St. Francis College for Women

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: Dr. M. Bhargavi

   Designation : Assistant Professor, Dept. of Chemistry

   Address : St. Francis College for Women,

   Begumpet, Hyderabad

   Phone No: 9700328586

3. Assessment duration: 08/08/2025 to 31/03/2026 Duration in years: 1 year

4. 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.
3	Chemistry	B. Sc., M. Sc.	11	4

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, HoDs and Department coordinators).

6. Qualitative improvements due to DBT support.

- Practical learning was strengthened through field visits, supporting both theoretical and applied understanding.
- Project work provided students with direct practical exposure.
- Guest lectures offered specialized insights, enhancing the curriculum.
- Faculty participation in workshops contributed to overall academic development.
- Strengthened laboratory infrastructure with advanced instrumentation.
- Improved technical skills through workshops and hands-on training and enriched curriculum with interdisciplinary and emerging topics.
- Enhanced student exposure to research and industry practices while strengthening collaborations

with industries and research organizations.

- Improved academic output through paper presentations.

Summary:

Projects	29
Mini Projects	52
Student & faculty training programs	5
Guest Lectures & Workshops	2 +2
Field trips	5
Outreach Activity	1
National seminars/ Conferences	-

Report on Research Projects from November 2025 to March 2026

The Department of Chemistry organized **Research Projects** under DBT STAR COLLEGE (Strengthening Component) for the B.Sc. students of III year (BZC/ BTZC/ MPC/ BTMBC/ BCMBC/ BTBCC/ BCCAC/ ANBC/ ANZC). 29 students have carried out the research projects under the supervision of 11 faculty members. The objective of these research projects is to integrate theoretical knowledge of chemistry with practical experimentation, fostering research skills, critical thinking, and innovation for real-world applications. By completing this project, the student will be able to apply theoretical chemistry concepts in practical experimentation, demonstrate research and analytical skills, and effectively communicate scientific findings for real-world problem solving.

List of UG research projects 2025-26

Report on Mini Projects done by students of Semester VI from December 2025 to February 2026

The Department of Chemistry organized **Mini Projects** under DBT STAR COLLEGE (Strengthening Component) for the B.Sc. students of III year (BZC/ BTZC/ MPC/ BTMBC/ BCMBC/ BTBCC/ BCCAC/ ANBC/ ANZC). 211 students have carried out the mini projects under the supervision of 15 faculty members. The mini projects were conducted to provide focused practical exposure by applying specific chemical concepts in a small-scale experimental study, thereby enhancing research aptitude, analytical skills, and problem-solving ability within a limited scope. From these mini projects the student gained practical exposure to specific chemical techniques, developed analytical and problem-solving skills, and demonstrated the ability to connect theoretical knowledge with focused experimental results.

Link for the list of students with the mini projects:
List of Mini Projects 2025-26

S. No	Roll Number	Names of the Students	Topic	Research Supervisor
1	121323056028	Sanskriti Kumari	"In Silico Identification of Potential EGFR Inhibitors Using Virtual Screening, Molecular Docking and DFT Studies for Cancer therapy"	Dr. M. Bhargavi
2	121323056025	T. Pavitra	Computational Approach for PPARG Protein Structure Modelling, Validation AND Molecular Docking for Potential Diabetic Therapeutics	Dr. M. Bhargavi
3	121323056025	Egala Bhargavi	Structure Based Identification of Novel PFKFB3 Inhibitors of Anticancer Drug Discovery	Dr. M. Bhargavi
4	121323061002	Fareeha Khan	Comparative synthesis of bis-chalcone under conventional and non-conventional conditions and its conversion into 1,3-thiazine heterocyclic scaffold	Dr. Pritha Das
5	121323061025	Sripuram Naveena	Synthesis, characterisation and cyclization of cyclohexanone-derived bis-chalcone: A route to 1,3-thiazine scaffolds via thiourea mediated heterocyclization	Dr. Pritha Das
6	121323050010	Bongarala Santoshi	Synthesis, characterization and antibacterial activity of substituted Benzylidenemalanonitriles via Knoevenagel condensation of aromatic aldehydes with malononitrile	Dr. Saritha Aduri
7	121323050021	Katuri Sri Sai Sri Lakshmi Samhitha Katuri	Green synthesis of α,β-unsaturated nitriles: A study of Knoevenagel condensation under microwave conditions and their antibacterial activity	Dr. Saritha Aduri
8	121323056026	Purimetla Rohini	Synthesis, characterization and antibacterial evaluation of novel Schiff bases derived from substituted benzaldehydes and primary amines	Dr. Saritha Aduri
9	121323056027	Sahaya Emylin Stanica	Design, characterization and molecular docking studies of Schiff base ligands for potential biological applications	Dr. Saritha Aduri
10	121323041021	Agnes Mathew	Green synthesis of ZnO Quantum dots using neem leaf extract for the potential biological applications	Dr. Y. Lakshmi Madhuri

