# DEPARTMENT OF CHEMISTRY

## RUSA 2.0

# SUMMARY OF EXPENDITURE

| HEADS/YEAR | 2022-23 | 2023-24 | 2024-25 |
|---|---|---|---|
| Software | 1135160 | | |
| Chemicals/Glassware | 1371515 | | |
| Seminar | 99811 | | |
| Study Tour/Industrial Training/Internship | | 100000 | 78398 |
| Patent/Promotion of Research | 80000 | 32000 | 40000 |
| FDP | 70000 | | |
| Conference/ Capacity Building | 164474 | | 164014 |
| Career Counseling | | 10750 | |
| Skill Development | | 75400 | - |
| Industrial Visit | | 104123 | |
| Guest Lecture/Teaching-Learning | | 35995 | 29250 |
| Lab Maintenance | 474600 | 120013 | |
| **GRAND TOTAL** | **3395560** | **478281** | **311662** |

# SOFTWARE

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| **2022-23** | **1000000 135160** | **1135160** | - | Gauss View 6 & Gaussian Software installed in Chemistry Computer Lab:<br><br>Enhancement of skill based teaching-learning & research capabilities<br><br>Beneficiaries: 15 (Research scholars) | Empowering research output and providing cutting-edge education through innovative teaching-learning pedagogy as per the need of curriculum |

# CHEMICALS & GLASSWARE

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| 2022-23 | **1000000 371515** | **1371515** | - | Chemicals & Glassware procured for UG/PG Lab courses:<br><br>Effective functioning of labs, performance of experiments/ skill enhancement activities/ project/ research work<br><br>Beneficiaries: All UG & PG students | Lab courses are an integral part of curriculum for chemistry students. To strengthening experiential learning component, provision of laboratory consumables is essential |

# SEMINAR

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| **2022-23** | **100000** | **99811** | **189** | National Conference Emerging Materials & Nanotechnology organized on 18-19 Nov. 2022: Updating latest trends in Science & Technology, development of presentation skills and networking opportunity<br><br>Beneficiaries: About 200 participants (Research scholars/ faculty/ students) | Exposing students and scholars to latest developments in research in the field of materials & nanotechnology and to encourage collaborative learning |


12th National Conference on Emerging Materials & Nanotechnology (NCEMN - 2022)
18-19 November, 2022
Organized by
Department of Chemistry
GOVT. V.Y.T. PG. AUTONOMOUS COLLEGE
DURG (C.G.)


12th National Conference on Emerging Materials & Nanotechnology (NCEMN - 2022)
18-19 November, 2022


GOVT. V.Y.T. PG. AUTONOMOUS COLLEGE
DURG (C.G.)


CULTURAL EVENING

# NCEMN -2022

- Nanotechnology is an innovative branch exploring wide areas of Science to indirectly support humanity and the wealth of nature. With this as a primary objective in mind the 12th National Conference on Emerging Materials and Nanotechnology (NCEMN) was organized by the Department of Chemistry, Govt. V.Y.T. PG Autonomous College, Durg, Chhattisgarh.

- The NCEMN-2022, a synergistic move primarily focused in designing and developing new inventive materials for their sustainable safe utilization in protecting the nature and minimizing the environmental impact caused by either natural calamities or man-made leading to disastrous catastrophes.

- **Prof. I.B. Sharma,** ISCAS Institute, Jammu, was the Chief Guest' inspired participants by inaugural address
- **Dr. N.S. Gajbhiye**, Ex Prof., IIT Kanpur, stressed on the need of organizing Seminars/Conferences for interactive learning
- First keynote address by **Dr. R.K. Shukla**, University of Lucknow focused on different methods of synthesis of vanadium doped $MoS_2$ and its effect on humidity sensing'.
- Second keynote address was by an eminent personality **Mr. Tata Narasinga Rao**, 'International Advanced Research Center for Powder Metallurgy and New Materials (ARCI),' Hyderabad elaborated on 'Indigenizing the Technologies for Advanced Materials (Powder to Product)'.
- **Dr. Anchal Srivastava**, University of Lucknow' gave a talk on Zinc Oxide Nanostructures.
- **Dr. Indu Bhushan Sharma** from 'ISCAS Institute of Solid State and Materials Science, Jammu,' prompted us with 'Quest for Materials with Novel Physical Properties'.

