

# LAB SAFETY RULES AND METHODS

DEPARTMENT OF CHEMISTRY

SREE NARAYANA COLLEGE, KOLLAM

2017-2018



- How to detect and control lab hazards
- Requirements for a Chemical Hygiene Plan

### Who Should Apply?

The certificate course in **Lab safety rules and methods (CPLSRM)**, is open to all students with Chemistry background at the higher secondary level and those who want to pursue their career in research.

### Course Details

Minimum Duration: 6 Months

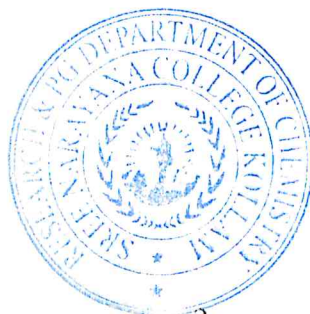
Maximum Duration: 1 Year

Course Fee: Rs. 2,000

Minimum Age: 20

Maximum Age: No bar

*Arunabhharajil*  
Principal  
Sree Narayana College  
Kollam



**LIST OF APPLIED STUDENTS**

SL NO.	NAME OF STUDENTS	ADDRESS	STATUS
1	ADARSH RAJ R	ATHAM KARUNAGAPPALLY THAZHAVA P O 690523 MOB: 9526728626	APPLICATION RECEIVED
2	NIKHITHA GOURI. I. S	PADIKKAL KIZHAKKATHIL KALLUMTHAZHAM KILIKOLLOOR 691004 MOB: 8921475856	APPLICATION RECEIVED
3	ADITHYA P S	PANAMPLAVIL THAZHATHIL KANJAVELY KANJAVELY 691602 Mob: 8078997880	APPLICATION RECEIVED
4	ARYA B	CHARUVILA PUTHEN VEEDU PALLICKAL PAKALKURI P O 695604 MOB: 9746573309	APPLICATION RECEIVED
5	PARAMESWARI P	PARAMESWARI BHAVAN KADAPPAKADA KADAPPAKADA P O 691008 MOB: 9495320951	APPLICATION RECEIVED
6	ADARSH S	VAISHAKHAM PERUMPUZHA PERUMPUZHA 691504 MOB: 8156903301  0474_2527627	APPLICATION RECEIVED



7	DEVIKA P	D D MANDIRAM VELLIMON VELLIMON 691511 MOB: 9446817413	APPLICATION RECEIVED
8	ATHIRA. U.S	PANTHAPLAVIL SUDHALAYAM KARICODE TKMC P.O. 691005 MOB: 8086990892	APPLICATION RECEIVED
9	ATHIRA RAJEEV	CHARUVILA KIZHAKKATHIL KOLLAM ADHICHANALLOOR P O 691573 MOB: 8281848234	APPLICATION RECEIVED
10	ARDRA R SAHADEVAN	ABHISHEKAM VETTUTHARA NEENDAKARA P O 691582 MOB: 9497960817	APPLICATION RECEIVED
11	ANUPAMA S KUMAR	THODIYIL PUTHEN VEEDU PUTHUCHIRA UMAYANALLOOR P.O 691572 MOB: 9895554105	APPLICATION RECEIVED
12	ABHIRAM SIVAPRASAD	UTHRAM AYATHIL AYATHIL 691021 MOB: 9495860881	APPLICATION RECEIVED
13	SONA VARGHESE	MADATHIL HOUSE, PRATHEEKSHA NAGAR 157 KOLLAM KILIKOLLOOR 691004 MOB: 9447454054	APPLICATION RECEIVED





