DEPARTMENT OF CHEMISTRY

DEVA MATHA COLLEGE,

KURAVILANGAD Affiliated to Mahatma Gandhi University, Kottayam

REPORT

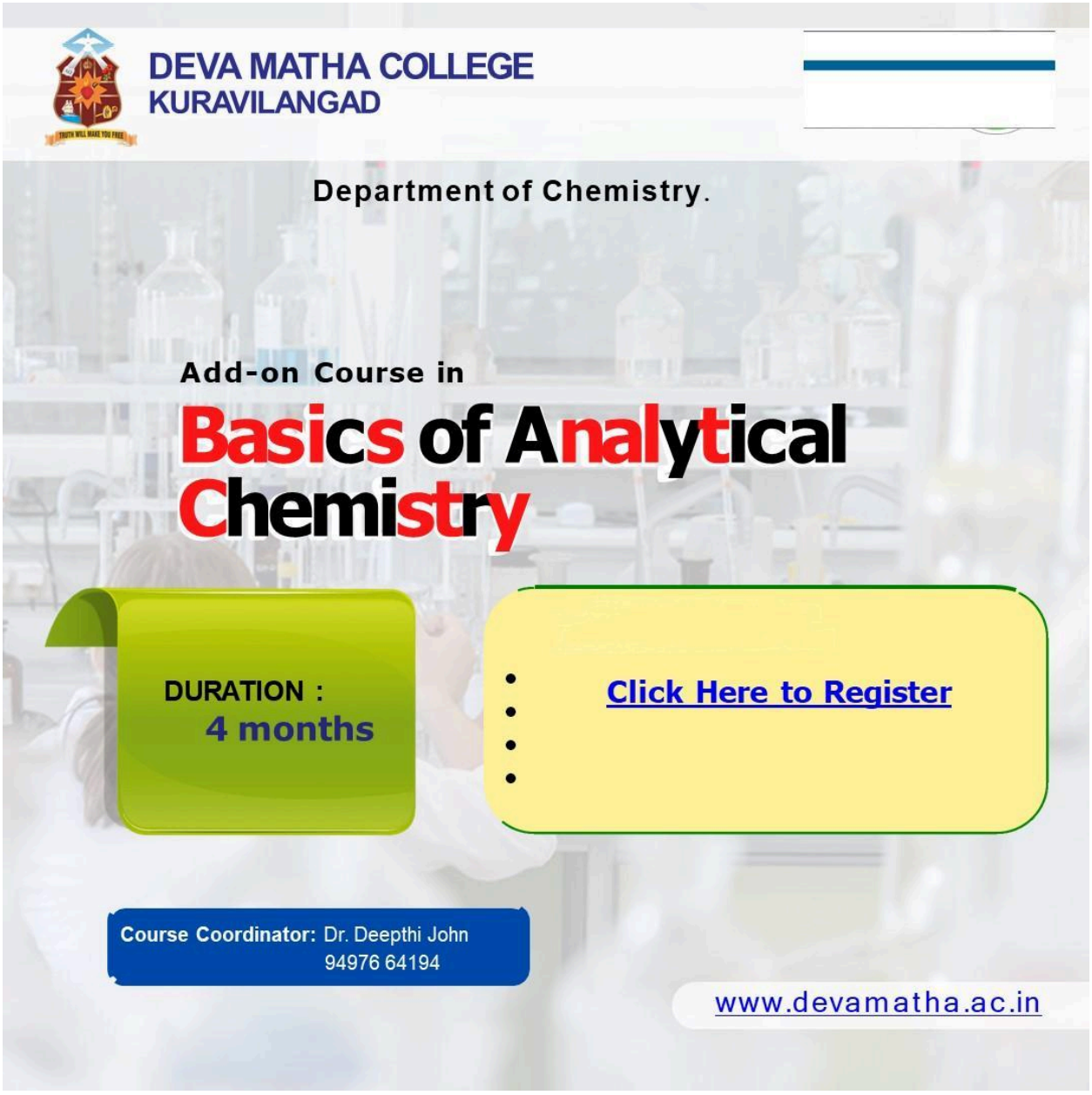
ON

ADD-ON COURSE

in

Basics of Analytical Chemistry

Academic Year: 2023-2024


DEVA MATHA COLLEGE
KURAVILANGAD
Department of Chemistry.
Add-on Course in
Basics of Analytical Chemistry
DURATION :
4 months
Click Here to Register
Course Coordinator: Dr. Deepthi John
94976 64194
www.devamatha.ac.in