- **Dr. S.P. Singh**, 'The Polymers and Functional Materials Department, CSIR-Indian Institute of Chemical Technology, Hyderabad, captured the attention of the whole gathering with his scientific delivery on 'Application Oriented Synthesis of Organic Dyes for Photonic Devices'.
- **Dr. Saroj K. Shukla**, 'The Department of Polymer Science, Bhaskaracharya College of Applied Sciences, and University of Delhi' gave a talk on 'Potential and Prospects of chemically functionality of conducting polymer Nano composites'.
- **Dr. Akhilesh Kumar Singh** , 'School of Materials Science and Technology Indian Institute of Technology' (Banaras Hindu University) Varanasi, delivered lecture on 'Crystal structure, Phase Coexistence and Electric field induced phase Transitions in Piezoelectric Smart Ceramics'.
- **Dr. B.V. Sarada**, 'The International Advanced Research Center for Powder Metallurgy and New Materials (ARCI)', Hyderabad, gave a talk on 'Advanced Materials and Processes for Energy and Healthcare'.
- **Dr. D.K. Mahato** , 'The Department of Physics, National Institute of Technology, Patna, India', gave a talk on 'The PZT and PLZT Materials for Piezoelectric Actuator Application'.

- **Dr. N.B. Singh,** 'The Department of Chemistry and Biochemistry and RDC Sharda University, Greater Noida, ', gave a talk on 'Effect of Nanomaterials on the Properties of Cement and Concrete'.
- **Dr. Jai Singh**, 'The Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya (A central university), Bilaspur, gave a talk on 'Applications of Metals Di-chalcogenides ($MoS_2$), in Transistors'.
- **Dr. R.P. Patel** 'The Deptartment of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur', gave a talk on Synthesis, Growth, macro-, nano Crystal's for device fabrication pharma and electronic uses.
- **Dr. W.B. Gurnule**, 'Post Graduate Department of Chemistry, Kamla Nehru Mahavidyalaya, Nagpur,' gave a talk on 'Emulsion Polymerization of SBR-Nano composites with Filler Nano Carbon Black'.
- **Dr. Tokeer Ahmad**, 'The Department of Chemistry, Jamia Millia Islamia, Jamia Nagar, New Delhi, India,' gave a talk on 'Designing Nano catalysts for $H_2$ Generation and Organic Transformation.'
- **Dr. A. K. Bajpai**, P.G. College Seoni (MP)' spoke on 'Corona-time', 'Emerging Nanomaterials in Health care.'
- Oral and Poster presentation

# STUDY /ACADEMIC TOUR/ TRAINING

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| **2024-25** | **100000** | **78398** | **21602** | Training Program organized for PG students at IICT, Hyderabad:<br><br>PG students got hands-on training in novel laboratory techniques, operation of sophisticated instruments and interaction with research experts leads to motivation of PG towards research<br><br>Beneficiaries:<br>M.Sc. Chem. students (40) & faculties | Laboratory training is a cornerstone of postgraduate (PG) education in scientific arena. Structured laboratory training instills a positive attitude toward research, encouraging innovation and lifelong learning among PG students |



# STUDY TOUR/TRAINING PROGRAM AT INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY, HYDERABAD, FEB 2025


# Educational Visit to Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad
# Date of Visit: 19.02.2025 to 21.02.2025

**Key Areas Explored:**

- **Analytical Instruments:**
  - Students were introduced to advanced instruments such as Gas Chromatography-Mass Spectrometry (GC-MS), High-Performance Liquid Chromatography (HPLC), Atomic Absorption Spectroscopy (AAS), and Nuclear Magnetic Resonance (NMR) Spectroscopy.
  - The use of these instruments in determining the composition of various chemical samples was demonstrated in real-time, with students observing experiments in progress.

- **Synthesis and Process Optimization:**
  - The students were shown the laboratory setup for chemical synthesis, where reactions are carefully monitored and optimized.
  - Researchers discussed reaction pathways, catalyst usage, and the importance of controlling variables like temperature, pressure, and concentration during chemical reactions.

