



MALAVIYA MISSION TEACHER TRAINING CENTRE
(Formerly known as Human Resource Development Centre)

Pt. Ravishankar Shukla University, Raipur



Refresher Course in Physical and Earth Science

March-11 to 23, 2024

Theme of Course/Program:	Refresher Course in Physical and Earth Science
Name of Course Coordinator:	Dr. D.P. Bisen Professor School of Studies in Physics and Astrophysics, Pt. Ravishankar Shukla University, Raipur
Name of Course Coordinator from HRDC:	Dr. Arvind Agrawal Assistant Professor Malaviya Mission Teacher Training Centre Pt. Ravishankar Shukla University, Raipur
Date of Course/Program:	11.03.2023 to 23-03-2024
Number of Participants:	22
State wise number of participants:	Chhattisgarh:- 17, Maharashtra: 03, Andhra Pradesh:01 and Bihar: 01
Gender wise number of participants:	Male – 14 , Female – 8
Number of Resource Persons	26
Name and Signature of Course Coordinator Prof. D.P. Bisen	
Online Platform	
Google Meet	https://forms.gle/kcW49NJW5JHYfrBz5

Organizing Team



Prof. Sachchidanand Shukla
Vice Chancellor,
Pt. Ravishankar Shukla University, Raipur



Prof. Preeti K Suhresh
Director,
HRDC, Pt. RSU, Raipur (C.G.)



Prof. D.P. Bisen
Professor S.O.S. in Physics and
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Course Coordinator

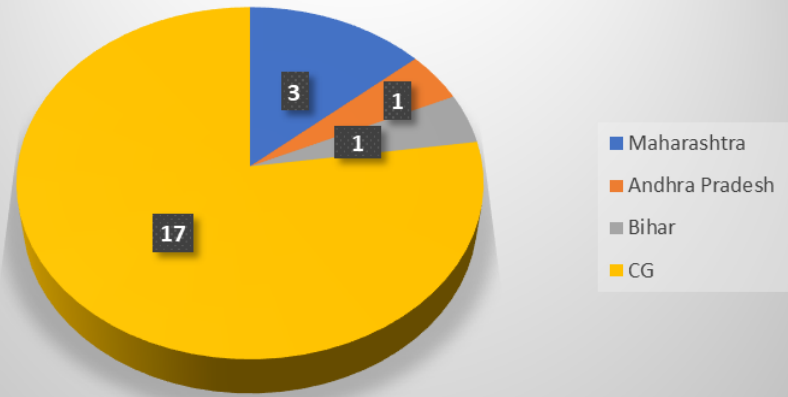


Dr. Arvind Agrawal
Assistant Professor
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Course Coordinator

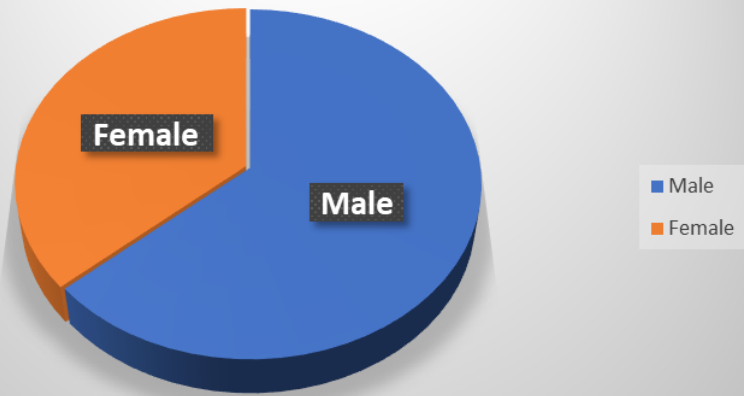
Summary of program

Malviya Mission Teacher Training centre, Pt. Ravishankar Shukla university Raipur has organized two weeks Refresher course in Physics held during 11.03.2024 to 23.03.2024. On the very first day during the inaugural session the honourable Vice-chancellor Prof. Sachchidananda Shukla in welcome address gave best wishes for organizing this course. Director, MMTTC Prof. Preeti K Suresh welcomed the honourable Vice chancellor and the participants from various states of the country and wished them for their best performance during the course. The coordinator of the course Prof. D P Bisen, professor, School of studies in physics and astrophysics introduced the session with the objectives and theme of refresher course in in physical and earth sciences”. He also gave a brief account of the various topics to be covered and about the resource persons who will join and train the participants. The assistant professors from various central and state universities from all the corners of the country were participated in this course. Most of the participants were from Chhattisgarh however, there were participants from the other states of the country like Andhra Pradesh, Bihar, Maharastra. Experts from various renowned academic institutes like IIT- Kharagpur, IIT Patna, NIT Warangal, BIT Mesra, BHU, Allahabad and professors from different central and state universities as well as many Vice-chancellors were invited to train the college and university teachers. All the experts discussed the recent trends in the teaching, learning and research in the various fields of physics. All the fundamental topics as per the syllabus at UG and PG levels of Physics, Geography and Geology were covered and discussed in detail during this course Also lectures on Learning Management skills and Artificial intelligence were scheduled to enhance the teaching and learning skills. The participants were evaluated on their performance in various assessment schemes like micro-teaching, Seminar, project presentation, assignment and holistic response. Dr. Brijesh Pandey, Prof. Anubha Singh Gaur, Prof. Nameeta Brahme have judged the micro-teaching, seminar and project presentation respectively.

