Department of Physics and Electronics

Annual Progress Report supported under Star College Scheme, 2025-26

1. Name of the College: St Francis College for Women
2. Name of the coordinator:

Physics: Dr. Usha Praveena V J
Designation: Associate Professor, Dept. of Physics
Address: St. Francis College for Women,
Begumpet, Hyderabad
Phone No: 8106265680

Electronics: Ms.B.Sushma
Designation: Assistant Professor, Dept. of Electronics
Address: St. Francis College for Women,
Begumpet, Hyderabad
Phone No: 9618583678

3. Assessment duration: 08/08/2025 to 31/03/2026
4. Duration in years : 1 year
5. Details of Departments Supported

Sl. No.	Name of Department	Courses (B.Sc./M.Sc./PG Diploma, certificate etc) offered	Regular Faculty members	
			Total = 82	
			With Ph.D.	Without Ph.D.
1	Physics & Electronics	B. Sc	2	1

5. Number & Date of Advisory committee meeting: 1, 22/07/2025

Internal meetings with the faculty: 8

(Principal,Vice Principal, DBT coordinator, Dean of Science, HoD's and Department coordinators).

6. Qualitative improvements due to DBT support.

- Strengthened laboratory infrastructure with advanced instrumentation.
- Improved technical skills through workshops and hands-on training and enriched curriculum with interdisciplinary and emerging topics.
- Increased student exposure to research and industry practices and built stronger linkages with industries and research organizations.
- Improved academic output through paper presentations.

Summary:

Activity	**Dept wise**	**Total**
Faculty training program	1 (Physics)	1
Guest Lectures & Workshops	GL- 1 (Physics), WS- 4 (Physics), 1 (Electronics)	6
Outreach Activity	4 science live experiments and 4 models-GLEE	1
Field Visit	1	1
FDP attended - Faculty	1 (Physics)	1
Paper presentation	1 – faculty &1- student (Physics)	2

1. Outreach: The science department organized social outreach programme GLEE for school Students to introduce scientific temper in them, 4 science live experiments and 4 models were designed and demonstrated to the students.

2. Guest lectures/ Workshops: To enhance learning experience and gain valuable insights from experts across various fields, guest lectures and workshops were organized a total of 5 guest lectures and workshops were organized this year.

3. Field Trips: The departments of the college have organized 1 field trip to enhance students learning experiences and provide them with practical exposure to their academic subjects. These trips include visits to industries, institutes, research centers and natural reserves depending on the subjects being studied and the objectives of the trip**.**

7. Any Novel aspect introduced or planning to introduce during the Scheme duration.

Activity	**Novel aspects introduced or planning to introduce**
Project based learning	Characterisation of magnetic materials and green energy.
FDP	College Teachers' Training Program On 'Simulations & Computer Interfaced UG Physics Practicals'
Workshop	Solar energy and composites, Astronomy themed Experiments
New experiments	Absorption lines in Rotational spectrum of Iodine Vapour Resistivity by Four probe Method Magnetic susceptibility of materials e/m by Thomson's method Fibre optic communication Experiments using Microcontroller Astronomy Tools
New approaches	Training Program on different softwares used as research Tools

8. Key performance indicators

	Indicator	**Pre-support (2022-2023)**				**During Support (2023-2024)**				**During Support (2024-2025)**				**During Support (2025-2026)**				**Remarks**
1.	No. of students admitted	**Total =1067**				**Total =1215**				**Total =1156**				Total = 996				
		Only Females				**Only Females**				**Only Females**				Only Females				
		SC	ST	OBC	GEN	SC	ST	OBC	GEN	SC	ST	OBC	GEN	SC	ST	OBC	GEN	
		82	24	325	636	102	21	535	557	74	28	378	676	88	25	334	549	
2.	No. of student passing out (%) Students Admitted/passing out (pass %)	UG-94%				UG – 89%				UG -90%				UG – 96%				
3.	Drop-out rates	3%				4%								4%				
4.	No. of Student opting for M.Sc.	600				700				700				700				

5.	Average marks	8.20	8.41		8.7	Most of the activities were completed as per the plan
6.	No. of hands-on experiments being conducted	U. G Curriculum based experiments.				
		Physics& Electronics			4	
7.	No. of new experiments introduced	Physics& Electronics			6	
8.	Publications (Scopus indexed) / patents, if. Any				-	
9.	Training received by faculty and student				Physics& Electronics -2	
10.	Exhibitions/ seminars / Training courses conducted	Physics& Electronics			2	
11.	Books/journals subscribed from grant				-	
12.	Outreach activities – (Popular lectures)				1	
13.	College mentored to apply for DBT Star College grants				-	
14.	Invited lectures	Physics& Electronics			1	

8. Lessons learnt / difficulties faced/suggestions if any, in implementation of the programme and utilization of DBT grant.

