

Departmental Report (Term I-AY 2023-24)

Preliminary information

I Department profile

1. Dr. P.Shetty, Head of Dept
2. Dr. S.Murthy
3. Ms. T.Asha
4. Ms. L.Jeysus
5. Sr. R.Khandagale
6. Ms. Payal Manna
7. Ms Vaishnavi Ghugare
8. Ms. Sajal Ansari

Junior College:

1. Ms. B. Gonsalves
2. Ms. S. Rathod
3. Ms. B.Shaikh

II Courses/Papers taught

Undergraduate

FYBSc

- Fundamentals of Chemistry-1
- Fundamentals of Chemistry Practical -1
- Food Additive and Food Adulteration
- Food Additive and Food Adulteration Practical
- Introduction to cosmeticology
- Introduction to cosmeticology Practical
- Minerals and Metals in Ancient India

SYBSc

- Chemistry Paper I -Physical and Analytical Chemistry
- Chemistry Paper II-Inorganic Chemistry
- Chemistry Paper III-Organic Chemistry
- Chemistry Practical

TYBSc

- Chemistry Paper I -Physical Chemistry

Chemistry Paper II-Inorganic Chemistry
Chemistry Paper III-Organic Chemistry
Chemistry Paper IV- Analytical Chemistry

Applied Component- Drugs and Dyes

Chemistry Practical

Applied Component Practical

Post Graduate

MSc Part I

Physical and Inorganic Chemistry

Physical and Inorganic Chemistry Practical

Organic and Analytical Chemistry

Organic and Analytical Chemistry Practical

Advanced Instrumental Techniques

Advanced Instrumental Techniques Practical

Research Methodology

MSc Part II

Quality in Analytical Chemistry

Advanced Instrumental Techniques

Bioanalytical Chemistry and Food Analysis

Environmental & Pharmaceutical Chemistry and Industrially Important Materials Quality in Analytical Chemistry Practical

Advanced Instrumental Techniques Practical

Bioanalytical Chemistry and Food Analysis Practical

Environmental & Pharmaceutical Chemistry and Industrially Important Materials Practical

III BOS composition

Name	Designation
Dr. Prabha Shetty	Chairperson
Dr. P. Sirisha Murthy	Faculty Member

Ms. Tanaz Asha	Faculty Member
Ms. Lynelle Jeysus	Co-opted Member
Sr. Rajani Khandagale	Co-opted Member
Dr. Jyoti Patil	Vice-Chancellor's Nominee
Dr. R.M. Patil	Subject Expert, The Institute of science, Dr. Homi Bhabha State University
Prof.I. N.N. Namboothri	Subject Expert, IIT Mumbai
Dr. Rajiv Kothurkar	Industry Expert
Ms. Ankita Yadav	Illustrious Alumni

IV Dates of BOS meetings

15th June 2023

Report

1. Activities Conducted by the department:

Name of activity	Date	Number of students	Guest Speaker Description Proof
'Holistic health: A Strategic Planning'	1 st September 2023	55	Guest Lecture by Dr Mukesh Gupta . https://docs.google.com/document/d/1NnMxVIilxLSjV7G6NSszq8KaVOIMSiEIHQTT6nVJ6y0/edit?usp=sharing
'CHEMQUEEN'	14 th July 2023.	40	Intra collegiate Chemistry Quiz for the UnderGraduate College students organised by the MSc Part II students on general chemistry https://docs.google.com/document/d/1ujBecBohQN-Wwa7Y6Hb7C2-T-gp7oTdc3ShxjIvSHwY/edit?usp=drive_link

'Flavours of India'	25 th August 2023	42	<p>Flavours of India - a food fest was organized to commemorate the independence of India by showcasing diversity of the various cultures through their food.</p> <p>Proceeds were donated to charity</p> <p>https://docs.google.com/document/d/1M7mVQaZSu9rmaLGQEVZW0g-F2BWlenDXHe9SzMQxABc/edit?usp=drive_link</p>
'Innovation in Natural Dyeing & entrepreneurship opportunities'	31 st October to 10 th November 2023	60	<p>RUSA sponsored credit course 'Innovation in Natural Dyeing & entrepreneurship opportunities' organised in collaboration with HRDC, School of Design (Fashion Design and Technology) Lovely Professional University, Punjab.</p> <p>https://docs.google.com/document/d/1lfQJZMvsSe9SjaHNNCyMwgWRI0VvTxd/edit?usp=drive_link&ouid=112210732267956779327&rtpof=true&sd=true</p>