State wise Number of Participants



Gender Wise Participants



Details of date wise organized program

The online Refresher course in Physical and Earth Sciences was organized from 11.03.2024 to 23.03.2024. Various lectures and assessment schemes were conducted date wise.

Day 1: (11/03/2024)

On the first day of the course, **the technical session 1 was started at 2:15 pm up to 5:30 pm**. The chairperson of this technical session was Dr. Laxmikant Chaware. In this technical session Prof. S K Pandey, Former Professor, SOS in Physics and Astrophysics, P.R.S.U delivered a lecture on the topic “Amazing Universe”. Sir started with fundamental concepts of classical and quantum mechanics and then he moved on basic concepts of universe, galaxies and black holes. He also answered the questions of the participants on Black holes and resolved the queries and doubts of the participants in an efficient manner. His presentation was very nice and informative with updated data. The reporter of the session was Dr. G Nag Bhargavi.

Day 2: (12/03/2024)

In **first session (10.30am - 12.00 noon)** Prof. K R Hari Sir HOD SoS Geology PRSU Raipur (C.G.) delivered his speech on “The Making & Breaking of Continent”. In the beginning of his talk he gave a brief about Columbia- the Super continent originated 2.7 million years back which is then reformed into other continents and oceans. During the speech, he the deformation is still alive which is responsible for the earthquakes, volcanic eruptions and tsunamis etc. His presentation was very nice and informative with updated data.

In the second session (12.15pm - 13.45pm) Prof. V. Nagrale HOD Geography SNDT Women University Pune, delivered his talk on “Sustainability & Sustainable Development Goals”. He explained the concept of sustainability and its indicators and he informed about the 17 sustainable development goals and 169 targets. He explained a case study on COVID-19 pandemic and how the sustainable development is achieved in economics,

social and health. He presented the talk in a very interesting manner to the participants and also cleared their various doubts as well.

In the **Third session (14.15pm – 15.45pm)** Prof. S.K. Omanwar Sir, HOD Physics SGB University Amarawati Maharashtra delivered an interesting and useful talk on the topic “Strategy of Learning” in the field of “research methodology”. He discussed about recent reforms in research and the and evaluation process. He also enlightens us with his insights on the methods of improvising the pattern of examination to enhance the learning skills of the students. He took questions of the participants and satisfied them with his answers.

In the **fourth session (16.00pm – 17.30pm)**, Prof. R.N. Baghel Sir, former HOD SoS Physics & Astrophysics PRSU Raipur (C.G.) discussed on the topic “Microprocessor and its applications”. He introduced the participants with the different applications of microprocessor in our daily life. He also explained the fundamental concepts and working of microprocessor. He also aware us with the advanced and upcoming versions of microprocessor. The entire sessions were chaired by Dr. Kaushlesh Kumar Dhruw, assistant professor of geography and reported by Dr. Mangal Chand Nirala, Assistant professor of Geography

Day 3: (13/03/2024)

The 3rd day of the refresher course featured four lectures, each providing profound insights into their respective subjects. The sessions were well-attended by participants from various disciplines, enhancing the interdisciplinary nature of the learning experience. The Chair person of today's session was Mrityunjay Kumar, Assistant Professor (Physics) Govt. College, Tokapal, Chhattisgarh, India and reported by Shri Vishram Tondon.

Session-I: (10:30am - 12:00 noon)

Resource Person: Dr. Ravi Sharma

Prof. Ravi Sharma presented “Physics of remote sensing and its applications”, an in-depth exploration of electromagnetic radiation interacts with Earth's surface and

atmosphere, covering its principles and its broad applications in both earth geography.

Key Highlights: • Prof. Ravi Sharma detailed about the remote sensing utilizes the entire electromagnetic spectrum, including visible, infrared, and microwave wavelengths, to gather information about the Earth's surface and atmosphere.

