



GOVERNMENT COLLEGE

An Autonomous Institution Since 2000 :: RAJAHMUNDRY, ANDHRA PRADESH, INDIA

HANSA & GCRJY - EDU INITIATIVE

HI - GLOW

HANSA SOLUTIONS INDIA PVT. LTD. - GOVERNMENT COLLEGE (A), RAJAHMUNDRY

LAB ON WHEELS

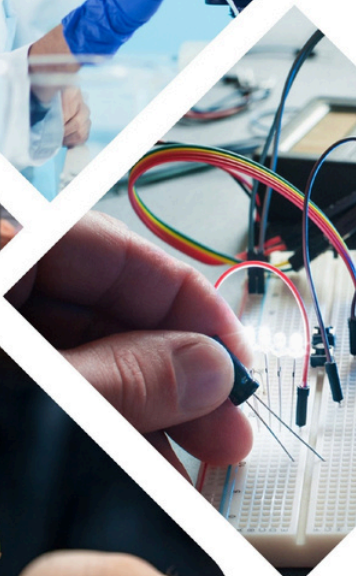
INSTITUTION OUTREACH PROGRAM

Under Institution Academic Social Responsibility (IASR)

A PRACTICAL EXPOSURE FOR GOVERNMENT HIGH SCHOOL STUDENTS

ASSOCIATED DEPARTMENTS

- PHYSICAL SCIENCES
- LIFE SCIENCES
- CHEMICAL SCIENCES
- MATHEMATICS & COMPUTER SCIENCES



0883 2475732



www.gcrjy.ac.in



gcrjy1853@gcrjy.ac.in

Foreword

HI-GLOW : HANSA SOLUTIONS INDIA PVT. LTD., – GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY LAB ON WHEELS

Government College (Autonomous), Rajahmundry, is a prestigious educational institution in the state of Andhra Pradesh, renowned for its rich legacy and commitment to quality education. Established initially in the year 1853 as Zilla School, the college was upgraded to higher education institution 1873. Since then, it has been instrumental in shaping students into knowledgeable and socially committed intellectuals. Notable alumni of the college include great people like Sri Tanguturi Prakasam Pantulu, the former Chief Minister of the erstwhile Andhra State, educationists Dr. C.R. Reddy, Justice Koka Subbarao and numerous IAS, IFS and other high rank officials across the country.

The college was conferred autonomy status in 2000 and reaccredited with A+ Grade by NAAC in 2020 achieving a CGPA of 3.38/4.00. Further, the institution was recognized as “College with Potential for Excellence” in 2016. The institution continues to uphold its tradition of excellence by fostering an environment of intellectual growth and societal contribution.

The college has a rich tradition of organizing Community Outreach Programmes aimed at fostering knowledge sharing, promoting social responsibility, and strengthening community engagement. As part of this initiative, all the Science Departments of our college have been instrumental in sharing the available laboratory resources with schools and colleges in the vicinity of Rajahmundry. Every year, these departments organize a one week programme to provide hands-on-experience to school children and junior college students.

In recognition of the rich legacy and contributions of our institution towards knowledge-sharing, Sri K.V. Ram Prasad, Chairman of Hansa Solutions India Pvt. Ltd. has extended a generous support to the institution by donating a 36 seat (recliner seats) air-conditioned bus (SML HIROI make) worth 39 lakhs. This donation enables us to further expand our outreach, providing practical exposure through mobile laboratory facilities to the needy educational institutions. Additionally, I am delighted to share that Sri Ram Prasad has contributed ₹70 lakhs towards the establishment of an Innovation and Incubation Hub at our institution, a remarkable boost to our efforts in nurturing creativity and entrepreneurship among students. We are extremely grateful to Sri K.V. Ram Prasad for his huge support for the institution which helps us serve the student community better.

Many students, particularly those in rural and underserved areas, lack access to modern laboratories and equipment, hindering their ability to engage in experiential learning and explore their full potential. This is precisely why the HI-GLOW : HANSA SOLUTIONS INDIA PVT. LTD. – GOVERNMENT COLLEGE (AUTONOMOUS),

RAJAHMUNDY LAB ON WHEELS programme was conceived – to give more access to quality education and bridge the gap between the privileged and the underserved. By bringing fully equipped laboratories on wheels to the doorstep of schools and communities, we aim to ignite curiosity, foster creativity, and nurture the next generation of thinkers, innovators, and leaders.

