



# J.K.K.MUNIRAJAH MEDICAL RESEARCH FOUNDATION'S ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY

Ethirmedu, B.Komarapalayam – 638 183, Namakkal Dist. Tamilnadu. India  
Approved by : Pharmacy Council of India, New Delhi & The Tamilnadu Dr.M.G.R Medical University, Chennai.  
Website : [www.jkkmmrfpharmacy.edu.in](http://www.jkkmmrfpharmacy.edu.in) |E-Mail : [principal@jkkmmrfpharmacy.edu.in](mailto:principal@jkkmmrfpharmacy.edu.in)  
Contact No. : +919789456750, +919943069944, +919943066944

AD DON COURSE	CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS
DEPARTMENT	PHARMACEUTICAL CHEMISTRY
ACADEMIC YEAR	2021-2022
DATE	04.03.2022-20.03.2022
VENUE	SEMINARHALL

## REPORT

### RESOURCEPERSONS:

1. MR.R. VIJAY AMIRTHARAJ .,M.PHARM  
VICE PRINCIPAL,

2. MRS.B.ANBARASI,.M.PHARM,  
ASSOCIATE PROFESSOR,

No.ofstudentsenrolled:63

No.of studentscertified: 61

**Objective:** The objective of this value added Chemical Sensor Technologies For Chemical Analysis provides the information about the chemical sensor technologies for chemical analysis. chemicalsensors technologies for chemical analysis were the highly advanced sensor materials study and toobtainknowledgeon sensor technologyin chemical analysis.

### Learningoutcomes:

- Providesknowledgeon Fullerenes
- Givesmoreideaontexturesin sensormaterials
- Devolptheindustrialskillsonsynthesisofcarbonnanotubes.
- Thestudentswereactivelyparticipatedinthese courseandgainedknowledgeonChemicalSens or TechnologiesFor Chemical Analysis.

R. Vijayaraj  
Programme  
Co-ordinator

HOD

Principal

Dr. N. SENTHILKUMAR,  
PRINCIPAL,

JKK MUNIRAJAH MEDICAL RESEARCH FOUNDATION  
ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY,  
ETHIRMEDU, KOMARAPALAYAM - 638 183.  
NAMAKKAL DISTRICT, TAMILNADU.

Dr. N. SENTHILKUMAR,  
PRINCIPAL

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REF.NO:JKKM/PG-PHARM.CHEM/REQ/2022/002

Date:01.03.2022

From

Department of Pharmaceutical chemistry,  
JKKMMRF'S Annai JKK Sampoorani Ammal College of Pharmacy.  
Komarapalayam, Namakkal [Dist]  
Tamil Nadu, PIN:638183.

To

The Principal,  
JKKMMRF'S Annai JKK Sampoorani Ammal College of Pharmacy.  
Komarapalayam, Namakkal [Dist]  
Tamil Nadu, PIN:638183.

Subject: Letter for requesting Permission to Conduct an **ADD ON COURSE** regarding:-

Respected Sir,

We Are writing this letter to request permission to conduct a seminar in the **SEMINAR HALL** on **04.03.2022 to 20.03.2022**. We wish to conduct a seminar regarding the **CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS**. We believe this will be a veryinformative session that many students will wish to attend.

We request you to kindly permit to conduct training program as this would be a great opportunity for Students to learn all about **CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS**. that would help a great deal to shape the students.

Looking forward to hearing from you.

Thank you,  
**Dr. N.SENTHILKUMAR,**  
PRINCIPAL

**JKK MUNIRAJAH MEDICAL RESEARCH FOUNDATION**  
**ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY**  
ETHIRMEDU, KOMARAPALAYAM - 638 183.  
NAMAKKAL DISTRICT, TAMILNADU, INDIA.

Yours sincerely,  
**R. Vigneshwari**  
Programme Co-ordinator

**Dr. N.SENTHILKUMAR,**  
PRINCIPAL

**JKK MUNIRAJAH MEDICAL RESEARCH FOUNDATION**  
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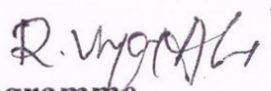
## CIRCULAR

This is inform to the ALL PHARM.D Students that the following value added course can be conducted by the Department of Pharmaceutical Chemistry, Jkkmmrf's Annai Jkk Sampooraniammal College Of Pharmacy, Komarapalayam and it will be commenced as per the schedule:

Course Name	Schedule	Duration	Venue	Resource Person
CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS	04.03.2022 To 20.03.2022	32 HRS	SEMINAR HALL	Mr.R.VijayAmirtharaj & Mrs.B.Anbarasi

All the above mentioned students must enroll and actively participate in the course without fail.

