



Rajeev Gandhi Govt. P.G. College, Ambikapur (C.G.)

Department of Chemistry

Report on Interdisciplinary Study Forum (ISF) for Physics, Chemistry, Computer Science and Mathematics Group

(Session: 2021-2022)

TOPIC: - "MATHEMATICAL TOOLS FOR PHYSICAL SCIENCES"



The meeting under Interdisciplinary Study Forum was conducted by Department of Chemistry on 14/02/2022 at 1:00 pm on entitled topic "Mathematical Tools for physical Sciences". In this meeting all faculty members of Physics, Mathematics, Chemistry and Computer Science were present. Meeting was started by welcome speech of Head of Coordinating Department Chemistry Mrs. Saroj Tirkey. She discussed the importance of interdisciplinary research and uses of mathematical approach in all field of science.

Later discussion was elaborated by Head of the Department Physics, Prof. S. K. Shrivastava with explanation of new systematic approach of Mathematics by Pythagoras theorem and different equations that characterizing science and engineering problems by Mathematical Tools (William G. Gray 2020) for analysis of physical and chemical by correlating computer science. Further he added synthesis characterization by X-Ray Diffraction Technique, solubility and various laws based on mathematics. He described calculation of significant figures, approximation and uses of semiconductors with the help of Mendeleev periodic table (1869). He focused on combined effort of research and interdisciplinary work.



Dr. S. K Sinha explained the importance of Supramolecules and its application in various fields of science. Head of the Department Mathematics Mrs. Sangeeta Pandey explained the key role of mathematics in calculation of various problems of all the area of science and tools that researchers studying balance equations for systems encountered in the fields of drug designing, hydraulics, hydrology, porous media physics, structural analysis, chemical transport, heat transfer and quantum mechanics.

Dr.(Mrs.)Rameshwari A. Banjara discussed the importance of mathematical tools (Michael Stone et.al., 2014) for calculation of various laws in defining gaseous, liquid and solid states. She explained the collaborative approach of spectroscopy in characterizations that provide sample information. Applications of mathematical techniques in surfaces, multiphase systems and various invaluable analysis. She focused on complementary goals to develop new mathematical models and methods of broad utility to science and engineering and collaborative approach of mathematical, physical, chemical and computer sciences to develop science and technology in empowerment of country.

Mr. Sandeep Kushwaha gave a sincere vote of thanks to all the coordinating departments. Guest faculties Payal Vishwakarma, Jyoti Shukla, Versha Singh, Ravina Rajwade and Priya Pandey appreciably participated in the meeting.

References:

1. Michael Stone et.al., 2002, Advances in Mathematical Chemistry and Applications, Vol. 1, 2014, 3-23 3 Subhash C. Basak, Guillermo Restrepo & José L. Villaveces (Eds) 2014

2. Mathematical Tools for Changing Scale in the Analysis of Physical Systems,
William G. Gray, Anton Leijnse, Randall L. Kolar, Cheryl A. Blain Edition1st Edition
(1993), e-Book Published31 March 2020.

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**“REPORT ON INTERDISCIPLINARY STUDY FORUM (ISF) FOR PHYSICS, CHEMISTRY,
COMPUTER SCIENCE AND MATHEMATICS GROUP”**

SESSION: 2022-23

**DISCUSSION TOPIC: - “ROLE OF RESEARCH INSTRUMENTS FOR THE DEVELOPMENT OF
SCIENCE AND TECHNOLOGY”**

Department of Physics, Rajeev Gandhi Govt. P.G. College, Ambikapur, organized an interdisciplinary discussion on **“ROLE OF RESEARCH INSTRUMENTS FOR THE DEVELOPMENT OF SCIENCE AND TECHNOLOGY”** on 27/08/2022 in physics department.



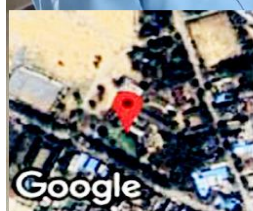
The participating faculty members were Smt. Saroj Tirkey (Assistant Prof. & HOD Chemistry), Dr. M. K. Maurya (Assistant Professor, Physics), Dr. Sangeeta Pandey (Assistant Professor & HOD Mathematics), Dr. Rameshwari Banjara (Assistant Professor, Chemistry) and Miss Monika Xess (Assistant Professor & HOD Computer Science).

The discussion was initiated through the welcome speech of coordinating Department physics Dr. M. K. Maurya.