Through HI-GLOW, we envision a future where every student, regardless of their geographical location or socio-economic background, has the opportunity to explore, experiment, and excel in the fields of science, technology, engineering, and mathematics (STEM). We believe that by empowering students with hands-on learning experiences, we can unlock their full potential, inspire them to pursue careers in STEM, and ultimately contribute to the development of a more informed, innovative, and equitable society.

We are proud to launch the HI-GLOW : HANSA SOLUTIONS INDIA PVT. LTD. – GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDY LAB ON WHEELS and look forward to partnering with schools, educators, and communities to make a meaningful difference in the lives of students everywhere.



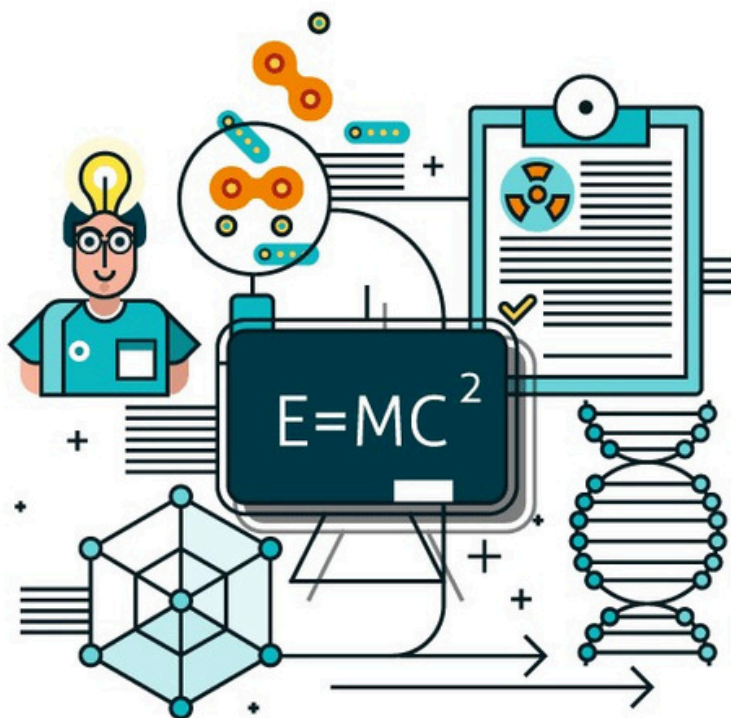
Dr. Ramachandra R.K. M.sc., Phd.
Principal, Government College (A), Rajahmundry.

DEPARTMENT OF PHYSICS & ELECTRONICS

Founded in 1930, the Department of Physics has a rich history dating back to the Madras Province of British India. The department offers a comprehensive range of programs, catering to both undergraduate and postgraduate students.

- Undergraduate Programs: The department offers four B.Sc. major programs, including one focused on Renewable Energy Management, a job-oriented program.
- Postgraduate Programs: Students can pursue a M.Sc. in Physics, along with research opportunities leading to M.Phil. And Ph.D. degrees. These research programs are affiliated with prestigious universities like Andhra University (Visakhapatnam), Adikavi Nannaya University (Rajamahendravaram), and Jawaharlal Nehru Technological University (Kakinada).
- Research Focus: Established in 2009-10, the Crystal Growth and Nano Science Research Centre fosters a research-centric environment for students and faculty.

Beyond academics, the department prioritizes practical knowledge and skills. They boast an advanced simulation robotics lab to enhance learning and offer various certificate courses through their Dual Degree Program. The department practiced LAB TO SCHOOL as best practice for the last 10 years. This programme targeted to improve the experimental skills of school students.



S. No	Name of the Experiment	Apparatus	Outcomes
1	Measuring with Vernier Calipers	Vernier calipers Set of objects to measure (e.g., metal rods, glass tubes, spheres)	Students will learn how to measure objects accurately and understand the significance of the least count in precision instruments.
2	Measurement Using a Screw Gauge	Screw gauge (micrometer) Standard calibration gauge block Assorted samples (thin metal wire, sheet of paper, small metal blocks)	
3	Determination of the Least Count of a Spectrometer and a Traveling Microscope	● Spectrometer with a Vernier scale ● Traveling microscope with a Vernier scale ● Calibration standards (if available)	Students will understand the precision of optical instruments.
4	Simple Pendulum	● A sturdy support stand ● String of varying lengths (1m, 1.2m, 1.4m) ● Small weights (such as metal washers or a small ball) ● Stopwatch or timer ● Meter stick or measuring tape ● Protractor for angular measurement device	Students will understand the factors affecting pendulum motion and estimate local gravitational acceleration
5	Determination of Wavelength of LASER Using Diffraction Grating	● Laser (visible wavelength) ● Diffraction grating (with known line spacing)	Students will explore concept of diffraction and wave optics

