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. Privadarshani. N.

Deshmukh Bestant Professor,

Department of Chemistry,

9881332586.

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

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

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

Professor & Head Department of Chemistry, Shri Shwoji Science College Contraction of the second

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Department of Chemistry

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

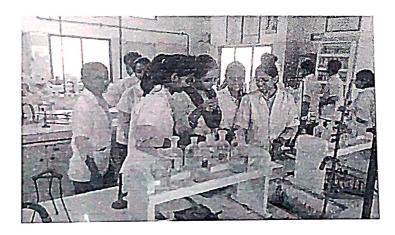
Date:-22/10/2023

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

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

made his shop

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| | Add-on Course — |
| | Computational Chemistry in Separation Science |
| | Starting date: - 4th Aggust 23 |
| | closing date: - 7th Oct-2023. |
| | student Registration> |
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S.S.E.S.A's Science College, Congress Nagar, Nagpur Department of Chemistry <u>Add-on certificate course</u> (2023-2024)

TIME TABLE

Certificate Course: Computational Chemistry in Separation Science

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

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 | 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 |
| Separation Science | * 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 | Content | | | | | | |
|-------------------------|--------------------|--|--|--|--|--|--|--|
| 11/ | Plan | | | | | | | |
| Week-1 Theory 30 Hrs | Unit I | 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 |
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| W | 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 |
| 332 1 45 | 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 -Name of the Course - Computational Chemistry in Separation Science Shri Shivaji Education Society Amravati's Science College, Nagpur

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RASHTRASANT TUKADOJI MAHARAJ, NAGPUR UNIVERSITY, NAGPUR

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

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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

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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. M.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 C | hemistry in Separation Science. |
|--|--|
| Solve all questions. Each question carries 2 marks. Time:- 1 hr. | Data: 20/10/2023 |
| 1. Hands-on training in computational chemistry software aims to: A) Increase manual calculation skills B) Enable students to perform complex simulations and analyses 2. The application/applications of Artificial | C) Reduce the need for experimental validation D) Teach software development (B) ICH Q2 |
| Intelligence is/are (A)Expert Systems | (C) ICH Q3 (D) ICH Q4 |
| (B)Gaming (C)Vision Systems | 7. In size exclusion chromatography, solute molecules are separated based on |
| (D)All of the above3. Who is known as the -Father of AI"?(A)Fisher Ada(B)Alan Turing | (A)Molecular geometry and size (B)Molecular composition (C) Molecular phase (D) Molecular formula |
| (C)John McCarthy | 8. Ion exchange chromatography is based on? |
| (D)Allen Newell 4. 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. | (A)Electrostatic attraction (B) Electrical mobility of ionic species (C)Partition chromatography (D)Adsorption chromatography. 9. Which method of separation will be used to separate butter from curd? (A) Sublimation |
| 5. In which type of chromatography, the stationary phase is held in a narrow tube and the mobile phase is forced through it under | (B) Chromatography(C)Centrifugation(D)All of the above |
| pressure? (A) Column chromatography (B) Planar chromatography (C) Liquid chromatography (D.) Gas chromatography | 10. The process in which the heavier impurities settle at the bottom is (A)Decantation (B)Sedimentation (C)Filtration |
| 6. Which of the following guidelines are applicable to Analytical Method validation | (D)Evaporation |

(A) ICH Q1

11.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
- (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

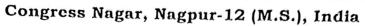
- C) Newtonian Dynamics
- D) Kinetic Theory
- 26. The primary purpose of molecular dynamics simulations is to study:
- A) Static molecular structures
- B) Molecular interactions over time
- C) Quantum mechanical wave functions
- D) Chemical reaction rates.
- 27. Computational tools for separation processes 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
- and correlations **Empirical** 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 chemical quantum for widely used calculations?
- A) Microsoft Excel
- B) Gaussian
- C) MATLAB
- D) SPSS
- involving study case In a 31. chromatography, computational models
- 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
- of analysis Computational 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
- A) Design new drugs
- active quantify and Identify 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
- 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

SCIENCE COLLEGE





Accredited with CGPA of 3.51 at 'A+' grade by NAAC, Bangalore A "College with Potential for Excellence" identified by UGC New Delhi. Institutional Member of APQN

Recognized Centre for Higher Learning and Research Mentor College under 'PARAMARSH Scheme', UGC, New Delhi

Add-on Course

20/10/23

| Jourse | Exam Name: | Certificate C Separat | ourse on tion Scie | i Computational (| Chemistry in | | | | |
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Shri Shivaji Education Society Amravati's Science College Congress Nagar Nagpur Department of Chemistry

Skill-Based Certificate course

<u>Title: "Computational Chemistry in Separation Science."</u>
Attendance Sheet-2023-2024

Course Coordinator: Dr. Priyadarshani N.Deshmukh.