He presented the overview and importance of research instruments for the development of science and technology. He also discussed about the scientific instruments that changing the world of research, manufacturing electronics for scientific instruments and instruments for creating the laboratory of the future.

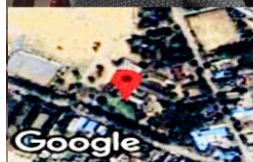
Later discussion was elaborated Smt. Saroj Tirkey. She presented the overview and an



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importance of research instruments for the development of science and technology. She also discussed the types of instruments that used in the field of chemistry.

Dr. Sangeeta Pandey spoke about the characteristics of good research instruments and instrumentation development programmes.



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She also focused on strengthening indigenous capability for research, design, development and production of instruments in the country.



Miss Monika Xess spoke about the choosing characteristics instruments in the particular research field and types of research instruments for interviews, observations, surveys and focus groups.

Dr. Rameshwari Banjara gave a sincere vote of thanks to all the participating departments.

Conclusion :- After meaningful discussion in Interdisciplinary Study Forum (ISF), the perspective of different types of research instruments for the development of Science and Technology is well clear and understood. In the ISF discussion, we have also learned about the types of research instruments that will depend on the format of the research study being performed: qualitative, quantitative or a mixed methodology.

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Report on INTERDISCIPLINARY STUDY FORUM (ISF) for PHYSICS, CHEMISTRY, COMPUTER SCIENCE AND MATHEMATICS GROUP (Session: 2022-2023)

Objective: ISF aims to explore ideas from common areas of interest from different disciplines to enrich the Research Field.

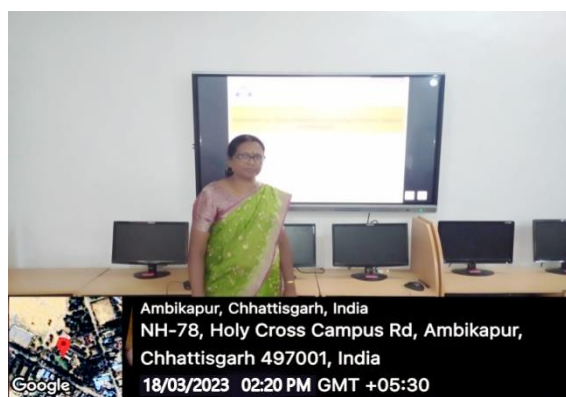
Department of Computer Science, Rajeev Gandhi Govt. Post Graduate College, Ambikapur, organized an interdisciplinary discussion on “**ROLE OF SCIENTIFIC COMPUTING IN MODERN SCIENCE & RESEARCH**” on 18/03/2023 in Computer Science Department. The participating faculty members were Smt. Saroj Tirkey (Assistant Prof. & HOD Chemistry), Dr. M. K. Maurya (Assistant Prof., Physics), Dr. Sangeeta Pandey (Assistant Prof. & HOD Mathematics), Dr. Rameshwari Banjara (Assistant Prof., Chemistry), Mrs. Kiran Minj (Assistant Prof., Physics) and Miss Monika Xess (Assistant Prof. & HOD Computer Science).



The discussion was started by Miss Monika Xess (Assistant Prof. & HOD Computer Science) opening remarks. She discussed about various advantages of Python Programming Language for Scientific Computing. She explained how complex mathematical computations, quantum computing, building AI applications can easily be done using Python programming language.

Followed by the discussion Dr. Sangeeta Pandey (Assistant Prof. & HOD Mathematics) spoke about different aspects of Applied Mathematics that is helpful in Applied Computing and Research.

Smt. Saroj Tirkey (Assistant Prof. & HOD Chemistry) enlightened the importance of Quantum Chemistry which integrates the diverse fields of Chemistry, Physics, Applied Mathematics and Computer Science.



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Smt. Saroj Tirkey (Assistant Prof. & HOD Chemistry)



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Dr. Sangeeta Pandey (Assistant Prof. & HOD Mathematics)

Later Dr. Rameshwari Banjara (Assistant Prof., Chemistry) talked over Molecular design and Photophysics along with the application of Computational Chemistry.

Mrs. Kiran Minj (Assistant Prof., Physics) introduced the forum with the applications of Computational Physics in Modern Science and Research.

At the end Dr. M. K. Maurya (Assistant Prof., Physics) summarized the importance of all the dimensions of Scientific Computing in Research followed by his vote of thanks.