		● Screen to observe the diffraction pattern ● Meter stick or measuring tape ● Protractor or angle measuring device ● Dark room to enhance visibility of the diffraction pattern	
6	Newton's Law of Cooling	● Hot water ● Insulated container (to minimize heat loss other than through natural cooling) ● Thermometer or digital temperature sensor ● Stopwatch or timer ● Graph paper or spreadsheet software for plotting data	Students will analyze thermal properties and cooling behaviors in liquids.
7	Determination of the Thickness of a Thin Wire Using Laser Diffraction	● Laser (visible wavelength, such as red or green) ● Thin wire (the sample whose thickness is to be determined) ● Screen to capture the diffraction pattern ● Optical bench or stable platform Meter stick or measuring tape Micrometer screw gauge (for validation of results)	Students will learn about light diffraction and use it for precise measurements

8	Determination of the Focal Length of a Convex Lens by Image Method	• Convex lens with a known approximate focal length • Optical bench or similar linear track • Light source (distant object or candle) • Screen (to capture the image formed by the lens) • Meter stick or ruler for measurement	Students will learn to focus light using a lens and apply lens formulas for calculations.
9	Verification of Ohm's Law	• A resistor (100 ohms, for example) • A variable power supply • A digital multimeter • Connecting wires • Breadboard (optional, for easier connections)	Students will observe the linear relationship between voltage and current for a resistor.
10	V-I Characteristics of a Solar Cell	• Solar cell • Variable resistor (load) • Multimeter or separate voltmeter and ammeter • Light source (e.g., halogen lamp) • Connecting wires	Students will gain insights into renewable energy and the efficiency of solar cells.
11	Verification of Basic Logic Gates - AND, OR, NOT Gates	• Logic gates kit (containing AND, OR, and NOT gates) • Power supply • Connecting wires • LED indicators or a digital logic probe	Students will understand fundamental digital logic principles.
12	Basic Operation of an Oscilloscope	• Oscilloscope • Function generator	Students will understand the usage of the

		• Connecting cables (BNC cables) • Simple electronic components (resistors, capacitors, if required for specific waveform creation)	oscilloscope in measurement of values such as peak-to-peak voltage, frequency, and any other relevant parameters. Students will learn circuit analysis techniques and resistance measurement.
13	Determination of Unknown Resistance Using a Meter Bridge	• Meter bridge (consisting of a 1-meter long wire of uniform cross-section) ● Unknown resistor • Known resistors (range of resistors for substitution) • Galvanometer • Jockey • One-way key • Battery or power supply • Connecting wires	
14	Variation of Magnetic Field with Distance Due to a Current Carrying Circular Coil	• Circular coil (with known number of turns and radius) • Power supply (DC) • Ammeter • Compass • Protractor or angular scale to measure deflection angles • Meter stick	Students will connect magnetism principles to practical applications.
15	Measurement of the Focal Length of a Concave Mirror Using the Image Method	• Concave mirror with a known diameter and approximate focal length • Optical bench or similar linear track	Students will explore image formation and apply formulas to

		• Small object (e.g., arrow or candle) • Screen to capture the image • Meter stick or Vernier caliper for precise measurement	calculate focal lengths.
16	Study of a Compound Pendulum	• Rigid bar or rod (compound pendulum) • Knife-edge clamps (pivot) • Stopwatch • Meter stick • Small protractor • Weighing scale	Students will understand advanced pendulum dynamics and derive key physical constants.

DEPARTMENT OF CHEMISTRY

MOBILE LAB



About The Chemistry Department: The Department of Chemistry was established in 1930 under the Madras Province of British India. The Post Graduate Course in CHEMISTRY was introduced in 1971. Recognized research Centre since 2005. Biggest department with 33 faculty members including 13 Doctorate faculties. At present, 03 B.Sc., Major programs are B.Sc. Chemistry (Hons), B.Sc. Organic Chemistry (Hons) and B.Sc. Analytical Chemistry (Hons), 03 M.Sc. (Chemistry) programs are M.Sc. Organic

Chemistry, M.Sc., Analytical Chemistry and M.Sc. Physical Chemistry being offered by the Department. The Department also offered Ph.D programmes.