1. Lessons Learnt:

Effective utilization of the DBT grant significantly enhanced student engagement through hands-on experiments, and exposure to advanced instrumentation. It reinforced the importance of experiential learning in improving conceptual clarity, particularly in areas like electronics, and materials science. The programme also highlighted the value of interdisciplinary approaches and collaborative learning, encouraging students to connect theoretical knowledge with real-world applications.

2. Difficulties Faced: Time constraints within the academic schedule sometimes restricted optimal utilization of the facilities.

3. Suggestions:

Extending the duration of the programme and encouraging industry academia collaborations can enhance research exposure and ensure long term benefits for both students and the institution.

St. Francis College for Women
Begumpet, Hyderabad-500016
(Autonomous & Affiliated to Osmania University)
NAAC Re-accredited with 'A' Grade 4th Cycle

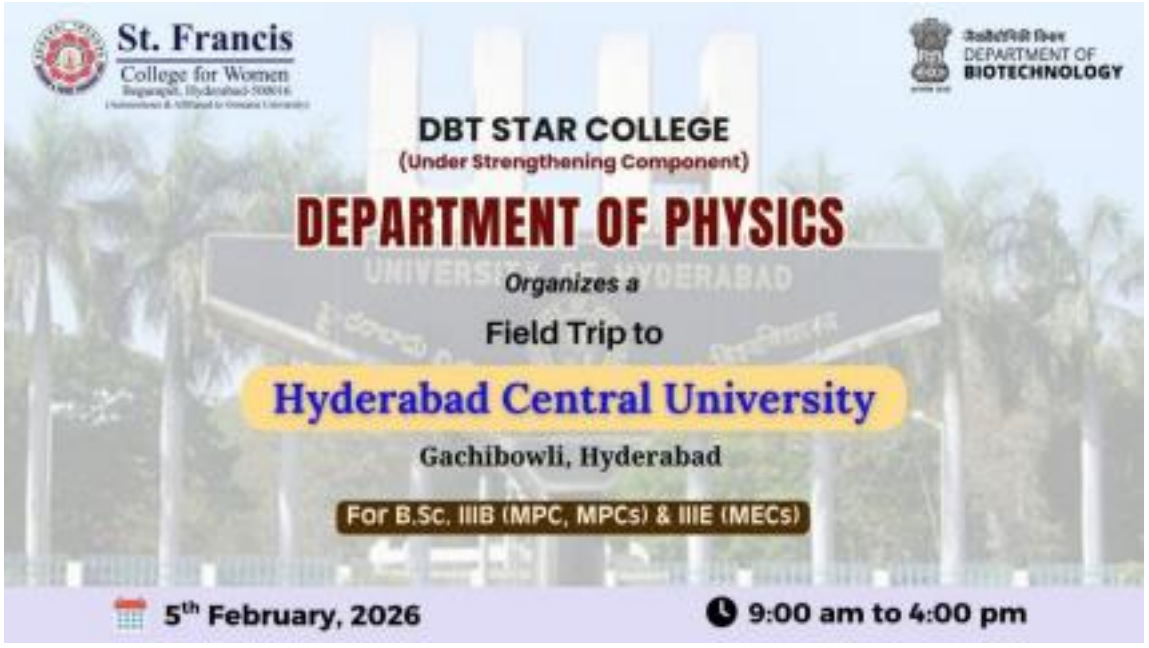
जैवप्रौद्योगिकी विभाग
DEPARTMENT OF BIOTECHNOLOGY

Field Trip to Hyderabad Central University

Date: 5th February 2026

Time: 9:00 AM - 4:00 PM

Brochure:



The Department of Physics organized a Field Trip to Hyderabad Central University under DBT STAR COLLEGE (Strengthening Component) for the Physics and Electronics students of III year (MPC, MPCs and MECs). Around 60 students and 2 faculty members participated.

Objectives:

1. To expose students to advanced research instruments and laboratory facilities in a university setting.
2. To provide an opportunity to explore the HCU campus and understand the academic environment for prospective higher studies.
3. To bridge the gap between classroom theory and practical scientific applications through direct observation.

