Sujal	Sujal	Sujal	Sujal	Sujal	Sujal	Sujal	Sujal	Sujal	Sujal	Sujal	Sujal
16	AKN-2018/010	Bhamare Yash Gautam	Y.Bhamare	Y.Bhamare	Y.Bhamare	Y.Bhamare	Y.Bhamare	Y.Bhamare	Y.Bhamare	Y.Bhamare	Y.Bhamare	Y.Bhamare	Y.Bhamare	Y.Bhamare
17	AKN-2018/011	Bhise Rahul Komal	Bhise	Bhise	Bhise	Absent	Bhise	Bhise	Bhise	Bhise	Bhise	Bhise	Bhise	Bhise
18	AKN-2018/012	Bhor Snehal Ravsaheb	Snehal	Snehal	Snehal	Absent	Snehal	Snehal	Snehal	Snehal	Snehal	Snehal	Absent	Snehal

Course Coordinator



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**Certificate course in  
"Analytical Instrumentation"**

**Academic Year 2021-22**

**Examination Methodology**

Sr no	Nature of exam	Marks
1	Written	20
2	Practical	30
3	Total	50

**Reference:**

Tandon, H. L. S. (2005) Methods of analysis of soils, plants, waters, and fertilizers.

Chopra, S.L., and Kanwar, J.S. (1991). Analytical Agricultural Chemistry. Kalyani publi; New Delhi, Ludhiana

Piper, C.S. (1966). Soil and plant analysis. Hans publi, Bombay.

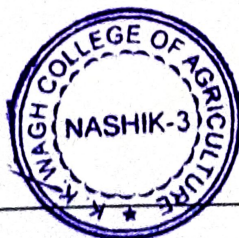
Somwanshi, R.B., Kadu, P.P; Tamboli, B.D; Patil, Y.M. and Bhakare, B.D. (1999). Analysis of plants, irrigation water, and soils MPKV. Extn. Publ. No. 284. Rahuri (Maharashtra)

Olsen, S.R., Cole, C.V., Watanbe, F.S., and Dean, L.A. (1954). Estimation of available phosphorous in soil by extraction with sodium bicarbonate circ, U.S. Dept Agri: 939

Jackson, M.L. (1973). Soil chemical analysis. Prentice-Hall of India, New Delhi.

Chopra, S.L., and Kanwar, J.S. (1991). Analytical Agricultural Chemistry. Kalyani publi; New Delhi, Ludhiana

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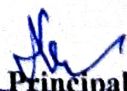
## Department of Soil Science and Agril. Chemistry

Certificate course in  
“Analytical Instrumentation”  
Academic Year 2021-22

### Student Result

Sr. No.	Registration no	Name of the students	Theory marks (20)	Practical Marks (30)	Mark Out of Total 50
1	AKN/D-2019/001	Asware Yogita Dnyaneshwar	20	24	44
2	AKN/D-2019/002	Bendkule Harshada Manohar	20	26	46
3	AKN/D-2019/005	Deokar Pratiksha Bhausahab	19	28	47
4	AKN/D-2019/008	Gangurde Dhananjay Bhimrao	20	26	46
5	AKN/D-2019/014	Rode Ajit Kailas	18	29	47
6	AKN/D-2019/015	Salve Rushikesh Ratnakar	20	24	44
7	AKN/D-2019/016	Shinde Akash Raghunath	18	29	47
8	AKN/D-2019/017	Shinde Atul Jayram	20	24	44
9	AKN/D-2019/018	Shinde Omkar Vasantao	19	28	47
10	AKN/D-2019/019	Shinde Pranjal Ravindra	19	27	45
11	AKN-2017/064	More Monika Sanjay	20	25	45
12	AKN-2018/002	Aher Pratiksha Anil	20	26	46
13	AKN-2018/003	Aklade Nikhil Prakash	20	25	45
14	AKN-2018/005	Ate Nikhil Amardeep	18	27	45
15	AKN-2018/007	Bachhav Sujal Sanjay	19	30	49
16	AKN-2018/010	Bhamare Yash Gautam	19	26	45
17	AKN-2018/011	Bhise Rahul Komal	19	27	46
18	AKN-2018/012	Bhor Snehal Ravaheeb	18	29	47

  
Course Coordinator

  
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Saraswatinagar, Panchavati, Nashik



**K.K. Wagh College of Agriculture, Nashik**  
**Department of Soil Science and Agril. Chemistry**  
**Theory Examination**  
**Certificate course on "Analytical Instrumentation"**