14	SARATH KRISHNA R S	KAITHOLEZHATHU CHAVARA PUTHUKKADU P O 691585 MOB: 9495682665	APPLICATION RECEIVED
15	ROSHINI RAJ	R S BHAVANAM PEROOR THATTARKONAM P O 691005 MOB: 9074442876	APPLICATION RECEIVED
16	NEENA BABU R	PADANNAYIL VEEDU MUNDROTHURUTHU MUNDROTHURUTHU 691502 MOB: 9946986394	APPLICATION RECEIVED
17	REVATHY S DAS	NEDIYAVILA VEEDU PUNUKKANNOR PERUMPUZHA P O 691504 MOB: 9496777434	APPLICATION RECEIVED
18	DHANEESH M	PALAMOOTTIL VEEDU EAST KALLADA EAST KALALDA 691502 MOB: 9048834244	APPLICATION RECEIVED
19	SUDHEESH.S	VEENASSERY VEEDU KALLUMTHAZHAM KILIKOLLOOR 691004 Mob: 9995773130	APPLICATION RECEIVED
20	SUCHITH S KUMAR	KANDATHIL PADINJATTATHIL TNRA -163 KOLLAM THIRUMULLAVAROM 691012 MOB: 9037313227	APPLICATION RECEIVED
21	UNNIKRISHNAN R	GOKULAM CHAVARASOUTH CHAVARASOUTH PO 691584 MOB: 7034497476	APPLICATION RECEIVED



## CERTIFICATE COURSE

(Offered By Research & Post Graduate Department of Chemistry

S N College, Kollam)

### Lab Safety Rules and Methods

Total Hours: 30

#### Aim of the Course

To develop awareness among students about the different aspects of laboratory safety, since it is essential to take proper precautions and implement safety guidelines while working in the laboratory.

#### Course objectives

- General lab safety rules and guidelines
- How to detect and control lab hazards
- Requirements for a Chemical Hygiene Plan

#### GENERAL ASPECTS OF EVALUATION

Mode of Evaluation - Certificate Course on Lab Safety Rules and Methods

- i. Attendance for lecture session
- ii. Test for theory

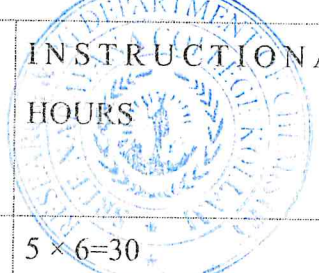
The weightage is shown in Table 1

Table 1

No	Component	Marks
1	Paper-1	100

#### DISTRIBUTION OF HOURS

Hours/Week	Course code	INSTRUCTIONAL HOURS
Theory		
5	CPLSRM	5 × 6=30



## COURSE OUTCOME

Co No	COURSE OUTCOME	Cognitive Level
	<b>Upon completion of this course, students</b>	
1	Develop knowledge about laboratory safety, laboratory emergencies and chemical hazards	U
2	Managing and working with chemicals, waste handling etc.	U, A
3	Develop skill in operating laboratory equipments.	A

## LAB SAFETY RULES AND METHODS

**30 Hours**

### **Module 1: Introduction to Laboratory Safety (6 hours)**

Risks in a research laboratory, health effects due to hazardous chemical exposure, methods to determine the hazards associated with specific chemicals, exposure routes, toxicity risk assessment, personal protective equipment (PPE), proper attire: eye/face protection, lab coats, gloves, respirators, disposal/removal of PPE, emergency equipment safety showers/eye washes, environmental health and safety (EHS)

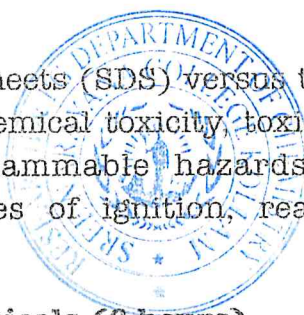
### **Module 2: Laboratory Emergencies: Spills and Fires (4 hours)**

General preparation for emergencies, handling the accidental release of hazardous materials notifications, spill containment and clean-up, leaking gas cylinders: causes and prevention, fires classification, fire extinguishers; types and method of operation

### **Module 3: Chemical Hazards (5 hours)**

Chemical hygiene plan, the new safety data sheets (SDS) versus the old material safety data sheets (MSDS), assessment of chemical toxicity, toxic hazards: dose and risk assessment, types of toxins, flammable hazards, flammability characteristics, flammability classes, causes of ignition, reactive hazards, explosives:

### **Module 4: Managing and Working with Chemicals (6 hours)**





General considerations: chemical segregation, transfer and transport, chemical fume hoods (safety, types, operation), other types of ventilation, working with highly toxic compounds: general considerations, planning, precautions for minimizing exposure - handling, in the event of a spill, working with flammable substances (standard operating procedures), working with highly reactive or explosive substances, working with compressed gases: parts of the cylinder, cylinder pressure regulator, storage guidelines, transporting cylinders, handling compressed gas cylinders.

