St. Michael's College, Cherthala

Alappuzha, Kerala-688 539
Affiliated to University of Kerala
and Re-accredited by NAAC with 'A' Grade

ADD ON COURSE 2019-20

Name of the Programme : GREEN CHEMISTRY AND ENVIRONMENTAL SUSTAINABILITY

Name of the Department : CHEMISTRY

Course Code : CH 090

St,Michael's College, Cherthala

NAME OF COURSE : Green Chemistry and Environmental Sustainability

COURSE CODE : CH 090

NO OF STUDENTS ENROLLED : 36

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Certificate Course

in

Green Chemistry and Environmental Sustainability

Unit I – Introduction to Green Chemistry (6hrs)

Principles of green chemistry-atom economy calculation(simple reactions)-production of Ibuprofen-less hazardous chemical syntheses, designing safer chemicals-Bhopal gas tragedy-new greener syntheses, safer solvents andauxiliaries ionic liquids-super critical fluids CO2 and H2O, advantages of SCFs

Unit II – Green Chemistry Methods (6hrs)

Design for energy efficiency-principle of microwave oven, microwave assisted organic syntheses, Green chemistry practices in research, educational and commercial laboratories- lab safety signs- introduction to micro scale experiments

Unit III – Environmental Components (6hrs)

Structure and composition of the, Atmosphere, hydrosphere, biosphere and Lithosphere – composition of atmosphere, air pollution, water pollution and soil pollution.

Unit IV – Environmental disasters (6hrs)

Major environmental disasters - - mercury poisoning in Minamata, Japan ,Itaiitai disease due to cadmium poisoning in Japan - Love Canal toxic waste site, Seveso disaster chemical plant explosion - Bhopal disaster -Chernobyl incident.

Unit V – Environmental laws: (6hrs)

Environment (Protection Act) – The Air (Prevention and control of pollution) Act – The water (Prevention andcontrol of pollution) Act – The wild life protection Act – Forest conservation Act – The Ozone Depleting Substances (Regulation and Control) Rules – The Plastic Waste (Management and Handling) Rules - Riodeclaration- Montreal protocol, Kyoto protocol.

References:

1 M.M.Sreevastava and Rashmi Sanghi, Green Chemistry for environment, Narosa Publishing

House.

2. V.K.Ahluwalia, Green Chemistry, Enviornmentally Benign Reaction, Ane Book Pvt. Ltd.

3. Anastas. P.T.; Warner, J.C.,"Green Chemistry; Theory and Practice", Oxford University Press; Oxford , U.K.,1998.

4. Lancaster,M,"Green Chemistry; An Introductory Text",Royal Society of Chemistry; Cambridge,UK, 2003

5. Rashmi Sanghi and M.M Srivasthava, "Green Chemistry Environment Friendly Alternatives", Narosa Publishing House,2006S. K. Banerji, "Environmental Chemistry".