Academic year 2021-22  
 Semester-VIII(New)  
 Total Marks-20

Class:Final year  
 Date -13/4/2022  
 Time-2.00pm to 3.00pm

Note: 1) Solve any 20 questions.  
 2) All questions carry equal marks

Sr.No	Question
Q.1	What do you mean by analytical instrumentation?
Q. 2	What is the law on which AAS work?
Q. 3	What nutrients are estimated in the AAS?
Q. 4	Which gas is used in the estimation in micronutrient estimation?
Q. 5	Which nutrients are estimated in the flamephotometer?
Q.6	Which solution is used for the standardization of flamephotometer?
Q. 7	What wavelength is used for phosphorus determination?
Q. 8	What wavelength is used for sulphur determination?
Q.9	What is the role of $KMnO_4$ in Nitrogen determination?
Q.10	Why Compressor is used in flamephotometer?
Q. 11	Which method is used for determination of nitrogen?
Q.12	Which method is used for determination of phosphorus?
Q. 13	Which method is used for determination of sulphur?
Q. 14	Which method is used for determination of potassium?
Q. 15	On which law Spectrophotometer work?
Q. 16	Why Acetylene gas is used in AAS?
Q. 17	Role of Alkali in Nitrogen estimation?
Q.18	What is the principle of flame photometer?
Q.19	Why it is always recommended to use A/C in the area where AAS working is practiced?
Q. 20	What buffers are used for pH determination?
Q. 21	Which light is used for the determination of phosphorus?
Q. 22	Which gas is used in AAS for estimation for Heavy metals?
Q. 23	Which Standard use for estimation of Zinc?
Q. 24	Which gas evolved during nitrogen estimation?
Q. 25	Which colour developed at the end point during phosphorus estimation ?
Q. 26	Which alkali used for estimation of Plant sample?
Q. 27	What is the role of air compressor in flame photometer?
Q.28	What is the use of muffle furnance ?
Q.29	What is the maximum temperature of muffle furnance?
Q. 30	What we are calculated from estimation of ash content?

**K.K. Wagh College of Agriculture, Nashik**  
**Department of Soil Science and Agril. Chemistry**  
**Practical Examination**  
**Certificate course on "Analytical Instrumentation"**

Academic year 2021-22  
Semester-VIII(New)  
Total Marks-30

Class:Final year  
Date -13/4/2022  
Time-10.00am to 12.00pm

**Note:** 1) Solve any 2 questions.  
2) All questions carry equal marks

Sr.No	Question
Q.1	Write down the Principal & Application of Atomic Adsorption spectrophotometer. Prepared required solution for analysis of Available Micronutrient
Q. 2	Write down the Principal & Application of Spectrophotometer. Estimate the Available P From Given Soil
Q. 3	Write down the Principal OF Available Nitrogen Estimate the Available N From Given Soil



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College Code: 11135 AISHE Code: C-50690

Phone: (0253)2555221, 2555222 - principal-bscagri@kkwagh.edu.in https://agri-bsc.kkwagh.edu.in

Department of Soil Science and Agril. Chemistry  
Certificate course  
"Analytical Instrumentation"  
Academic Year 2021-22  
Exam Block Report

Class- Final Year

Date-13/4/2022

Subject: Practical Paper of "Analytical Instrumentation"  
Block no: 01

SR NO	REGISTRATION NO	NAME OF STUDENT	SIGN
1	AKN/D-2019/001	Asware Yogita Dnyaneshwar	
2	AKN/D-2019/002	Bendkule Harshada Manohar	
3	AKN/D-2019/005	Deokar Pratiksha Bhausahab	
4	AKN/D-2019/008	Gangurde Dhananjay Bhimrao	
5	AKN/D-2019/014	Rode Ajit Kailas	
6	AKN/D-2019/015	Salve Rushikesh Ratnakar	
7	AKN/D-2019/016	Shinde Akash Raghunath	
8	AKN/D-2019/017	Shinde Atul Jayram	
9	AKN/D-2019/018	Shinde Omkar Vasantao	
10	AKN/D-2019/019	Shinde Pranjal Ravindra	
11	AKN-2017/064	More Monika Sanjay	
12	AKN-2018/002	Aher Pratiksha Anil	
13	AKN-2018/003	Aklade Nikhil Prakash	
14	AKN-2018/005	Ate Nikhil Amardeep	
15	AKN-2018/007	Bachhav Sujal Sanjay	
16	AKN-2018/010	Bhamare Yash Gautam	
17	AKN-2018/011	Bhise Rahul Komal	
18	AKN-2018/012	Bhor Snehal Ravsaheb	

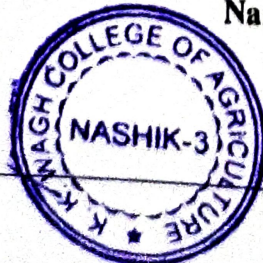
Total no of student: 18

No of student present: 18

No of students absent: 0

Name and Sign of Jr. Supervisor

Name and Sign of Sr. Supervisor







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**Department of Soil Science and Agril. Chemistry**  
Certificate course in  
**“Analytical Instrumentation”**  
Academic Year 2021-22

**Exam Time Table**

All enrolled students of the Certificate Course are hereby informed that for the academic year 2021-22, the Certificate Course on “Analytical Instrumentation” has been completed. The examination for this certificate course is scheduled to be conducted on 13/4/2022. Therefore, all students are required to be present without exception.

