

Certificate Course: Computational Chemistry in Separation Science

Free Certificate course for college students

Duration – 30 hrs. (10 weeks).

Reserve Your Seat Today.

Registration Started

Course Objectives

- To introduce the fundamental concepts of computational chemistry and its relevance to separation science.
- To provide practical skills in using computational tools and software for chemical analysis and separation processes.
- To enhance problem-solving abilities by applying computational methods to real-world separation science challenges.
- To foster a deeper understanding of the molecular interactions and mechanisms underlying separation techniques

Start Your Course with Promising Future

Course Outcomes

Upon completion of this course, students will be able to:

- Understand and explain the basic principles of computational chemistry and how they apply to separation science.
- Utilize computational chemistry software to model, simulate, and analyze chemical separations.
- Interpret computational results to make informed decisions in the design and optimization of separation processes.
- Apply computational methods to solve complex problems in separation science, including the identification and quantification of compounds

Contact- Course
Convener

**Dr. Priyadarshani. N.
Deshmukh**

**Assistant Professor,
Department of Chemistry,
9881332586.**

To,
The Principal
SSES Aml's Science College,
Congress Nagar, Nagpur-12

Subject: For permission to conduct the add on courses in the department during the session 2023-2024

Respected Sir,

This is to request you that, the teachers of our Chemistry department have prepared the syllabus and modules of the 30 hours certificate courses for the session 2023-2024.

The details of the course module, syllabus and time table is submitted here with.

Hence please permit to run the add on courses and oblige me.

Thanking you

Yours sincerely



(Prof. R. U. Khope)

Professor & Head
Department of Chemistry,
Shri Shriji Science College
Congress Nagar, Nagpur-12

Permitted
A. D. Dhar

Department of Chemistry

Report on skill-based Course:- Computational Chemistry in Separation Science

Date:-22/10/2023

Computational Chemistry in Separation Science, An Add-on course run by the Department of Chemistry Shri Shivaji Science College Nagpur, the motto behind this course is to enrich students with knowledge of Computer in the field of Chemistry, especially in the separation of metal ions, organic pigmentations, etc. Students from B.Sc I, II, and III were admitted for this course. It's a 10-week duration course in which theory and practicals are taken. For practical demo was given on Software like Gaussian, AMBER, etc. and an assessment was done with the help of viva voce, the report writing, and case study preparation were very helpful for students. Theory Paper was MCQ-based, 55 students were enrolled and appeared for theory as well as for practicals. This course duration is from 4th August 2023 to 7th October 2023.

Course Name:- Computational Chemistry in Separation Science

Number of Students Appeared:- 55

Number of Passed Students:- 55.



Theory and Practical Class:- Add-on Course- Computational Chemistry in Separation Science

P. P. Chaudhary

S.S.E.S. Amt's Science College, Congress Nagar, Nagpur.

Department of Chemistry

Add-on (2023-2024)

Certificate Course:- Computational Chemistry in Separation Science.

Notice

Date: 15/07/2023

The Department of Chemistry is conducting an Add-on Certificate Course on **Computational Chemistry in Separation Science** for the session 2023-24. Interesting students of B.Sc. Part I, Part II & Part III should register early and contact the Course Coordinator Dr.P.N.Deshmukh immediately.

Starting date of Course:- 04/08/2023.



Dr.P.N.Deshmukh

Course Coordinator

Add-on Course —

Computational Chemistry in
Separation Science

Starting date :- 4th August 23

closing date :- 7th Oct-2023.

~~enrollment~~ ~~app.~~

Student Registration. →

- ① Aiban Anushka Manish.
- ② Banait Bachhi Baburao.
- ③ P. C. Chomalwar.
- ④ M-M. Deshbhatar.
- ⑤ R-K. Cheehan.
- ⑥ K. G. Digmore.
- ⑦ D. W. Gavhade.
- ⑧ J. V. Wadhire.
- ⑨ H. D. Wandhe.
- ⑩ M. S. Wankhede.
- ⑪ Anjali R. Yadav.
- ⑫ M. V. Zatale.
- ⑬ Sampada R. Ragit.
- ⑭ K. P. Shende.
- ⑮ K. B. Rahate.
- ⑯ K. G. Rajpurshit.
- ⑰ Himanshi S. Raut.
- ⑱ Mansi N. Nakrole.
- ⑲ Radha V. Pawar.

- (20) Aditi S. Rathod.
- (21) Anushka P. Raut.
- (22) Riya Singh
- (23) Avantika. Somkumar.
- (24) D. A. Alone
- (25) P. A. Atram.
- (26) Unnatti Atram
- (27) Sejal Borkar.
- (28) Mohini chapke.
- (29) Ayush. S. chaudhary.
- (30) K. K. Mahabiyar.
- (31) G. T. Nagpure.
- (32) Chaitali J. Nakshine
- (33) P. R. Patil.
- (34) T. B. Mandale.
- (35) Mahura C. Rajput.
- (36) Bhise gayatri
- (37) Manisha Dahanekar.
- (38) Poonam S. Dubey.
- (39) Tanushree Sadhar.
- (40) Shruti W. Bankar.
- (41) Kashish Mankar.
- (42) R. B. Rajput.
- (43) P. S. Raut.
- (44) S. V. Surpam
- (45) Anjuman M. Shrivastav.
- (46) Bhumiika, Thaware
- (47) Tanushree Yelne
- (48) Shama O. Jamre
- (49) Sharmali Kale

- (50) S. R. Kapse
- (51) Ashwini Kathane
- (52) Arya Naetum
- (53) Bhumika. S. Nimji
- (54) Rohit Pal.
- (55) Kaynat. Patel.