Unique Features of the programme:

- ✓ Interactive sessions with highly qualified and professional faculty.
- ✓ Tomorrow's Laboratories Today!
- ✓ Micro scale Based Practical Experiments.
- ✓ Application of Theory to Practice.
- ✓ Useful for students having the zeal to learn and excel in chemistry.
- ✓ Demonstration and Hands on experience.
- ✓ Innovative science projects included.
- ✓ For Promoting Collaboration attitude and Communication among students

S. No	Name of the Experiment	Apparatus required	Chemicals required	Outcome of the Experiment
1.	Introduction of glassware and other equipments are used in laboratory	Beakers, test tubes, watch glass, test tube holders, Conical flasks, Volumetric flasks, burettes, pipettes, Wash bottle, Bunsen burner, tripod stands, burette stands	-	Students can able to know name and use of different glassware and other equipments used in Laboratory
2.	Solubility: Solubility of some common liquids in water, saturated solution and Supersaturated solution.	Beakers, Test tubes, Glass rods, test tube holders	Vinegar, Lemon juice, mustard oil, coconut oil, kerosene, NaCl, HCl, NaOH.	Students can able to distinguish soluble and insoluble liquids and Understand the concepts of Saturated and Supersaturated solutions
3.	Separation of substances: Sedimentation, Decantation, Filtration, Evaporation	Beakers, Bunsen burners, and tripod stand	Water, Salt and mud water, Filter paper Epsom salt (patika)	Students can able to learn how to separate components

	And Condensation Evaporation And Condensation Acids,			from mixture
4.	bases and Salts: identification of acids, bases and Salts using indicators, PH papers, Litmus paper, Phenolphthalein indicator and some natural indicators turmeric paper and China rose solution, Beetroot and Cabbage juice. Physical and Chemical	Beakers, Test tubes, Gloss rods, test tube holders, Test tube stands	Litmus papers, Phenolphthalein indicator, methyl orange, Filter papers, turmeric powder, China roses, Beetroot and Cabbage, HCl, NaOH, NaCl, Vinegar, Tamarind, Lemon Juice, Amla and Unripe Mango	Students are able to easily identify acids and bases.
5.	changes: Melting of ice, evaporation of water, solidification of water, determination of Melting point and Boiling point, rusting of iron and heating of magnesium ribbon, Crystallization Combustion and Flame: Combustion	Beakers, Test tubes, Gloss rods, test tube holders, Bunsen burners, and tripod stand	Ice, water, rusted iron piece, magnesium ribbon and Copper sulphate and dil H ₂ SO ₄	Students are able to distinguish physical and chemical changes of compounds and crystallization techniques.
6.	of different substances, different Zones of flame of Bunsen burner and use of Fire extinguisher	Bunsen burner, Candle and Fire extinguisher	Wood, paper, Iron nails, kerosene oil straw, match stick, Charcoal and glass	Students can able to understand Combustible and NonCombustible substances, understand knowledge about oxidation, reduction Zones of flame and use of Fire extinguisher

7.	Physical nature of Matter :Sublimation Evaporation, Volatility ,And Condensation	Glass funnel, China dish, beakers and watch glass Bunsen burners, and tripod stand	NH ₄ Cl, Water, Ethanol and ether, Camphor	Students can able to understand Sublimation and Evaporation techniques
8.	Types of mixtures: types of solutions Concentration of solutions, True solution, Suspension, Precipitation, and Colloidal solution	Beakers, test tubes, Volumetric flasks	NaCl, BaCl ₂ , Sugar, Milk	Students can able to understand Homogeneous and heterogeneous solutions, expressing concentration of solutions and identify the Suspension and Colloidal solutions Students
9.	Qualitative analysis: a) Identification and confirmatory tests for Cl ⁻ , Br ⁻ , CO ₃ ²⁻ , NO ₃ ⁻ , SO ₄ ²⁻ b) Identification tests for Nitrogen	Bunsen burner flame, test tubes, holders, glass rods, watch glass.	Dil.HCl Ca(OH) ₂ Conc. H ₂ SO ₄ FeSO ₄ NH ₄ Cl, AgBr, CaCO ₃ BaCl ₂ AgNO ₃ Ethanol	Students can able to identify anions
10.	Volumetric analysis: a) Preparation of 1M oxalic acid b) Standardization of NaOH using std. oxalic acid c) Standardization of HCl using std. NaOH	1) 250mL volumetric flask 2) Burette 3) Pipette 4) Conical flask 5) Burette stand 6) Funnel 7) Weighing balance 8) Wash bottle 9) Weighing bottle	1) Distilled water 2) Oxalic acid 3) NaOH 4) HCl 5) Indicators (Phenolphthalein and methyl orange)	Students can able to prepare standard solutions and determine the strength of unknown solutions.