**NOTE: Certificates should be issued to all the students after completion of the course and examination.**

  
Programme  
Co-ordinator

  
HOD

  
Principal

Dr. N. SENTHILKUMAR,  
PRINCIPAL,

J.K.K. MUNIRAJAH MEDICAL RESEARCH FOUNDATION  
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Dr. N.SENTHILKUMAR,  
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<b>ADD ON COURSE</b>	<b>CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS</b>
DEPARTMENT	PHARMACEUTICAL CHEMISTRY
ACADEMIC YEAR	2021-2022
DATE	04.03.2022-20.03.2022
VENUE	SEMINAR HALL

## SYLLABUS

DATE	HOURS	TOPIC	SUB TOPICS	RESOURCE PERSON
04.03.2022	5 hrs	CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS	INTRODUCTION, SENOR THEORY	MR.R.VIJAY AMIRTHARAJ
06.03.2022	5 hrs		ELECTROCHEMIC AL SENSOR	
08.03.2022	6 hrs		GAS SENSOR	
10.03.2022	5 hrs		FRAME WORK, TRANSDUCERS	MRS.B.ANBARASI
15.03.2022	6 hrs		BIOSENSOR	
20.03.2022	5 hrs		CONCLUSION	



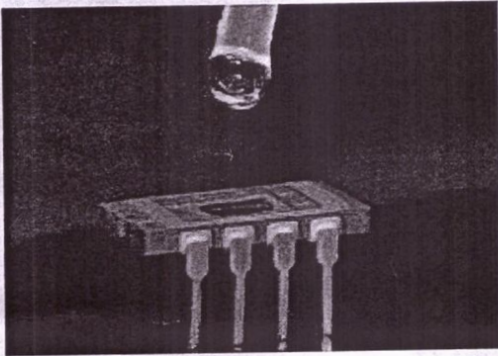
  
**Dr. N.SENTHILKUMAR,**  
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## BROCHURE

### DEPARTMENT OF PHARMACEUTICAL CHEMISTRY



### TOPIC: CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS

VENUE: SEMINAR HALL

DATE: 04.03.2022 TO 20.03.2022

TIME: 9.00 am to 6.00 pm



**Dr. N.SENTHILKUMAR,  
PRINCIPAL**

**JKK MUNIRAJAH MEDICAL RESEARCH FOUNDATION  
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### COURSE SCHEDULE:

- INTRODUCTION
- FLEXIBLE CHEMICAL SENSOR
- SENSING MATERIAL, SENSOR THEORY
- 
- NATURAL AND SYNTHETIC SENSORS
- PRACTICAL ASPECTS OF ACOUSTIC WAVE
- WEARABLE SENSOR, SURVEY AND APPLICATION

### Resource person:

**MR.R.VIJAY AMIRTHARAJ, M.Pharm.,**  
Vice Principal,  
JKKMMRF'S Annai JKK Sampoornani Ammal  
College of Pharmacy, Komarapalayam.



**MRS.B.ANBARASI, M.Pharm.,**  
Associate Professor,  
JKKMMRF'S Annai JKK Sampoornani Ammal  
College of Pharmacy, Komarapalayam.





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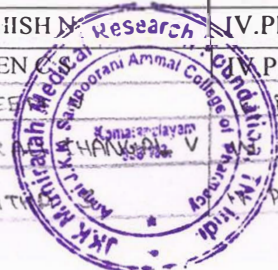
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## LIST OF STUDENTS ENROLLED FOR THE COURSE

S.NO	REG.NO	NAME OF THE STUDENTS	COURSE	SIGNATURE
1	381610419	RAJARAJARATHINAM	VI.PHARM D	Rajaraj
2	381610420	ROSHNY A	VI.PHARM D	Roshny
3	381610421	SABEERBASHA K	VI.PHARM D	Sabeer
4	381610423	SHEEBA S KOSHY	VI.PHARM D	Sheeba
5	381610424	SUBHASHINI A	VI.PHARM D	Subhasini
6	381610426	TAMJID B	VI.PHARM D	Tamjid
7	381610427	UDHAYAKUMAR P	VI.PHARM D	Udhay
8	381610428	VELSREEYA RAJ R	VI.PHARM D	Velsreeya
9	381610429	VISWA S	VI.PHARM D	Viswa
10	381610430	YESHWANTH S	VI.PHARM D	Yeshwanth
11	381610431	PEJMAN GHADAMI	VI.PHARM D	Pejman
12	381410410	HARISH M	VI.PHARM D	Harish
13	381510402	AZAD V P	VI.PHARM D	Azad
14	381510422	SENAF K	VI.PHARM D	Senaf
15	381710401	ANDLY CHEDRICK C	V.PHARM D	Andly ched
16	381710402	ASHA M	V.PHARM D	Asha
17	381710403	ASHRITHA D N	V.PHARM D	Ashritha
18	381710404	DEEPIKA K	V.PHARM D	Deepika
19	381710405	HARINI R	V.PHARM D	Harini
20	381710406	JAYAPRAKASH U	V.PHARM D	Jayaprakash
21	381810416	KEZIA K SABU	IV.PHARM D	Kezia
22	381810417	KISHANKANTH P	IV.PHARM D	Kishan
23	381810418	KUMAR V	IV.PHARM D	Kumar
24	381810419	MANOJ KUMAR S	IV.PHARM D	Manoj
25	381810421	NANTHISH N	IV.PHARM D	Nanthish
26	381810422	NAVEEN	IV.PHARM D	Naveen
27	381810423	NAVEEN	IV.PHARM D	Naveen
28	381810424	OMAR	IV.PHARM D	Omar
29	381810425	PAPITHA	IV.PHARM D	Papitha

