

## St. Michael's College, Cherthala

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



Name of the Programme: GREEN CHEMISTRY AND ENVIRONMENTAL

**SUSTAINABILITY** 

Name of the Department: CHEMISTRY

Course Code : CH 090



## St. Michael's College

MAYITHARA P.O., CHERTHALA, ALAPPUZHA-688539

An institution with Minority Status Affiliated to the University of Kerala and Re-accredited by NAAC with 'A' Grade

**Add on Course - 2019-20** 

## COMMERCE

Basic Corporate Accountant Program

## **PHYSICS**

**Robotics** 

## TOURISM STUDIES

Customer Service Management

## SOFTWARE DEVELOPMENT

Basics of Al

## **ENGLISH**

**Certificate Course** 

Remedial Grammar and Public Speaking

### **MATHEMATICS**

Introduction to Mathematical thinking

## **ENGLISH**

Business Benchmark

## CHEMISTRY

Green Chemistry and Environmental Sustainability



Phone: 0478-2822387, 2810387

Email: michaelscherthala@gmail.com, Web: www.stmc.ac.in

#### Add on Course 2019-20

NAME OF COURSE : Green Chemistry and Environmental Sustainability

COURSE CODE : CH 090

NO OF STUDENTS ENROLLED: 36

## **CONTENTS**

**SYLLABUS** 

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MARK LIST

**CERTIFICATE** 

**PHOTO** 

**REPORT** 

#### **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 tragedynew greener syntheses, safer solvents and auxiliaries 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 and control 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.

St, Michael's College, Cherthala

- 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							
Course: Analytical Techniques for Department: Chemistry Quality Control					iques for			
S1 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			

### Add on Course 2019-20

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

### Add on Course 2019-20

## ATTENDANCE STATEMENT

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#### 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 <u>one</u> 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
Nam	e and Dated Signature of	Name and Dated Signature	of
th	e Course Coordinator	the HoD	



# ADD-ON COURSE CERTIFICATE

B.Sc Chemistry 2017 Admission

B.Sc Chemistry 2017 Admission

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 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.