- **Environmental and Safety Protocols:**
  - Safety was a major focus of the visit, with the laboratory team emphasizing the correct handling of chemicals, disposal of hazardous materials, and emergency protocols.
  - Students were given a hands-on demonstration of the safety equipment available, including fume hoods, eyewash stations, and fire extinguishers.
- **Research Projects:**
  - Several ongoing research projects were showcased, including topics on nanomaterials, pharmaceutical chemistry, and sustainable chemical processes.
  - Students had the opportunity to interact with research scholars and ask questions about the methodologies, challenges, and breakthroughs in the field.

➢ **Learning Outcomes**

The visit provided valuable insights into various aspects of chemical research and laboratory work.

# PATENT/ PROMOTION OF RESEARCH

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| **2022-23** | | **80000** | - | Five Patents | Motivate towards innovative research for the benefit to society at large and encouraging patenting of the outcome |
| **2023-24** | | **32000** | - | | |
| **2024-25** | **40000** | **40000** | - | | |

# PATENTS

| S. No. | Title |
|---|---|
| 1. | Intensified process using modified Zinc oxide nanoparticles for effective dye removal from wastewater |
| 2. | Photocatalytic degradation of drug Amoxicillin and dye Fulphon fast Black-F by Cu-ZnS quantum dot |
| 3. | Process for Preparing ZNO/B-Cyclodextrin/NI/Ferrite/ Nanocomposite Material and Composion ther |
| 4. | South African Patent |
| 5. | Method and Composition for Synthesizing Phyto-Nano-MGO Quantum Dots for Evaluation of oxin IN-VIVO/VITRO/SILICO Sequels |

# Urkunde

über die Eintragung des
Gebrauchsmusters Nr. 20 2021 106 116

**Bezeichnung:**
Ein verstärktes System mit modifizierten Zinkoxid-Nanopartikeln zur effektiven Entfernung von Farbstoffen aus Abwasser

**IPC:**
B01J 23/06

**Inhaber/Inhaberin:**
Jain, Bhawana, Dr., Durg, Chhattisgarth, IN
Patel, Jyoti, Durg, Chhattisgarth, IN
Singh, Ajaya Kumar, Dr., Durg, Chhattisgarth, IN

**Tag der Anmeldung:**
09.11.2021

**Tag der Eintragung:**
19.11.2021

Die Präsidentin des Deutschen Patent- und Markenamts

Cornelia Rudloff-Schäffer

München, 19.11.2021

Die Voraussetzungen der Schutzfähigkeit werden bei der Eintragung eines Gebrauchsmusters nicht geprüft.
Den aktuellen Rechtsstand und Schutzumfang entnehmen Sie bitte dem DPMAregister unter www.dpma.de.

REPUBLIC OF SOUTH AFRICA — REPUBLIEK VAN SUID AFRIKA

PATENTS ACT, 1978

## CERTIFICATE

In accordance with section 44 (1) of the Patents Act, No. 57 of 1978, it is hereby certified that:

**SINGH, AJAYA KUMAR; PATEL, JYOTI; JAIN, BHAWANA; ASTHANA, ANUPAMA; MATHEW, SUNITHA B.; HASHMI, AYESHA**

Has been granted a patent in respect of an invention described and claimed in complete specification deposited at the Patent Office under the number

**2021/10082**

A copy of the complete specification is annexed, together with the relevant Form P2.

In testimony thereof, the seal of the Patent Office has been affixed at Pretoria with effect from the **29th** day of **June 2022**

Registrar of Patents

INTELLECTUAL PROPERTY INDIA

बाम सं/SL No :022145043

पेटेंट कार्यालय,भारत सरकार — The Patent Office, Government Of India
पेटेंट प्रमाण पत्र | Patent Certificate
(पेटेंट नियमावली का नियम 74) | (Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No. : 540667
आवेदन सं. / Application No. : 202321059700
फाइल करने की तारीख / Date of Filing : 05/09/2023
पेटेंटी / Patentee : 1.Dr. Ajaya Kumar Singh 2.Dr. Bhawana Jain 3.Dr. Sunita Sanwaria 4.Dr. Anupama Asthana

प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाप्रकटित *A PROCESS FOR PREPARING ZNO/B-CYCLODEXTRIN/NI/FERRITE NANOCOMPOSITE MATERIAL AND COMPOSITION THEREOF* नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख सितम्बर 2025 के पांचवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled *A PROCESS FOR PREPARING ZNO/B-CYCLODEXTRIN/NI/FERRITE NANOCOMPOSITE MATERIAL AND COMPOSITION THEREOF* as disclosed in the above mentioned application for the term of 20 years from the 5th day of September 2025 in accordance with the provisions of the Patents Act,1970.