11.	Ball and stick Models: Demonstration of structures of simple molecules using ball and Stick model	Ball and Stick Models		Students can understand structures of H ₂ O, NH ₃ , CH ₄ , PCl ₅ and SF ₆
12.	Atom, molecule, Ions and Names and symbols of elements, ions and Writing formula of Simple compounds			Students can understand basics of structure of atom and writing formula of compounds
13.	Theories of structure of atoms: Thomson's model of an atom, Rutherford's model of an atom, Bohr's model of an atom, Particles in Atom, Distribution of electrons in different orbitals, Atomic number and Mass number, Isotopes, isobars.	Charts, PowerPoint presentations		

Department of Computer Science & Applications

TECHTREK

EXPLORING COMPUTER SCIENCE ON WHEELS



About the Department:

The Department of Computer Science, Government College (A) Rajahmundry is a hub of innovation and education in computational sciences and information technology. Its primary aim is to prepare students for careers in software development, data science, artificial intelligence, cyber security, and other cutting-edge areas of computing. As one of the youngest departments in a college with a 170-year legacy, we take pride in our dynamic approach to education, constantly evolving to meet the demands of the ever-changing digital landscape. With a dedicated team of 8 experienced faculty members and a thriving community of over

1000 ambitious students pursuing Bachelor's degrees and Master's Degrees, the Department of Computer Science and Applications is a beacon of academic excellence. Our students' eagerness to learn, coupled with the expertise of our industry-trained faculty, ensures the cultivation of top-notch professionals sought after by esteemed companies worldwide. International students form a vital part of computer science departments worldwide, bringing diverse perspectives, innovative ideas, and global cultural experiences to academic institutions.

Our state-of-the-art facilities, including four fully air-conditioned computer laboratories equipped with 200 systems and robust computing infrastructure, underscore our commitment to providing cutting-edge resources for learning and innovation. Moreover, as the custodians of software and hardware requirements for the entire college, we play a pivotal role in driving technological advancements across campus.

Objectives of the Program:

The primary objective of this program is to introduce high school students to the fundamentals of Computer Science in a hands-on, practical, and engaging manner, even without a dedicated computer lab facility. Through this program, students will:

- 1 .Understand Basic Computer Science Concepts: Introduce key concepts in computer science such as algorithms, programming, Hardware and problem-solving.
- 2 . Develop Problem-Solving Skills: Help students develop critical thinking and logical reasoning through simple coding exercises and algorithmic challenges.
- 3 . Introduce Computational Thinking: Promote computational thinking by teaching students how to break down complex problems into smaller, manageable tasks.
- 4 . Hands-On Learning: Provide practical experience in using basic tools and software to solve problems, even without advanced technology or resources.
- 5 . Create Awareness of Computer Science Applications: Help students understand how computer science is applied in the real world, in everyday life, and in various industries.

6 . Boost Interest in Technology: Inspire students to consider pursuing computer science and related fields in further studies.