- Different materials interact with electromagnetic radiation in distinct ways, such as absorption, reflection, and scattering, enabling remote sensing techniques to distinguish between various surface features and properties.

- Remote sensing has diverse applications, ranging from environmental monitoring and natural resource management to urban planning and disaster assessment.

Session-II: (12:15pm - 13:45pm)

Resource Person: Prof. H. S. Tewari, Guru Ghasidas University, Bilaspur

Prof. Tewari presented “XRD: Basics and Instrumentation”, an in-depth exploration of XRD, covering XRD principles, various synthesis techniques and its broad applications electronic device application. The lectures were structured to make the complex topic of XRD accessible to participants from diverse fields.

Key Highlights:

- Prof. Tiwari detailed about X-ray diffraction, which is a powerful analytical technique used to determine the crystallographic structure of materials.

- XRD is crucial in the synthesis of materials as it provides insights into the crystal structure, phase purity, and phase transitions during the synthesis process. By analyzing the diffraction patterns of samples at different stages, researchers can optimize synthesis conditions for desired material properties.

- XRD plays a vital role in research and development of new materials. Novel materials with tailored properties for specific applications, such as advanced ceramics, catalysts, or electronic devices.

Session: 14:15 - 15:45 and 16:00 - 17:30

Resource Person: Prof. P. K. Ahluwalia

Prof. P. K. Ahluwalia engaged the participants with lectures focusing on the fundamental aspects of AI and the use in daily and research.

Key Highlights:

- Prof. Ahluwalia detailed about the AI techniques, such as machine learning algorithms, enable physicists to analyze vast amounts of experimental data more efficiently and accurately than traditional methods, facilitating the discovery of new particles or phenomena.
- AI algorithms can optimize experimental setups and parameters, accelerating the process of experimental design and refinement, leading to more effective and efficient experiments.
- AI empowers physicists to explore previously uncharted territories in physics, such as the discovery of new materials with unique properties or the investigation of unconventional physical theories, by leveraging advanced computational techniques and algorithms.

Conclusion: The sessions on Day 3 of the refresher course successfully broadened the participants' knowledge XRD, remote sensing and AI, a cross-disciplinary appreciation for the sciences discussed. The lectures by Dr. Ravi Sharma, Dr. H. S. Tewari and Dr. P. K. Ahluwalia were not only educational but also inspirational, encouraging further exploration and study in their respective fields.

Day 4: (14/03/2024)

Session-I (10.30 to 12.00 noon): First lecture started at 10.30am up to 12.00pm, The Chairperson of this technical session was Dr. Vikal Kumar Singh, Assistant professor, department of geology, Central university of south Bihar, Gaya. The resource person for First Lecture was Prof. A.R. Siddiqui, Shri Bhagwan College of Pharmacy, Aurangabad, India. He was delivered a lecture on the topic is “Integration of various Rural development programs and it's sustainability” Sir started with the integration of various social rural development reviews of objectives and observation of issues during the covid pandemic issues and metrological drought indices, vegetation condition index, substationable development goals lecture in this session. His lecture was more effective

and more informative.

Session-II (12.15 to 1.45 pm): Second lecture started at 12.15 pm up to 1.30 pm, The Chairperson of this technical session was Dr. Vikal Kumar Singh, Assistant professor, department of geology, Central university of south Bihar, Gaya. The resource person for second lecture was Prof. A.R. Siddiqui, department of Geography, University of Allahabad, India. He was delivered a lecture on the topic is “Rural Development”. He started with Rural development with different aspects like as soil moisture assessment testing using Remote sensing techniques, soil moisture characteristics, crop acreage estimation latest innovations through remote sensing techniques. His presentation was very nice and informative.

Session-III (2.15 to 3.45 pm): Third lecture started at 2.15 pm up to 3.45 pm. The Chairperson of this technical session was Dr. Vikal Kumar Singh, Assistant professor, department of geology, Central university of south Bihar, Gaya. The resource person for third lecture was Dr. Mrityunjay Kumar, Assistant Professor in Physics, Shaheed Harchand Naik Govt. College, Tokapal, Bastar, affiliated to Shaheed Mahendra Karma Vishwavidyalaya, Jagdalpur, Bastar. He was delivered a lecture on the topic is “Photoelectric effect”. He started with the importance of the photoelectric effect, electrons can be ejected from the surface of the metals and detailed explanation, applications with explain different materials with information through his lecture. The session is more informative.