अनुदान की तारीख : 03/06/2024
Date of Grant :

पेटेंट नियंत्रक
Controller of Patent

**टिप्पणी** - इस पेटेंट के नवीकरण के लिए यदि, यदि इसे बनाए रखा जाना है, सितम्बर 2025 के पांचवें दिन को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।

**Note.** - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 5th day of September 2025 and on the same day in every year thereafter.

REPUBLIC OF SOUTH AFRICA — REPUBLIEK VAN SUID AFRIKA

PATENTS ACT, 1978

## CERTIFICATE

In accordance with section 44 (1) of the Patents Act, No. 57 of 1978, it is hereby certified that:

**DR. AJAYA KUMAR SINGH; S. SREEVIDYA; DR. SUNITA SANWARIA**

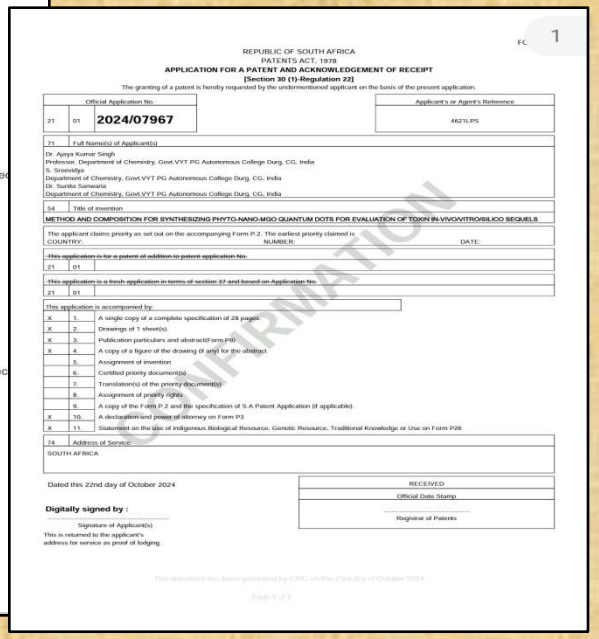
Has been granted a patent in respect of an invention described and claimed in complete specification deposited at the Patent Office under the number

**2024/07967**

A copy of the complete specification is annexed, together with the relevant Form P2.

In testimony thereof, the seal of the Patent Office has been affixed at Pretoria with effect from the **28th** day of **May 2025**

Registrar of Patents



FC 1

REPUBLIC OF SOUTH AFRICA
PATENTS ACT, 1978
**APPLICATION FOR A PATENT AND ACKNOWLEDGEMENT OF RECEIPT**
**[Section 30 (1)-Regulation 22]**

The granting of a patent is hereby requested by the undermentioned applicant on the basis of the present application.

| Official Application No. | Applicant's or Agent's Reference |
|---|---|
| 21 01 **2024/07967** | 4621LPS |

71 Full Name(s) of Applicant(s)
Dr. Ajaya Kumar Singh
Professor, Department of Chemistry, Govt.VYT PG Autonomous College Durg, CG, India
S. Sreevidya
Department of Chemistry, Govt.VYT PG Autonomous College Durg, CG, India
Dr. Sunita Sanwaria
Department of Chemistry, Govt.VYT PG Autonomous College Durg, CG, India

54 Title of invention
METHOD AND COMPOSITION FOR SYNTHESIZING PHYTO-NANO-MGO QUANTUM DOTS FOR EVALUATION OF TOXIN IN-VIVO/VITRO/SILICO SEQUELS

The applicant claims priority as set out on the accompanying Form P.2. The earliest priority claimed is
COUNTRY: NUMBER: DATE:

~~This application is for a patent of addition to patent application No.~~
21 01

~~This application is a fresh application in terms of section 37 and based on Application No.~~
21 01