11	121323041007	Faieza Binte Amin	Phyto Mediated synthesis of ZnO Quantum dots - Characterization and biological evaluation	Dr. Y. Lakshmi Madhuri
12	121323050038	S. B. Vaishnavi	Biosynthesis of CdS supported Ta2O5 for Photocatalytic applications	Dr. B. Prashanthi
13	121323050034	S. Sruthi Sahasra	Green synthesis of CdS doped Ta2O5 nanoparticles for visible light driven photodegradation of Methylene blue	Dr. Y. Lakshmi Madhuri
14	121323057011	J. Nilaya	Green synthesis of CdS/ Ta2O5 nanocomposites for photocatalytic applications	Dr. Y. Lakshmi Madhuri
15	121323041010	G. Tharani	Adsorptive removal of Dyes from textile effluents using Low cost and Sustainable Adsorbents	Dr. B. Prashanthi
16	121323041011	K. Krishna Gayathri	Adsorption based remediation of Textile Industry wastewater: Performance and mechanistic insights	Dr. B. Prashanthi
17	121323061011	Koojitha Janga	Novel Schiff Base synthesis, Characterization and their active biological studies	Dr. Asha Danti
18	121323061023	R.Sathwika	Synthesis of Iron Oxide Nanoparticles, characterization and it's applications	Dr.Shikha Chander
19	121323061012	K.Sujana Reddy	Synthesis of Iron oxide nanoparticles, characterization and its application	Dr.Shikha Chander
20	121323050017	Yashoda Preethi	Green synthesis of silver nanoparticles from ashwagandha and it's applications	Dr.Shikha Chander
21	121323057020	Meenakshi Praveen	Green synthesis of silver nanoparticles from ashwagandha and it's applications	Dr.Shikha Chander
22	121323050006	Anireddy Nikhita	Eco-Friendly Microwave-Assisted Synthesis and In Vitro Biological Evaluation of Schiff Bases from Cyanoacetohydrazide	Dr. K. Susmitha
23	121323050012	Cherukuru Lekhana	Environmentally Benign Synthesis and Multimodal Biological Studies of 5-Nitro-2-Hydroxybenzaldehyde-Derived Schiff Bases and Their Fe (II) Coordination Compounds	Dr. K. Susmitha
24	121323061021	Hemanjali Ramireddy	Speciation Studies on the interaction of Succinicaciddihyrazide, Alanine and Phenylalanine with essential and toxic metal ions	Dr. Uma Rani Bhagavatula
25	121323050020	K. Srushitha Yadav	Development of a low-cost natural pH testing kit for school science education	Dr. Uma Rani Bhagavatula