Note: Time Table is as follow

Sr no	Date	Time	Certificate course subject
1	13/4/2022	10:00 to 12:00	Practical Exam
2		02:00 to 03:00 pm	Theory exam

**Course Coordinator**

**Exam Incharge**

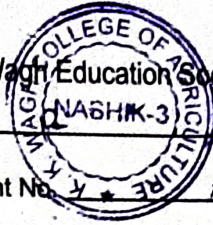
**PRINCIPAL**  
K.K.Wagh College of Agriculture  
Saraswatinagar, Panchavati, Nashik





K. K. Wagh Education Society's

Name of the Student



Bachhav Sujal Sanjay

Registration / Enrolment No.

ARN-2018/007

Ex. Seat No.

007

Signature of Supervisor / Invigilator

Instrumentation

theory paper of add on course on analytical instrumentation

Q1

To reduce size of particle for sprinkling on flame is the main role of compressor

Q2

Alkali pigment

Q3

Olsen method

Q4

Tiodate titration method

Q5

Flame photometer

Q6

Beer Lambert law

Q7

It provide a more favourable chemical and optical environ ( $2300^{\circ}\text{C}$ )

Q8

Because it oxidise organic nitrogen and ammonia in the sample in the sample nitrate

Q9

measurement of emitted light intensity when a metal is introduced to the flame of wavelength of colour give information about element

Q10

For the ventilation purpose (reduce temp of room)

Q11

4.0, 8.2, 7.0 ( $\text{Ca, N, K}$  sol<sup>n</sup>)

Q12

UV light

Q13 NO<sub>2</sub>

Q14 0, 0.1, 0.2, 0.4, 0.6, 0.8 ppm

Q15 Ammonia gas

Q16 At Blue

Q17 Alkali permagnet

Q18 Reduce the size of particle to sprinkle on film.

Q19 muffle furnace is used for precise of consistent heating like ashing, heat treatment, calcination.

Q20 1200°C

Q21 organic carbon.

Q22 Analytical instrument refers to set of tools and devices used to analyze the composition structure and properties.

Q23 Beer's - Lambert - law.

Q24 micro-nutrient and heavy metal estimated in AAS.

Q25 Acetylene gas is used for micro-nutrient estimation.

~~26~~ Alkali metals (sodium potassium)

~~27~~ ~~lcl~~ solution

~~28~~ 882 nm

~~29~~ 276 nm

~~30~~ ~~KMnO<sub>4</sub>~~ oxidizing agent



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**Department of Soil Science and Agril. Chemistry**  
Certificate course in  
**“Analytical Instrumentation”**

Academic Year 2021-22

**Report**

K.K.Wagh Education Society's K.K.Wagh College of Agriculture, Saraswatinagar, Nashik which provide education in agriculture at U.G. level students. College has to decide introduce new Certificate Course in “Analytical Instrumentation”. Total 18 students are enrolled from department of Soil Science and Agril. Chemistry. Due to this certificate course in “Analytical Instrumentation” Students get more knowledge of practical demonstration on instruments, calibration and method development.

**Course outcome**

1. The students will be able to understand the working principle of various analytical instruments.
2. The students will be able to handle and operate the scientific instruments.
3. The students will be able to use the analytical instruments for practical applications.

This Course in Analytical Instrumentation has been designed with the aim to provide conceptual basic and hands on practical exposure of instruments for thorough understanding of analytical instruments and methods. This training course aims to give practical demonstration on instruments, calibration and method development so the participant can achieve the analytical and interpretative skills which is critical for working in the laboratory. Students who are pursuing their bachelors or master's course or have completed study and want to enter industry can join this course which will provide them the needed training and exposure in the field of analytical instrumentation..This course also helps to motivate students to improve their entrepreneurship skill. In academic year 2023-24 eighteen students are enrolled for this certificate course. Course structure had been divided into theory and practical. Theory has 20 marks while practical has 30 marks weightage, examination has been conducted for total 50 marks. Duration for this certificate course is 4/4/2022 to 9/4/2022 (Total 36 hrs.) the students who successfully completed the certificate course were given a certificate as appreciation by the college. Course coordinator is Prof. P. V. Shinde, and member for this certificate course are Prof. S. S. Bairagi.

**Course Coordinator**



**Principal**  
**PRINCIPAL**  
K.K.Wagh College of Agriculture  
Saraswatinagar, Panchavati, Nashik

K K Wagh Education Society's

# K K WAGH COLLEGE OF AGRICULTURE

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Saraswatinagar, Panchavati, Nashik - 422 003



## *Certificate*

This is to certify that Mr. / Ms. *Bachhav... Sujal... Sanjay*.....

Class final year has completed Certificate Course on Analytical... Instrumentation  
..... from *04/04/2022* to *04/04/2022*.... organized by

Department of *Sa. Science & Agricultural Chem* in academic year *2021-22*.....

Date : *13 / 04 / 2022*

Place : *Nashik*

  
Course Coordinator



  
Principal  
College of Agriculture  
Nashik



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**College Code;11135** **AISHE Code: C-50690**

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**Department of Soil Science and Agril. Chemistry**

**Certificate course in  
“Analytical Instrumentation”**

**Academic Year 2021-22**

**Photo of students during handling of Instruments**



**pH & EC Meter**



**Flamephotometer**



**During inauguration of course “Analytical Instrumentation”**



**Muffle furnance**



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**AAS**



**N analyzer**



**Spectrophotometer**



**Weighing balance**