6. K. De "Environmental Chemistry - An introduction"

7. B. K. Sharma "Air Pollution".

8. V. K. Ahluwalia "Environmental Chemistry"

9. G.W. vanLoon and S. J. Duffy "Environmental Chemistry: A global perspective"

10. S.K.Mohanty, Environment and Pollution Laws, Universal Law Publishing Co. Pvt Ltd.

Add-On Cell

St.Michael's College, Cherthala

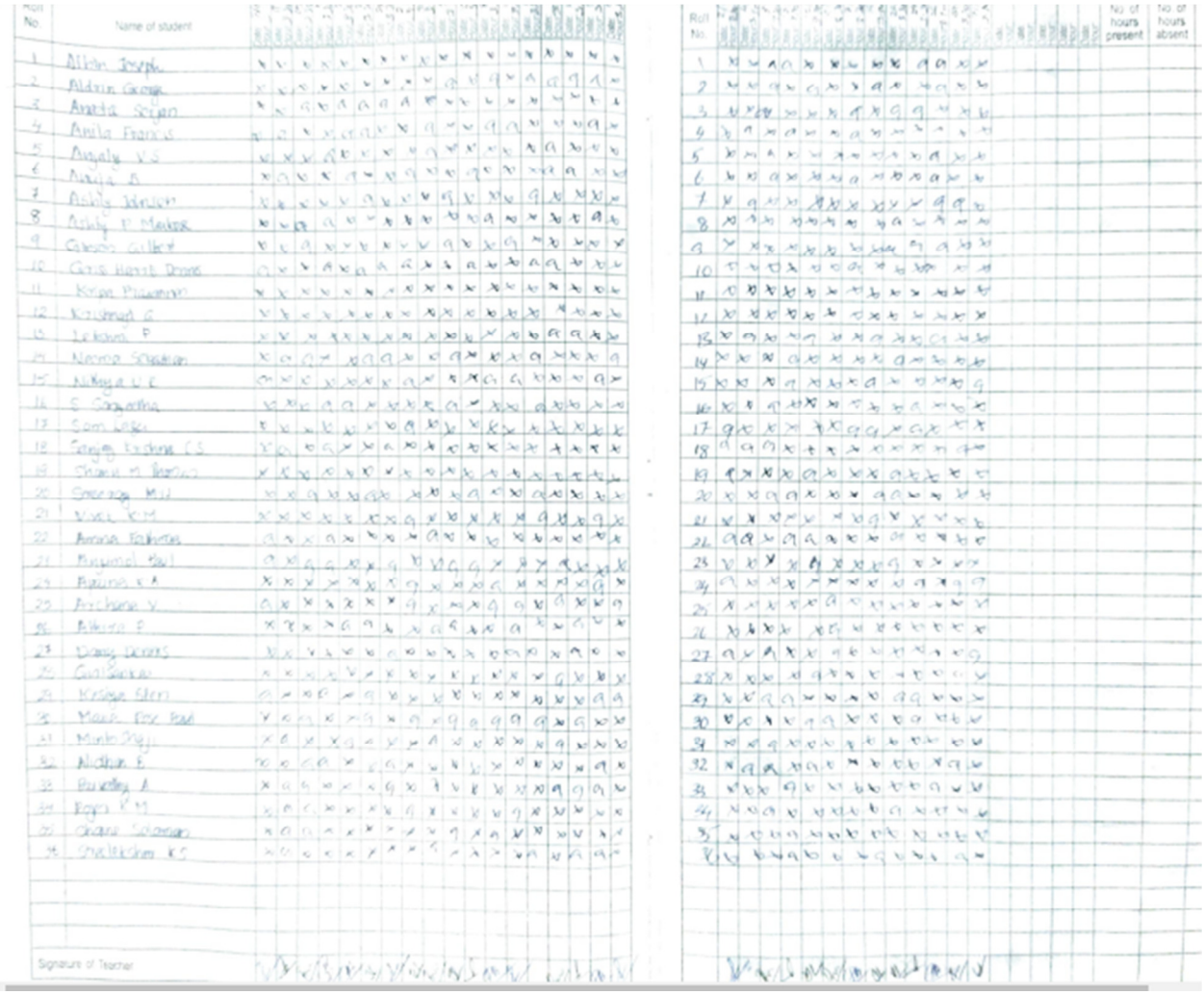
Class Schedule Format 2023-2024

Department: Chemistry | **Course: Analytical Techniques for Quality Control**

Sl No	Date	Day	Time	Name of Teacher	Class Room No
1	11/8/2019	Wednesday	3.30 - 4.30 pm	Smt.Seena Elizabeth George	A- 48
2	11/13/2019	Monday	3.30 - 4.30 pm	Dr.Pearl Augustine	A- 48
3	11/15/2019	Wednesday	3.30 - 4.30 pm	Smt. Liya Jose	A- 48
4	11/17/2019	Friday	3.30 - 4.30 pm	Sri. Joseph Libin K.L	A- 48
5	11/20/2019	Monday	3.30 - 4.30 pm	Dr. Beena James	A- 48
6	11/22/2019	Wednesday	3.30 - 4.30 pm	Smt. Seena Elizabeth George	A- 48
7	11/24/2019	Friday	3.30 - 4.30 pm	Dr.Pearl Augustine	A- 48
8	11/27/2019	Monday	3.30 - 4.30 pm	Smt. Liya Jose	A- 48
9	11/30/2019	Thursaday	3.30 - 4.30 pm	Sri. Joseph Libin K.L	A- 48
10	12/4/2019	Monday	3.30 - 4.30 pm	Dr. Beena James	A- 48