Overview of Practical Sessions

Sl. No.	Name of the Practical	Tools Required	Applications	Outcomes
1	Introduction to Algorithms (Paper-based exercises) Understanding	Pen, Paper, Whiteboard	Algorithm design, Problem-solving	Students will understand how algorithms solve problems step-by-step. Students will learn to
2	Flowcharts	Pen, Paper, Whiteboard	Designing algorithms visually, Flowchart creation	visualize and plan algorithms before coding. Students will understand
3	Binary Numbers and Binary Arithmetic	Pen, Paper, Whiteboard	Basics of computer data representation	how data is stored and processed in binary form. Students will visualize and
4	Basic Sorting Algorithms	Pen, Paper, Whiteboard	Understanding sorting techniques like Bubble Sort, Selection Sort	implement simple sorting algorithms. Students will convert
5	Number Systems and Conversions	Pen, Paper, Whiteboard	Understanding Decimal, Binary, Octal, Hexadecimal systems	numbers between different numeral systems. Students will learn how logic
6	Introduction to Logic Gates and Boolean Algebra	Pen, Paper, Whiteboard, or Printable Logic Gate Cards	Circuit design, Digital logic	gates work and their role in computer systems. Students will identify and describe the
7	Exploring Basic Computer Hardware Components	Whiteboard, Pen, Paper, Printouts of computer parts diagrams (CPU, RAM, HDD, etc.)	Understanding the functions of different hardware components	role of each hardware component in a computer system.

8	Introduction to Cybersecurity and Online Safety	Whiteboard, Pen, Paper, Internet access (optional)	Recognizing the importance of online safety and basic cybersecurity concepts	Students will learn to protect personal information and avoid online threats like malware and identity theft.
9	Exploring Safe Social Media Usage	Internet access (if available), Whiteboard, Pen, Paper	Discussing safe and responsible use of social media platforms	Students will understand the risks of social media and learn how to protect their privacy online.
10	Email Etiquette and Professional Communication	Whiteboard, Pen, Paper, Email templates (optional)	Understanding proper communication through email	Students will learn the rules of professional email etiquette, including structure, tone, and privacy.
11	Exploring Virtual Labs and Simulations	Computers/Tables with Internet access, Virtual lab software/tools (e.g., PhET simulations, Tinkercad, Scratch, etc.)	Using online simulations to learn and experiment with virtual science and computer science labs	Students will explore virtual labs and simulations for subjects like physics, programming, and electronics, gaining hands-on experience in a digital environment.

Conclusion:

This program aims to make computer science and technology education accessible, engaging, and practical for high school students, regardless of their school's resources. By bringing hands-on learning experiences directly to the classroom, students explore fundamental concepts of computer science, hardware, cybersecurity, and digital literacy.

Through experiments on hardware components, cyber safety, email etiquette, and virtual labs, students not only gain technical skills but also develop essential knowledge of responsible online behavior. The program fosters curiosity and equips students with

the skills needed to navigate the digital world, preparing them for future opportunities in an increasingly connected society.

Feedback and Recommendations:

To ensure the continued improvement and effectiveness of the College Lab on Wheels program, we request that all participants (students and teachers) provide their feedback. This will help us assess the impact of the program, identify areas for improvement, and understand the overall experience.

Department of Geology

"GeoDiscovery: Exploring Earth's Wonders"?



About the Department:

Geology is the scientific discipline focused on examining the Earth's composition, structure, and the evolutionary processes since its origin about 4.6 Ga ago in the geological history.

The Department of Geology at Government College (Autonomous) Rajahmundry was established in 1959, marking a significant milestone in the institution's commitment to geological studies. Over the years, the department has played a crucial role in providing quality education and fostering research in the field of geology. With a rich history spanning several decades, it has contributed to the academic and scientific community, producing knowledgeable graduates and contributing to advancements in geological knowledge. The department's longevity underscores its dedication to the pursuit of geological understanding and education, making it a noteworthy part of the academic legacy of the Institution.

Other than Core Geology employment, students of geology can opt their career in the areas such as Environmental Consulting, Mining and Mineral Exploration, Petroleum and

Regulation, Research and Academia, Natural Hazard Assessment and Mitigation, Remote Sensing and GIS Analysis, Palaeontology and Archaeology, Hydrogeology, Geotechnical Engineering, Environmental Policy

Geology Experiments: Objectives, Tools, Applications, and Outcomes

Sl. No.	Name of the Practical	Tools Required	Applications	Outcomes
1	Identifying Rocks and Minerals	Rock and mineral samples, Hand lens or magnifying glass, Mohs hardness kit (optional), Streak plates (porcelain tiles)	Students learn to identify basic rock types (igneous, sedimentary, metamorphic) and common minerals by observing their physical properties like color, lustre, hardness, and streak Gain a visual understanding of Earth's layers (crust,	Students will be able to identify different types of rocks and minerals by examining key characteristics and understand their formation processes. Students will construct a model of
2	Layers of the Earth Model	Modelling clay or playdough (in different colors), Scissors,		