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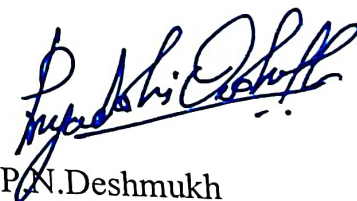
Course - Coordination
Skill - Base Certificate
Course.

S.S.E.S.A's Science College, Congress Nagar, Nagpur
Department of Chemistry
Add-on certificate course (2023-2024)

TIME TABLE

Certificate Course: Computational Chemistry in Separation Science

Days	Time	
	Theory Classes	Practical Classes
Monday	-	-
Tuesday	-	-
Wednesday	-	-
Thursday	-	-
Friday	PND (C8) Theory 3.30 to 4.30 pm	PND Practical 4.35 to 5.35 pm -Chem Lab
Saturday	PND (C8) Theory 3.30 to 4.30 pm	-



Dr.P.N.Deshmukh

Course Coordinator
Department of Botany

Certificate Course: Computational Chemistry in Separation Science

Introduction

Computational Chemistry in Separation Science is an interdisciplinary certificate course designed to bridge the gap between theoretical chemistry and practical applications in separation science. This course will introduce students to the principles and techniques of computational chemistry and how they can be applied to solve problems in separation science. Through a combination of lectures, hands-on practical sessions, and case studies, students will gain a comprehensive understanding of computational methods and their application in the separation and analysis of chemical compounds.

Course Objectives

1. To introduce the fundamental concepts of computational chemistry and its relevance to separation science.
2. To provide practical skills in using computational tools and software for chemical analysis and separation processes.
3. To enhance problem-solving abilities by applying computational methods to real-world separation science challenges.
4. To foster a deeper understanding of the molecular interactions and mechanisms underlying separation techniques.

Course Outcomes

Upon completion of this course, students will be able to:

1. Understand and explain the basic principles of computational chemistry and how they apply to separation science.
2. Utilize computational chemistry software to model, simulate, and analyze chemical separations.
3. Interpret computational results to make informed decisions in the design and optimization of separation processes.
4. Apply computational methods to solve complex problems in separation science, including the identification and quantification of compounds

Course Structure

Unit 1: Fundamentals of Computational Chemistry*

- Introduction to Computational Chemistry
- Basic Theories and Models
- Quantum Chemistry Fundamentals
- Molecular Mechanics and Dynamics

Unit 2: Computational Techniques in Separation Science

- Overview of Separation Techniques (Chromatography, Electrophoresis, etc.)
- Computational Tools for Separation Processes
- Modeling of Separation Mechanisms
- Simulation of Separation Processes

Unit 3: Practical Applications and Case Studies

- Case Studies in Chromatography
- Computational Analysis of Electrophoresis
- Applications in Environmental and Pharmaceutical Separation
- Case Study: Separation of Complex Mixtures

Unit 4: Advanced Topics and Emerging Trends

- Advanced Computational Methods
- Machine Learning and AI in Separation Science
- Emerging Trends and Technologies
- Future Directions in Computational Chemistry and Separation Science

Practical Sessions (Demonstration)

- Hands-on Training with Computational Chemistry Software (e.g., Gaussian, AMBER, etc.)
- Simulation and Analysis of Separation Processes
- Data Interpretation and Report Writing
- Project Work: Solving Real-world Separation Problems

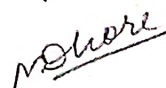
Duration of course: Ten weeks (30 Hours)

The Structure of Syllabus and system of evaluation -

Course	Theory Papers and Practical	Total Marks	
		Theory	Practical
Certificate Course in Computational Chemistry in Separation Science	Theory paper- Computational Chemistry in Separation Science * Theory examination will be of MCQ pattern having 40 questions each question carries 2 equal marks.	80	20
	* Practical examination will be based on performance evaluation in the laboratory	100	



Internal Quality Assurance Cell
(IQAC)
S. S. E. S. A. Science College
Congress Nagar, Nagpur.

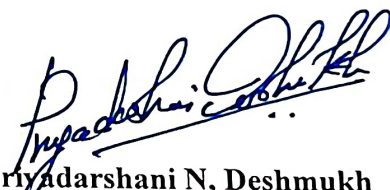


Principal
S. S. E. S. Amravati's
Science College, Nagpur.