26	121323042007	K. Sri Sharanya	Thermoelectric Energy Harvesting of floral offerings and adsorption studies	Dr. Uma Rani Bhagavatula
27	121323050042	Y. Haveela Rani	Molecular Docking and ADMET Analysis of Selected Ligands Against Mycobacterium Tuberculosis Protein 5V3Y	Dr. Sabiha Fatima
28	121323057024	S. Pravallika	In silico studies on the potential inhibitors of Pancreatic Cancer using Molecular Docking and Pharmacokinetics	Dr. Sabiha Fatima
29	121323041020	Nikodi Mounika	Exploring Potential Acetylcholinesterase Inhibitors for Alzheimer's Disease: A Molecular Docking and ADMET Analysis	Dr.Sabiha Fatima

Department of Chemistry organized

- **A Field visit to BITS-Pilani, Hyderabad** provided an overview of the institution's legacy, academic programs, research initiatives, collaborations and 2 alumni students at St. Francis College for Women who were currently pursuing their PhD in BITS shared their experiences. Students were encouraged to pursue higher education and research opportunities in the field of science. Following the orientation, students proceeded to visit a few general laboratories within the campus.
- **A Workshop on NMR Spectroscopy: A Key to Unlocking Molecular Structure** was solely address on the topic "NMR Spectroscopy: A Key to Unlocking Molecular Structure " was delivered by Dr. Sarbani Pal, Associate Professor, HOD chemistry, MNR PG College, Hyderabad. She has given a vivid description on NMR Spectroscopy and elucidation of Structure by using NMR spectroscopy.
- **A Guest Lecture on "IPR Management for Start-ups and Regulatory Affairs & IP Management Training**" was planned for the B.Sc. III B and III F students. The resource person was Mr. Ashok Ram Kumar, Senior Counsel and Founder & Senior Partner of Wordict-IPR. The resource person Mr. Ashok Ram Kumar, who shared his expertise on the fundamentals of patents, copyrights, trademarks, designs, and geographical indications.
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were participated in various events like Sci-fi Tambola, Chemistry Idol and Role Play the winners were awarded with the cash prizes.

- **A Faculty Improvement program on Research Based Pedagogical Tools** for the faculty members of the Chemistry Department. The programme aimed to enhance teaching skills through innovative and research-based methods. The resource person Dr. Y. Aparna, Assistant Professor, Department of Microbiology, Bhavan's Vivekananda College of Science. Humanities and Commerce, explained modern teaching strategies such as active learning, problem-based learning, and effective assessment techniques. Eleven faculty members of Chemistry department actively participated in the interactive session.

- **An Online an Alumna talk on Catalysing Your Career** was planned for the B.Sc. III A. The resource person was Ms. Misbah Fatima, Ph. D Scholar, Sustainable Geochemistry and Mineral Sciences, Research Group, School of Math, Statistics, Chemistry and Physics, Murdoch university, Perth, Australia. About 50 students and faculty members attended and actively interacted with the speaker, making the event highly engaging and informative.
- **Social Outreach:** To encourage students' curiosity and scientific temper, the Department conducted a social outreach initiative called GLEE. Live science experiments and 3D models were used to encourage interactive learning, which made subjects more interesting and simpler to comprehend. Through practical experiences, this program helped students understand scientific concepts and increased their enthusiasm in science education.

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

Activity	**Chemistry**
Project based learning	Projects were introduced on various topics such as Nanochemistry and Computational Chemistry, Synthesis of novel organic molecules their biological activity, docking and DFT studies, Green Chemistry, Development of a low-cost natural pH testing kit for school science education, Thermoelectric Energy Harvesting of floral offerings and adsorption studies.
Training Programme	School teachers training program, College teachers training, Research based pedological tools, Industrial training programs were conducted
Workshop	Conducted workshop on NMR spectroscopy: A Key to Unlocking Molecular Structure. Chem Fest: Celebrated National Periodic Table Day.

New experiments	• Potentiometric Titrations -02 • Estimation of Sodium Carbonate using commercial washing soda. • Microwave assisted synthesis of Organic compounds
Entrepreneurship	Guest Lecture on "IPR Management for Start-ups and Regulatory Affairs & IP Management Training".