11	12/6/2019	Wednesday	3.30 - 4.30 pm	Smt. Seena Elizabeth George	A- 48
12	12/8/2019	Friday	3.30 - 4.30 pm	Dr.Pearl Augustine	A- 48
13	12/11/2019	Monday	3.30 - 4.30 pm	Smt. Liya Jose	A- 48
14	12/13/2019	Wednesday	3.30 - 4.30 pm	Sri. Joseph Libin K.L	A- 48
15	12/15/2019	Friday	3.30 - 4.30 pm	Dr. Beena James	A- 48
16	12/18/2019	Monday	3.30 - 4.30 pm	Smt. Seena Elizabeth George	A- 48
17	12/20/2019	Wednesday	3.30 - 4.30 pm	Dr.Pearl Augustine	A- 48
18	1/2/2020	Tuesday	3.30 - 4.30 pm	Smt. Liya Jose	A- 48
19	1/4/2020	Thursaday	3.30 - 4.30 pm	Sri. Joseph Libin K.L	A- 48
20	1/8/2020	Monday	3.30 - 4.30 pm	Dr. Beena James	A- 48
21	1/10/2020	Wednesday	3.30 - 4.30 pm	Smt. Seena Elizabeth George	A- 48
22	1/12/2020	Friday	3.30 - 4.30 pm	Dr.Pearl Augustine	A- 48
23	1/15/2020	Monday	3.30 - 4.30 pm	Smt. Liya Jose	A- 48
24	1/17/2020	Wednesday	3.30 - 4.30 pm	Sri. Joseph Libin K.L	A- 48
25	1/19/2020	Friday	3.30 - 4.30 pm	Dr. Beena James	A- 48
26	1/22/2020	Monday	3.30 - 4.30 pm	Smt. Seena Elizabeth George	A- 48
27	1/24/2020	Wednesday	3.30 - 4.30 pm	Dr.Pearl Augustine	A- 48
28	1/26/2020	Friday	3.30 - 4.30 pm	Smt. Liya Jose	A- 48
29	1/29/2020	Monday	3.30 - 4.30 pm	Sri. Joseph Libin K.L	A- 48
30	1/31/2020	Wednesday	3.30 - 4.30 pm	Dr. Beena James	A- 48

ATTENDANCE STATEMENT



ST.MICHAEL'S COLLEGE, CHERTHALA

Add-on Course Examination February 2020

Branch: Chemistry

Green Chemistry and Environmental Sustainability

Time: 1 Hr. **Maximum Marks: 30**

Section A, 1 mark each (Very short answer type)
(Answer in one word/2 sentences)
Answer all questions

1. What you meant by Triple R in waste management?
2. What type of pollution causes acid rain?
3. What are the misuses of plastics?
4. What are the three major man made sources of air pollution?
5. What kind of materials are discharged into the seas?
6. What increases the amount of carbon dioxide in the atmosphere?
7. Explain the action of zeolites on hard water.
8. What are freons?
9. Define pollution.
10. What is fly ash.

(10x1=10 Marks)

Section B, 2 marks each (Short answer type - should not exceed one paragraph)
Answer any *five* questions from the following

11. What are the main concepts of Green Chemistry?
12. Discuss the major composition of earth's atmosphere.
13. Write about the cause and consequence of Chernobyl incident.
14. What is the goal of Forest Conservation Act?.
15. What is the Greenhouse effect and what is its cause?
16. What is Codex Alimentarius Commission?
17. What are the types of air pollutants?
18. What is BOD and COD?

(5x2=10Marks)

Section D, 10 marks each (Long essay)
Answer any *one* question

19. (a) Discuss about green chemistry
    (b) Explain Montreal protocol and Kyoto protocol.
20. Write short note on causes and problems of ozone layer depletion.
21. Discuss about the various sources of water pollution..