Session-IV (4.00 to 5.30 pm): (Participants Micro-teaching session). The last session started at 4.00 pm up to 5.30pm. The Chairperson of this participants Micro-teaching session was Dr. Vikal Kumar Singh, Assistant professor, department of geology, Central university of south Bihar, Gaya. In this session all the participants (22-No's) participating in Micro-teaching with different topics were explain with in the stipulated time.

Day 5 : (15/03/2024)

Session-I (10.30 to 12.00 am): First lecture started at 10.30am up to 12.00pm, The

Chairperson of this technical session was Dr. Gunvant Wadpalliwar Assistant professor and head, department of geology, Shri Govindrao Munghate Art and Science College Kurkheda district Gadchiroli, Maharashtra, The resource person for First lecture was Dr. Vinod Patle, Associate Professor School of Studies in Computer Science, Pt. Ravishankar Shukla University, Raipur delivered a lecture on the topic “Understanding Learning Management System” Sir started with the definition of a learning management system (LMS), its benefits, importance, types of LMS and key features of the LMS software as well as MOOC Importance, Indian platform SWAYAM and different online learning platforms information and their features.

Session-II (12.15 to 1.45 pm): Second lecture started at 12.15 pm up to 1.30 pm, The Chairperson of this technical session was Dr. Gunvant Wadpalliwar Assistant professor and head, department of geology, Shri Govindrao Munghate Art and Science College Kurkheda district Gadchiroli, Maharashtra, The resource person for second lecture was Prof. Y. M. Gupta, Rtd. Principal, Rungta Engineering College, Bhila delivered a lecture on the topic “Basics of Statistical Mechanics” sir started with what is purpose and objective statistical mechanics is being developed, definition of mechanics, statistical mechanics versus thermodynamics and kinetic energy of material. His presentation was very nice and informative.

Session-III (2.15 to 3.45 pm): Third lecture started at 2.15 pm up to 3.45 pm. The Chairperson of this technical session was Dr. Gunvant Wadpalliwar Assistant professor and head, department of geology, Shri Govindrao Munghate Art and Science College Kurkheda district Gadchiroli, Maharashtra, The resource person for third lecture was Prof. Y. M. Gupta, Rtd. Principal, Rungta Engineering College, Bhila delivered a lecture on the topic “Concept of Gibbs Ensemble” according to the Gibbs ensemble a group of large no of M system at which are being imagined as the true replaces of actual system (existing at different times) existing at same time is called Gibbs ensemble. Also, sir tells about time and space continuity.

Session-IV (4.00 to 5.30 pm): last lecture started at 4.00 pm up to 5.30pm, The Chairperson

of this technical session was Dr. Gunvant Wadpalliwar Assistant professor and head, department of geology, Shri Govindrao Munghate Art and Science College Kurkheda district Gadchiroli, Maharashtra, The resource person for last lecture was Dr. Vinod Patle, and Associate Professor School of Studies in Computer Science, Pt. Ravishankar Shukla University, Raipur delivered a lecture on the topic “Online learning” Sir teaches us how to create moodlecloud site and how we add course in site including quiz, paper, course details and everything related to course, the session was informative.

Day 6: (16/03/2024)

Session-I (10:30 to 12:00 a.m.): First lecture started at 10.30 a.m. up to 12.00 p.m., The Chairperson of this technical session was Dr. Yugendra Kumar Kurrey, Assistant Professor in Physics, Govt. Chandulal Chandrakar Arts & Science College, Patan, Durg. The resource person for First Lecture was Prof. Manoranjan Kar, from Department of Physics, IIT Patna. He delivered a lecture on the topic “Modern Microscopy: Tools for Observing Unconventional World”. Sir covered the topic from Conventional & Unconventional Microscopy by giving the details of Magnification and Resolution their interrelation and Resolution Power. Sir detailed about the SEM & TEM techniques and brief about the EDS. Sir also discussed STM (Scanning Tunneling Microscopy), AFM, Atomic Force Microscopy & MFM Magnetic Force Microscopy. His lecture was more effective and more informative.

Session-II (12:15 to 1:45 p.m.): Second lecture started at 12.15 pm up to 1.30 pm, The Chairperson of this technical session was Dr. Yugendra Kumar Kurrey, Assistant Professor in Physics, Govt. Chandulal Chandrakar Arts & Science College, Patan, Durg. The resource person for second lecture was Prof. Manas Kanti Deb. He is a Professor in SoS Chemistry, at Pt. RSU, Raipur Sir delivered a lecture on the topic “Analytical Tools for the Diagnosis of the Atmosphere”. He detailed the PM10 & PM2.5 SPM, RSPM, VOC and Monitoring of Ambient Air Quality by discussing about the standards and the Air Quality Index. He also discussed the NAMP parameters and the sampling procedures of Aerosol by cascade impactor sampler. The discussion was so impactful when Sir started giving the details about

the working principles of various analytical procedures including the Ion Chromatography, AAS (Atomic Absorption Spectrometry), Gas Chromatography. FID (Flame ionization Detector), NPD (Nitrogen Phosphors Detector), PID (Photo Ionization Detector) and MS (Mass Detector). His entire lecture was highly informative and mind blowing.

