Department of Chemistry

Green Agrochemistry: Advancing Agricultural Sustainability

Year of Admission: 2022
Year of Enrolment: 2023

The Department of Chemistry conducted an additional Chemistry course "Green Agrochemistry: Advancing Agricultural Sustainability" in the academic year 2023-24.

This program is to explain the important aspects of Chemistry in Agricultural Science. This helps to understand the role of manures and fertilizers in supplying nutrients to plants.

This also provides knowledge about the major research areas in Agricultural Chemistry

Upon completion of the course the students were able to understand the basics of Agricultural Chemistry. Also they can evaluate the importance of Instrumental techniques and analytical methods in the field of Agricultural Chemistry. This helps to understand the major research areas in Agro chemistry and thus gives a real inspiration to the students to this area

The course commenced on 16th October 2023.

The number of participants in the academic year 2023-24 included 31. The course was imparted to the Second year B.Sc. Chemistry students.

The students were evaluated, after each activity, through a verbal feedback system.

The course had duration of 30 hours. The students were submitted assignments based on lectures given, taken two in-semester written examinations and a research proposal was submitted and presented before the group and an end semester final examination were conducted

Grades were awarded on the following basis:

80% and above	:	A Grade
70 - 79%	:	B Grade
60 -69%	:	C Grade

Out of the 31 students who enrolled in the course, 19 students secured A Grade

Classes were engaged by the following faculty members of the Department of Chemistry:

1. Dr. Sumalekshmy, S., Assistant Professor
2. Dr. Simimole H., Assistant Professor
3. Dr. Chithra Gopinath, Assistant Professor
4. Dr. Anas S., Assistant Professor
5. Dr. Siyad M. A., Assistant Professor
6. Ms. Sherifa Rahim, Assistant Professor
7. Dr. Abdul Rahim M. K., Assistant Professor
8. Dr. Tharun A Rauf, Assistant Professor

Principal

Sherifa Rahim

ഡോ. ചിത്രാ ഗോപിനാഥ്
അസിസ്റ്റന്റ് പ്രൊഫസർ
ഡിപ്പാർട്ട്മെന്റ് ഓഫ് കെമിസ്ട്രി
ടി.കെ.എം. കോളേജ് ഓഫ് സയൻസ്
കൊല്ലം - 691005

Department of Chemistry

GREEN AGROCHEMISTRY: ADVANCING AGRICULTIRAL SUSTAINABILITY

Year of Admission: 2022

Year of Enrolment: 2023

Roll No.	Adm No.	Name	Attendance 5	Assignment 5	Project 40	Total 50	Grade
5201	58715	AGIN A	3	2	30	35	B
5202	58559	ANITA ANN SAJI	5	5	28	38	A
5203	58577	MITHUN KUMAR.K	5	5	32	42	A
5204	58622	SAFNA ANVAR	5	5	33	43	A
5205	58556	SHAHANA. T	5	5	32	42	A
5206	58813	SHAHIRABANU .M	5	5	35	45	A
5207	58716	VISHNU S	2	3	30	35	B
5208	58690	VISMAYA V	5	5	31	41	A
5209	58389	ABHISHEK. V	5	5	32	42	A
5210	59047	AKHILKUMAR S	3	1	31	35	B
5211	58401	AMEENA N	5	5	40	50	A
5212	58548	APARNA V	5	5	35	45	A
5213	58828	ASNA MOL S	5	5	31	41	A
5214	58396	ASWATHY LEKSHMI A J	5	5	32	42	A
5216	59013	FARIS N	5	1	30	36	B
5217	58709	FATHIMA M	5	5	25	35	B
5218	59017	FATHIMA S	5	5	25	35	B
5219	58904	FIDA A AHAD	5	5	38	48	A
5220	58388	FOUSIYA HISHAM	5	5	25	35	B
5222	58653	KARTHIK R.KRISHNA	1	1	32	34	B
5223	58399	LINCY MOL. L	5	5	33	43	A
5224	58705	M ASIF RAHUMAN	2	1	31	34	B
5225	58967	MUHAMMAD AJIS N	2	2	31	35	B
5228	59074	MUHAMMED THASKEER N	2	2	29	33	B
5229	58398	MUHSINA M	5	5	34	44	A
5230	59067	MUNEER N	3	2	30	35	B

5231	58973	NIFFINSHA L S	2	3	**30**	**35**	**B**
5232	58402	NOORA FATHIMA	5	5	**25**	**35**	**B**
5236	58550	VIVEK PRAKASH	5	5	**30**	**40**	A
5237	58867	AFSAL A	3	2	**30**	**35**	**B**
5238	58728	AFSAL A K	3	2	**30**	**35**	B

Principal.