(1x10=10 Marks)

Add-On Cell

St.Michael's College, Cherthala

Mark List

Discipline : Chemistry

Course Title :Green Chemistry & Environmental Sustainability

Date of Examination : 13/03/2020

Maximum Marks: 30

Sl No	Candidate Code	Name of the Student	Mark Obtained
1	**23517136001**	**ALBIN JOSEPH**	24
2	**23517136002**	**ALDRIN GEORGE**	25
3	**23517136003**	**ANEETA SERJAN**	27
4	**23517136004**	**ANILA FRANCIS**	28
5	**23517136005**	**ANJALY V S**	25
6	**23517136006**	**ANUJA B**	27
7	**23517136007**	**ASHLY JOHNSON**	24
8	**23517136008**	**ASHLY P. MARKOSE**	26
9	**23517136009**	**GINSON GILBERT**	27
10	**23517136010**	**GRISS HARRIS DENNIS**	23
11	**23517136011**	**KRIPA PRASANNAN**	22
12	**23517136012**	**KRISHNAJA G**	21
13	**23517136013**	**LEKSHMI P**	24
14	**23517136014**	**NEEMA SEBASTIAN**	30
15	**23517136015**	**NITHIYA U R**	30
16	**23517136016**	**S SANGEETHA**	30
17	**23517136017**	**SAM LAZER**	25
18	**23517136018**	**SANJAY KRISHNA C S**	22
19	**23517136019**	**SHANU M. THOMAS**	26
20	**23517136020**	**SREERAG M H**	22
21	**23517136021**	**VIVEK K M**	26
22	**23517136022**	**AMNA FATHIMA**	30
23	**23517136023**	**ANJUMOL PAUL**	28
24	**23517136024**	**APARNA K A**	27
25	**23517136025**	**ARCHANA V**	25
26	**23517136026**	**ATHIRA P**	26
27	**23517136027**	**DANY DENNIS**	22
28	**23517136028**	**GIRISANKAR SURESH**	24
29	**23517136029**	**KESIYA STEN**	26
30	**23517136030**	**MARIA ROSE PAUL**	30

31	**23517136031**	**MINTO SHAJI**	22
32	**23517136032**	**NIDHIN B**	27
33	**23517136033**	**PARVATHY A**	24
34	**23517136034**	**ROJER K M**	30
35	**23517136035**	**SHAINE SOLAMAN**	24
36	**23517136036**	**SREELEKSHMI K S**	30
Name and Dated Signature of the Course Coordinator		Name and Dated Signature of the HoD	

ST. MICHAEL'S COLLEGE
CHERTHALA, ALAPPUZHA - 688 539
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ADD-ON COURSE
CERTIFICATE

This is to certify that Miss. ANUJA B (23517136006)
B.Sc Chemistry 2017 Admission has completed
Certificate/Add-on course in Green Chemistry and Environmental Sustainability
(CH 090) offered by the Department of
Chemistry during the academic year 2019-2020. He/She is awarded with A Grade.

Head of the Department | Course Coordinator | Principal

ST.MICHAEL'S COLLEGE, CHERTHALA

Department of Chemistry

Add-On Course: Green Chemistry and Environmental Sustainability

Green chemistry is a field dedicated to designing chemical products and processes that minimize the use and generation of hazardous substances. It focuses on creating sustainable solutions that reduce environmental impact throughout a product's lifecycle. Environmental sustainability is at the heart of green chemistry, aiming to preserve resources, reduce pollution, and promote a healthier planet. The integration of green chemistry practices into industries and research contributes significantly to environmental sustainability. It minimizes pollution, conserves resources, and reduces the environmental footprint associated with various manufacturing processes. By developing eco-friendly alternatives, such as biodegradable plastics, cleaner production methods, and efficient catalytic processes, green chemistry plays a pivotal role in addressing environmental challenges like climate change, pollution, and resource depletion. It aligns economic growth with environmental responsibility, fostering a more sustainable future. In order to make an awareness about this Green Chemistry applications and its environmental impacts department of chemistry offered a add on course in this specific area.. It is a five moulded 30hrs programme. The syllabi cover most of the essential features of the Green chemistry, environmental pollution, development of green chemistry to control the pollution etc. and this programme will help pupil to get a better understanding about their surroundings.

ST MICHAEL'S COLLEGE MAYITHARA 686539 CHERTHALA

Principal
St. Michael's College
Cherthala