Session-III & IV (2:15 to 5:30 p.m.): (Seminar session). The last session started at 2:15 p.m. upto 5:30 p.m. The Chairperson of this participants Micro-teaching session was Dr. Yugendra Kumar Kurrey, Assistant Professor in Physics, Govt. Chandulal Chandrakar Arts & Science College, Patan, Durg and the Resource person was Prof. Anubha Singh Gour, Madam is presently working as a Professor in SoS Physics & Astrophysics at Pt. RSU, Raipur. In this session all the participants (22-No's) delivered the Seminars on variety topics. The last session was also informative.

Day 7: (18/03/2024)

Session I & II (10:30 – 12:30 & 12: 30 – 13:45)

Resource Person – Dr. G.M. Naik, Professor of High Academic Grade in Electronics & Former Dean, Faculty of Natural Science, Goa University, Goa, India.

Topic – Computational Environment for Machine Learning

Respected Naik sir provided very important, interesting and useful information related to computational environment for machine learning. He explained various points like classification on the basis of type, size and purpose, configuration of computers in a good and simple manner. He gave huge information on USB, CPU, Memory, Microprocessor and its speed and types. Also gave knowledge on super computer and its speed, mainframe and mini computers. Which CPU do I need? How do the CPU and GPU interact? and difference between CPU & GPU were explained by our resource person. After then, the programming on the CPU and GPU, Advantages of GPU Programming, Types of GPU are also discussed by Dr. Naik. Dr. Naik also interacted with the participants.

Session III & IV (14:15pm – 15:45pm)

Resource Person – Prof. T Kishore, National Institute of Technology Warangal

Topic – Application of Artificial Intelligence of Things (AIoT)

Our resource parson Prof. T. Kishore Kumar sir gave very informative knowledge on

current scenario topic Artificial Intelligence (AI). He explained need for artificial intelligence, Interdisciplinary domains and AI Hierarchy. The classification of AI on the capability based – weak AI, General AI and Supper AI and functionality based – reactive machines, limited memory, theory of mind and self-awareness was discussed by resource person. He also provided information on research areas in AI, feature extraction methods – filter method, wrapper method and embedded method, classification methods and applications of AI. After then, he provided information on reinforcement machine learning, Internet of Things (IoT) and Artificial Internet of Things (AIoT), data processing, IoT application in home, transport, health, buildings, cities, organizations and agriculture areas. Prof. T. Kishore Kumar Also discussed on application of AIoT in shopping, healthcare and Industry. Finally, he briefs discussed the application of AI & IoT in Physics such as data analysis, simulations and modelling, particle physics research, complex system analysis and real time adaptation. Prof. T; Kishore Kumar also interacted with the participants.

Session IV (16: 00 pm – 17:30 pm) – Project Work

In this session all the participants discussed the preparation of project work with their project group members and the projects were evaluated by Prof. Nameeta Brahme, Professor & Head, SoS in physics and Astrophysics, PRSU, Raipur. Today sessions were chaired by Dr. Preetibala Jaiswal and reporter was Mr. Lekhram Hirwani.

Day 8: (19/03/2024)

Session – I (10.30 to 12 pm): First lecture started at 10.30 am up to 12.00 pm, The Chairperson of this technical session was **Dr. G. Nag Bhargavi** Assistant Professor of Physics, Govt. Pt. Shyamacharan Shukla College Dharsiwa, Pt Ravishankar Shulka University Raipur, (C.G.). The resource person for first lecture was **Dr. Tarasankar Pal**, distinguished visiting Prof. University of Johannesburg South Africa, former Prof. IIT Kharagpur, delivered a lecture on the topic “**Fats, Oils, Soaps & Detergents**” He gave detailed explanation about soap and detergent and also difference between hard and soft water. He discussed on discovery of bulb, CFL, LED, Tube light.

Session – II (12.00 noon to 01.45 pm): Second lecture started at 12.00 pm up to 01.45 pm, The Chairperson of this technical session was **Dr. G. Nag Bhargavi** Assistant Professor of Physics, Govt. Pt. Shyamacharan Shukla College Dharsiwa, Pt Ravishankar Shulka University Raipur, (C.G.). The resource person for second lecture was **Dr. Tarasankar Pal**, distinguished visiting Prof. University of Johannesburg South Africa, former Prof. IIT Kharagpur, delivered a lecture on the topic “**Metals and Non-metals**”. He gave detailed explanation about metallurgy of stainless steel and solute and solvent.