This application is accompanied by:

| | | |
|---|---|---|
| X | 1. | A single copy of a complete specification of 28 pages. |
| X | 2. | Drawings of 1 sheet(s). |
| X | 3. | Publication particulars and abstract(Form P8) |
| X | 4. | A copy of a figure of the drawing (if any) for the abstract. |
| | 5. | Assignment of invention |
| | 6. | Certified priority document(s) |
| | 7. | Translation(s) of the priority document(s) |
| | 8. | Assignment of priority rights. |
| | 9. | A copy of the Form P.2 and the specification of S.A Patent Application (if applicable). |
| X | 10. | A declaration and power of attorney on Form P3 |
| X | 11. | Statement on the use of indigenous Biological Resource, Genetic Resource, Traditional Knowledge or Use on Form P26 |

74 Address of Service:
SOUTH AFRICA

Dated this 22nd day of October 2024

RECEIVED
Official Date Stamp
Registrar of Patents

**Digitally signed by :**
Signature of Applicant(s)
This is returned to the applicant's address for service as proof of lodging.







# PATENTS

# FDP

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| 2022-23 | 70000 | 70000 | - | FDP on Indian Knowledge System (IKS) organized on 20-27 September 2023:<br><br>Faculty members equipped to incorporate traditional knowledge to teaching<br><br>Beneficiaries: Faculty members | Integration of IKS to curriculum to meet the NEP objectives of instilling value in students and preserving the valuable traditional knowledge |

# FACULTY DEVELOPMENT PROGRAMME
# SEPTEMBER 20-27, 2023
# INDIAN KNOWLEDGE SYSTEM (IKS)

**Objectives**

- To contribute to the exploration of Indian Knowledge System,
- To address societal challenges through IKS,
- To ensure Scientific validation of IKS, and
- To orient the mindset of faculties for the adoption of validated IKS.

| DATE | SPEAKERS |
|---|---|
| 20th September, 2023 | Prof. Rajive Prakash Director, IIT, Bhilai<br>Dr. Rakesh Mishra, Veterinary Physician, Kamdhenu University, Durg<br>Dr. Pragya Kulkarni, HoD, Dept. of Microbiology, Govt. V.Y.T. PG. Auto. College, Durg |
| 21st September, 2023 | Prof. Krishna Kumar Pandey, Dean, Faculty of Ancient Indian Science & Humanities, Kavikulguru Kalidas Sanskrit Univtersity, MS<br>Dr. Yashwant Atbhaiya, Technical Officer , Kamdhenu University, Durg |
| **22nd September, 2023** | Dr. Rudra Bhandari Associate Professor, Dept. of Yoga Science, University of Patanjali, Haridwar<br>Dr. Kusumanjali Deshmukh Dept. of Physics, Govt. V.Y.T.PG. Auto. College, Durg. |
| **23rd September, 2023** | Dr. K.S. Laddha Professor of Pharmacognosy, Institute of Chmical Technology, Matunga (E), Mumbai<br>Dr. Mausami Day Deptt. of Zoology,Govt. V.Y.T. PG. Auto. College, Durg. |

| DATE | SPEAKERS |
| --- | --- |
| **25th September, 2023** | Prof. M. Abdul Kareem HoD & Associate Professor,<br>Centre for Conservation of Natural Resource,<br>The University of Trans-Disciplinary Health Science and Technology, Bengaluru<br><br>Dr. Subrahmanya Kumar, K. Associate Professor,<br>Centre for Ayurveda Biology and Holistic Nutrition,<br>The University of Trans-Disciplinary Health Science & Technology, Bangaluru. |
| **26th September, 2023** | Dr. V. M. Pendsey Principal,D.R.B. Sindhu Mahavidyalaya, Nagpur<br><br>Dr. O.P. Pandey Eminent Scientist, New Delhi |
| **27th September, 2023** | Prof. Madhusudan PeenaEx. Vice-Chancellor,<br>Dean, Faculty of Indian Philosophy and Culture,<br>Kavikulguru Kalidas Sanskrit University, Ramtek, M.S.<br><br>Hrikanth B H<br>Industry-Academia Specialist, Pune |