Academic year : 2023-2024

Title : Basics of Analytical Chemistry (Code: DMCK/CHEM/AD 02/2023) **Instructional Hours : 30 Hours**

Duration : 4 months

Mode of Instruction : Offline Classroom teaching with practical session Intake Capacity : 30

Eligibility : UG/PG students from Science stream

Beneficiaries : III DC Chemistry students

Date(s) on which program was conducted : 03.10.2023, 10.11.2023, 24.1.2024, 25.1.2024, 27.2.2024, 28.2.2024, 06.3.2024, 07.3.2024, 14.3.2024

Collaborating agency inside/outside the institute : NIL

Organizing Dept. & Name of the Coordinator : Department of Chemistry,

Dr. Deepthi John

Number of students participated in the programme : 18

The number of students completed the programme : 18

A brief Report

Industrial placements are a key component of many undergraduate chemistry programs, and many of our students pursue careers in analytical fields such as pharmaceuticals, forensics, bioanalytics, environmental monitoring, and more. To make the most of these opportunities, students need to be well-versed in good laboratory practices and instrumental methods of analysis. Those aiming for careers as analytical chemists in industry must be introduced to the foundational principles of analytical chemistry.

To enhance both employability and academic aspirations, it is essential to provide hands-on practical training, including additional courses during the degree program. With this goal in mind, the Department of Chemistry has organized an Add-on Course in Basics of Analytical Chemistry for science students interested in expanding their knowledge.

Basics of Analytical chemistry relates to the management of a Laboratory following all good practices and sticking to all Laboratory safety practices, proficiency in using instruments commonly found in modern chemical Laboratories, Professional Ethical behavior etc. To bring a smooth 'Campus to Corporate Transition' for the students, we familiarize them with the industrial environment through industrial visits and exposure.

A total of 18 final-year B.Sc. Chemistry students registered for and successfully completed the course, which took place from October 2023 to March 2024. The course comprised 30 hours of instruction, including classroom lectures, practical sessions, and industrial exposure. Upon completion, students participated in an examination, and the results were published. Certificates were issued to those who successfully completed the programme

Course Objective:

- Familiarize with the principles underlying qualitative and quantitative techniques in analytical chemistry

Course Outcomes:

- To describe the basic principles of methods in chemical analysis
- To express the analytical data obtained from measurements scientifically
- To relate theoretical principles to the demonstration of experiments

Syllabus

Module 1: Scientific Expression of Analytical Data **5 Hours**

Units, significant digits, rounding, scientific and prefix notation, graphing of data. Precision and accuracy-types of errors – ways of expressing precision – ways to reduce systematic errors - reporting analytical data. Statistical treatment of analytical data – population and samples – Mean and standard deviation – distribution of random errors.

Module 2: Qualitative and Quantitative Methods of Analysis **10 Hours**

Qualitative analysis: Applications of solubility product and common ion effect in the precipitation of cations. Principle of intergroup separation of cations. Interfering acid radicals and their elimination (oxalate, fluoride, borate and phosphate). Titrimetric analysis - fundamental concepts. Methods of expressing concentration: Weight percentage, molality, molarity, normality, mole fraction, ppm. and ppb. Primary and secondary standards, quantitative dilution – problems. Acid-base titrations- titration curves – pH indicators. Redox titrations – titration curve –titrations involving KMNO4 & K2Cr2O7 redox indicators. Complexometric titrations – EDTA titrations - titration curves – metal ion indicators. Gravimetric analysis: Unit operations in gravimetric analysis - illustrations using iron and barium estimation. Separation and purification techniques – filtration, crystallization and precipitation – fractional distillation, solvent extraction.

Module 3: Chromatographic Methods **5 Hours**

Column Chromatography: Principle, types of adsorbents, preparation of the column, elution, recovery of substances and applications. Thin Layer Chromatography: Principle, Rf-values, significance of Rf values. Ion exchange chromatography: Principle and experimental techniques. Gas Chromatography: Principle and experimental techniques. High-Performance Liquid Chromatography (HPLC): Principle and experimental techniques.

Module 4: Demonstration of Experiments and industrial visit **10 hours**

1) TLC – Separation of p-nitroaniline and o-nitroaniline
2) Simple distillation ($KMnO_4$)
3) Volumetric titrations (Estimation of Mg^{2+}, Zn^{2+} using EDTA)
4) Solvent extraction (aniline from water - methyl benzoate from water - using ether)
5) Gravimetry – Estimation of Ba as $BaSO_4$

References

1. Fundamentals of Analytical Chemistry, Skoog & West, Ed. 7, Cengage Learning.
2. Analytical Chemistry, Gary D Christian, Ed. 7, John Wiley and Sons.
3. Vogel's textbook of quantitative analysis, Ed. 5, Longman Scientific & Technical
4. Quantitative Chemical Analysis, Daniel C Harris, Ed. 7, W.H. Freeman and Company
5. Modern Analytical Chemistry, David Harvey, Ed. 1, Mc Graw Hill
6. Principles of Inorganic Chemistry, Puri, Sharma, Kalia, Ed. 33, Vishal Publishing Co.