Certificate course in
Computational Chemistry in Separation Science
 Department of Chemistry
 Teaching Plan 2023-2024

Week	Hour Wise Teaching Plan	Content
Week-1 Theory 30 Hrs	Unit I 1	Introduction to Computational Chemistry
	1	Comparative Study of Computational Chemistry with Classical Chemistry.
	1	Basic Theories and Models
Week-2	Unit II 1	Quantum Chemistry Fundamentals.
	1	Molecular Mechanics and Dynamics.
	1	Overview of Separation Techniques (Chromatography, Electrophoresis, etc.)
Week-3,	Unit III 1	Computational Tools for Separation Processes Modeling of Separation Mechanisms, Simulation of Separation Processes
	1	Case Studies in Chromatography.
	1	Computational Analysis of Electrophoresis.
Week-4	1	Applications in Environmental and Pharmaceutical Separation.
	1	Case Study: Separation of Complex Mixtures
	1	Case Study: Separation of Complex Mixtures
Week-5	1	Computational Analysis of Electrophoresis
	1	Applications in Environmental and Pharmaceutical Separation
		Applications in Environmental and Pharmaceutical Separation
	1	Case Study: Separation of Complex Mixtures
Week-6	1	Case Study: Separation of Complex Mixtures
	Unit III 1	Advanced Computational Methods
Week-7	1	Machine Learning and AI in Separation Science
	1	Machine Learning and AI in Separation Science
	1	Emerging Trends and Technologies
Week-8	1	Emerging Trends and Technologies

	1	Future Directions in Computational Chemistry and Separation Science
	1	Future Directions in Computational Chemistry and Separation Science
Week-9	Unit IV 1	Hands-on Training with Computational Chemistry Software (e.g., Gaussian, AMBER, etc.)
	1	Simulation and Analysis of Separation Processes
	1	Data Interpretation and Report Writing
Week-10	1	Data Interpretation and Report Writing
	1	Project Work: Solving Real-world Separation Problems
	1	Project Work: Solving Real-world Separation Problems
	1	Exam For Certificate Course


 Dr. Priyadarshani N, Deshmukh
 Course coordinator

RASHTRASANT TUKADOJI MAHARAJ, NAGPUR UNIVERSITY, NAGPUR

Name of the College / Institute - Shri Shivaji Education Society Amravati's Science College, Nagpur

Name of the Course - Computational Chemistry in Separation Science

Year (Duration) - 10 Weeks

Sr.No	Name Of the Student	4/8/23	5/8/23	8/8/23	12/8/23	18/8/23	19/8/23	25/8/23	26/8/23	1/9/23	2/9/23
1	AIDBAN ANUSHKA MANISH	P	P	P	A	P	A	P	A	P	P
2	BANAIT PRACHI BABURAO	P	P	P	P	P	A	P	P	P	P
3	CHAMALWAR PREET RAVINDRA	P	P	P	P	P	P	P	P	P	A
4	CHAUDHAN KASHISH RAMVEER	P	P	P	P	P	P	A	P	A	P
5	DESHBHARATAR MANASVI MANOJ	P	P	P	P	P	P	A	A	A	P
6	DIGHORE KARTIK GANESH	A	P	A	P	P	P	P	P	P	A
7	GAVHADE DRUTI WAMAN	P	P	P	P	P	A	P	P	P	P
8	WADHIVE JANHAVI VASANTA	P	P	P	P	P	A	A	A	P	P
9	WANDHE HIMANSHU DINESH	A	P	P	P	P	P	P	A	P	P
10	WANKHADE MRUNAL SUNIL	P	P	P	P	P	P	P	P	A	P
11	YADAV ANJALI RAJESH	P	P	A	P	P	P	P	P	P	P
12	ZATALE MONA VIJAY	P	P	P	P	P	A	P	P	P	P
13	RAGIT SAMPADA RAVICHANDRA	P	P	A	P	A	A	A	A	P	P
14	SHENDE KASHISH GOPAL	A	P	P	P	P	P	A	A	P	A
15	RAHATE KHUSHI BHUMIRAJ	P	P	P	P	P	P	P	A	P	P
16	RAJPUROHIT KALYANI GIRISH	P	P	P	P	P	P	P	P	P	P
17	RAUT HIMANSHI SUNIL	A	P	P	A	P	P	P	P	P	P
18	NAKHALE MANSI NAGESH	P	P	P	P	P	P	P	P	A	A
19	PAWAR RADHA VINOD	P	P	P	P	A	A	P	P	P	P
20	RATHOD ADITI SANJAY	P	P	P	A	P	P	P	P	P	A
21	RAUT ANUSHKA PRAMOD	P	P	A	P	P	P	A	P	P	P
22	SINGH RIYA VIRENDRA KUMAR	P	P	P	P	P	P	A.	P	P	P