Outcomes:

1. Students developed a clearer understanding of modern analytical techniques and their applications in physics research.

2. Exposure to advanced instrumentation enhanced technical awareness among participants.
3. The visit enhanced curiosity and awareness regarding higher studies and research opportunities in the field of physics.

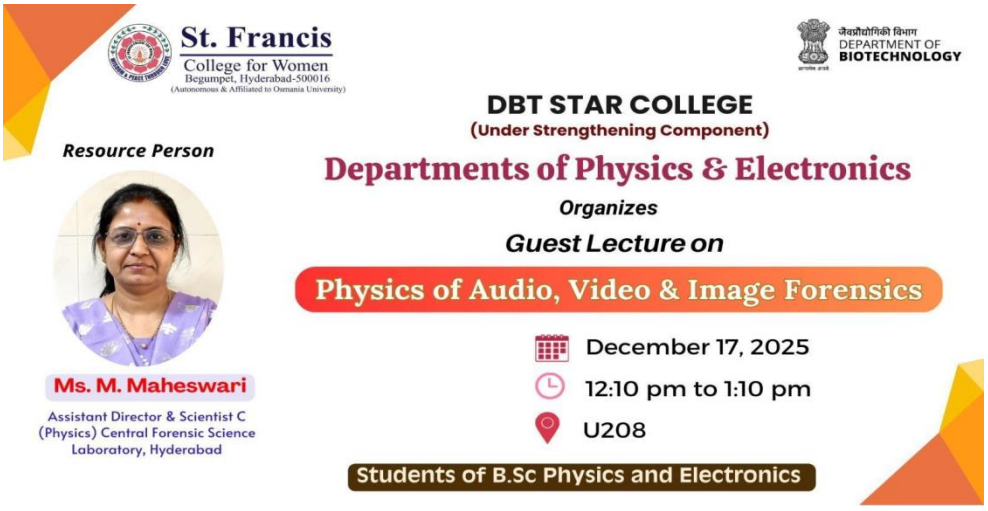
Pictures:

Guest Lecture on 'Physics of Audio, Video & Image Forensics'

Date: 17 December 2025

Time: 12:10-1:30 PM

Brochure:



The Department of Physics & Electronics organized a guest lecture on the topic **"Physics of Audio, Video & Image Forensics"** under DBT STAR COLLEGE (Strengthening Component) for the Physics and Electronics students of I, II and III year (MPC, MPCs and MECs). Around 50 students and 3 faculty members participated. The resource person for the event was Ms. M. Maheshwari (Assistant Director & Scientist (physics), Central Forensic Science Laboratory, Hyderabad).

Objectives:

1. To introduce the application of physics and electronics principles in audio, video, and image forensics
2. To provide exposure to the professional role and responsibilities of a physicist working in a forensic science laboratory through real case studies.
3. To enhance understanding of how physical evidence such as ballistic patterns, material wear and tear, and footprints is analyzed using scientific methods.

Outcomes:

1. Students gained practical insight into the role of physics in forensic investigations involving audio, video, and image analysis.
2. Awareness was created about interdisciplinary career pathways in forensic science for physics and electronics graduates.
3. The lecture enabled better correlation between theoretical knowledge and real world Forensic case analysis.

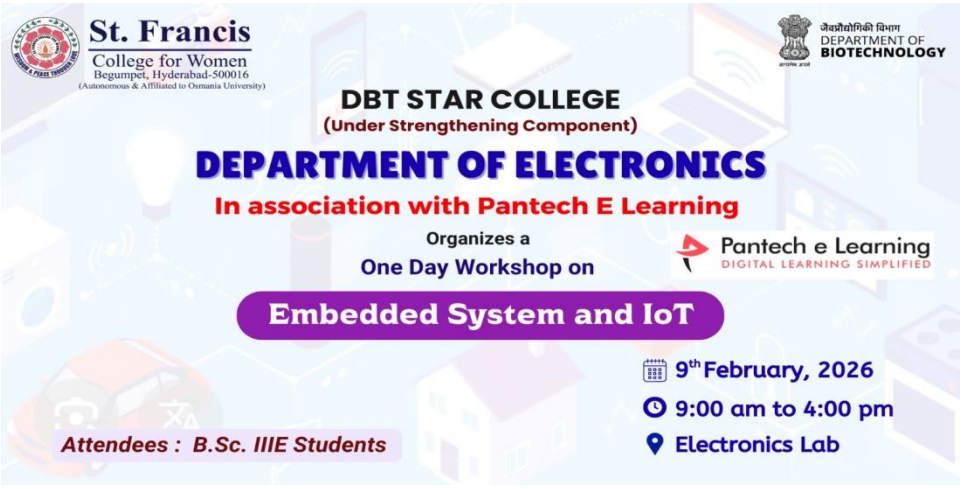
Pictures:

Workshop on "Embedded System and IoT

Date: 9th February 10, 2026

Time: 9.00 a.m to 4.00 p.m

Brochure



The Department of Electronics organized a hands on training workshop on the topic "Embedded System and IoT" under DBT STAR COLLEGE ,Strengthening Component, for the B.Sc students of III year (M.E.CS). Around 40 students and one faculty member participated. The resource person for the event was Mr. Vijayan from Pantech e-Learning.

Objectives:

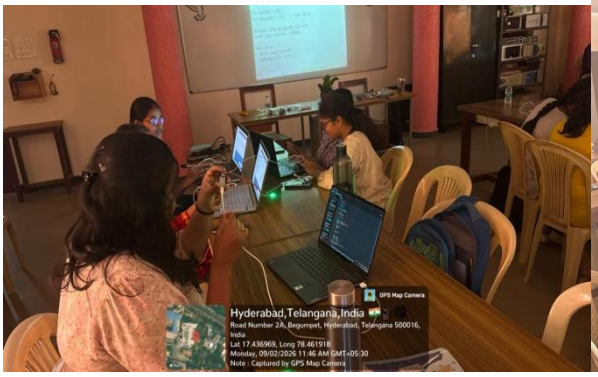
1. The primary objective of the session was to enhance the students' knowledge in electronic skills and embedded systems.
2. Apply the knowledge in the IoT field which will help the students to pursue a career as embedded engineer or an IoT professional with this hands on training workshop.

Outcomes:

Basic programming in Arduino IDE Micro controller including GPIO manipulation. Embedded C programs were implemented.

- Soil moisture Sensor, LDR Sensor, OLED DISPLAY, IP address Sensor, Ultrasonic Sensor using Arduino with this system.
- Comprehensive understanding of real-life applications and conducted an in-depth study of core components like micro controllers.

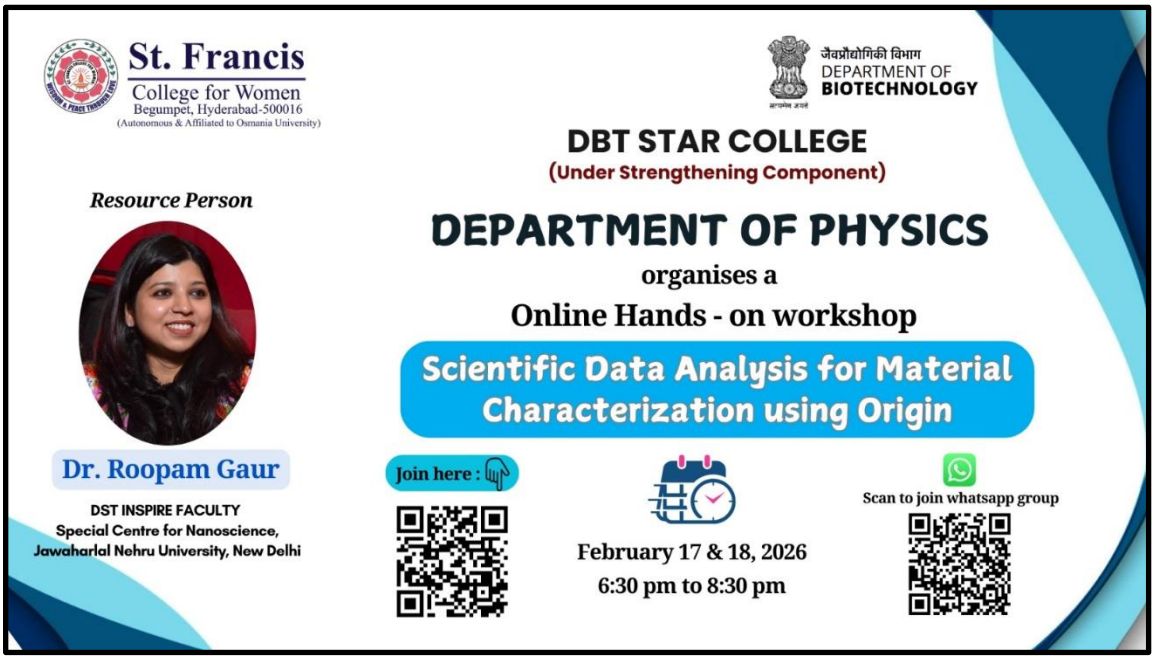
Pictures



Workshop in "Scientific Data Analysis for Material Characterization using Origin Software"