**Dr. N.SENTHILKUMAR,**  
PRINCIPAL





30	381910418	NAVEENA S	III.PHARM D	Naveena
31	381910419	PRABHAT KUMAR GUPTA	III.PHARM D	Prabhat
32	381910420	PRADESH C	III.PHARM D	Pradesh
33	381910421	RAMYA G K	III.PHARM D	Ramya
34	381910423	SILAMBARASAN M	III.PHARM D	Silambarasan
35	381910426	SURENDRAN P	III.PHARM D	Surenth
36	381910427	TAMILSELVAN S	III.PHARM D	Tamil
37	381910428	THOMAS JUDE RODRIGUES	III.PHARM D	Thomas
38	381910429	VIGNESHWAR R	III.PHARM D	Vigneshwar
39	381910430	VIMALRAJ G	III.PHARM D	Vimal
40	380020507512	KEERTHIVEL T S	II.PHARM D	Keerthi
41	380020507513	KESTIN K SABU	II.PHARM D	Kestin
42	380020507514	KIRTHIGA A	II.PHARM D	Kirthi
43	380020507515	MAGCELINE CHRISTOPHER	II.PHARM D	Maguel
44	380020507516	MARSHAL RAJ S	II.PHARM D	Marshall
45	380020507518	MUKILAN S	II.PHARM D	Mukul
46	380020507519	RAGUL VIGNESHAA K	I.PHARM D	Raghu
47	380020507520	RAJASEKAR R	I.PHARM D	Raj
48	380020507521	RAKSHANA B	I.PHARM D	Rakshana
49	Pharm D/260/ 2021-22	KARTHICK J	I.PHARM D	Karthi
50	Pharm D/261/ 2021-22	KAVIYA R	I.PHARM D	Kaviya
51	Pharm D/262/ 2021-22	KIRANKUMARN V	I.PHARM D	Kiran
52	Pharm D/263/ 2021-22	MOHANRASU P	I.PHARM D	Moha
53	Pharm D/264/ 2021-22	MOHIT R	I.PHARM D	Mohit
54	Pharm D/265/ 2021-22	PARTHASARATHY S	I.PHARM D	Parthas
55	Pharm D/266/ 2021-22	PAVITHRA M	I.PHARM D	Paritha
56	Pharm D/267/ 2021-22	PRASANTH R	I.PHARM D	Prasanth
57	Pharm D/268/ 2021-22	PUNITHKUMAR V	I.PHARM D	Punitha
58	Pharm D/269/ 2021-22	SARANYA R	I.PHARM D	Saranya
59	Pharm D/70/ 2021-22	SARATHY S	I.PHARM D	Sarathy
60	Pharm D/271/ 2021-22	SHYAM S S	I.PHARM D	Shyam
61	Pharm D/272/ 2021-22	SIVAPRASATH G	I.PHARM D	Sivprasad
	Pharm D/273/ 2021-22	SREESANTHEYA S G	I.PHARM D	Sreesanthya
	Pharm D/274/ 2021-22	SUBASH B	I.PHARM D	Subash



**Dr. N.SENTHILKUMAR,**  
PRINCIPAL

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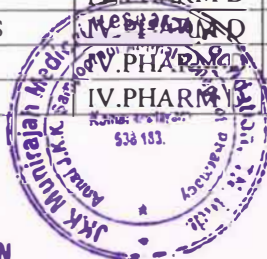
## STUDENT ATTENDANCE FOR THE COURSE

S.NO	REG.NO	NAME OF THE STUDENTS	COURSE	4/03	6/03	8/03	10/03	15/03	20/03
1	381610419	RAJARAJARATHINAM	VI.PHARM D	✓	✓	✓	✓	✓	✓
2	381610420	ROSHINY A	VI.PHARM D	✓	✓	✓	✓	✓	✓
3	381610421	SABEERBASHA K	VI.PHARM D	✓	✓	✓	✓	✓	✓
4	381610423	SHEEBA S KOSHY	VI.PHARM D	✓	✓	✓	✓	✓	✓
5	381610424	SUBHASHINI A	VI.PHARM D	✓	✓	✓	✓	✓	✓
6	381610426	TAMJID B	VI.PHARM D	✓	✓	✓	✓	✓	✓
7	381610427	UDHAYAKUMAR P	VI.PHARM D	✓	✓	✓	✓	✓	✓
8	381610428	VELSREEYA RAJ R	VI.PHARM D	✓	✓	✓	✓	✓	✓
9	381610429	VISWA S	VI.PHARM D	✓	✓	✓	✓	✓	✓
10	381610430	YESHWANTH S	VI.PHARM D	✓	✓	✓	✓	✓	✓
11	381610431	PEJMAN GHADAMI	VI.PHARM D	✓	✓	✓	✓	✓	✓
12	381410410	HARISH M	VI.PHARM D	✓	✓	✓	✓	✓	✓
13	381510402	AZAD V P	VI.PHARM D	✓	✓	✓	✓	✓	✓
14	381510422	SENAF K	VI.PHARM D	✓	✓	✓	✓	✓	✓
15	381710401	ANDLY CHEDRICK C	V.PHARM D	✓	✓	✓	✓	✓	✓
16	381710402	ASHA M	V.PHARM D	✓	✓	✓	✓	✓	✓
17	381710403	ASHRITHA D N	V.PHARM D	✓	✓	✓	✓	✓	✓
18	381710404	DEEPIKA K	V.PHARM D	✓	✓	✓	✓	✓	✓
19	381710405	HARINI R	V.PHARM D	✓	✓	✓	✓	✓	✓
20	381710406	JAYAPRAKASH U	V.PHARM D	✓	✓	✓	✓	✓	✓
21	381810416	KEZIA K SABU	IV.PHARM D	✓	✓	✓	✓	✓	✓
22	381810417	KISHANKANTH P	IV.PHARM D	✓	✓	✓	✓	✓	✓
23	381810418	KUMAR V	IV.PHARM D	✓	✓	✓	✓	✓	✓
24	381810419	MANOJ KUMAR S	IV.PHARM D	✓	✓	✓	✓	✓	✓
25	381810421	NANTHISEN	IV.PHARM D	✓	✓	✓	✓	✓	✓
26	381810422	NAVEEN C S	IV.PHARM D	✓	✓	✓	✓	✓	✓