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ഡ്രോയിംഗ് ആന്റ് ഡിസ്പെൻസിങ് ഓഫീസർ
ടി.കെ.എം. കോളേജ് ഓഫ് ആർട്സ് ആന്റ് സയൻസ്
കൊല്ലം - 691005, കേരളം.

Green Agrochemistry: Advancing AgriculturalSustainability

Course	Details			
Code				
Title	Green Agrochemistry : Advancing Agricultural Sustainability.			
Degree	B.Sc.			
Branch	Chemistry			
Year/Semester	S3/S4			
Type	Extracurricular/Additional course			
Credits	Hrs/week		Total hours	30 h

Objectives

- To introduce the various concepts of Agrochemistry.and to impart knowledge about soil physical properties and processes in relation to plant growth.
- To give awareness to the students about effects and remedies of Pesticides, Insecticides etc.
- To provide knowledge about the major research areas in agricultural Chemistry

Expected Course Outcome

Upon completion of the course the students will be able to:

- Understand the basics of Agricultural Chemistry
- Understand the role of manures and fertilizers in supplying nutrients to plants.

Evaluate the importance of Instrumental techniques and analytical methods in th field of Agricultural Chemistry.

Explain the Importance of Chemistry in Agricultural Science.

Understand the major research areas in Agrochemistry and thus gives a real inspiration to the students to this area.

Course Overview

Sl No.	Topics	Hrs
1.	**Introduction to Agricultural Chemistry**	6
	Introduction: Soil and Water Management, Composition, water pollution and soil pollution. Types of soil, Organic and Inorganic Constituents of Soil. Fertilizers and Manures. Essential elements, Role of Micro and macronutrients in plant growth.	
2.	**Branches of Agricultural Chemistry**	6
	Agricultural Production, Food Processing, Pesticides, Insecticides, Herbicides, Fungicides, Processing of raw products into foods and beverages, Chemurgy, Environment Restoration.	
3.	**Role of Chemistry in Agricultural Science**	10
	Photosynthesis: Basics of Photosynthesis, **Fertilizers**: Classification, **Natural and artificial** fertilizers. Examples for natural fertilizers, Artificial fertilizers: Nitrogenous, Phosphatic, Potash fertilizers. **Pesticides and Insecticides**: Classification (Based on use and chemical composition), Chemistry, composition and processing of agricultural Insecticides & Pesticides. Benefits of Pesticides, Potential hazards of Pesticides. **Pesticides-Safety measures. Insect Repellents**: Examples. **Chemistry in Other areas:** For improved irrigation, Storage and preservation of Agricultural products, Food processing, Chemicals from agricultural waste.	
4.	**Analytical techniques and Instrumental Methods in AgroChemistry**	5
	Applications of gas chromatography and liquid chromatography. Applications of Ultraviolet-visible spectroscopy, infrared spectroscopy, atomic absorption spectroscopy, Inductively coupled plasma spectrometry, and mass spectrometry. X-ray defractrometry. Preparation of solutions for standard curves, analytical reagents, qualitative reagents, indicators and standard solutions for acid-base, oxidation reduction and complexometric titration.	
5.	**Major research Areas in Agrochemistry**	3
	Improvement and restoration of soil fertility, Use and Recycling of biomass,Biostimulants for Agriculture, Economic and policy studies related to production of agricultural raw materials (Food &	

	Non-food),Tracking Impurities,Environmental,human and animal safety, Management of Rural areas and environmental resources.	

xpectations

You are expected to watch all online/offline lectures, complete the work at-home, submit weekly problem sets and worksheets, and take two in-semester assessment and an end-semester assessment.

3OOKS AND REFERENCES

1. Jack R Plimmer, *Encyclopaedia of Agrochemicals* , Nil edition ,Wiley-Blac, New Jersey (**2003**)
2. R.J Cremlyn, *Agrochemicals: Preparation and mode of Action*, 2nd Edition, Wiley-Blackwell publishers, New Jersey (**1991**).
3. S.M Khopkar, *Concepts in Analytical Chemistry,* 3rd Edition, New Academic Science, New York (**2008**).
4. Willard, Merittee and Dean, *Instrumental methods of Analysis*, 5th Edition, Van Nostrand Publishers, Newyork (**1974**).
5. John H Montgomery, *Agrochemicals Desk Reference*, 2nd Edition, CRC Press, Boca Raton (**1997**).

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