# CONFERENCE

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| **2022-23** | **150000**<br>**14474** | **164474** | **-** | National Conference on Futuristic Material (NCFM) organized on 22-23 June 2023<br><br>Beneficiaries: 170 participants | Provide a platform for students/scholars and faculty to engage with leading experts and peers, facilitating exchange of the latest research, methodology, experimental results in advanced materials.<br>Foster Interdisciplinary broadening the scope of research and innovation.<br>Exposure to emerging topics like biomaterials, programmable materials, and the integration of AI in materials discovery. |
| **2024-25** | **300000** | **164014** | **135986** | International Conference on Material Science for Sustainable Development (ICMSSD) 05-06 March 2025<br><br>Beneficiaries: 150 participants across the globe | |


National Conference on Futuristic Materials
(NCFM - 2023)
22-23 June, 2023
Organized by
Department of Chemistry
WELCOME
IN
NATIONAL CONFERENCE ON
FUTURISTIC MATERIALS 2023


National Conference on Futuristic Materials
(NCFM - 2023)
Department of Chemistry

# NCFM-2023


National Conference on Futuristic Materials
(NCFM - 2023)
22-23 June, 2023
Organized by
Department of Chemistry
Thank you

# NCFM-2023

| Day-1: 22.06.2023 (Thursday) | | |
|---|---|---|
| | Inaugural Function<br>Keynote Address by Dr. Pralay Maiti, IIT BHU | |
| **Technical Session-I Chairperson Dr. Y. R. Katre** | | |
| | Invited Talk-1 | Dr. Akhilesh Kumar Singh, IIT BHU |
| | Invited Talk -2 | Dr. Chandan Upadhyay, IIT BHU |
| **Technical Session-II Chairperson Dr. Akhilesh Kumar Singh, IIT BHU** | | |
| | Invited Talk- 3 | Dr. Jai Singh , GGU, Bilaspur |
| | Invited Talk-4 | Prof. Ravin M. Jugade, RTM Nagpur |
| | | |

| Day-2: 23.06.2023 (Friday) | | |
|---|---|---|
| **Technical Session- III Chairperson Dr. Jai Singh, GGU, Bilaspur** | | |
| | Invited Talk-5 | Dr. W.B. Gurnule, Nagpur |
| | Invited Talk-6 | Dr. Satyajit Gupta, IIT Bhilai |
| **Technical Session- IV Chairperson Dr. Ravin M. Jugade, RTM Nagpur** | | |
| | Invited Talk-7 | Prof. Ayush Khare, NIT, Raipur |
| | | |
| **Presentations** | | |
| | Oral presentations and Poster presentations | |
| | VALEDICTORY FUNCTION<br>Chief Guest: Dr. Rajiv Prakash, Director, IIT, Bhilai | |
| | | |



# INTERNATIONAL CONFERENCE ON MATERIAL SCIENCE & SUSTAINABLE DEVELOPMENT -2025


# ICMSSD -2025

- **Chief Guest** - ***N. B. Singh*** *(Sharda University, Greater Noida, India) explored "***Eco-Friendly Nanomaterials and Their Industrial Applications."**
- **Keynote Address: Prof. Sreekantha B. Jonnalagadda** (University of KwaZulu-Natal, South Africa) delivered an insightful lecture on "Binary Oxides and Nanocomposites as Sustainable Catalysts for Green Synthesis."
- **Invited Talks:**
- **Dr. Rohit Kumar Rana** (CSIR-IICT, Hyderabad, India) presented "Bio-inspired Strategies for Hierarchical Assembly and Functional Materials," providing an in-depth discussion on biomimetic methodologies for nanoscale material design.
- **Dr. Sunita Sanwaria** (NPG Science College, Raipur) elucidated the self-assembly behavior of polymer-coated nanoparticles, demonstrating "Helical Packing of Nanoparticles in Cylindrical Domains of Block Copolymers."
- **Ihebuluche Fortune Chiugo** (Sharda University, Nigeria)His topic was "Public Spending and Population Health: Assessing Risks from Chemical Industries for Sustainable Development". This study analyzed the effects of chemical industry operations on public health and environmental safety.