Dr. N.SENTHILKUMAR,  
PRINCIPAL

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27	381810423	NAVEEN V	IV.PHARM D	✓	✓	✓	✓	✓	✓
28	381810424	OMARALI THANGAL V	IV.PHARM D	✓	✓	✓	✓	✓	✓
29	381810425	PAPITHA S	IV.PHARM D	✓	✓	✓	✓	✓	✓
30	381910418	NAVEENA S	III.PHARM D	✓	✓	✓	✓	✓	✓
31	381910419	PRABHAT KUMAR GUPTA	III.PHARM D	✓	✓	✓	✓	✓	✓
32	381910420	PRADESH C	III.PHARM D	✓	✓	✓	✓	✓	✓
33	381910421	RAMYA G K	III.PHARM D	✓	✓	✓	✓	✓	✓
34	381910423	SILAMBARASAN M	III.PHARM D	✓	✓	✓	✓	✓	✓
35	381910426	SURENDHARAN P	III.PHARM D	✓	✓	✓	✓	✓	✓
36	381910427	TAMILSELVAN S	III.PHARM D	✓	✓	✓	✓	✓	✓
37	381910428	THOMAS JUDE RODRIGUES	III.PHARM D	✓	✓	✓	✓	✓	✓
38	381910429	VIGNESHWAR R	III.PHARM D	✓	✓	✓	✓	✓	✓
39	381910430	VIMALRAJ G	III.PHARM D	✓	✓	✓	✓	✓	✓
40	380020507512	KEERTHIVEL T S	II.PHARM D	✓	✓	✓	✓	✓	✓
41	380020507513	KESTIN K SABU	II.PHARM D	✓	✓	✓	✓	✓	✓
42	380020507514	KIRTHIGA A	II.PHARM D	✓	✓	✓	✓	✓	✓
43	380020507515	MAGCELINE CHRISTOPHER	II.PHARM D	✓	✓	✓	✓	✓	✓
44	380020507516	MARSHAL RAJ S	II.PHARM D	✓	✓	✓	✓	✓	✓
45	380020507518	MUKILAN S	II.PHARM D	✓	✓	✓	✓	✓	✓
46	380020507519	RAGUL VIGNESHAA K	I.PHARM D	✓	✓	✓	✓	✓	✓
47	380020507520	RAJASEKAR R	I.PHARM D	✓	✓	✓	✓	✓	✓
48	380020507521	RAKSHANA B	I.PHARM D	✓	✓	✓	✓	✓	✓
49	Pharm D/260/ 2021-22	KARTHICK J	I.PHARM D	✓	✓	✓	✓	✓	✓
50	Pharm D/26/ 2021-22	KAVIYA R	I.PHARM D	✓	✓	✓	✓	✓	✓
51	Pharm D/262/ 2021-22	KIRANKUMARN V	I.PHARM D	✓	✓	✓	✓	✓	✓
52	Pharm D/263/ 2021-22	MOHANRASU P	I.PHARM D	✓	✓	✓	✓	✓	✓
53	Pharm D/264/ 2021-22	MOHIT R	I.PHARM D	✓	✓	✓	✓	✓	✓
54	Pharm D/265/ 2021-22	PARTHASARATHY S	I.PHARM D	✓	✓	✓	✓	✓	✓
55	Pharm D/266/ 2021-22	PAVITHRA M	I.PHARM D	✓	✓	✓	✓	✓	✓
56	Pharm D/267/ 2021-22	PRASANTH R	I.PHARM D	✓	✓	✓	✓	✓	✓
57	Pharm D/268/ 2021-22	PUNITHKUMAR V	I.PHARM D	✓	✓	✓	✓	✓	✓
58	Pharm D/269/ 2021-22	SARANYA R	I.PHARM D	✓	✓	✓	✓	✓	✓
59	Pharm D/270/ 2021-22	SARATHY S	I.PHARM D	✓	✓	✓	✓	✓	✓
60	Pharm D/271/ 2021-22	SHYAM S S	I.PHARM D	✓	✓	✓	✓	✓	✓
61	Pharm D/272/ 2021-22	SIVAPRASATH G	I.PHARM D	✓	✓	✓	✓	✓	✓
62	Pharm D/273/ 2021-22	SREESANTHEYA S G	I.PHARM D	✓	✓	✓	A	A	A
63	Pharm D/274/ 2021-22	SUBASH B	I.PHARM D	✓	✓	✓	A	A	A