1. Lessons learnt / difficulties faced/suggestions if any, in implementation of the programme and utilization of DBT grant. (Max 3 points within 300 words).

1. **Lessons learnt**

The STAR DBT activities in chemistry provided valuable experiential learning and strengthened the connection between theoretical knowledge and practical application. Students gained hands-on experience in designing experiments, selecting appropriate chemicals, and understanding standard laboratory protocols. They developed skills in solution preparation, titration, synthesis, and basic analytical techniques, which enhanced their technical competence. Overall, STAR DBT activities nurtured scientific temper, laboratory confidence, and a research-oriented approach, motivating students to explore innovative solutions in the field of chemistry.

2. Difficulties/Suggestions:

The delay in fund release slightly affected the timely procurement of chemicals and laboratory materials. A more streamlined and timely disbursement process would help ensure smooth execution of STAR DBT activities.

2. **Key performance indicators**

<table>
<tr><th>S. no</th><th>Indicator</th><th colspan="4">During /After Support (2025-2026)</th><th>Remarks</th></tr>
<tr><td>1</td><td rowspan="3">No. of students admitted</td><td colspan="4">Total =996</td><td></td></tr>
<tr><td></td><td colspan="4">Only Females</td><td></td></tr>
<tr><td></td><td>SC
88</td><td>ST
25</td><td>OBC
334</td><td>GEN
549</td><td></td></tr>
<tr><td>2</td><td>No. of students passing out (%) Students Admitted/passing out (pass %)</td><td colspan="4">UG-96%</td><td></td></tr>
<tr><td>3</td><td>Drop-out rates</td><td colspan="4">4%</td><td></td></tr>
<tr><td>4</td><td>No. of students opting for MSc</td><td colspan="4">700</td><td></td></tr>
<tr><td>5</td><td>Average marks</td><td colspan="4">8.7</td><td></td></tr>
<tr><td>6</td><td>No. of hands-on experiments being conducted</td><td colspan="2">U. G Curriculum based experiments
6</td><td colspan="2">1. Conductometric Titrations
2. Colorimetric Estimations
3. pH metric Titrations
4. Green synthesis of Organic Compounds
5. Green Synthesis of Nano particles and their applications.
6. Computational Chemistry</td><td>Completed</td></tr>
<tr><td>7</td><td>No. of new experiments introduced</td><td colspan="2">7</td><td colspan="2">1. Potentiometric titration of FAS Vs $K_2Cr_2O_7$
2. Potentiometric titration of HCl Vs NaOH
3. Estimation of Sodium Carbonate using commercial washing soda.
4. Microwave assisted synthesis of Organic compounds.
5. Estimation of Antacid using HCl
6. Estimation of Nickel by back titration Mg SO_4
7. Adsorption of acetic acid on animal charcoal, Verification of Freundlich adsorption isotherm.</td><td>Completed</td></tr>
<tr><td>8</td><td>Publications (scopus indexed) /patents, if any.</td><td colspan="2"></td><td colspan="2">1. Activated carbon derived from walnut shells for enhanced wound care applications. (Patent Publication)
2. Bioshell calcium oxide derived from sea shells for use in wound healing and topical dressings (Patent Publication).
3. Unveiling the Therapeutic Efficacy of Benzimidazole–Piperazine Hybrids Through Synthesis, Spectral Studies, and Biological Evaluation. ChemistrySelect, 2026; https://doi.org/10.1002/slct.202503755 (Paper Publication)
4. Molecular Docking, anti-bacterial studies and synthesis of Ruthenium (III) complexes modified with benzoic acid (4-nitro benzylidene) Hydrazide and Furan 2-yl methylene -hydrazide. Next Materials;</td><td></td></tr>
</table>