Assessment: A theory examination will be conducted at the end of the course

External: 80 marks, Internal: 20 marks

Grading:

Percentage of Marks	Grade	Rating
90% and above	A+	First Class with Distinction
80% and above	A	First Class
60% and above	B	Second Class
50% and above	C	Third Class

Students List

Deva Matha College, Kuravilangad Dept. of Chemistry (B. Sc Chemistry 2021-24 Batch)		
Sl. No	**Roll No**	**Name**
1.	21UG201	ACHU.K.S
2.	21UG202	JAISE JOHNY
3.	21UG203	SUBIN BABU
4.	21UG205	ANJITHA S NAIR
5.	21UG206	ARATHI KRISHNAN
6.	21UG207	ARATHY DINESAN
7.	21UG208	ARYA K SURESH
8.	21UG209	GAYATHRI N L
9.	21UG210	NEHA PAUL
10.	21UG211	SREEDEVI HARIMON
11.	21UG213	ASWANTH E U
12.	21UG214	ROBIN JOSEPH
13.	21UG215	AMALA T R
14.	21UG216	DRISYA D
15.	21UG218	JANAKI SAMEERABHADRA
16.	21UG219	ROSE MARIYA JOSEPH
17.	21UG221	SIVAPRIYA. T.B
18.	21UG222	T.B KRISHNAPRIYA

Attendance Sheet of students

Attendance Sheet

Add-on Course in Basics of Analytical Chemistry

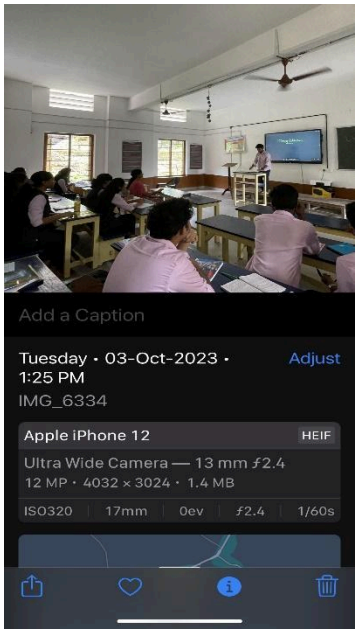
Sl. No	Roll No	Name	03.10.23	10.11.23	24.1.24	25.1.24	27.2.24	28.2.24	6.3.24	7.3.24	14.3.24	16.3.24
1	201	ACHU K S										
2	202	JAISE JOHNY										
3	203	SUBIN BABU										
4	205	ANJITHA S NAIR										
5	206	ARATHI KRISHNAN										
6	207	ARATHY DINESAN										
7	208	ARYA K SURESH										
8	209	GAYATHRI N.L										
9	210	NEHA PAUL										
10	211	SREEDEVI HARIMON										
11	213	ASWANTH E.U										
12	214	ROBIN JOSEPH										
13	215	AMALA T R										
14	216	DRISYA D										
15	218	JANAKI SAMEERA BHADRA			a	a						
16	219	ROSE MARIYA JOSEPH			a	a						
17	221	SIVAPRIYA TB										
18	222	T B KRISHNAPRIYA										

DEPARTMENT OF CHEMISTRY * DEVA MATHA COLLEGE, KURAVILANGAD *

Dr. Deepthi John.