**Dr. N.SENTHILKUMAR,**  
PRINCIPAL

**JKK MUNIRAJAH MEDICAL RESEARCH FOUNDATION**  
**ANNAI JKK SAMPOORANI ANIMAL COLLEGE OF PHARMACY**  
ETHIRMEDU, KOMARAPALAYAM - 638 183.  
NAMAKKAL DISTRICT. TAMILNADU. INDIA.





# J.K.K.MUNIRAJAH MEDICAL RESEARCH FOUNDATION'S ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY

Ethirmedi, B.Komarapalayam – 638 183, Namakkal Dist. Tamilnadu. India  
Approved by : Pharmacy Council of India, New Delhi & The Tamilnadu Dr.M.G.R Medical University, Chennai.  
Website : [www.jkkmmrfpharmacy.edu.in](http://www.jkkmmrfpharmacy.edu.in) |E-Mail : [principal@jkkmmrfpharmacy.edu.in](mailto:principal@jkkmmrfpharmacy.edu.in)  
Contact No. : +919789456750, +919943069944, +919943066944

ADD ON COURSE	CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS
DEPARTMENT	PHARMACEUTICAL CHEMISTRY
ACEDAMIC YEAR	2021-2022
DATE	04.03.2022-20.03.2022
VENUE	SEMINAR HALL

NAME : TAMJID . B

COURSE : VI - PHARM D

ANSWER ALL THE QUESTION:

DATE:20.03.2022

MULTIPLE CHOICE QUESTION

MARKS:20

1. Which of the following change electrical conductivity on the absorption of a gasmolecule?

- a) Tin
- b) Zinc
- c) Nickel
- d) All of the mentioned

2. Polypropylene is a/an \_\_\_\_\_

- a) In organic sensor
- b) Organic sensor
- c) Metal sensor
- d) Gaseous sensor

3. ISE stands for \_\_\_\_\_

- e) Ion sticking electrode
- f) Ion selective electrode
- g) Inactive segment electrode
- h) Inorganic substance electrode

4. Water purity is tested by \_\_\_\_\_

- i) Water activity sensor
- j) pH meter
- k) SAW sensor
- l) BAW sensor



Dr. N.SENTHILKUMAR,  
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ETHIRMEDU, KOMARAPALAYAM - 638 183.  
NAMAKKAL DISTRICT. TAMILNADU. INDIA.



5. Chemi resistor sensors are used for test gases in \_\_\_\_\_
- m) Solid form
  - n) Liquid form
  - o) Vapour form
  - p) All of the mentioned

6. IR sensors are used in detection of \_\_\_\_\_
- q) Organic gases
  - r) Inorganic gases
  - s) Vapours
  - t) All of the mentioned

7. Photo ionization and flame ionization technique are most favoured in detection of \_\_\_\_\_
- u) Organic gases
  - v) Inorganic gases
  - w) Vapours
  - x) All of the mentioned

8. Heater power in thick film hybrid technology is \_\_\_\_\_
- a) 5KW
  - b) 50MW
  - c) 500MW
  - d) 500mW

9. Which of the following electrode/sis/are used for measuring electrode potential?
- a) Reference electrode
  - b) Indicator electrode
  - c) Both reference and indicator electrode
  - d) None of the mentioned

10. Mass sensors are a combination of \_\_\_\_\_
- e) SAW
  - f) BAW
  - g) Both and b
  - h) None of the above

11. SAW stands for \_\_\_\_\_
- a) Sound actuated wave
  - b) Surface acoustic wave
  - c) Surface activated wave
  - d) Surface actuated wave



  
**Dr. N.SENTHILKUMAR,**  
**PRINCIPAL**

**JKK MUNIRAJAH MEDICAL RESEARCH FOUNDATION**  
**ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY**  
**ETHIRMEDU, KOMARAPALAYAM - 638 183.**  
**NAMAKKAL DISTRICT, TAMILNADU, INDIA.**

12. Direction of acoustic wave in QCM will be \_\_\_\_\_

- a) Same as crystal surface
- b) Opposite to crystal surface
- c) Perpendicular to crystal surface
- d) None of the mentioned

13. Acoustic wave in QCM meets minimum impedance when thickness of devices \_\_\_\_\_

- a) Equal to wavelength of acoustic wave
- b) Product of Half of wavelength of acoustic wave
- c) Product of quarter of wavelength of acoustic wave
- d) None of the mentioned