23	SONKUWAR AVANTIKA GHANSHYAM	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P
24	ALONE DEEVYANI ANAND	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P
25	ATRAM PRATIK JOGA	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
26	ATRAM UNNATTI SHASHIKANT	P	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
27	BORKAR SEJAL RAJESH	A	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
28	CHAPKE MOHINI SHANKAR	A	A	A	A	P	P	P	P	P	P	P	P	P	P	P	P	P
29	CHAUDHARY AYUSH SHRICHAND	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P
30	MOHABIYA KASAK KAMAL	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
31	NAGPURE GAYATRI TELAL	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
32	NAKSHINE CHAITALI JITENDRA	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
33	PATIL PRADYA RATHRAM	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
34	MANDALE TANVI BABAN	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
35	RAPUT MADHURA CHANDRASHEKHAR	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
36	BHISE GAYATRI RAVI	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
37	DEHANKAR MANISHA SHASHIKANT	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
38	DUBEY POONAM SUSHIL	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
39	JADHAV TANUSHREE SUHAS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
40	BANKAR SHRUTI WAMAN	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
41	MANKAR KASHISH SHANKAR	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
42	RAPUT RIDDHI BHAIYALAL	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
43	RAUT PRADNYA SURESH	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
44	SURPAM SHREYA UMESH	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
45	SHRIVASTAV ARYAMAN MANOJ	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
46	THAWARE BHUMIKA RAVINDRA	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
47	YELNE TANUSHREE DEVANAND	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
48	JAMRE SHANU OMPRAKASH	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
49	KALE SHAMALI PRAKASH	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
50	KARSE SAHIL RAMESHWAR	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
51	KATHANE ASHWINI DINESH	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

8/9/23 9/9/23 15/9/23 16/9/23 22/9/23 23/9/23 23/9/23 30/9/23

52	NARTAM ARYA RAU	A	D	P	P	P	P	P	P	P
53	NIMJE BHUMIKA SITARAM	A	P	P	A	P	P	P	P	P
54	PAL ROHIT KUMAR .ASHOK	A	P	P	P	A	P	P	P	P
55	PATEL KAYNAT WAJID	A	P	P	P	P	P	P	P	P

Name of the College / Institute - Shri Shivaji Education Society Amravati's Science College, Nagpur

Name of the Course - Computational Chemistry in Separation Science

Year (Duration)- 10 Weeks

[illegible]

[illegible]

[illegible]

Name of the College / Institute -

Shri Shivaji Education Society Amravati's Science College Nannur

Name of the Course - Computational Chemistry in Separation Science

Year (Duration)- 10 Weeks

[illegible]

23	SOMKUWAR AVANTIKA GHANSHYAM
24	ALONE DEVYANI ANAND
25	ATRAM PRATIK JOGA
26	ATRAM UNNATTI SHASHIKANT
27	BORKAR SEJAL RAJESH
28	CHAPKE MOHINI SHANKAR
29	CHAUDHARY AYUSH SHRICHAND
30	MOHABIYA KASAK KAMAL
31	NAGPURE GAYATRI TEJAL
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33	PATIL PRADYA RATIRAM
34	MANDALE TANVI BABAN
35	RUPUT MADHURA CHANDRASHEKHAR
36	BHISE GAYATRI RAVI
37	DEHANKAR MANISHA SHASHIKANT
38	DUBEY POONAM SUSHIL
39	JADHAV TANUSHREE SUHAS
40	BANKAR SHRUTI WAMAN
41	MANKAR KASHISH SHANKAR
42	RUPUT RIDDHI BHAITYALAL
43	RAUT PRADNYA SURESH
44	SURPAM SHREYA UMESH
45	SHRIVASTAV ARYAMAN MANOJ
46	THAWARE BHUMIKA RAVINDRA
47	YELE TANUSHREE DEVANAND
48	JAMRE SHANU OMPRAKASH
49	KALE SHAMALI PRAKASH
50	KARSE SAHIL RAMESHWAR
51	KATHANE ASHWINI DINESH

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Shri Shivaji Education Society Amravati's SCIENCE College, Congress Nagar, Nagpur.

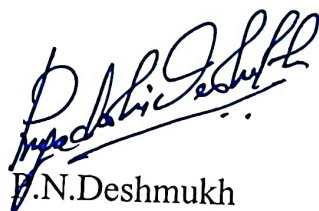
ADD-ON COURSE EXAMINATION (2023-2024)

Certificate Course: Computational Chemistry in Separation Science.

NOTICE

Date: 9/10/2023

All the registered students of the add-on Course on Computational Chemistry in Separation Science under the Department of Chemistry for the session 2023-24 are hereby informed that the **Theory examination** is to be scheduled on 20/10/2023 from 10:30 am to 11:30 am in the Chemistry classroom (C8) at our college center. Also, the Practical examination in Chemistry Lab A and Lab B is followed by the theory Examination All Students should be present in the Classroom and the laboratory before 10 mins of the scheduled time of examination.



Dr. P.N. Deshmukh

Course Coordinator
Department of Chemistry.

S.S.E.S. Amt's Science College, Congress Nagar, Nagpur.

Department of Chemistry

Add-on (2023-2024)

Certificate Course:- Computational Chemistry in Separation Science.

Solve all questions. Each question carries 2 marks.
Time:- 1 hr.