Theory Examination.

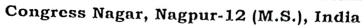
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| 18 NAKHALE MANSI NAGESH 19 PAWAR RADHA VINOD 20 RATHOD ADITI SANJAY 21 RAUT ANUSHKA PRAMOD 22 SINGH RIYA VIRENDRA KUMAR 23 SOMKUWAR AVANTIKA GHANSHYAM 24 ALONE DEVYANI ANAND 25 ATRAM PRATIK JOGA 26 ATRAM UNNATTI SHASHIKANT 27 BORKAR SEJAL RAJESH Many Aclid Andria A | 16 | RAJPUROHIT KALYANI GIRISH | K.G. Roja |
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| 23 SOMKUWAR AVANTIKA GHANSHYAM 24 ALONE DEVYANI ANAND 25 ATRAM PRATIK JOGA 26 ATRAM UNNATTI SHASHIKANT 27 BORKAR SEJAL RAJESH 28 ATRAM UNNATTI SHASHIKANT 29 BORKAR SEJAL RAJESH | 21 | RAUT ANUSHKA PRAMOD | Anohka Sroh |
| 24 ALONE DEVYANI ANAND 25 ATRAM PRATIK JOGA 26 ATRAM UNNATTI SHASHIKANT 27 BORKAR SEJAL RAJESH A.D. Anand. D. Atram. D. Atram. | 22 | SINGH RIYA VIRENDRA KUMAR | Ruga |
| 25 ATRAM PRATIK JOGA 26 ATRAM UNNATTI SHASHIKANT 27 BORKAR SEJAL RAJESH 34 July 1 | 23 | SOMKUWAR AVANTIKA GHANSHYAM | AÀ |
| 26 ATRAM UNNATTI SHASHIKANT 27 BORKAR SEJAL RAJESH STATISTICS STATISTICS STATISTICS THE S | 24 | ALONE DEVYANI ANAND | A.D Anouel. |
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| SACVI | 26 | ATRAM UNNATTI SHASHIKANT | Vahen |
| 28 CHAPKE MOHINI SHANKAR | 27 | BORKAR SEJAL RAJESH | Julye . |
| | 28 | CHAPKE MOHINI SHANKAR | Methia |

| HARY AYUSH SHRICHAND | A.C. Shed. |
|------------------------|----------------------|
| BIYA KASAK KAMAL | A. C.Shal. Kasak. |
| RE GAYATRI TEJLAL | Goralis i. |
| NE CHAITALI JITENDRA | Cheix tools. |
| RADYA RATIRAM | Recobiger - |
| LE TANVI BABAN | Tani. |
| MADHURA CHANDRASHEKHAR | Mortile |
| AYATRI RAVI | G. Pearly |
| KAR MANISHA SHASHIKANT | Mahaha |
| POONAM SUSHIL | Poonam. |
| TANUSHREE SUHAS | Tapuspale. |
| R SHRUTI WAMAN | Sugar |
| R KASHISH SHANKAR | Postyst |
| RIDDHI BHAIYALAL | Rich |
| RADNYA SURESH | of aclupy |
| 1 SHREYA UMESH | Shygeld |
| TAV ARYAMAN MANOJ | Sylves |
| RE BHUMIKA RAVINDRA | Brewike 1 |
| ANUSHREE DEVANAND | T.x. Dennid. |
| HANU OMPRAKASH | Skerre 1. |
| AMALI PRAKASH | Showels |
| AHIL RAMESHWAR | Scelil. |
| E ASHWINI DINESH | Affinia |
| ARYA RAJU | Keefa.N. |
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| YNAT WAJID | Kallan |
| ľ | T KUMAR .ASHOK |



Shri Shivaji Education Society, Amravati's

SCIENCE COLLEGE





Accredited with CGPA of 3.51 at 'A+' grade by NAAC, Bangalore A "College with Potential for Excellence" identified by UGC New Delhi. Institutional Member of APQN Recognized Centre for Higher Learning and Research Mentor College under 'PARAMARSH Scheme', UGC, New Delhi

| 1 | Add-on Course | | | | | | | | | | | |
|---|--|--------|---|--------|---|---|--|--|--|--|--|--|
| Course | Course Exam Name: Certificate Course on Computational Chemistry in | | | | | | | | | | | |
| | Separation Science | | | | | | | | | | | |
| 1 | . Bana | t | 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. | | | | | | | | | |
| Roll No.: | CC-2 | S | Session: 2 | 023-24 | 4. Circles should be da | ofly prohibited. Arkened completely and properly. on this sheet is not allowed. | | | | | | |
| Test Date: 20/ | 10/2023 | Max. M | arks: 40 | | 6. Do not use any stra | y marks on the sheet. or white fluid to hide the mark. | | | | | | |
| Invigilator | Signature | Obtain | ed Marks: | | WRONG METHODS CORRECT METHOD © © © © O O ● | | | | | | | |
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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.