Date: 17th -18th February 2026
Time: 6:30 PM – 8.30 PM

Brochure:



The Department of Physics organized an experimental workshop on **"Scientific Data Analysis for Material Characterization using Origin"** under DBT STAR COLLEGE (Strengthening Component) for the UG and PG students of St. Francis College for Women. Around 45 students and 12 faculty members participated in this two-day workshop. The resource person was Dr.Roopam Gaur, DST Inspire faculty, Centre for Nanomaterials, Jawaharlal Nehru University, Delhi.

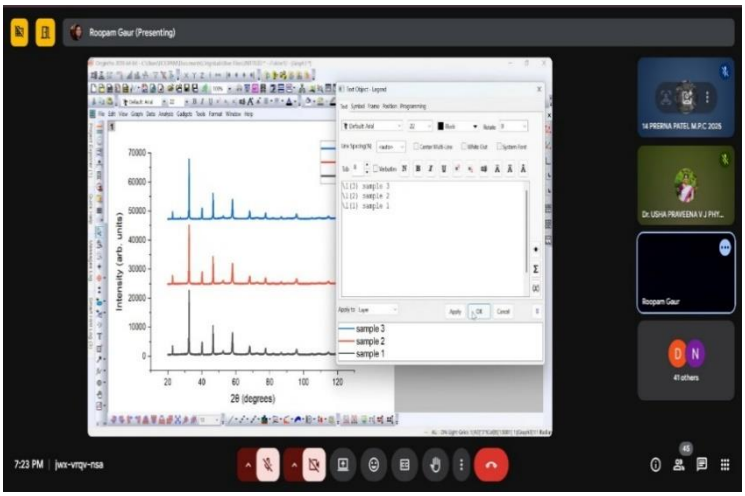
Objectives:

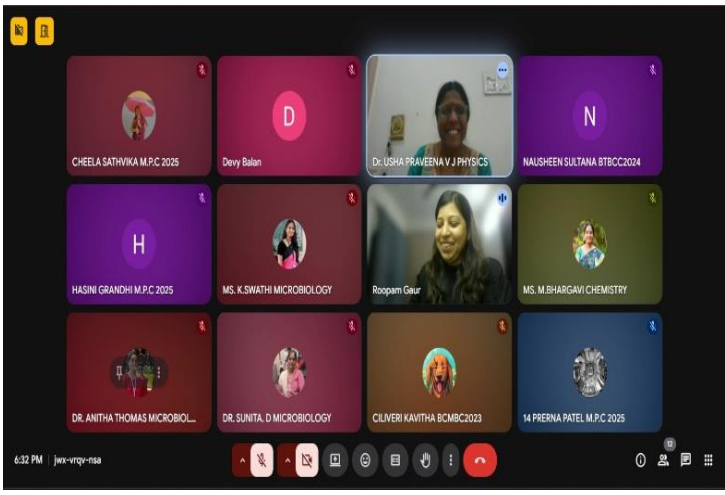
1. To introduce students to Materials and Characterization Techniques, fundamentals of XRD and Introduction to SEM Principles.
2. To provide hands-on experience in Data Handling in using ORIGIN software and Image J Software.
3. To enhance understanding of Data Analysis & Interpretation and Applications in Research and Industry.

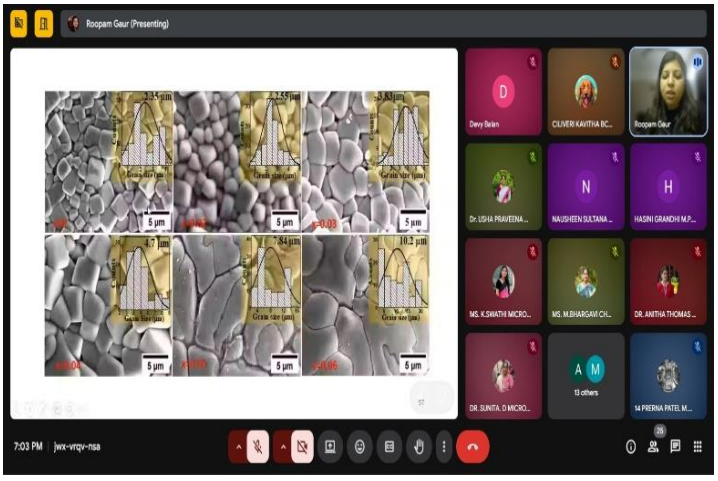
Outcomes:

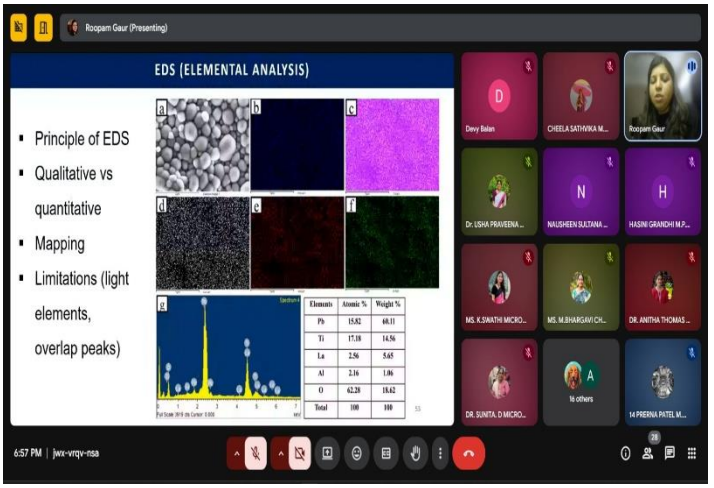
1. Students gained practical knowledge of Materials & Characterization Techniques, XRD and SEM Principles.
2. Improved understanding of Data Handling and Analysis using Origin and Imaging and Resolution Capabilities of Image J Software.
3. The demonstrative explanation strengthened basic knowledge and provided clarity in the applications in Research and Industry.

Pictures:









Hands on Training in "Experimental Techniques on Magnetic Material Analysis"

Date: 9th February 2026

Time: 1:00 PM - 5:00 PM

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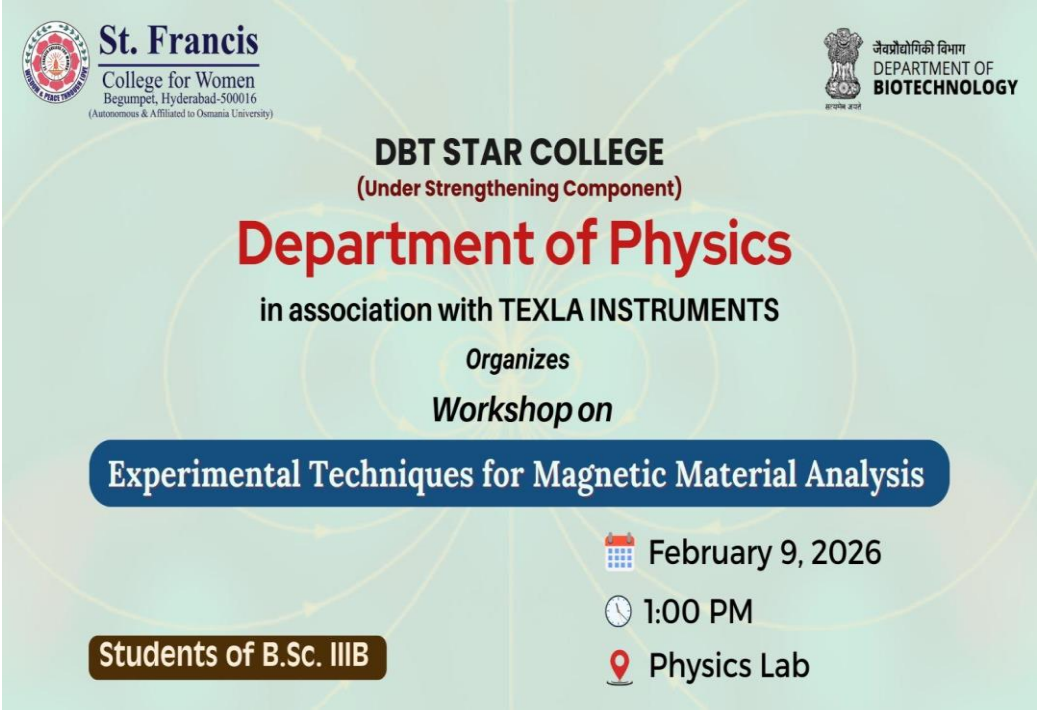


The Department of Physics organized a Hands-on training session on the topic **"Experimental Techniques on Magnetic Material Analysis"** under DBT STAR COLLEGE (Strengthening Component) for the Physics students of III year (MPC and MPCs). Around 47 students and 2 faculty members participated. The resource person for the event was Mr. Vijaya Krishna from Texla Instruments, Hyderabad.