Head of the Department of Chemistry
Deva Matha College
Kuravilangad

Photos of sessions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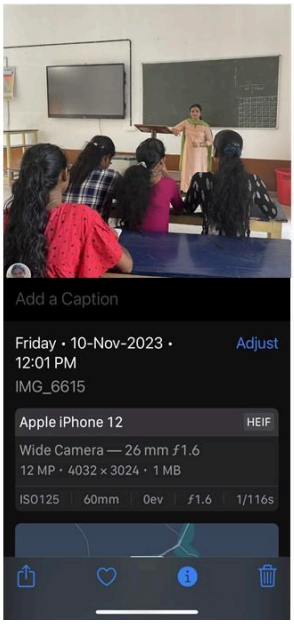
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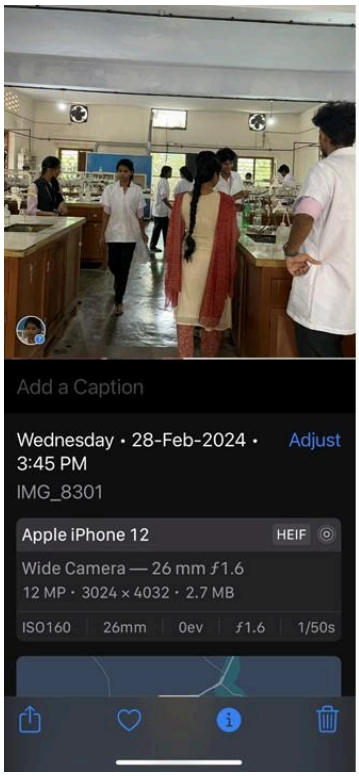
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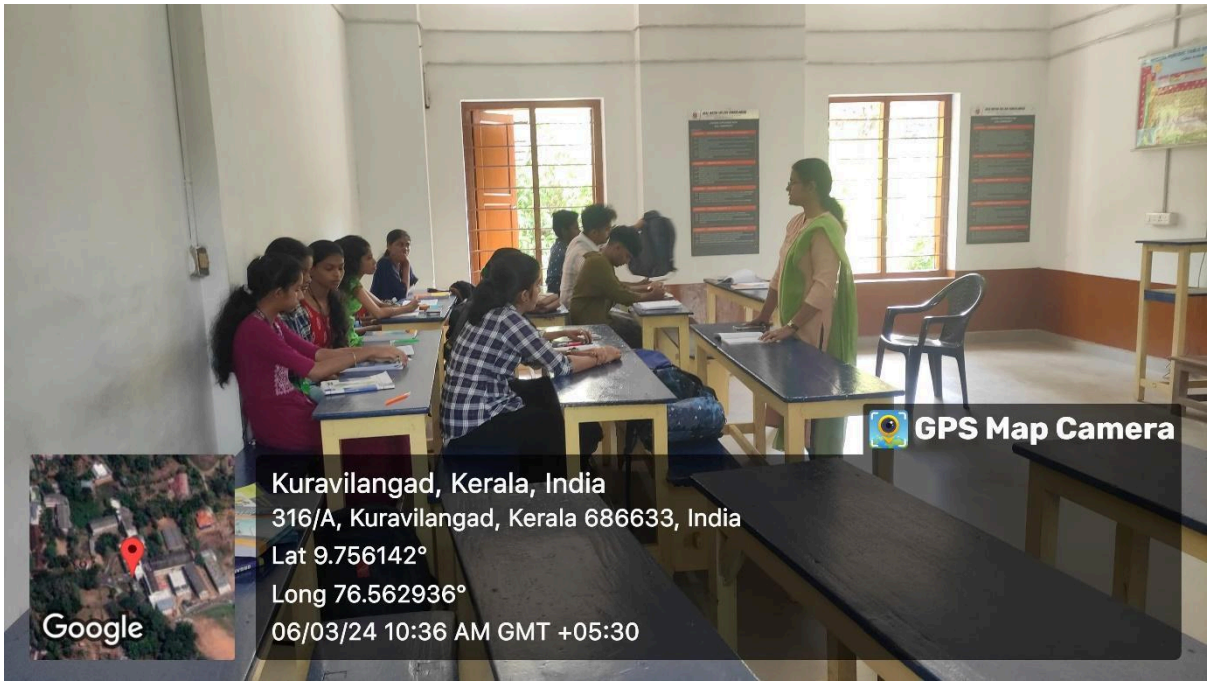
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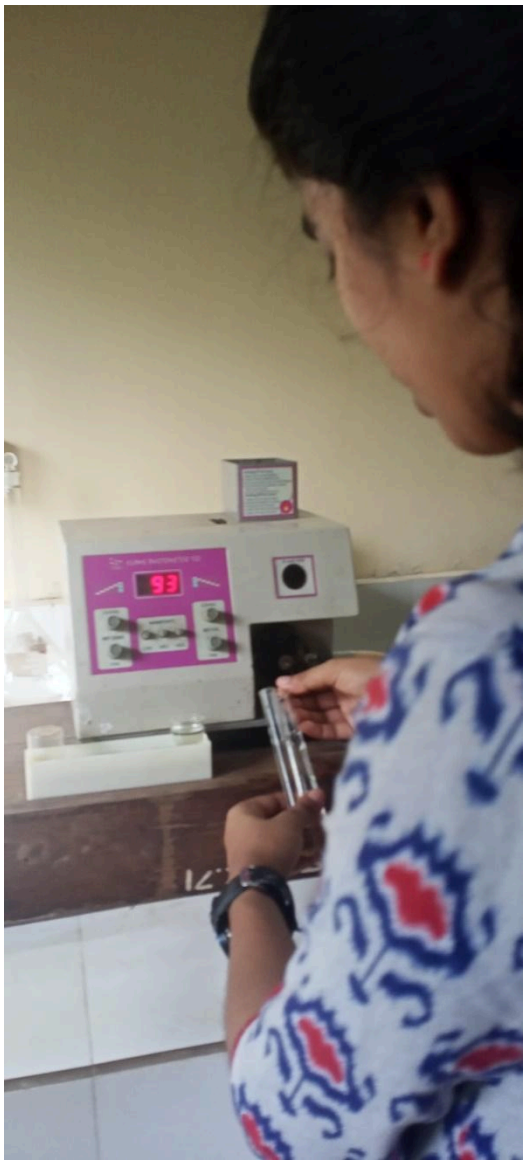