			Elsevier, Scopus Indexed Journal (Paper Publication). 4. ARNT2 protein associated in cancer: Homology modelling, validation, Virtual screening and molecular docking. ISBN: 978-93-7020-647-2. Futuristic Research Trends 2025, Volume 2; IIP series (Book Chapter).	
9	Training received by faculty	2	1. Training on Cheminformatics -2 Faculty 2. Research based pedological tools- 11 Faculty 3. Swayam -01 Faculty 4. Planning for Seminars / workshops in collaboration with Research Institutes 5. Planning for Hands on training on synthesis of cosmetics using nano particles.	Completed Planned for next academic year
10	Exhibitions/seminars /Training courses conducted		**Workshops:2** 1. Workshop on NMR Spectroscopy: A Key to Unlocking Molecular Structure 230 Students + 5 Faculty 2. Chemfest- Intercollegiate Chemistry Fest-300 Students + 14 Faculty 3. Industrial Training to DSN labs -09 Students + 1Faculty 4. Industrial Training to YMC School of Chromatography- 29 Students + 3 Faculty **Field trips:5** 1.Field trip to CSIR -IICT (Two times)– 46 students + 3 faculty 2.Field visit to BITS-Pilani HYD- 51 students + 2 faculty YMC school of Chromatography-29 students + 3 faculty Nuclear Fuel Complex-50 students + 2 faculty **Seminar/Conference:2** • Planning Seminars/Workshops in collaboration with Research Institutes. • Hands on training on synthesis of Cosmetics using nanomaterials.	Completed Completed Planned for next academic year
11	Books/journals subscribed from grants	-		
12	Outreach activities (Popular lectures)			
13	Colleges mentored to apply for DBT Star College grants			
14	Invited lectures	2	1.Guest lecture on IPR Management for Start-ups and Regulatory Affairs & IP	Completed

			Management Training- 45 students + 3 Faculty 2. Online Alumna talk on Catalysing your career– 50 students+ 4 Faculty	

- Proofs (S.No. 6-14 not more than 5 pages, 1.5 line spacing 11 times roman font size) to be provided duly attested by Principal and Coordinator.

Proofs

S. No. 6

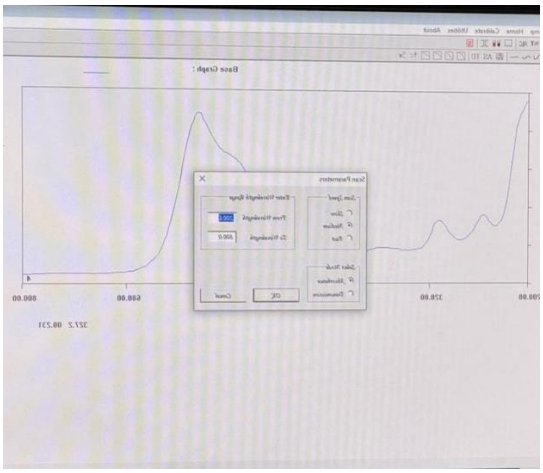
1. Colorimetric estimations

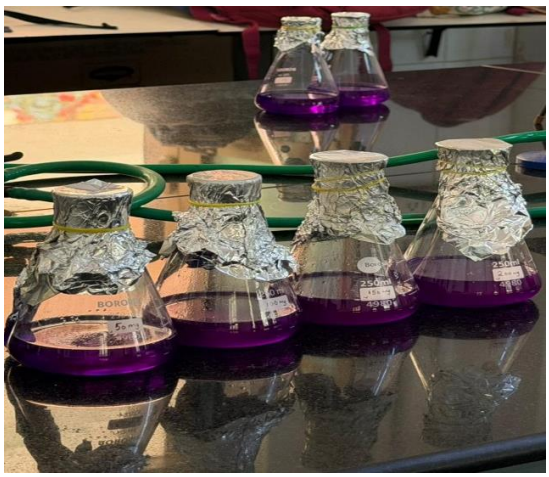
The experimental study emphasized the importance of verify Beer's Law using potassium permanganate ($KMnO_4$) solution and to determine the concentration of an unknown solution by measuring its absorbance with a colorimeter/spectrophotometer.