Objectives:

1. To introduce students to the fundamental concepts of Magnetic materials.
2. To provide practical knowledge of Material Analysis through hands-on exposure.
3. To create awareness about Magnetic properties and their applications.

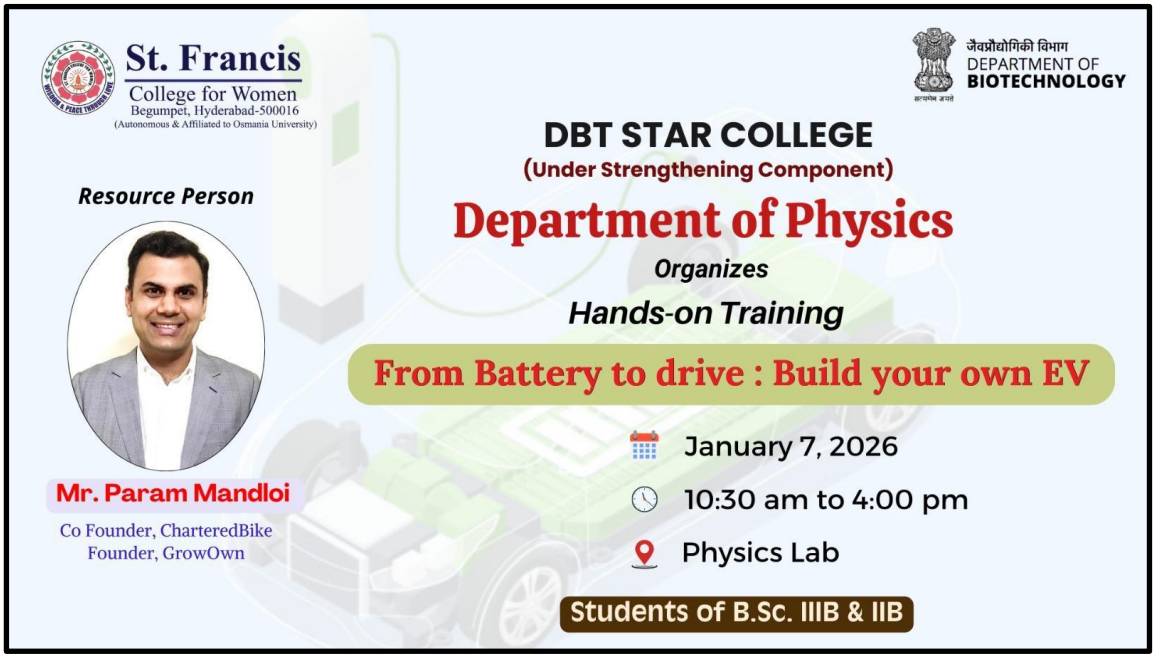
Outcomes:

1. Participants developed a foundational understanding of magnetic materials and its practical relevance.
2. Improved awareness of magnetic materials and their role in sensor performance and safety was achieved.
3. The hands-on exposure enhanced the ability to identify and differentiate different materials.

Pictures:

Hands-on Training on 'From Battery to drive: Build your own EV'

Date: 7 January 2026
Time: 10:30 AM - 4:00 PM
Brochure:



The Department of Physics organized a Hands-on training session on the topic **"From Battery to drive: Build your own EV"** under DBT STAR COLLEGE (Strengthening Component) for the Physics students of II and III year (MPC and MPCs). Around 124 students and 3 faculty members participated. The resource person for the event was Mr. Param Mandloi (Co Founder, CharteredBike; Founder, GrowOwn).

Objectives:

1. To introduce students to the fundamental concepts and working principles of electric vehicles.
2. To provide practical knowledge of EV components and battery technologies through hands-on exposure.
3. To create awareness about safety, efficiency, and quality standards in electric vehicle design and usage.