2. Field trips done by the department :NIL

3. Special pedagogical tools used, other than the lecture method

- i. **Ball and stick, molecular models, solid state models, chemistry molecular model kit:** Molecular models give a 3-D view of the molecule and thus help students to visualize the molecule and understand the molecular structure better. These were used for topics like:
 - Solid state chemistry for TYBSc class -TA
 - Neighbouring group participation for TYBSc class-LJ
 - Stereochemistry for TYBSc class-SM
 - Molecular symmetry TYBSc -VG
 - Hybridisation for FYBSc class-LJ

ii. Practical demonstrations:

FYBSc

- Preparation of emulsions in the VSC class to understand cosmetic formulation.-LJ
- Adulteration of food samples in the VSC class -TA

TYBSc

- Azo and Vat dyeing methods for a better understanding of the classification of dyes -LJ
- Phase titrations -TA
- Sampling of free-flowing solid using a sample thief working model for TYBSc class-PS
- Solvent extraction for the separation of copper and methyl red-PS

iii. Use of PowerPoint presentations by staff:

FYBSc

- VSC-Food additives and adulteration (all lectures)-TA
- VSC -Introduction to cosmeticology-LJ
- Atomic structure - RK
- Periodic table and periodicity - RK
- IKS - minerals and metals of ancient India - RK

SYBSc

Green chemistry - RK

12 Principles of green chemistry - RK

Microwave and ultrasound methods for organic synthesis - RK

Basics of analytical chemistry-PS

Environmental chemistry-PS

Ways of expressing accuracy and precision-PS

Air and water Pollution-PS

TYBSc

- Solid state chemistry, Nanoparticles, Supercritical fluids and Ionic liquids-TA
- Scattering methods-TA
- Photochemistry, structural determination of citral and nicotine-LJ
- Classification of dyes based on application, types of fibers, dye-fibre attachment, dyeing methods, basic processes of dyeing.-LJ
- Rotational, vibrational and Raman spectroscopy - RK
- Surface chemistry - RK
- Colloids - RK
- Statistical treatment of data-PS
- Sampling techniques-PS
- Ion-exchange chromatography-PS
- HPLC-PS
- Chemical calculations-PS
- Methods of separation-PS

MSc Part I

- DSE Unit 2 all lectures -TA
- DSC Physical Organic Chemistry- LJ
- Language of Analytical Chemistry- TQM and Good lab practices
- Chemical calculations and Stoichiometry-PS

- HPTLC-PS

MSc Part II

- MSc Part 2 Paper 2 Unit 2 all lectures-TA
- Chromatography techniques - affinity, 2D TLC, Ag ion and preparative TLC

iv. Creative activities/methodologies used for teaching chemistry:

- Recapitulation of basic concepts in chemistry were conducted to bridge the gap in knowledge of students.
 - Six pillars of Chemistry SM
 - Lewis dot structures and formal Charge LJ
- Bridge practical session for FY practicals for titration experiment and lab apparatus
- Creative Activities
 - Infographic and PPT on Pharmaceutical Chemistry for TYBSc class-SM
 - Group activity on creating molecular models using eco-friendly materials and presenting the model for FYBSc class-LJ
 - Infographic on cosmetic chemistry for VSc class.-LJ
 - Infographs on atomic structure for FYBSc - RK
 - Infographs on Minerals and metals of ancient India for IKS- RK
- Participative Learning
 - Group discussion was done before introducing atomic spectroscopy for TYBSc class -TA
 - Brain teasers were assigned on NGP reactions and later discussed was held on approach towards the questions in the TYBSc class-LJ
 - A set of questions on a particular concept were given which were solved by the students and then explained to the SYBSc class. SM.
 - Students were asked to solve exercises and share them with the SYBSc class.-SM
 - Group activity on identifying the difference between qualitative and quantitative analysis of components on product labels in SYBSc class-PS.
 - Group activity on sampling of solids and miscible and immiscible liquids was conducted for TYBSc class-PS
- Flipped classroom
 - Chemical kinetics for FYBSc class-TA
 - Basics of mechanisms in organic chemistry and natural products for TYBSc class.-LJ
 - Nomenclature for TYBSc class SM
 - Metallurgy, Vedic era, Minerals, Chalcolithic and paleolithic age for IKS class - RK
- Experiential learning
 - Students worked with molecular models to perform the mechanism and predict the stereochemistry of the product for TYBSc class-LJ.
 - Stereochemistry was taught by students making models using the model kit for TYBSc class.SM
 - Students made clay models for various concepts like hybridisation involved in molecules to understand the concepts for TYBSc class. SM
 - Minerals and semi-gem samples were brought to the IKS class for students to understand better - RK
- POGIL
 - Stereochemistry for TYBSc class-SM
 - Significant figures for SYBSc class-PS
 - Atomic structure for FYBSc class - RK