Date:-20/10/2023
Marks:-80 M

-
- Hands-on training in computational chemistry software aims to:
A) Increase manual calculation skills
B) Enable students to perform complex simulations and analyses
 - The application/applications of Artificial Intelligence is/are
(A) Expert Systems
(B) Gaming
(C) Vision Systems
(D) All of the above
 - Who is known as the "Father of AI"?
(A) Fisher Ada
(B) Alan Turing
(C) John McCarthy
(D) Allen Newell
 - In which chromatography stationary phase is more polar than mobile phase?
(A) Ion exchange chromatography
(B) Normal phase chromatography
(C) Reversed chromatography
(D) Size exclusion chromatography.
 - In which type of chromatography, the stationary phase is held in a narrow tube and the mobile phase is forced through it under pressure?
(A) Column chromatography
(B) Planar chromatography
(C) Liquid chromatography
(D) Gas chromatography
 - Which of the following guidelines are applicable to Analytical Method validation
(A) ICH Q1
C) Reduce the need for experimental validation
D) Teach software development
(B) ICH Q2
(C) ICH Q3
(D) ICH Q4
 - In size exclusion chromatography, solute molecules are separated based on
(A) Molecular geometry and size
(B) Molecular composition
(C) Molecular phase
(D) Molecular formula
 - Ion exchange chromatography is based on?
(A) Electrostatic attraction
(B) Electrical mobility of ionic species
(C) Partition chromatography
(D) Adsorption chromatography.
 - Which method of separation will be used to separate butter from curd?
(A) Sublimation
(B) Chromatography
(C) Centrifugation
(D) All of the above
 - The process in which the heavier impurities settle at the bottom is _____.
(A) Decantation
(B) Sedimentation
(C) Filtration
(D) Evaporation
 - A report or account is an:

- (A) Informational work
(B) Technical work
(C) Professional work
(D) None of these
12. The data proceed to support the recommendation should be:
(A) Accurate
(B) Unreliable
(C) Incomplete
(D) All of these
13. Report are often used to display the result of:
(A) Experiment
(B) Investigation
(C) Inquiry
(D) All of these
14. Common formats for report writing are:
(A) Introduction
(B) Method
(C) Both A and B
(D) Inform
15. Which thing we need to do in writing report:
(A) Record the survey not carry out
(B) Record deleted data
(C) Record the object
(D) None
16. In report writing, the language used to be:
(A) Loudly
(B) Unclear
(C) Whispers
(D) Ambiguous
17. The report is always written in:
(A) Sequential manner
(B) Irregular manner
(C) Horizontal manner
(D) Data biased manner
18. Report writing by the individual should be written in:
(A) First person
(B) Last person
(C) Both A, B
(D) None
19. The length of the informal report should be:
(A) 13 pages
(B) 1-3 pages
(C) 1/5-page
(D) full page
20. Report should preferably write _____.
(A) Sequential manner
(B) Regular manner
(C) Irregular manner
(D) None
21. Formal report can be categorized as _____.
(A) Informational
(B) Analytical
(C) Recommendation
(D) All of these
22. Which of the following is a fundamental concept of quantum chemistry?
A) Newton's Laws
B) Schrödinger Equation
C) Boyle's Law
D) Charles's Law
23. Molecular mechanics primarily uses which type of force field to model molecular interactions?
A) Electromagnetic field
B) Gravitational field
C) Classical force field
D) Quantum force field
24. In computational chemistry, the Born-Oppenheimer approximation separates which two types of motion?
A) Electronic and nuclear
B) Rotational and vibrational
C) Translational and rotational
D) Electronic and vibrational
25. Which method is commonly used to calculate the electronic structure of molecules?
A) Density Functional Theory (DFT)
B) Classical Mechanics

- C) Newtonian Dynamics
- D) Kinetic Theory

26. The primary purpose of molecular dynamics simulations is to study:

- A) Static molecular structures
- B) Molecular interactions over time
- C) Quantum mechanical wave functions
- D) Chemical reaction rates.

27. Computational tools for separation processes primarily aim to:

- A) Simplify manual calculations
- B) Model and optimize separation mechanisms
- C) Replace laboratory experiments
- D) Analyze reaction kinetics

28. Retention time in chromatography can be predicted using:

- A) Quantum mechanical models
- B) Molecular mechanics simulations
- C) Empirical correlations and computational models
- D) Gravitational equations

29. Electrophoresis is primarily used for the separation of:

- A) Gaseous compounds
- B) Large biological molecules
- C) Metals
- D) Crystals

30. Which computational software is widely used for quantum chemical calculations?

- A) Microsoft Excel
- B) Gaussian
- C) MATLAB
- D) SPSS

31. In a case study involving chromatography, computational models help to:

- A) Design new chromatographic equipment
- B) Predict retention times and optimize separation conditions
- C) Analyze the legal aspects of chemical separations
- D) Improve software coding for simulations

32. The separation of complex mixtures often requires:

- A) Single-stage separation techniques
- B) Multiple-stage or multidimensional separation techniques
- C) Only manual intervention
- D) Non-computational approaches

33. Computational analysis of electrophoresis data can provide insights into:

- A) Electrical circuit design
- B) Molecular size and charge distribution
- C) Geological formations
- D) Astronomical distances

34. A key application of computational chemistry in pharmaceutical separation is to:

- A) Design new drugs
- B) Identify and quantify active pharmaceutical ingredients
- C) Conduct clinical trials
- D) Market pharmaceutical products

35. Which advanced computational method is increasingly used in separation science for pattern recognition and data analysis?