Feed back

Sl. No	Roll No	Name	How do you rate the course?	How do you rate the coordination of the course by the Department of Chemistry?	Any comments/suggestions for improvement?
1	21UG201	ACHU.K.S	4	4	Good and relevant course
2	21UG202	JAISE JOHNY	5	4	Good coordinated course
3	21UG203	SUBIN BABU	5	5	Content relevant
4	21UG205	ANJITHA S NAIR	5	5	Need More time for practical sessions
5	21UG206	ARATHI KRISHNAN	5	4	More time should be allotted
6	21UG207	ARATHY DINESAN	5	4	Nil
7	21UG208	ARYA K SURESH	4	4	Good
8	21UG209	GAYATHRI N L	4	4	Good
9	21UG210	NEHA PAUL	5	5	Good coordination
10	21UG211	SREEDEVI HARIMON	5	5	Nil
11	21UG213	ASWANTH E U	5	5	Relevant content
12	21UG214	ROBIN JOSEPH	5	5	Nil
13	21UG215	AMALA T R	5	5	Good
14	21UG216	DRISYA D	5	4	Nil

15	21U G218	JANAKI SAMEERABHADRA	5	4	Nil
16	21U G219	ROSE MARIYA JOSEPH	5	5	Nice course
17	21U G221	SIVAPRIYA. T.B	4	5	Relevant
18	21U G222	T.B KRISHNAPRIYA	4	5	More relevant topics to be included

Mark List

Sl. No	Roll No	Name	Marks	Grade
1	21UG 201	ACHU.K.S	86	A
2	21UG 202	JAISE JOHNY	86	A
3	21UG 203	SUBIN BABU	82	A
4	21UG 205	ANJITHA S NAIR	80	A
5	21UG 206	ARATHI KRISHNAN	81	A
6	21UG 207	ARATHY DINESAN	86	A
7	21UG 208	ARYA K SURESH	88	A
8	21UG 209	GAYATHRI N L	87	A
9	21UG 210	NEHA PAUL	89	A
10	21UG 211	SREEDEVI HARIMON	87	A

11	21UG 213	ASWANTH E U	80	A
12	21UG 214	ROBIN JOSEPH	87	A
13	21UG 215	AMALA T R	89	A
14	21UG 216	DRISYA D	88	A
15	21UG 218	JANAKI SAMEERABHADRA	83	A
16	21UG 219	ROSE MARIYA JOSEPH	84	A
17	21UG 221	SIVAPRIYA. T.B	80	A
18	21UG 222	T.B KRISHNAPRIYA	83	A

Certificate issued to the students (sample).

DEVA MATHA COLLEGE KURAVILANGAD

Re-Accredited by NAAC with 'A++' Grade and CGPA 3.67

Affiliated to Mahatma Gandhi University, Kottayam

Website: www.devamatha.ac.in, E-Mail: principaldmck@gmail.com

TRUTH WILL MAKE YOU FREE

Certificate

Certificate No: 031

This is to certify that **Achu K. S.** has successfully completed the Add-on Programme titled **Basics of Analytical Chemistry** (DMCK/CHEM/AD 02/2023) conducted by the Department of Chemistry, Deva Matha College Kuravilangad during the academic year 2023-24 with 'A' grade.

Kuravilangad
20-03-2024

Dr. Deepthi John
Programme Co-ordinator

Dr. Brincy Mathew
General Co-ordinator

Dr. Sunil C. Mathew
Principal

Dr. Deepthi John

Coordinator

Dept of Chemistry