#### **Module 5: Waste Handling (4 hours)**

Characterization of waste, collection and storage (lids, leaks, labels, location, containers), consequences of mixing incompatibles solid wastes (chemicals, broken glass, sharps, cylinders, pick-up), hazardous waste minimization

#### **Module 6: Laboratory Equipment (5 hours)**

Working with electricity, working with water (liquid)-dependent equipment (hazards, proper use, heating baths), working with high pressure/vacuum, working with vacuum pumps, working with stirring and mixing devices, working with heating devices (oil, salt, sand baths, microwave ovens), working with ultrasonicators and centrifuges, Examples of common mistakes and ways to avoid them.

#### **References**

1. Laboratory safety for chemistry students (2nd ed): Robert H Hill and David C Finster, Wiley 2016. ISBN 9781119243380
2. CRC Handbook of Laboratory Safety: A. Keith Furr.
3. Handbook for Laboratory Safety: Benjamin Sveinbjornsson, Sveinbjorn Gizurarson.
4. Handbook of Laboratory Health and Safety Measures: S.B. Pal
5. Laboratory Safety: Theory and Practice: Anthony A. Fuscaldo, Barry J. Erliok and Barbara Hindman.

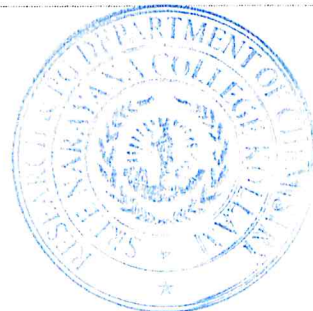




**CERTIFICATE COURSE IN "LAB SAFETY RULES &  
METHODS" 2017-2018**

**LIST OF QUALIFIED STUDENTS**

SL NO.	CANDIDATE CODE	NAME OF STUDENTS	ADDRESS	STATUS
1	CP17LSRJ01	ADARSH RAJ R	ATHAM KARUNAGAPPALLY THAZHAVA P O 690523 MOB: 9526728626	QUALIFIED
2	CP17LSRJ02	NIKHITHA GOURI. I. S	PADIKKAL KIZHAKKATHIL KALLUMTHAZHAM KILIKOLLOOR 691004 MOB: 8921475856	QUALIFIED
3	CP17LSRJ03	ADITHYA P S	PANAMPLAVIL THAZHATHIL KANJAVELY KANJAVELY 691602 Mob: 8078997880	QUALIFIED
4	CP17LSRJ04	ARYA B	CHARUVILA PUTHEN VEEDU PALLICKAL PAKALKURI P O 695604 MOB: 9746573309	QUALIFIED
5	CP17LSRJ05	PARAMESWARI P	PARAMESWARI BHAVAN KADAPPAKADA KADAPPAKADA P O 691008 MOB: 9495320951	QUALIFIED



6	CP17LSRJ06	ADARSH S	VAISHAKHAM PERUMPUZHA PERUMPUZHA 691504 MOB: 8156903301  0474_2527627	QUALIFIED
7	CP17LSRJ07	DEVIKA P	D D MANDIRAM VELLIMON VELLIMON 691511 MOB: 9446817413	QUALIFIED
8	CP17LSRJ08	ATHIRA. U.S	PANTHAPLAVIL SUDHALAYAM KARICODE TKMC P.O. 691005 MOB: 8086990892	QUALIFIED
9	CP17LSRJ09	ATHIRA RAJEEV	CHARUVILA KIZHAKKATHIL KOLLAM ADHICHANALLOOR P O 691573 MOB: 8281848234	QUALIFIED
10	CP17LSRJ10	ARDRA R SAHADEVAN	ABHISHEKAM VETTUTHARA NEENDAKARA P O 691582 MOB: 9497960817	QUALIFIED
11	CP17LSRJ11	ANUPAMA S KUMAR	THODIYIL PUTHEN VEEDU PUTHUCHIRA UMAYANALLOOR P.O 691572 MOB: 9895554105	QUALIFIED
12	CP17LSRJ12	ABHIRAM SIVAPRASAD	UTHRAM AYATHIL AYATHIL 691021 MOB: 9495860881	QUALIFIED