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Mrs. Kiran Minj (Assistant Prof., Physics)



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Miss Monika Xess (Assistant Prof. & HOD Computer Science)

Conclusion: The discussion helped the forum to visualize the importance of Scientific Computing in the future of Modern Science and Research. Computational Simulations in the field of Chemistry and Physics along with Mathematical models have reduced the complex task of analyzing huge data and helps in better understanding of research findings and innovations. Also Scientific Programming has helped the researchers to increase the growth rate of their work and on the same time has reduced the time complexity of the research work.

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**“REPORT ON INTERDISCIPLINARY STUDY FORUM (ISF) FOR PHYSICS, CHEMISTRY,
COMPUTER SCIENCE AND MATHEMATICS GROUP”**

SESSION: 2023-24

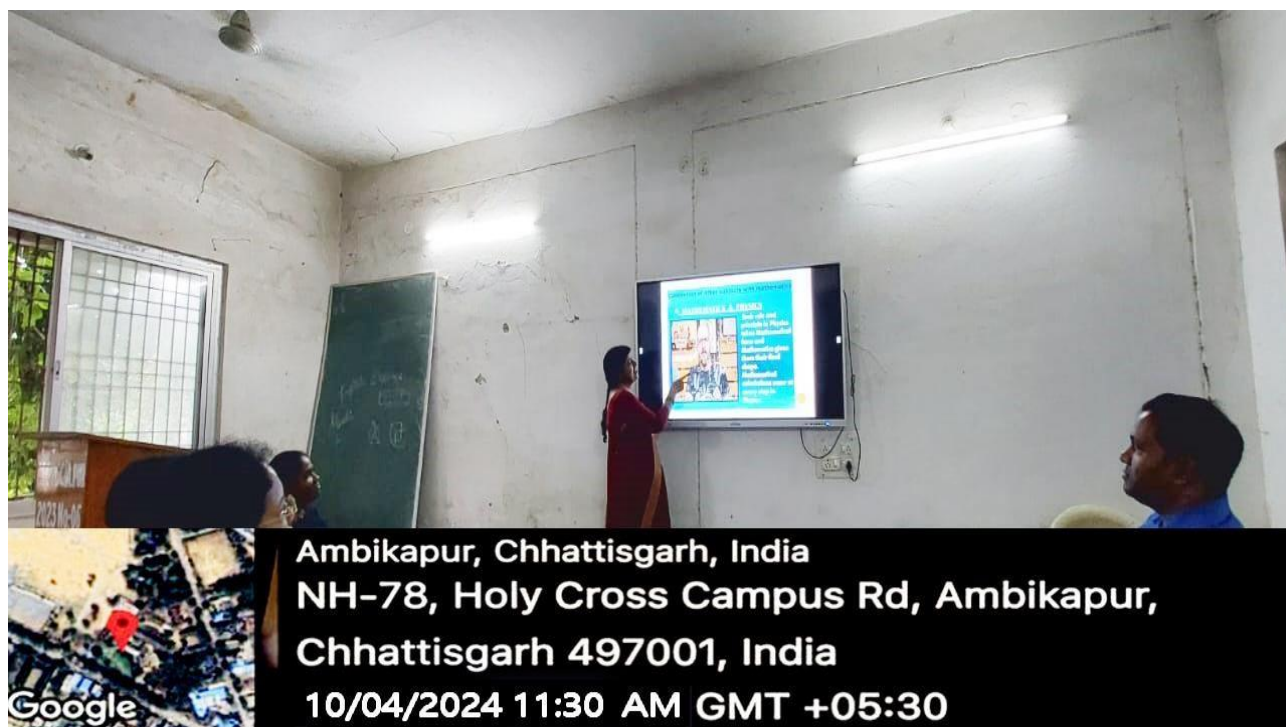
DISCUSSION TOPIC:- “Interdisciplinary Approach of Mathematics”

Department of Mathematics, Rajeev Gandhi Govt. P.G. College, Ambikapur, organized an interdisciplinary discussion on **“Interdisciplinary Approach of Mathematics”** on **10/04/2024 in Mathematics** department.



The participating faculty members were Smt. Saroj Tirkey (Assistant Prof. & HOD Chemistry), Dr. M. K. Maurya (Assistant Professor, Physics), Dr. Sangeeta Pandey (Assistant Professor & HOD Mathematics), Smt. Kiran Minj (Assistant Professor, Physics), Miss Monika Xess (Assistant Professor & HOD Computer Science), Hina B. (Guest Lecturer, Mathematics).