		Ruler or measuring tape, Plastic transparent container	mantle, outer core, inner core) and their relative sizes and properties	Earth's layers, gaining a clearer understanding of the structure and composition of the planet. Students
3	Soil Profile	Clear glass jar, Soil samples from different locations, Water organic	Learn about soil horizons and how matter, sand, silt, and clay settle in layers	will observe and understand the structure of different soil layers and the processes involved in soil formation. Students
4	Volcano Eruption Model	Baking soda, Vinegar, Red food coloring (optional), Plastic bottle, Sand or clay for shaping	Understand volcanic eruptions and the role of pressure and chemical reactions in magma movement	will simulate a volcanic eruption, illustrating the forces and processes that lead to eruptions and the formation of volcanoes.

Conclusion:

The Geology Experiments provide students a hands-on understanding of Earth's natural processes, structures, and materials. By conducting experiments related to rocks and minerals, soil profiles, the layers of the Earth, and volcanic eruptions, students gain a deeper appreciation of the planet's geological systems. These interactive activities provide valuable learning experiences that allow students to explore geology beyond the textbook, fostering curiosity and a better understanding of Earth's dynamic processes.

The feedback from students and teachers will be essential for improving the program and ensuring that these experiments continue to meet educational objectives, enhancing the learning experience for future participants.

DEPARTMENT OF GEOGRAPHY

MOBILE LAB EXPERIMENTS

S. No	Name of the Experiment	Tools /equipment required	Outcome of the Experiment
1.	Introduction of Latitudes and longitudes, International time scale	Glob,World mapwith latitudes and longitudes	Students are able to know the use of latitudes and longitudes, and to understand the International time scale. Students can able to know the various time scales of various countries
2.	Conventional signs of Topographical maps and interpretation of Topographical maps	Charts of Conventional signs of topographical maps and topographic maps	Students can able to Understand the Conventional signs of topographical maps and they are able to know the Topographical maps and its Importance
3.	Contours – Representation of relief features	Charts of slopes and relief features and Topographical maps	Students can able to Understand the Contours and representation of relief features and can able to understand the various types of slopes of Landforms

DEPARTMENT OF MATHEMATICS

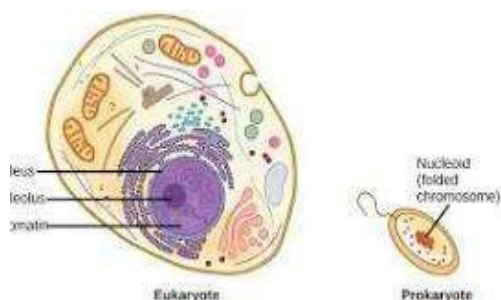
The department was established in 1871 with UG programs. The PG program was introduced in 1971. Currently, the department runs two UG programs i.e. B.Sc Honours Mathematics, B.Sc Honours Computational Mathematics with a sanctioned intake of 60 students in each stream. Next, the Department runs one PG program i.e. M.Sc Mathematics with a sanctioned intake of 40 students. The department has 15 faculty members with rich teaching experience.

MOBILE LAB EXPERIMENTS

S. No	Name of the Experiment	Tools required	Applications
1	An experiment with the tangent ratio can help visualize and understand how it relates to the geometry of a Right triangle.	A protractor or angle-Measuring tool, A ruler or measuring tape, A calculator.	Studying Measuring Building Heights, Designing Roofs, Land Surveying, Geographic Location, Inclined Planes, Geography and Meteorology.
2	To explore and identify the Golden Ratio in various geometric shapes, and to observe its occurrence in Nature or art.	Ruler or measuring Tape Protractor (optional) Graph paper Scissors and paper (optional for constructing shapes).	Applications in Art and Architecture, study of Growth Patterns in Plants, Spirals in Nature, Stock Market Analysis, Economic Models, Computer Graphics and Animation.
3	Investigating the Circle, Parabolas, an Ellipse Hyperbolas.	Two pins (for foci), A Piece of string, A pencil, Paper, A straight- edge (ruler) A, small mirror or a flash - light, Graphing Calculators, Geometrical Drawing Tools, Conic Section Software.	Reflective Properties in Optics, Planetary Orbits, Reflective Properties in Optics, Satellite Dishes and Parabolic Mirrors, Projectile Motion, Applications in Navigation: Hyperbolic positioning systems.