- **Dr. Santosh Kumar Verma** (Yulin University, China) discussed "Hydrolysis Hydrogen Generation Behavior of Mechanico-Chemical Reactions in Mg-based Binary Materials for Hydrogen Storage." The lecture provided a comprehensive analysis of the mechanico-chemical reaction strategy for activating Mg-based alloys.
- **Dr. Ratiram Gomaji Chaudhary** (RTM Nagpur University, India) explored "Synergy for Sustainable Development through Nature-Inspired Materials Synthesis." The talk emphasized on the green synthesis of nanomaterials using bioresources.
- **Akhilesh Kumar Singh** (IIT BHU, Varanasi, India) discussed "Development of Multifunctional Materials for Sensors and Energy" This talk explored the synthesis and applications of multifunctional oxide ceramics, particularly perovskite-based materials.
- **Surya Prakash Singh** (CSIR-IICT, Hyderabad, India) highlighted "Materials and Molecules: Rational Design, Synthesis, and Their Applications in Photonic Devices". This presentation focused on the development of organic molecules for advanced photonic applications.
- **Lingamallu Giribabu** (CSIR-IICT, Hyderabad, India) discussed **"Long-Lived Charge Separated Species in Donor-π-Acceptor Based Tetrapyrrolic Systems for Optoelectronic Applications"**.The talk gave insight into artificial Donor-π-Acceptor (D-A) systems and their significance.
- **Jai Singh** (Guru Ghasidas Vishwavidyalaya, Bilaspur, India) '**Two-Dimensional Materials for Thermoelectric and Transistor Applications"** The presentation highlighted graphene and MoS2 synthesis via chemical vapor deposition (CVD) and their applications in thermoelectric devices and transistors.

# CAREER COUNSELLING

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| **2023-24** | **10000** | **10750** | **-750** | PG Students were given special coaching and career guidance. Preparation of various competitive exams, preparation for interview.<br><br>Students got oriented towards competitive exams<br><br>Beneficiaries:<br>M. Sc. Chemistry students (50) | To enhance employability of the stake holders and to make them competent |

# SKILL DEVELOPMENT

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| **2023-24** | **75000** | **75400** | **-400** | PG students participated in seven days workshop at Siddhachalam Lab., Birgoan (22-29 Jan. 24) Hands on training by experts at Soil Analysis Lab, Ruabanda (02- 05 Feb. 2024)<br><br>Students got exposed to various analytical techniques and methods of analysis<br><br>Beneficiaries: All PG students (50) | To enhance the analytical and presentation skills of students and to make them competent, employable and self confident |
| **2024-25** | **50000** | - | **50000** | | |



# SKILL DEVELOPMENT PROGRAM, SIDDHACHALAM LAB., BIRGAON , JAN. 2024



# SKILL DEVELOPMENT PROGRAM, SOIL ANALYSIS LAB, RUABANDA FEB. 2024


# INDUSTRIAL VISIT

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| **2023-24** | **100000** | **104123** | **- 4123** | UG & PG students gained practical exposure to real-world industry operations, helping them connect theoretical knowledge from classrooms with actual processes and technologies<br><br>Beneficiaries: | Bridging the gap between Academia and Industry & giving practical exposure to meet the requirements of curriculum relevance, employability & entrepreneurship |



## INDUTRIAL VISIT TO JINDAL STEEL PLANT, RAIGARH



## ACADEMIC VISIT TO INDIRA GANDHI NATIONAL TRIBAL UNIVERSITY, AMARKANTAK, MP



## INDUTRIAL VISIT TO BHILAI STEEL PLANT, BHILAI


## VISIT TO MAA LAXMI FOOD INDUSTRY'S BAKERY AND CONFECTIONERY, BIRKONI



# INDUTRIAL VISIT TO BHORAMDEO SAHAKARI SHAKKAR KARKHANA, KAWARDHA



# INDUTRIAL VISIT TO RAJARAM MAIZE PRODUCTS

# GUEST LECTURE

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| **2023-24** | **50000** | **35995** | **14005** | **Total 16 Guest lectures** were arranged: Students get to interact with specialized subject experts, enables breaking classroom monotony, fosters student motivation, and makes learning more interactive and stimulating<br><br>Beneficiaries: 60 PG students, Research scholars & faculty | Guest lectures supplement the curriculum by introducing specialized topics, contemporary issues, and advanced techniques |
| **2024-25** | **30000** | **29250** | **950** | | |