- A) Machine Learning
- B) Traditional Statistics
- C) Manual Data Entry
- D) Simple Regression

36. Artificial Intelligence (AI) can enhance separation processes by

- A) Performing physical separations
- B) Optimizing separation conditions through predictive modeling
- C) Replacing all human analysts
- D) Reducing the need for quality control

37. An emerging trend in computational chemistry involves the integration of:

- A) Traditional paper-based records
- B) Quantum computing techniques
- C) Manual chromatographic techniques
- D) Classical mechanical methods



Answer Key .
Shri Shivaji Education Society, Amravati's
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20/10/23

Add-on Course				
Course Exam Name: Certificate Course on Computational Chemistry in Separation Science				
Name of Student:		INSTRUCTIONS FOR FILLING THE SHEET 1. This sheet should not be folded or crushed. 2. Use only blue/ black ball point pen to fill the circles. 3. Use of pencil is strictly prohibited. 4. Circles should be darkened completely and properly. 5. Cutting and erasing on this sheet is not allowed. 6. Do not use any stray marks on the sheet. 7. Do not use marker or white fluid to hide the mark. WRONG METHODS CORRECT METHOD 		
Roll No.:				Session: 2023-24
Test Date: 20/10/2023	Max. Marks: 40			
Invigilator Signature				Obtained Marks:

A B C D				A B C D				A B C D				A B C D				A B C D								
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Shri Shivaji Education Society Amravati's
Science College Congress Nagar Nagpur
Department of Chemistry

Skill-Based Certificate course

Title: "Computational Chemistry in Separation Science."
Attendance Sheet-2023-2024

Course Coordinator: Dr. Priyadarshani N.Deshmukh.

Theory Examination.

Sr.No	Name of the Student	Signature
1	AIDBAN ANUSHKA MANISH	Anushka
2	BANAIT PRACHI BABURAO	B.P. Baburao
3	CHAMALWAR PREET RAVINDRA	Preet
4	CHAUHAN KASHISH RAMVEER	C.K. Ramveer
5	DESHBHRATAR MANASVI MANOJ	Manvi
6	DIGHORE KARTIK GANESH	Kartik
7	GAVHADE DRUTI WAMAN	G.D. Gavha
8	WADHIVE JANHAVI VASANTA	Janhavi
9	WANDHE HIMANSHU DINESH	Himanshu
10	WANKHADE MRUNAL SUNIL	Mrunal
11	YADAV ANJALI RAJESH	Anjali
12	ZATALE MONA VIJAY	Mona
13	RAGIT SAMPADA RAVICHANDRA	Sampada
14	SHENDE KASHISH GOPAL	Kashish
15	RAHATE KHUSHI BHUMIRAJ	Khushi
16	RAJPUROHIT KALYANI GIRISH	K.G. Rajpur
17	RAUT HIMANSHI SUNIL	Himanshi
18	NAKHALE MANSI NAGESH	Mansi
19	PAWAR RADHA VINOD	Radha
20	RATHOD ADITI SANJAY	Aditi
21	RAUT ANUSHKA PRAMOD	Anushka S. Raut
22	SINGH RIYA VIRENDRA KUMAR	Riya
23	SOMKUWAR AVANTIKA GHANSHYAM	AA
24	ALONE DEVYANI ANAND	A.D. Anand
25	ATRAM PRATIK JOGA	P. Atram
26	ATRAM UNNATTI SHASHIKANT	U. Atram
27	BORKAR SEJAL RAJESH	Sejal
28	CHAPKE MOHINI SHANKAR	Mohini

29	CHAUDHARY AYUSH SHRICHAND	A.C. Shal.
30	MOHABIYA KASAK KAMAL	Kasak.
31	NAGPURE GAYATRI TEJLAL	Gayatri
32	NAKSHINE CHAITALI JITENDRA	Chaitali
33	PATIL PRADYA RATIRAM	Pradya
34	MANDALE TANVI BABAN	Tanvi
35	RAJPUT MADHURA CHANDRASHEKHAR	Madhura
36	BHISE GAYATRI RAVI	G. Ravi
37	DEHANKAR MANISHA SHASHIKANT	Manisha
38	DUBEY POONAM SUSHIL	Poonam
39	JADHAV TANUSHREE SUHAS	Tanushree
40	BANKAR SHRUTI WAMAN	Shruti
41	MANKAR KASHISH SHANKAR	Kashish
42	RAJPUT RIDDHI BHAIALAL	Ridhi
43	RAUT PRADNYA SURESH	Pradnya
44	SURPAM SHREYA UMESH	Shreya
45	SHRIVASTAV ARYAMAN MANOJ	Aryaman
46	THAWARE BHUMIKA RAVINDRA	Bhumika
47	YELNE TANUSHREE DEVANAND	T. Y. Devanand
48	JAMRE SHANU OMPRAKASH	Shanu
49	KALE SHAMALI PRAKASH	Shamali
50	KAPSE SAHIL RAMESHWAR	Sahil
51	KATHANE ASHWINI DINESH	Ashwini
52	NARTAM ARYA RAJU	Arya N.
53	NIMJE BHUMIKA SITARAM	Nimje
54	PAL ROHIT KUMAR .ASHOK	Rohit
55	PATEL KAYNAT WAJID	Kaynat