Session – III & IV (02.15 pm to 05.30 pm): Third and fourth lecture started at 02.15 pm up to 05.30 pm, The Chairperson of this technical session was **Dr. G. Nag Bhargavi** Assistant Professor of Physics, Govt. Pt. Shyamacharan Shukla College Dharsiwa, Pt Ravishankar Shulka University Raipur, (C.G.). The resource person for the third & fourth lecture was **Dr.M.P. Gupta** former Prof. School of Studied in Geography Pt. Ravishankar Shukla University Raipur (C.G.), delivered a lecture on topic “**Route to Scientific Explanation/Scientific Explanation of Geography**” He gave detail explanation about multidisciplinary aspect of all subject and technology and also discussed about types of analysis, data collection, system analysis, research hypothesis and research parameters. The reporter of the today sessions was Deepesh Kumar Barsel, Assistant Professor in Chemistry, Late Daran Bai Taram Govt.College Gurur, Dist – Balod (Chhattisgarh)

Day 9: (20/03/2024)

Chairperson of the day: Dr. Ragini Pandey, Asst. Prof. Govt. D. B. Girls College, Raipur

Session - I and II (10:30am to 12:.00 noon) and (12:15 pm to 13:.45 pm)

Resource person: Dr. Vinod Patle, SoS in Computer Science, Pt. Ravishankar Shukla, University, Raipur.

Dr. Patle started his lecture at 10:30 AM for the technical session-I on LMS; Website creation and management using the Moodle cloud portal. He made us learn how to create and manage a website for any course work. We learned to create multi-layered web-page for

adding contents and student's evaluation tools. He continued his talk for the next technical session-II on LMS for the remaining steps.

Session - II and IV: (14:15 pm to 15:45 pm) and (16:00 pm to 17:30 pm)

PROJECT PRESENTATION

Technical expert: Prof. Nameeta Brahme, SoS in Physics & Astrophysics, Pt. Ravishankar Shukla University, Raipur. All the participants were clubbed in small groups for the Project presentation. Total five groups were presented their project report. The Technical expert Dr. Namita Brahme Madam, appreciated the participants and gave them feedback as per their presentation. A total of 5 presentations were presented by the groups and assessed by Prof. Brahme.

Day 10: (21/03/2024)

Session – I (10.30 am to 12 noon): First lecture started at 10.30 am up to 12.00 pm, The Chairperson of this technical session was Dr. Saraswati Devi Bervanshi Assistant Professor of Geography, Shri Kuleshwar Mahadev Government College Gobra Nawapara, Pt Ravishankar Shukla University Raipur, (C.G.). The resource person for first lecture was Prof. NK Baghmar Former Professor SoS in Geography Pt. Ravishankar Shukla University Raipur, delivered a lecture on the topic He gave detailed explanation about the impact of water resources on the environment is profound and multifaceted. Depletion of water sources, pollution from industrial and agricultural activities, and alteration of aquatic ecosystems are significant concerns. Addressing these issues requires sustainable management practices and widespread awareness to mitigate adverse effects on the environment and ensure the availability of clean water for future generations.

Session – II (12.00 noon to 01.45 pm): Second lecture started at 12.00 pm up to 01.45 pm, The Chairperson of this technical session was Dr. Saraswati Devi Bervanshi Assistant Professor of Geography, Shri Kuleshwar Mahadev Government College Gobra Nawapara, Pt Ravishankar Shukla University Raipur, (C.G.). The resource person for

second lecture was Dr. Anusuiya Baghel Retd. Professor SoS in Geography Pt. Ravishankar Shukla University Raipur, delivered a lecture on the topic. She gave detailed explanation about the Chhattisgarh's population regions vary from densely populated urban centers like Raipur and Bilaspur to sparsely inhabited rural areas such as Bastar and Surguja. These demographic patterns influence the state's development dynamics, with urban regions driving economic growth while rural areas maintain traditional agrarian livelihoods.

Session – III (02.15 pm to 03.45 pm): Third lecture started at 02.15 pm up to 03.45 pm, The Chairperson of this technical session was Dr. Saraswati Devi Bervanshi Assistant Professor of Geography, Shri Kuleshwar Mahadev Government College Gobra Nawapara, Pt Ravishankar Shulka University Raipur, (C.G.). The resource person for the third lecture was Dr. S. K. Rout Prof. Dept. Of Physics BIT, Mesra, delivered a lecture on topic He gave detail explanation about material research plays a pivotal role in social advancement by enabling the development of innovative technologies and sustainable solutions for various societal challenges. Through advancements in materials science, such as lightweight and durable materials for infrastructure or eco-friendly alternatives for packaging, societal needs can be addressed while minimizing environmental impact.