- Hydrogen atomic model for FYBSc class - RK
- Co-ordination complexes - TY Inorganic practical - RK
- Open book test
- Mechanism of organic reactions for TYBSc class-LJ.
- Symmetry elements and point group for TYBSc class.-VG

- Peer Learning:

- MSc students presented a review in class on topics related to environmental Chemistry. -LJ
- Students made flash cards for various catalysts and reagents and its use for conversions which was explained in the TYBSc class-SM
- Literature review on applications of green chemistry and did a presentation along with a write up for SYBSc class - RK
- Literature review on applications of surface chemistry and did a presentation along with a write up for TYBSc class - RK

- Use of digital resources

- Showed videos on topics like photochemistry, basic dyeing processes, various topics in cosmetic chemistry, extraction of essential oil from natural products. LJ
- Videos on IUPAC and stereochemistry -SM
- Videos on Pharmaceutical Chemistry-SM
- Youtube and animation videos-PS,RK
- Simulations-PS,RK
- Used applications like pubchem, chemtube to show the 3D structures of molecules for better understanding.-LJ,SM
- The following applications were used for administering the quizzes: testmozz and Quizizz.-LJ
- Interactive PDF from various sites-PS
- Shared e-books and important links of reference material and videos-PS,RK
- BBC Documentary on formation of minerals, how earth was made, fire and metallurgy for FY IKS - RK
- Virtual museum visit - Gargoti - minerals and gems museum, Nasik - RK

Other methods:

- Conducted an informal test on NGP reactions for TYBSc students.-LJ
- Revision, problem solving and training for attempting semester end examination on all topics in the TYBSc class.LJ
- Conducted pre and post lab sessions for a few practical sessions.-LJ,RK
- Use of comic- strip for introducing the topic of errors-PS
- Interactive illustrations were shared of nitrogen, carbon cycles-PS

v. Other teaching strategies

Worksheets were provided to students on topics like:

FYBSc

- Chemical calculations-TA,RK
- Provided students with worksheets on IUPAC nomenclature, lewis dot structures and formal Charge-LJ

SYBSc

- VBT, MOT and numericals based on Born-Haber cycle.-VG
- Types and sources of errors-PS

- Mean, median, standard deviation, range, variance, deviation, relative average deviation-PS.
- Error: absolute error and relative error-PS.
- Atom economy numericals for practice for SY - RK

TYBSc

- Introduction to Spectroscopy -TA
- Superconductors ,Contact process ,Solid state -TA
- Formal charge, NGP reactions and natural products-LJ
- IUPAC Nomenclature-SM
- Symmetry elements,point groups and MOT.-VG
- 2.5d, 4d and Q test-PS
- Null hypothesis:t-test and F-test-PS
- Graphical representation of data: Method of averages, method of least squares.-PS
- Confidence limit, confidence interval-PS
- Normality, molarity, ppm, interconversion of concentration units, empirical formula, mole fraction and percentage composition-PS.
- Single step, multistep extraction and percentage extraction-PS.

II] Teaching learning in the laboratory (Star College Experiments) :

- Estimation of Ibuprofen content from commercial drug samples for TYBSc class.
- Vitamin C estimation in different samples by redox titration for TYBSc class.
- Estimation of potassium by flame photometry in processed food samples or TYBSc class.
- Estimation of calcium in different milk powder samples for TYBSc class.
- Analysis of different soil samples for potassium, chlorine, nitrogen for TYBSc class.
- Identification of acidic and basic shampoos from different samples using portable pH meter for FYBSc class.

4. Any special programs conducted for either /both slow learners and advanced learners. NA

5. Mentor Mentee programs conducted by the department.

Every student studying chemistry is assigned a contact teacher who follows up their academic progress/ problems through the year.

At FY and SY level the practical teacher is the contact teacher whereas T.Y.B.Sc. students are divided into groups and assigned one staff member each as the contact teacher.