| Cu Ni- | | | Theory | Practical | Total | |
|--------|-----------------------------|----------|--------|-----------|-------|-------|
| Sr.No. | Name of the Student | Roll. No | Marks | Marks | 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 | С |
| 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 | 0 |
| 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 | С |
| 12 | ZATALE MONA VIJAY | CC-12 | 46 | 9 | 55 | В |
| 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 | В |
| 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 | С |
| 22 | SINGH RIYA VIRENDRA KUMAR | CC-22 | 78 | 14 | 92 | 0 |
| 23 | SOMKUWAR AVANTIKA GHANSHYAM | CC-23 | 20 | 14 | 34 | P |
| 24 | ALONE DEVYANI ANAND | CC-24 | 42 | 17 | 69 | В |
| 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 | С |
| 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 | 0 |

| 34 | MANDALE TANVI BABAN | | | | | |
|----|-------------------------------|-------|-----|--|------|-----|
| 35 | RAJPUT MADHURA CHANDRASHEKHAR | CC-34 | 68 | 20 | 99 1 | . 1 |
| 36 | BHISE GAYATRI RAVI | CC-35 | 60 | The second secon | 88 | A+ |
| 37 | DEHANKAR MAANIS | CC-36 | 72 | 19 | 91 | 0 |
| | DEHANKAR MANISHA SHASHIKANT | CC-37 | 34 | 15 | 49 | C |
| 38 | DUBEY POONAM SUSHIL | 36-37 | 64 | 22 | 86 | A+ |
| 39 | JADHAV TANUSHREE SUHAS | CC-38 | 22 | 10 | 10 | |
| | BANKAR BUILD | CC-39 | 40 | 9 | 32 | P |
| 40 | BANKAR SHRUTI WAMAN | | | 9 | 49 | C |
| 41 | MANKAR KASHISH SHANKAR | CC-40 | 48 | 14 | 62 | B+ |
| 40 | RAIDLIT DIDDING | CC-41 | 32 | 20 | 52 | В |
| 42 | RAJPUT RIDDHI BHAIYALAL | | | | | В |
| 43 | RAUT PRADNYA SURESH | CC-42 | 58 | 13 | 71 | Α |
| 44 | SURPAM SHREYA UMESH | CC-43 | 48 | 14 | 62 | B+ |
| 45 | SHRIVASTAV ARYAMAN MANOJ | CC-44 | 40 | 17 | 57 | В |
| 46 | THAWARE BHUMIKA RAVINDRA | CC-45 | 22 | 17 | 39 | P |
| 47 | YELNE TANUSHREE DEVANAND | CC-46 | 56 | 13 | 69 | B+ |
| 48 | JAMRE SHANU OMPRAKASH | CC-47 | 78 | 11 | 89 | A+ |
| 49 | KALE SHAMALI PRAKASH | CC-48 | 70 | 20 | 90 | 0 |
| 50 | | CC-49 | 28 | 18 | 46 | C |
| 30 | 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 | (0) | | | _ n |
| 53 | NIMJE BHUMIKA SITARAM | CC-52 | 62 | 19 | 81 | A+ |
| 54 | PAL ROHIT KUMAR .ASHOK | | 34 | 15 | 49 | С |
| 55 | PATEL KAYNAT WAJID | CC-54 | 34 | 19 | 53 | В |
| | 1 | CC-55 | 28 | 9 | 37 | P |

Dr.P.N.Deshmukh



Shri Shivaji Education Society Amravati's

SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR

Accredited with CGPA of 3.51 at 'A+' Grade
A College with Potential for Excellence

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, SSESA'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

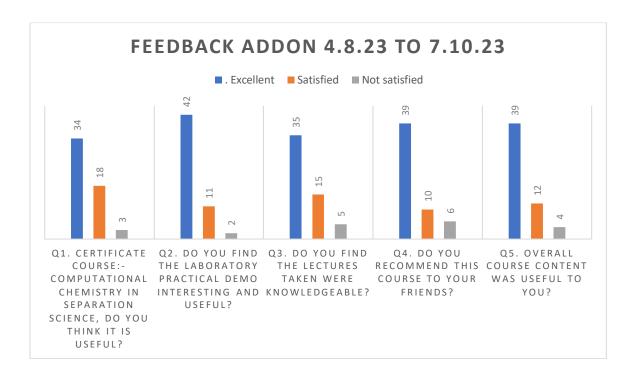
Principal, Science College,

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