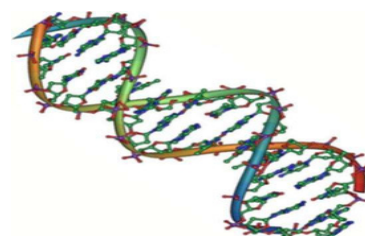
Life Sciences

An outreach activity organized with the aim of fostering curiosity in young students and promoting the field of life sciences as an exciting and dynamic area of study. The initiative sought to ignite young minds and encourage them to think critically about the world around them as well as contributing to the promotion of science education.



Objectives

1. To introduce high school students to basic concepts in life sciences, particularly biology, and its relevance to everyday life, create an interactive platform where students could share their knowledge and passion for science.



2. To raise awareness on the role of science in addressing global challenges such as environmental conservation and public health.

Event Highlights

1. Interactive Demonstrations: The Life Sciences UG & PG students organize hands-on activities and demonstrations, on simple biology experiments such as the dissection of plant tissues, observation of cells under a microscope, and illustrating DNA Models etc.,

2. Science Games and Quizzes: Fun and educational science games were organized to reinforce key concepts from the model presentations to challenge the students' knowledge in an engaging and friendly competition format.

Biotechnology proposed activities:

S.no	Name of the practical/ Demonstration	Apparatus used/ Required	Outcome
1.	Demonstration of Salivary amylase activity	Test tubes Starch Iodine	Know about Role of enzymes in Digestion.
2.	Evolution of CO ₂ during respiration from germinating seeds	Airtight Glass bottle Beaker KOH	Knows about cellular respiration and metabolic activity.

		Lime water	
3.	Working Model of DNA	Thin wooden sticks LEDs	Know about monomers in the Structure of DNA
4.	Puzzle Game demonstrating Sex Determination	Cardboard Pipes Color balls	Understands the genetic basis of gender determination.
5.	Working Model of Animal cell	Thermocol Glass chamber	Know detailed structure of animal cell and its organelles

Microbiology Proposed activities

S.no	Name of the practical/ Demonstration	Apparatus used/ Required	Outcome
1.	Demonstration of Gram staining	Slides Crystal violet Safranin Bacterial culture, Microscope	Know about structure of bacterial cell and differentiation of Gram+ve and -Ve bacteria
2.	Demonstration of onion peel cells	Slides Methylene blue dropper Microscope	Identification of key components of plant cells.
3.	Models of Bacteria and Virus	Thin wooden sticks Thermopolis	Understand the basic structure of Viruses and mechanism of pathogenesis.

Zoology proposed activities: Six Rare Specimens explaining the characteristics of Invertebrates and vertebrates.

S.no	Name of the practical/ Demonstration	Apparatus used/ Required	Outcome
1.	Demonstration of Human embryo	Specimen of 6 month old Human embryo	Identification of structural changes during embryonic development.
2.	Demonstration of Reptiles	Specimen of Naja Naja (Indian cobra)	Identification of physical characteristics

			like color, size and Hood marking
3	Demonstration of Actinopterygii of Exocoetus	Specimen of Exocoetus (Flying fish)	Identification of characteristics like elongated pectoral fins and streamlined body.
4	Demonstration of Chondrichthyes of Chordates	Specimen of Pristis (Saw fish)	Identification of distinctive features like saw like rostrum for defense
5	Demonstration of Mollusca - cephalopoda	Specimen of Octopus	Understanding of anatomical features including arms, suckers, mantle etc.,

Botany Proposed activities:

S.no	Name of the practical/ Demonstration	Apparatus used/ Required	Outcome
1.	Demonstration of Osmosis	Beaker Potato tubers Water Sugar solution	Know the process of water movements in plant cells
2.	Demonstration of chromatography on photosynthetic pigments	Chromatography paper Solvents Fresh green leaves	Knows about the presence of different coloured pigments in leaves.



PRINCIPAL

DR. RAMACHANDRA R.K. M.SC., PHD

UGC RAMAN PDF (USA),
STATE BEST TEACHER AWARDEE - 2018
GOVERNMENT COLLEGE (A), RAJAHMUNDRY

In Collaboration with:

SRI. RAM PRASAD K.V. Chairman
HANSA SOLUTIONS INDIA PVT. LTD., HYDERABAD, INDIA.