14. Which of the following is most preferred?

- a) QCM and SAW sensor
- b) QCM and BAW sensor
- c) QCM
- d) All of the mentioned

15. Magnetic bio sensor is wide used for \_\_\_\_\_

- a) Blood detection
- b) DNA detection
- c) ECG detection
- d) EMG detection

16. QCM stands for \_\_\_\_\_

- a) Quartz crystal microbalance
- b) Quality control balance
- c) Quartz crystal magnifier
- d) None of the mentioned

17. Changes in resonant frequency of QCM is proportional to \_\_\_\_\_

- a) Mass accumulated in crystal
- b) Crystal used
- c) Time of usage
- d) None of the mentioned

18. BAW stands for \_\_\_\_\_

- a) Bulk acoustic wave
- b) Barrier acoustic wave
- c) Barrier avoiding wave
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Dr. N. SENTHILKUMAR,  
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ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY  
ETHIRMEDU, KOMARAPALAYAM - 638 183.  
NAMAKKAL DISTRICT, TAMILNADU, INDIA.



19. Fluoride glass is used with \_\_\_\_\_
- a) IR waves
  - b) UV rays
  - c) Normal light
  - d) All of the Mentioned

20. Which of the following conversion take place in the galvanic cell and electrolytic cell?

- a) Chemical energy to electrical energy without power supply
- b) Electrical energy to chemical energy without power supply
- c) Mechanical energy to chemical energy without power supply
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A handwritten signature in blue ink, appearing to read "Dr. N. Senthilkumar".

**Dr. N.SENTHILKUMAR,  
PRINCIPAL**

**JKK MUNIRAJAH MEDICAL RESEARCH FOUNDATION  
ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY  
ETHIRMEDU, KOMARAPALAYAM - 638 183.  
NAMAKKAL DISTRICT, TAMILNADU, INDIA.**



# J.K.K.MUNIRAJAH MEDICAL RESEARCH FOUNDATION'S ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY

Ethirnedu, **B. Komarapalayam** – 638 183, Namakkal Dist, Tamilnadu, India

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<b>ADD ON COURSE</b>	<b>CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS</b>
DEPARTMENT	PHARMACEUTICAL CHEMISTRY
ACADEMIC YEAR	2021-2022
DATE	04.03.2022-20.03.2022
VENUE	SEMINAR HALL

**ANSWER ALL THE QUESTION:**

**DATE: 20.03.2022**

**MULTIPLE CHOICE QUESTION**

**MARKS:20**

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- A) Tin
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- A) Ion sticking electrode
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4. Water purity is tested by \_\_\_\_\_

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ETHIRMEDU, KOMARAPALAYAM - 638 183.  
NAMAKKAL DISTRICT, TAMILNADU, INDIA.**





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- A] Solid form
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ETHIRMEDU, KOMARAPALAYAM - 638 133.  
NAMAKKAL DISTRICT, TAMILNADU, INDIA.



C]Sound activatedwave

D]Surface activatedwave

12.Direction of acoustic wave in QCM willbe\_\_\_\_\_

A]Same as crystalsurface

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**C]Perpendicular to crystalsurface**

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**Dr. N.SENTHILKUMAR,**  
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**ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY**  
**ETHIRMEDU, KOMARAPALAYAM - 626**  
**NAMAKKAL DISTRICT. TAMILNADU. IN.**



- A] Bulk acoustic wave
- B] Barrier acoustic wave
- C] Barrier avoiding wave
- D] Bulk activated wave

18. Fluoride glass is used with \_\_\_\_\_

- A] IR waves
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- A] Chemical energy to electrical energy without power supply
- B] Electrical energy to chemical energy without power supply
- C] Mechanical energy to chemical energy without power supply
- D] None of the mentioned

20. Which of the following can be used by NHE?

- a) Reference electrode
- b) Indicator electrode**
- c) Both reference and indicator electrode
- d) None of the mentioned



**Dr. N. SENTHILKUMAR,**  
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**ETHIRMEDU, KOMARAPALAYAM - 625 833.**  
**NAMAKKAL DISTRICT, TAMILNADU, INDIA.**



# J.K.K.MUNIRAJAH MEDICAL RESEARCH FOUNDATION'S ANNAL JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY

Ethirmedi, B.Komarapalayam – 638 183, Namakkal Dist. Tamilnadu. India

Approved by : Pharmacy Council of India, New Delhi & The Tamilnadu Dr.M.G.R Medical University, Chennai.