Session – IV (04.00 pm to 05.15 pm): In this session group 6 to 8 participants discussed the preparation of project work with their project group members. The Chairperson of this session was Dr. Namita Brahme, SoS in Physics and Astrophysics at Pt. RSU, Raipur. The last session was also informative. In the end Prof. Brahme gave brief of all the presentations and valuable suggestions to improvise the research proposals to be submitted to the funding agencies. She also explained through powerpoint presentation about how to write an effective research proposal.

Day 11: (22/03/2024)

The 11th day of the refresher course featured four lectures, each providing profound insights into their respective subjects. The sessions were well-attended by participants from various disciplines, enhancing the interdisciplinary nature of the learning

experience. The Chairperson of today's session was Dhanesh Kumar Banjare, Assistant Professor (Physics) Govt. L.C.S. PG College, Ambagarh, Chowki and reporter was Dr. La Reported by: Dr. Laxmi Kant Center for Basic Sciences, Pt. Ravishankar Shukla University, Raipur (C.G.).

Session-I & II: 10:30 am - 12:00 noon and 12:15 pm- 13:45 pm

Resource Person: Dr. Awadhesh Kumar Rai

Prof. Awadhesh Kumar Rai presented “Laser Induced Breakdown Spectroscopy (LIBS): Principle and Application in Earth and Biomedical Science”, an in-depth exploration of Laser Induced Breakdown Spectroscopy (LIBS), covering its principles and its broad applications in both earth and biomedical sciences. The lectures were structured to make the complex topic of LIBS accessible to participants from diverse fields, achieving this through the use of engaging examples and clear explanations.

Key Highlights:

- Prof. Rai detailed how LIBS technology enables the precise analysis of various samples, including human teeth, hair, nails, vegetables, and ancient coins, with minimal sample damage.
- The importance of LIBS in environmental studies was illustrated through the analysis of river water and gemstones, showcasing its role in both current and future scientific research.
- The lectures emphasized the interdisciplinary utility of LIBS, bridging physics, earth sciences, and biomedical sciences through real-world applications. The sessions were highly appreciated by participants for making a sophisticated technology like LIBS understandable and relevant to a broad audience. Dr. Rai's ability to connect with participants across different disciplines was commendable.

Session-III & IV: (14:15 pm- 15:45 pm and 16:00 pm- 17:30 pm)

Resource Person: Prof. D.P. Kuity

Prof. D.P. Kuity engaged the participants with two compelling lectures focusing on the

foundational aspects of geology and the dynamic processes shaping the Himalayas.

Key Highlights: Language of Petrology-

- Prof. Kuity elucidated the chemical compositions, crystallization processes, and alterations of rocks.
- The session provided valuable insights into microscopic analysis and mineral identification, crucial for understanding rock types and their formation.

Evolution of Himalayas-

- The formation and tectonic history of the Himalayan mountain range were detailed, highlighting the collision between the Indian and Eurasian plates.
- Prof. Kuity discussed the geological diversity within the Himalayas, including various sedimentary belts and crystalline units.

Participants expressed deep appreciation for Prof. Kuity's expertise in geology, noting how his lectures expanded their understanding of petrology and the geological evolution of significant landforms like the Himalayas. His ability to distill complex concepts into accessible knowledge was highly praised.

Conclusion: The sessions on Day 11 of the refresher course successfully broadened the participants' knowledge horizons, cultivating a cross-disciplinary appreciation for the sciences discussed. The lectures by Dr. Rai and Prof. Kuity were not only educational but also inspirational, encouraging further exploration and study in their respective fields.

Day 12: (23/03/2024)

GROUP DISCUSSION & VALEDICTORY FUNCTION

The Valedictory function was started at 11 am in the esteemed presence of honourable Director Prof. Preeti K Suresh and Course co-ordinator Prof. D P Bisen. In the valedictory session the Prof. Suresh, blessed the session and wished the co-ordinators for successful

completion of the course. Director Prof. Suresh wished all the participants for their excellent academic career. Three participants Dr. G Nag Bhargavi from Pt. Shyamacharan Shukla College Dharsiwa, Dr. Vikal Kumar Singh, Central University of South Bihar Gaya, DR Gunwant Ganpati Wadpalliwar, Gondwana University Gadchiroli gave feedback on the entire course. The final report was presented by the co-ordinator Dr. Bisen. Dr. Arvind Agarwal gave the vote of Thanks. Then all had a group photo.