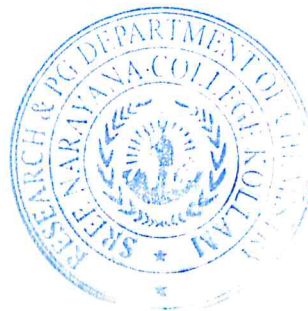
13	CP17LSRJ13	SONA VARGHESE	MADATHIL HOUSE, PRATHEEKSHA NAGAR 157 KOLLAM KILIKOLLOOR 691004 MOB: 9447454054	QUALIFIED
14	CP17LSRJ14	SARATH KRISHNA R S	KAITHOLEZHATHU CHAVARA PUTHUKKADU P O 691585 MOB: 9495682665	QUALIFIED
15	CP17LSRJ15	ROSHINI RAJ	R S BHAVANAM PEROOR THATTARKONAM P O 691005 MOB: 9074442876	QUALIFIED
16	CP17LSRJ16	NEENA BABU R	PADANNAYIL VEEDU MUNDROTHURUTH U MUNDROTHURUTH U 691502 MOB: 9946986394	QUALIFIED
17	CP17LSRJ17	REVATHY S DAS	NEDIYAVILA VEEDU PUNUKKANNOR PERUMPUZHA P O 691504 MOB: 9496777434	QUALIFIED
18	CP17LSRJ18	DHANEESH M	PALAMOOTTIL VEEDU EAST KALLADA EAST KALALDA 691502 MOB: 9048834244	QUALIFIED





19	CP17LSRJ19	SUDHEESH.S	VEENASSERY VEEDU KALLUMTHAZH AM KILIKOLLOOR 691004 Mob: 9995773130	QUALIFIED
20	CP17LSRJ20	SUCHITH S KUMAR	KANDATHIL PADINJATTATHIL TNRA -163 KOLLAM THIRUMULLAVARA M 691012 MOB: 9037313227	QUALIFIED

*Sudheesh S*  
Principal  
Sree Narayana College  
Kollam



**CERTIFICATE COURSE IN "LAB SAFETY RULES &  
METHODS" 2017-2018**  
**MARK LIST OF STUDENTS**

SL. NO.	CANDIDATE CODE	NAME OF STUDENTS	MARKS IN THEORY (OUT OF 100)	GRADE
1	CP17LSRJ01	ADARSH RAJ R	91	A <sup>+</sup>
2	CP17LSRJ02	NIKHITHA GOURI. I. S	98	A <sup>+</sup>
3	CP17LSRJ03	ADITHYA P S	85	A
4	CP17LSRJ04	ARYA B	92	A <sup>+</sup>
5	CP17LSRJ05	PARAMESWARI P	100	A <sup>+</sup>
6	CP17LSRJ06	ADARSH S	90	A <sup>+</sup>
7	CP17LSRJ07	DEVIKA P	92	A <sup>+</sup>
8	CP17LSRJ08	ATHIRA. U.S	94	A <sup>+</sup>
9	CP17LSRJ09	ATHIRA RAJEEV	80	A
10	CP17LSRJ10	ARDRA R SAHADEVAN	100	A <sup>+</sup>
11	CP17LSRJ11	ANUPAMA S KUMAR	95	A <sup>+</sup>
12	CP17LSRJ12	ABHIRAM SIVAPRASAD	93	A <sup>+</sup>
13	CP17LSRJ13	SONA VARGHESE	100	A <sup>+</sup>
14	CP17LSRJ14	SARATH KRISHNA R S	92	A <sup>+</sup>
15	CP17LSRJ15	ROSHINI RAJ	90	A <sup>+</sup>
16	CP17LSRJ16	NEENA BABU R	94	A <sup>+</sup>
17	CP17LSRJ17	REVATHY S DAS	92	A <sup>+</sup>
18	CP17LSRJ18	DHANEESH M	96	A <sup>+</sup>
19	CP17LSRJ05	SUDHEESH.S	80	A
20	CP17LSRJ06	SUCHITH S KUMAR	91	A <sup>+</sup>

Dr. Rijith S.  
(Chairman)

Dr. V. L. Pushpa  
HoD.