Website : [www.jkknmrfpharmacy.edu.in](http://www.jkknmrfpharmacy.edu.in) | E-Mail : [principal@jkknmrfpharmacy.edu.in](mailto:principal@jkknmrfpharmacy.edu.in)

Contact No. : +919789456750, +919943069944, +919943066944

ADD ON COURSE	CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS
DEPARTMENT	PHARMACEUTICAL CHEMISTRY
ACADEMIC YEAR	2021-2022
DATE	04.03.2022-20.03.2022
VENUE	SEMINAR HALL

## STUDENTS MARKSHEET

S.NO	REG.NO	NAME OF THE STUDENTS	COURSE	MARKS SCORED	%MARKS
1	381610419	RAJARAJARATHINAM	VI.PHARM D	19	95%
2	381610420	ROSHNY A	VI.PHARM D	18	90%
3	381610421	SABEERBASHA K	VI.PHARM D	17	85%
4	381610423	SHEEBA S KOSHY	VI.PHARM D	17	85%
5	381610424	SUBHASHINI A	VI.PHARM D	17	85%
6	381610426	TAMJID B	VI.PHARM D	17	85%
7	381610427	UDHAYAKUMAR P	VI.PHARM D	18	90%
8	381610428	VELSREEYA RAJ R	VI.PHARM D	19	95%
9	381610429	VISWA S	VI.PHARM D	20	100%
10	381610430	YESHWANTH S	VI.PHARM D	17	85%
11	381610431	PEJMAN GHADAMI	VI.PHARM D	18	90%
12	381410410	HARISH M	VI.PHARM D	16	80%
13	381510402	AZAD V P	VI.PHARM D	19	95%
14	381510422	SENAF K	VI.PHARM D	16	80%
15	381710401	ANDLY CHEDRICK C	V.PHARM D	16	80%
16	381710402	ASHA M	V.PHARM D	17	85%
17	381710403	ASHRITHA D N	V.PHARM D	18	90%
18	381710404	DEEPIKA K	V.PHARM D	19	95%
19	381710405	HARINI R	V.PHARM D	18	90%
20	381710406	JAYAPRAKASH U	V.PHARM D	19	95%
21	381810416	KEZIA K SABU	IV.PHARM D	18	90%
22	381810417	KISHANKANTH P	IV.PHARM D	19	95%
23	381810418	KUMAR V	IV.PHARM D	17	85%
24	381810419	MANOJ KUMAR S	IV.PHARM D	17	85%
25	381810421	NANTHISH N	IV.PHARM D	17	85%
26	381810422	NAVEEN C S	IV.PHARM D	19	95%
	381810423	NAVEEN V	IV.PHARM D	19	95%
	381810424	OMARALI THANGAL V	IV.PHARM D	18	90%
	381810425	PAPITHA S	IV.PHARM D	19	95%
	381810418	NAVEENA S	IV.PHARM D	16	80%

Dr. N. SENTHILKUMAR,  
PRINCIPAL  
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ANNAL JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY,  
ETHIRMEDU, KOMARAPALAYAM - 638 183,  
NAMAKKAL DISTRICT, TAMILNADU.





32	381910420	PRADESH C	III.PHARM D	18	90%
33	381910421	RAMYA G K	III.PHARM D	19	95%
34	381910423	SILAMBARASAN M	III.PHARM D	18	90%
35	381910426	SURENDRAN P	III.PHARM D	19	95%
36	381910427	TAMILSELVAN S	III.PHARM D	18	90%
37	381910428	THOMAS JUDE RODRIGUES	III.PHARM D	17	85%
38	381910429	VIGNESHWAR R	III.PHARM D	17	85%
39	381910430	VIMALRAJ G	III.PHARM D	18	90%
40	380020507512	KEERTHIVEL T S	II.PHARM D	18	90%
41	380020507513	KESTIN K SABU	II.PHARM D	18	90%
42	380020507514	KIRTHIGA A	II.PHARM D	19	95%
43	380020507515	MAGCELINE CHRISTOPHER	II.PHARM D	16	80%
44	380020507516	MARSHAL RAJ S	II.PHARM D	17	85%
45	380020507518	MUKILAN S	II.PHARM D	18	90%
46	380020507519	RAGUL VIGNESHA K	I.PHARM D	19	95%
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61	Pharm D/272/ 2021-22	SIVAPRASATH G	I.PHARM D	19	95%



  
**Dr. N. SENTHILKUMAR,**  
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**ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY,**  
**ETHIRMEDU, KOMARAPALAYAM - 638 183.**  
**NAMAKKAL DISTRICT, TAMILNADU.**

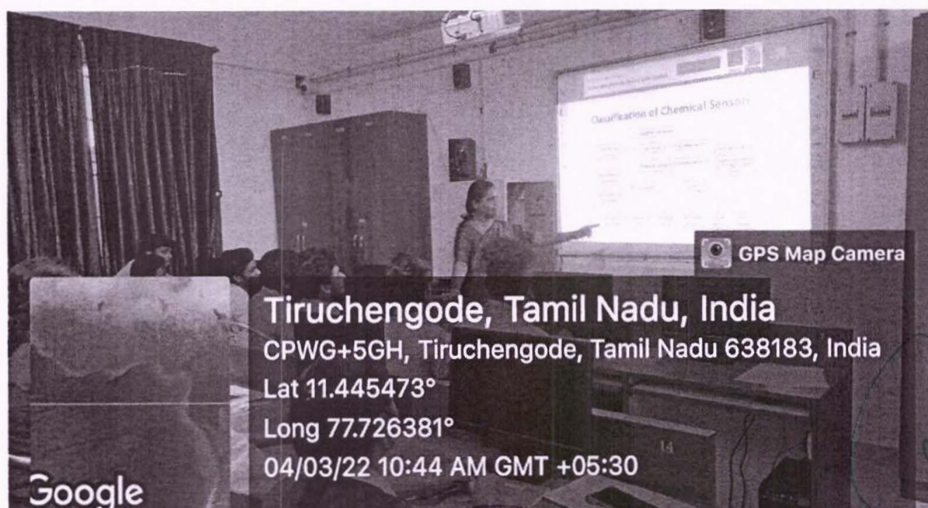


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ADD ON COURSE	CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS
DEPARTMENT	PHARMACEUTICAL CHEMISTRY
ACADEMIC YEAR	2021-2022
DATE	04.03.2022-20.03.2022
VENUE	SEMINAR HALL