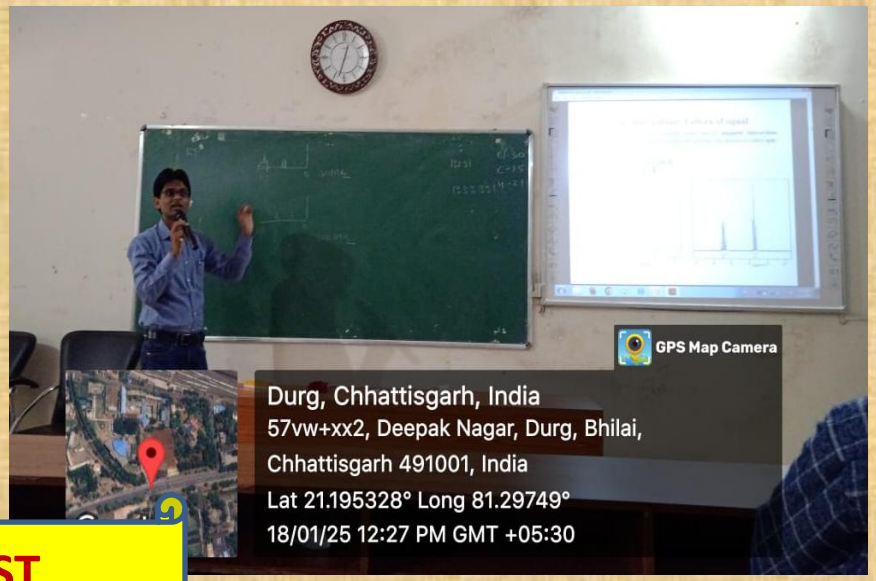
# GUEST LECTURES
# 2023-24

| S. No. | Speakers & Topic | Date |
|---|---|---|
| 1 | Dr. Manmohan Satnami – Optical Spectroscopy: Fundamentals & Applications | 11-01-2024 |
| 2 | Dr. Ravin Jugade – Atomic Absorption Spectroscopy | 03-02-2024 |
| 3 | Dr. Vijay Tangde – XRD Theory and Applications | 03-02-2024 |
| 4 | Dr. Narayan Prasad Adhikari – Modelling in Chemistry | 08-02-2024 |
| 5 | Dr. Rameshwar Adhikari – Electron Spectroscopy | 08-02-2024 |
| 6 | Dr. S. B. Jonalagadda – Recyclable catalysts and Green synthesis | 10.02.2024 |
| 7 | Dr. Bhawana Jain – Chemistry and Lab Techniques | 27.03.2024 |
| 8 | Dr. Kshitij Singh – Green Electronics | 28.03.2024 |
| 9 | Dr. Santosh Kumar Verma – Micro-alloying of transition mteals on $Mg/MgH_2$ for hydrogen storage | 28.03.2024 |

# GUEST LECTURES
# 2024-25

| S. No. | Speakers / | Date |
|---|---|---|
| 1 | Dr. Rajinikant Sharma - Water Quality-Everything you need to know… | 18-01-2025 |
| 2 | Dr. D. K. Verma - NMR Fundamentals to Advanced | 18-01-2025 |
| 3 | Dr. Ravin Jugade - Atomic Spectroscopies | 23-01-2025 |
| 4 | Dr. Vijay Tangde - Quantum Mechanics | 23-01-2025 |
| 5 | Dr. Manmohan Singh - Overview of Nanoscience and its Applications | 25-01-2025 |
| 6 | Dr. Kamlesh Sriwas - Introduction of Analytical Techniques | 25-01-2025 |
| 7 | Dr. Ashish Asatkar - Principle, Instrumentation, Applications of Mass Spectroscopy and Fundamental of Infrared Spectroscopy | 30-01-2025 |

# GUEST LECTURES



# LAB MAINTANANCE

| YEAR | ALLOCATED AMOUNT | AMOUNT SPEND | BALANCE | OUTCOME | JUSTIFICATION |
|---|---|---|---|---|---|
| **2022-23** | | **474600** | - | Updating of routine lab facility & maintenance of sophisticated instruments<br><br>Beneficiaries: UG/PG students & research scholars | For effective and efficient smooth functioning of routine lab work & sophisticated instruments |
| **2023-24** | | **120613** | - | | |

# THANK YOU