Verification of Beer's Law using KMnO4 and determination of the concentration of the given solution.

2. Adsorption

The adsorption of acetic acid on animal charcoal and to verify the Freundlich adsorption isotherm by establishing the relationship between the amount of acetic acid adsorbed and its equilibrium concentration. This experiment is important for understanding the concept of adsorption and surface phenomena. It demonstrates how substances accumulate on solid surfaces, which is widely applied in purification, catalysis, and environmental processes like water treatment.





Adsorption of acetic acid on animal charcoal, Verification of Freundlich adsorption isotherm.

3. Potentiometry

Students gained hands-on experience in determination of concentration of a given solution by measuring the potential difference using a potentiometer and to study the variation of electrode potential during a titration.

Titration of strong acid vs strong base (HCl vs NaOH)

4. pH metry

Students gain practical knowledge of pH measurement and develop hands-on skills in using a pH meter accurately.

Titration of strong acid Vs strong base. Determination of ionization constant of acetic acid by pH metric method.

5. Computational Chemistry

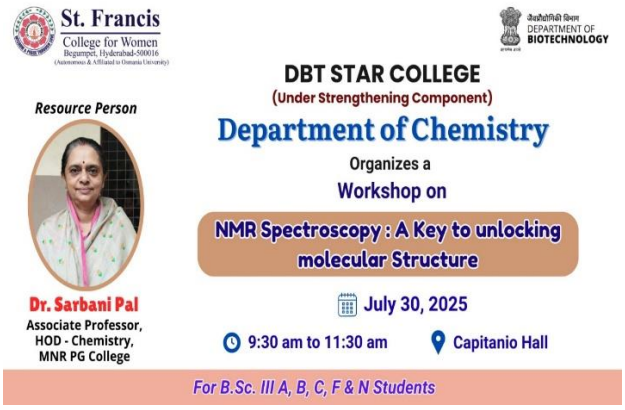
Students develop a strong foundation in Computational Chemistry and gain hands-on experience with Molecular Docking. They learn to model molecular structures, predict drug–target interactions, and evaluate binding affinities using computational tools.

Protein -Ligand and Protein – Protein Docking studies

S. No 10. Exhibitions/seminars /training courses conducted

Workshops conducted

- **A Workshop on NMR Spectroscopy: A Key to Unlocking Molecular Structure** was solely address on the topic “NMR Spectroscopy: A Key to Unlocking Molecular Structure " was delivered by Dr. Sarbani Pal, Associate Professor, HOD chemistry, MNR PG College, Hyderabad. She has given a vivid description on NMR Spectroscopy and elucidation of Structure by using NMR spectroscopy.



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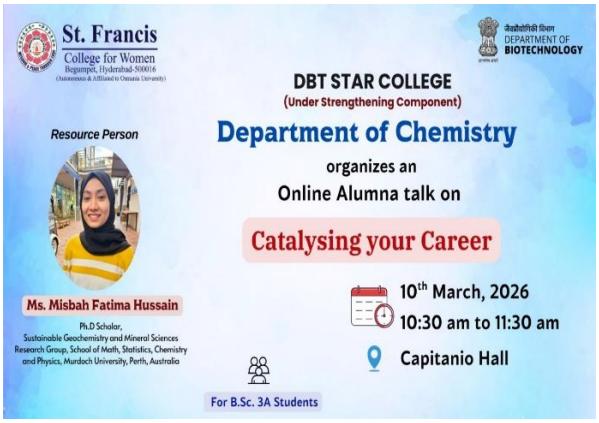