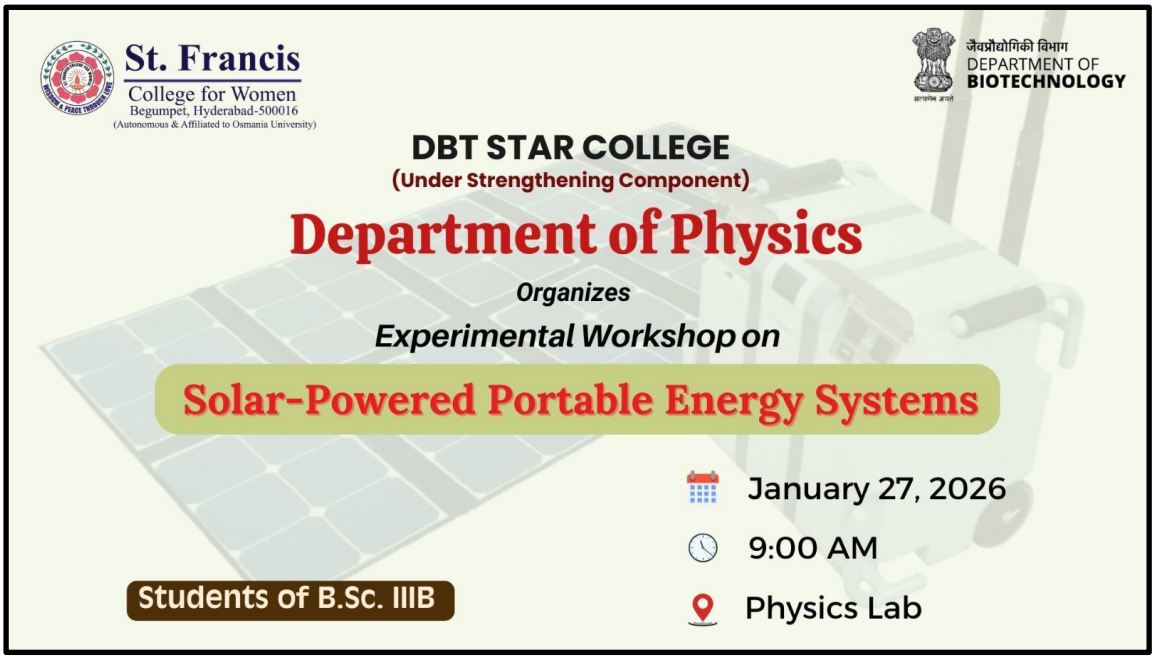
Outcomes:

1. Participants developed a foundational understanding of electric vehicle technology and its practical relevance.
2. Improved awareness of battery systems and their role in EV performance and safety was achieved.
3. The hands-on exposure enhanced the ability to identify and differentiate quality EV components and designs.

Pictures:

Experimental workshop on 'Solar-Powered Portable Energy Systems'

Date: 27 January 2026
Time: 9:00 AM
Brochure:



The Department of Physics organized an experimental workshop on **"Solar-Powered Portable Energy Systems"** under DBT STAR COLLEGE (Strengthening Component) for the Physics students of III year (MPC and MPCs). Around 45 students and 2 faculty members participated.

Objectives:

1. To introduce students to the basic principles of solar energy conversion and portable energy storage systems.
2. To provide hands-on experience in assembling and testing a functional solar-powered power bank.
3. To enhance understanding of the components and circuit design involved in renewable energy devices.

Outcomes:

1. Students gained practical knowledge of solar power bank design and the working of its individual components.
2. Improved understanding of renewable energy applications and portable energy solutions was achieved among the participants.
3. The experimental approach strengthened technical skills and confidence in building and demonstrating simple electronic energy devices.

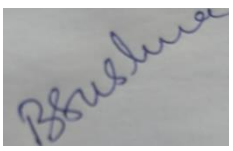
Pictures:

9. **Self-Evaluation:**

Department	***Objective (as stated in proposal)**	**% achieved**	**Reasons for underachievement / If achieved, state in quantitative metrics**
Physics & Electronics	1. Visit to reputed laboratories (Completed) 2. Guest lecture (Completed) 3. Workshops-Students& faculty (Completed) 4. New experiment based on new instruments purchase (Completed) 5. Training program attended by Faculty(completed) 6. Paper Presentation by student (completed)	83%	Quantitative metrics – 10/12

Sanctioned Budget details: (Rs. in Lakhs)

Head	**Total Released Budget from DBT**	**Total Expenditure**	**Balance as on**	**Remarks if any**
Grants for creation of capital assets (Non- recurring)	5,19,772	5,19,772	-	Nil
Grants-in-aid General (Recurring)	1,48,958	1,48,958	-	Nil



Course Coordinator

(DBT coordinators)

Head of the Institution

(With Seal)