The discussion was initiated through the welcome speech of coordinating Department Mathematics Dr. Sangeeta Pandey.



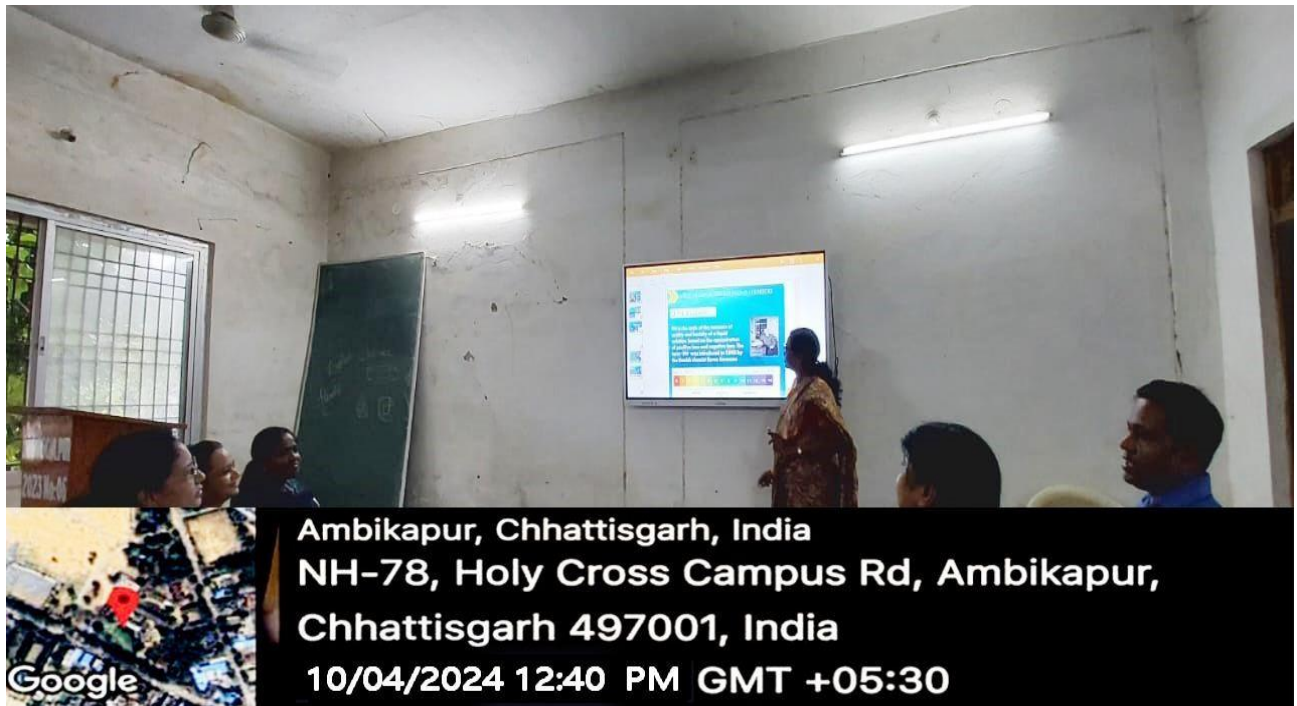
She explained interdisciplinary approach in mathematics involves integrating mathematical concepts & Methods with other discipline (Physics, Computer Science, Chemistry). She discussed some many real problems related to Chemistry, Physics, Computer Science..

Later discussion was elaborated Dr. M. K. Maurya. He presented the overview and an



Importance of mathematical tools & Technique to solve problems related to Physics. He also discussed about differential equations, Hypergeometric functions, Statistics etc. which are used in physics.

Smt. Saroj Tirkey spoke about use of mathematical Calculation that are absolutely necessary to explore important concept of Chemistry. She also discussed about how mathematically handle chemistry problems in order to understand what they mean and how to prepare specific quantities of chemicals.



Miss Monika Xess spoke about the use of Mathematics in Computer Science. She discussed about Numerical Analysis, Discrete Mathematics which are use in Computer Science to make algorithm of various problems.

Conclusions: -In conclusion, the interdisciplinary approach that integrates mathematics with Physics, chemistry & Computer Science enriches our understanding problem-solving capabilities across these fields. Mathematics provides the foundational tools for modeling physical system, analyzing chemical reaction & developing algorithms in Computer Science.


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