## RESOURCE PERSON'S:



**Dr. N. SENTHILKUMAR,**  
PRINCIPAL,  
JKK MUNIRAJAH MEDICAL RESEARCH FOUNDATION  
ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY,  
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## ADD ON COURSE FEEDBACK FORM

STUDENT NAME: TAMJID B

DATE: 04.03.2022 to 20.3.2022

YEAR/ COURSE: VI - PHARM D

NAME OF THE ADD ON COURSE: CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS

COURSE CODE: 21VAC008

DURATION: 32 HRS

EVALUATE HONESTLY:

Questions	Excellent	Good	Fair	Poor
The objectives of the training were	✓			
The instructor's contribution to the course was:		✓		
The presentation materials were relevant	✓			
The instructor's effectiveness in teaching the subject matter was:	✓			
Answers to the students questions by the instructor	✓			
The venue was appropriate for the event		✓		
Course organisation was:	✓			
Level of course was		✓		
Course content was:		✓		

### Student Participation

1. On average, how many hours a week did you spend on this course (in and out of class)?

A)0-2 B) 2-5 C)6-10  D)11-14 E)15UP

2. What grade do you expect in this course?

A)BELOW 50% B) 50-60%  C)60-70% D) 70-80% E) ABOVE 80%



Dr. N.SENTHILKUMAR,  
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ETHIRMEDU, KOMARAPALAYAM - 638 183.  
NAMAKKAL DISTRICT. TAMILNADU. INDIA.

Tamjid  
SIGNATURE

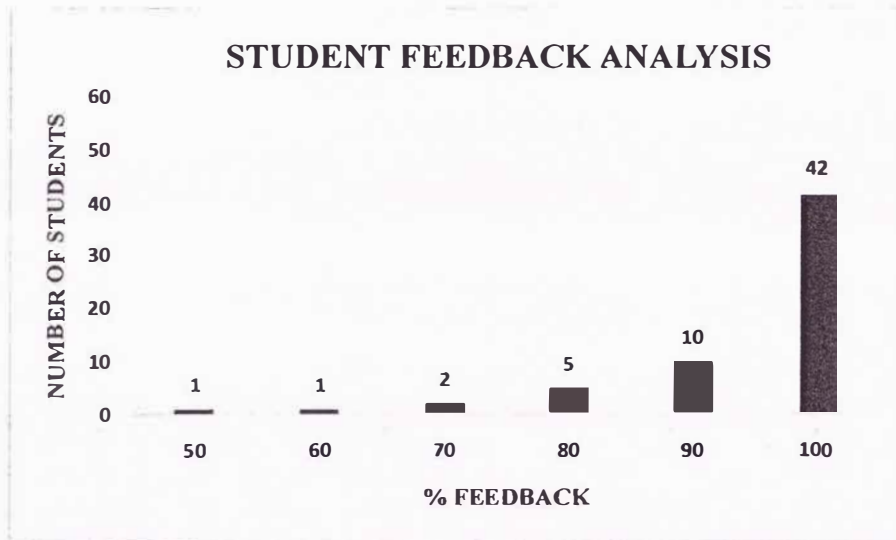


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DEPARTMENT	PHARMACEUTICAL CHEMISTRY
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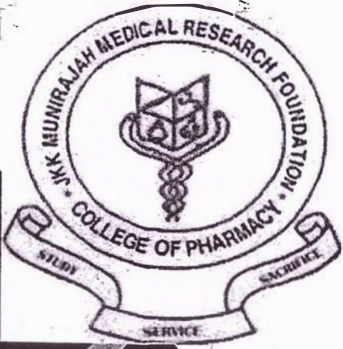
## STUDENTS FEEDBACK ANALYSIS



Dr. N.SENTHILKUMAR,  
PRINCIPAL

JKK MUNIRAJAH MEDICAL RESEARCH FOUNDATION  
ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY  
ETHIRMEDU, KOMARAPALAYAM - 638 183.  
NAMAKKAL DISTRICT, TAMILNADU, INDIA.





# JKKMMRF'S ANNAI JKK SAMPOORANI AMMAL COLLEGE OF PHARMACY CERTIFICATE OF PARTICIPATION

This is to certify that MR./MS./MRS.

TAMJID - B

*Has appreciated for his/ her participation in Value Added Course-*

CHEMICAL SENSOR TECHNOLOGIES FOR CHEMICAL ANALYSIS

Organised by the Department of Pharmaceutical Chemistry

on

20/03/2022

  
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