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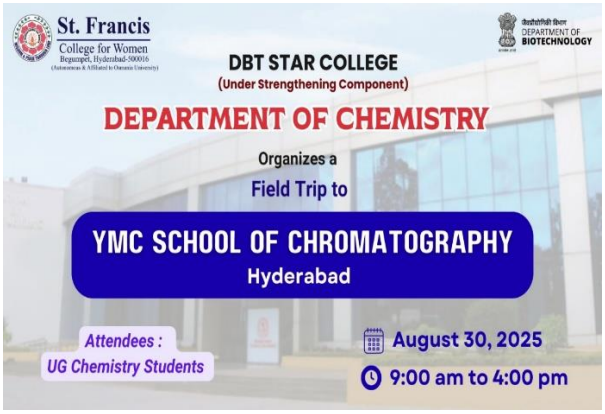

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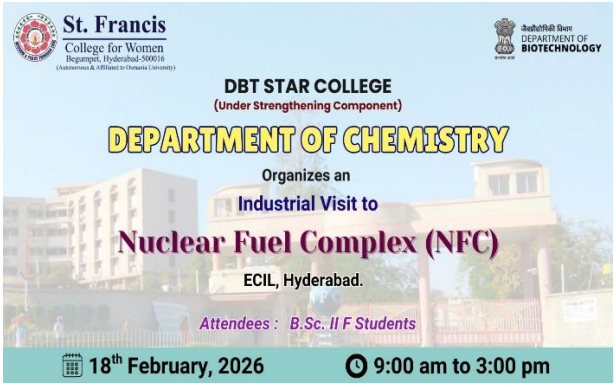

Industrial Training Programs Organised

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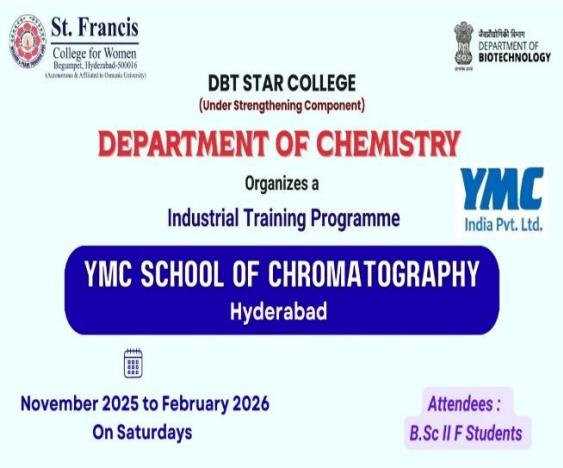

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3. Self-evaluation

Department	*Objective (as stated in proposal)	% Achieved	Reasons for underachievement / If achieved, state in quantitative metrics

Chemistry	1.Students' research projects (completed) 2. Industrial Training (completed) 3. Visit to Pharma industries and labs (completed) 4. Faculty Improvement Program (completed) 5.International Conference/Seminar-Completed 3.Guest lectures-completed 4.Workshops-Completed 5. Hands-on guided laboratory experience on school curriculum. 6. Outreach activities for school teachers and college teachers - completed	**90%**	Couldn't do Seminars/Workshops in collaboration with Research Institutes. And Hands on training on synthesis of Cosmetics using nanomaterials. Will be completed in the coming academic year. **Quantitative metrics-11/12**

* For quantitative analysis you may fix five objective (max) each having 2 marks and accordingly can calculate the matrix.

ZBSA Status: (Mark Check Box):

Not opened ☐ Under process ☐ Opened but not mapped on PFMS ☐ Account is functional ☐

Remarks if, any:

4. Sanctioned Budget details:

(Rs. in Lakhs)

Head	**Total Released Budget from DBT**	**Total Expenditure**	**Balance as on 31.03.2026**	**Remarks if any**
Grants for creation of capital assets (Non- recurring)	Rs. 5,11, 292/-	Rs. 5,11,292	Nil	-
Grants-in-aid General (Recurring)	Rs.1,48,958/-	1,48,678/-	280/-	-
Total	**Rs. 6,60,250/-**	**Rs. 6,59,970**	280/-	-

DBT Coordinator
Department of Chemistry
St. Francis College for Women.