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Add-on Course

Course Exam Name: Certificate Course on Computational Chemistry in Separation Science

Name of Student:

Ruchi B. Banait

Roll No.:

CC-2

Session: 2023-24

Test Date: 20/10/2023

Max. Marks: 40

Invigilator Signature

Obtained Marks:

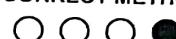
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WRONG METHODS



CORRECT METHOD



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RASHTRASANT TUKADOJI MAHARAJ, NAGPUR UNIVERSITY, NAGPUR

Name of the College / Institute - Shri Shivaji Education Society Amravati's Science College, Nagpur

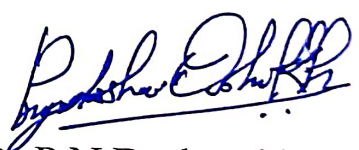
Name of the Course - Computational Chemistry in Separation Science

Year (Duration)- 10 Weeks

Result of Skill-Based Course:- Computational Chemistry in Separation Science.

Sr.No.	Name of the Student	Roll. No	Theory Marks	Practical Marks	Total Marks	Grade
1	AIDBAN ANUSHKA MANISH	CC-1	24	15	39	P
2	BANAIT PRACHI BABURAO	CC-2	46	20	66	B+
3	CHAMALWAR PREET RAVINDRA	CC-3	48	12	60	B+
4	CHAUHAN KASHISH RAMVEER	CC-4	34	17	51	C
5	DESHBHRATAR MANASVI MANOJ	CC-5	62	15	77	A
6	DIGHORE KARTIK GANESH	CC-6	28	17	45	P
7	GAVHADE DRUTI WAMAN	CC-7	46	18	64	B+
8	WADHIVE JANHAVI VASANTA	CC-8	80	11	91	O
9	WANDHE HIMANSHU DINESH	CC-9	68	14	82	A+
10	WANKHADE MRUNAL SUNIL	CC-10	20	16	36	P
11	YADAV ANJALI RAJESH	CC-11	34	16	50	C
12	ZATALE MONA VIJAY	CC-12	46	9	55	B
13	RAGIT SAMPADA RAVICHANDRA	CC-13	54	12	66	B+
14	SHENDE KASHISH GOPAL	CC-14	58	15	73	A
15	RAHATE KHUSHI BHUMIRAJ	CC-15	46	11	57	B
16	RAJPUROHIT KALYANI GIRISH	CC-16	46	16	62	B+
17	RAUT HIMANSHI SUNIL	CC-17	74	17	91	A+
18	NAKHALE MANSI NAGESH	CC-18	22	10	32	P
19	PAWAR RADHA VINOD	CC-19	70	8	78	A
20	RATHOD ADITI SANJAY	CC-20	20	19	39	P
21	RAUT ANUSHKA PRAMOD	CC-21	34	12	46	C
22	SINGH RIYA VIRENDRA KUMAR	CC-22	78	14	92	O
23	SOMKUWAR AVANTIKA GHANSHYAM	CC-23	20	14	34	P
24	ALONE DEVYANI ANAND	CC-24	42	17	69	B
25	ATRAM PRATIK JOGA	CC-25	16	9	25	P
26	ATRAM UNNATTI SHASHIKANT	CC-26	24	11	36	P
27	BORKAR SEJAL RAJESH	CC-27	34	13	47	C
28	CHAPKE MOHINI SHANKAR	CC-28	60	9	69	B+
29	CHAUDHARY AYUSH SHRICHAND	CC-29	46	16	62	B+
30	MOHABIYA KASAK KAMAL	CC-30	66	19	85	A+
31	NAGPURE GAYATRI TEJLAL	CC-31	24	14	38	P
32	NAKSHINE CHAITALI JITENDRA	CC-32	60	12	72	A
33	PATIL PRADYA RATIRAM	CC-33	78	14	92	O