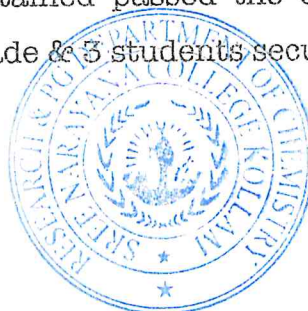
Abhilash S.  
Coordinator

## **Final Report for the LAB SAFETY COURSE conducted by the Department of Chemistry during 2017-2018**

PG & Research Department of Chemistry, SN college Kollam conducted various methods to passivate and modulated the knowledge level of students who have keen interest in Chemistry. A short-term certificate courses was implemented for student with an objective to supplement their academic curricula. This certificate course in **LAB SAFETY RULES AND METHODS** is designed to introduce students, to the array of dangers associated with research in the chemical sciences. The course also provides guidance on planning procedures for the handling, storage, and disposal of chemicals.

Out of 21 students applied, 20 were selected for the course. The classes were handled by expert teachers from the Chemistry Department. This course has given students a basic understanding of laboratory safety and an awareness of potential hazards that may run into while working there. They provided with basic knowledge about general rules in handling chemicals. These rules help to prevent contamination of the chemicals, but can also be used to prevent users from having problems caused by undesirable events during use.

After completing the course, the students are now aware of the need for safety when handling potentially hazardous materials and other hazards in the lab. With the help of this course, students will be able to recognise dangers, evaluate the risks associated with various chemicals and equipment, take the necessary precautions, and put safety rules into practice to ensure their safety while working in the lab. They can now practice safety procedures and use the applied procedures to handle chemicals and laboratory equipment. All of the selected candidates finished the certificate program successfully. In a summative assessment, all the students attained passed the course. From above 20 students 17 students secured A+ grade & 3 students secured A grade.







# SREE NARAYANA COLLEGE KOLLAM

## DEPARTMENT OF CHEMISTRY

### CERTIFICATE COURSE IN LAB SAFETY RULES AND METHODS

This is to certify that Mr./Ms./Mrs. .... ANURAMA KUMAR Department of.....  
.....CHEMISTRY.....has successfully completed Certificate Course in  
.....Lab Safety Rules and Methods  
during the Academic Year.....2017-2018.....

Course Coordinator



Principal



# SREE NARAYANA COLLEGE KOLLAM

## DEPARTMENT OF CHEMISTRY

### CERTIFICATE COURSE IN LAB SAFETY RULES AND METHODS

This is to certify that Mr./Ms./Mrs..... ATHIRA RAJEEV Department of.....  
.....CHEMISTRY..... has successfully completed Certificate Course in  
.....Lab Safety Rules and Methods  
during the Academic Year.....2017-2018.....

Course Coordinator



Principal



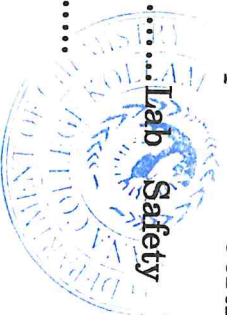


# SREE NARAYANA COLLEGE KOLLAM

DEPARTMENT OF CHEMISTRY

## CERTIFICATE COURSE IN LAB SAFETY RULES AND METHODS

This is to certify that Mr./Ms./Mrs.....**DEVIKA P**.....Department of.....  
.....**CHEMISTRY**.....has successfully completed Certificate Course in  
.....Lab Safety Rules and Methods  
during the Academic Year.....**2017-2018**.....



  
\_\_\_\_\_

Course Coordinator

  
\_\_\_\_\_

Principal