(11.03.2024 to 23.03.2024)

	Session -I (10:30 to 12:00)	Session -II (12:15 to 13:45)	Session -III (14:15 to 15:45)	Session -IV (16:00 to 17:30)
Day 05 15.03.2024	Lecture-12 LMS Dr. Vinod Patle SoS Computer Science, Pt. RSU, Raipur	Lecture-13 Prof. Y M Gupta Rtd. Principal Rungta Engineering College Bhilai	Lecture-14 Prof Y.M. Gupta Rtd. Principal Rungta Engineering College, Bhilai	Lecture-15 LMS Dr. Vinod Patle SoS Computer Science, Pt. RSU, Raipur
Day 06 16.03.2024	Lecture-16 Dr. Manoranjan Kar Dept. of Physics IIT, Patna 9470836606	Lecture-17 Prof. Manas Kanti Dev SoS Chemistry, Pt. RSU, Raipur	Seminar (1-12) Prof. Anubha Singh Gour SoS Physics & Astrophysics, Pt. RSU, Raipur	Seminar (13-22) Prof. Anubha Singh Gour SoS Physics & Astrophysics, Pt. RSU, Raipur
Day 07 18.03.2024	Lecture-16 Dr.G.M.Naik Professor of High Academic Grade in Electronics & Former Dean, Faculty of Natural Sciences,Goa University, Goa, 403206, India Ph:8762786501, e- mail: gmaik@unigoa.ac.in	Lecture-17 Professor of High Academic Grade in Electronics & Former Dean, Faculty of Natural Sciences,Goa University, Goa, 403206, India Ph:8762786501, e- mail: gmaik@unigoa.ac.in	Lunch Break	Tea Break
Day 08 19.03.2024	Lecture-20 Prof. Tarasankar Pal Distinguished Visiting Professor,University of Johannesbu South Africa; Former Prof. IIT, Kharagpur tarasankar.pal@gmail.com 8436797435/9434342349	Lecture-21 Prof. Tarasankar Pal Distinguished Visiting Professor,University of Johannesburg, South Africa; Former Prof. IIT, Kharagpur tarasankar.pal@gmail.com 8436797435/9434342349	Lecture-22 Prof. M.P. Gupta Former Professor SoS in Geography Pt. Ravishankar Shukla University, Raipur (CG)	Lecture-23 Prof. M.P. Gupta Former Professor SoS in Geography Pt. Ravishankar Shukla University, Raipur (CG)

Day 09 20.03.2024	Lecture-24 LMS Dr. Vinod Patle SoS Computer Science, Pt. RSU, Raipur	Lecture-25 LMS Dr. Vinod Patle SoS Computer Science, Pt. RSU, Raipur	Project (Group 1-4) Prof. Nemita Brahme SoS in Physics & Astrophysics Pt. Ravishankar Shukla University, Raipur (CG)	Project (Group 5-7) Prof. Nemita Brahme SoS in Physics & Astrophysics Pt. Ravishankar Shukla University, Raipur (CG)
Day 10 21.03.2024	Lecture-26 Prof. NK Baghmar Former Professor SoS in Geography Pt. Ravishankar Shukla University, Raipur (CG)	Lecture-27 Prof. Ansuuya Bhagel Former Professor SoS in Geography Pt. Ravishankar Shukla University, Raipur (CG)	Lecture-28 Prof. Sanjib Rout Dept. of Physics BIT, Mesra	Project (Group 8-11) Prof. Nemita Brahme SoS in Physics & Astrophysics Pt. Ravishankar Shukla University, Raipur (CG)
Day 11 22.03.2024	Lecture-29 Dr. Awadhesh Kumar Rai Professor of Physics Former Head, Department of Physics Former Dean, Research and Development Former Director, Institute of Professional Study University of Allahabad Allahabad 211002 Phones 9335110163 (Mob)	Lecture-30 Dr. Awadhesh Kumar Rai Professor of Physics Former Head, Department of Physics Former Dean, Research and Development Former Director, Institute of Professional Study University of Allahabad Allahabad 211002 Phones 9335110163 (Mob)	Lecture-31 Prof. D.P. Kuity Former Professor SoS in Geology Pt. Ravishankar Shukla University, Raipur (CG)	Lecture-32 Prof. D.P. Kuity Former Professor SoS in Geology Pt. Ravishankar Shukla University, Raipur (CG)
Day 12 23.04.2024	Lecture-33 Group Discussion	VALEDICTORY		