34	MANDALE TANVI BABAN	CC-34	68	20	88	A+
35	RAJPUT MADHURA CHANDRASHEKHAR	CC-35	72	19	91	O
36	BHISE GAYATRI RAVI	CC-36	34	15	49	C
37	DEHANKAR MANISHA SHASHIKANT	CC-37	64	22	86	A+
38	DUBEY POONAM SUSHIL	CC-38	22	10	32	P
39	JADHAV TANUSHREE SUHAS	CC-39	40	9	49	C
40	BANKAR SHRUTI WAMAN	CC-40	48	14	62	B+
41	MANKAR KASHISH SHANKAR	CC-41	32	20	52	B
42	RAJPUT RIDDHI BHAIIYALAL	CC-42	58	13	71	A
43	RAUT PRADNYA SURESH	CC-43	48	14	62	B+
44	SURPAM SHREYA UMESH	CC-44	40	17	57	B
45	SHRIVASTAV ARYAMAN MANOJ	CC-45	22	17	39	P
46	THAWARE BHUMIKA RAVINDRA	CC-46	56	13	69	B+
47	YELNE TANUSHREE DEVANAND	CC-47	78	11	89	A+
48	JAMRE SHANU OMPRAKASH	CC-48	70	20	90	O
49	KALE SHAMALI PRAKASH	CC-49	28	18	46	C
50	KAPSE SAHIL RAMESHWAR	CC-50	28	10	38	P
51	KATHANE ASHWINI DINESH	CC-51	60	14	74	A
52	NARTAM ARYA RAJU	CC-52	62	19	81	A+
53	NIMJE BHUMIKA SITARAM	CC-53	34	15	49	C
54	PAL ROHIT KUMAR .ASHOK	CC-54	34	19	53	B
55	PATEL KAYNAT WAJID	CC-55	28	9	37	P


Dr.P.N.Deshmukh



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CERTIFICATE

Mr./Ku. **Prachi Baburao Banait** is awarded with certificate on successful completion of the course entitled, Certificate course in "Computational Chemistry in Separation Science".

Session 2023-24 under Add-on course conducted for 30 hours from 04/08/2023 to 06/10/2023 by Department of Chemistry, SSES's, Science College, congress Nagar, Nagpur 440012.

He/She has passed the Examination with 'B+' Grade.

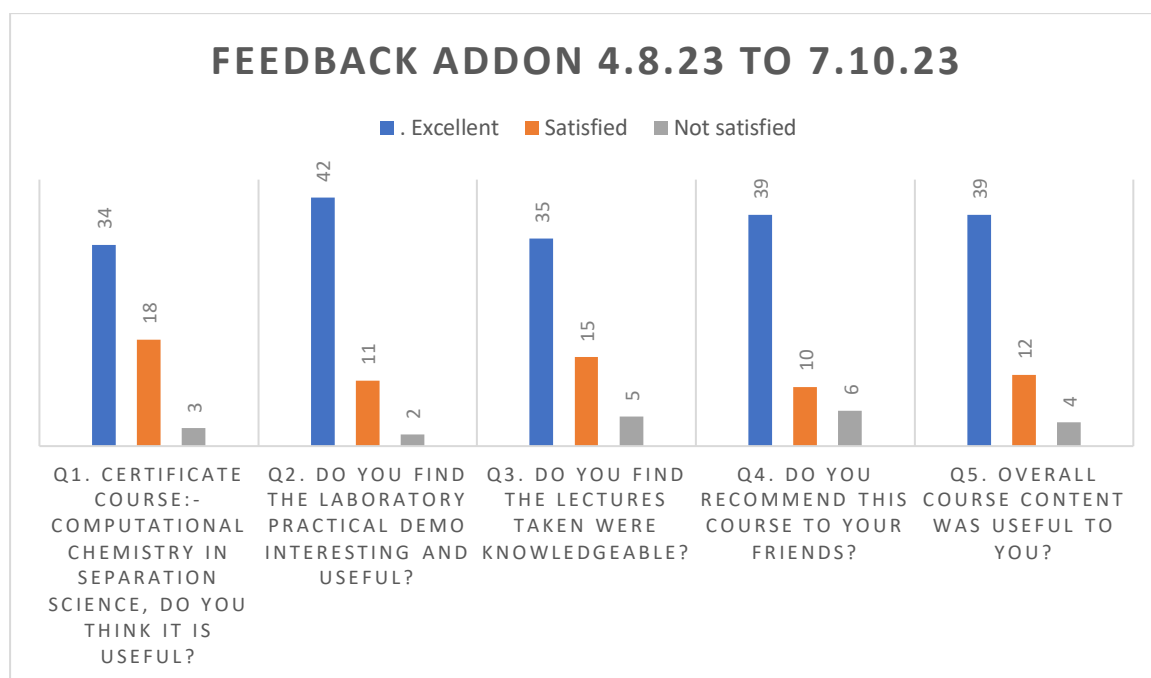
Dr. P. N. Deshmukh
Coordinator,
Department of Chemistry.

Prof. M. P. Dhore
Principal, Science College,
Nagpur.

Action Taken and Feedback: -

Computational Chemistry in Separation Science, An Add-on course run by the Department of Chemistry Shri Shivaji Science College Nagpur, the motto behind this course is to enrich students with knowledge of Computer in the field of Chemistry, especially in the separation of metal ions, organic pigmentations, etc. It's a 10-week duration course in which theory and practicals are taken. 55 students were enrolled and appeared for theory as well as for practicals. This course duration is from 4th August 2023 to 7th October 2023.

No.of benefited Student = 55



Course Coordinator