6. Research Papers Presented NA

7. Research Grants Received

Awarded the “Smt Dhandevi Mahindra Scholarship” for the academic year 2023-24- TA

8. Research Guide for PhD students NA

9. National or International awards/fellowships received. Successfully completed Indian Academy of Sciences -SRFP 2023 for teachers at NCL, Pune under the guidance of Dr. K. Krishnamoorthy.-PS

10. Department/ lecturers having research projects funded by Government (include RUSA), Non-Government agencies, college during the year. NIL

11. Workshops/seminars/ Conferences conducted during the year. NIL

12. Workshops/seminars/ Conferences conducted on Intellectual Property Rights (IPR), during the year. NA

13. Workshops/seminars/ Conferences conducted on Gender related issues during the year.

Name of activity	Date	Number of students	Guest Speaker Description Proof
'Holistic health: A Strategic Planning'	1st September 2023	55	Guest Lecture by Dr Mukesh Gupta .

14. Extension activities carried out in the neighborhood sensitizing students to social issues for their holistic development NIL

13 TYBSc students used to teach students of St Stephens school from classes 1st to 4th.

15. E-content development. NIL

16. Capacity Development and Skill Enhancement activities organised for improving students' capabilities; like Soft Skills, Language and Communication Skills, Life Skills (Yoga, Physical fitness, Health and Hygiene) & Awareness of Trends in Technology.

Name of activity	Date	Number of students	Guest Speaker Description Proof
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'CHEMQUEEN'	14 th July 2023.	40	Intra collegiate Chemistry Quiz for the Undergraduate College students organised by the MSc Part II students on general chemistry https://docs.google.com/document/d/1ujBecBohQN-Wwa7Y6Hb7C2-T-gp7oTdc3ShxjlvSHwY/edit?usp=drive_link
'Flavours of India'	25th August 2023	42	Flavours of India - a food fest was organized to commemorate the independence of India by

			<p>showcasing diversity of the various cultures through their food.</p> <p>Proceeds were donated to charity</p> <p>https://docs.google.com/document/d/1M7mVQaZSu9rmaLGOEVZW0g-F2BWIenDXHe9SzMOxABc/edit?usp=drive_link</p>
‘Innovation in Natural Dyeing & entrepreneurship opportunities’	31st October to 10th November 2023	60	<p>RUSA sponsored credit course ‘Innovation in Natural Dyeing & entrepreneurship opportunities’ organised in collaboration with HRDC, School of Design (Fashion Design and Technology) Lovely Professional University, Punjab.</p> <p>https://docs.google.com/document/d/11fQJIZMvsSe9SjaHNNCyMwgWRl0VvTxd/edit?usp=drive_link&oid=112210732267956779327&rtpof=true&sd=true</p>

17. Guidance/coaching for competitive examinations and career counseling offered to students.

Seven PMRF (Prime Ministers Research Fellows) students from IIT-B were providing 36 UG and PG students of Sophia College with guidance for competitive examinations via online sessions six days a week from to 28th August 2023 onwards.



Dr. Prabha Shetty
Associate Professor
Head Department of Chemistry
Sophia College (Autonomous)
Date: 30/11/2023

Preliminary information

Department profile

1. Dr. P.Shetty, Head of Dept
2. Dr. S.Murthy
3. Ms. T.Asha
4. Ms. L.Jeysus
5. Sr. R.Khandagale
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7. Ms Vaishnavi Ghugare
8. Ms. Sajal Ansari

Junior College:

1. Ms. B. Gonsalves
2. Ms. S. Rathod
3. Ms. B.Shaikh

II Courses/Papers taught

Undergraduate

FYBSc

Fundamentals of Chemistry-1

Fundamentals of Chemistry Practical -1

Journey of Metals: Ores to alloys

Journey of Metals: Ores to alloys Practical

Chemistry of the Universal solvent : Water

Chemistry of the Universal solvent : Water Practical

Serendipitous: Accidental discoveries by chance

SYBSc

Chemistry Paper I -Physical and Analytical Chemistry

Chemistry Paper II-Inorganic Chemistry

Chemistry Paper III-Organic Chemistry

Chemistry Practical

TYBSc

Chemistry Paper I -Physical Chemistry
Chemistry Paper II-Inorganic Chemistry
Chemistry Paper III-Organic Chemistry
Chemistry Paper IV- Analytical Chemistry
Applied Component- Drugs and Dyes
Chemistry Practical
Applied Component Practical

Post Graduate

MSc Part I

Physical and Inorganic Chemistry
Physical and Inorganic Chemistry Practical
Organic and Analytical Chemistry
Organic and Analytical Chemistry
Advanced Instrumental Techniques
Advanced Instrumental Techniques Practical
On - Job Training

MSc Part II

Quality in Analytical Chemistry
Advanced Instrumental Techniques
Selected Topic in Analytical chemistry
Intellectual Property Rights and Cheminformatics

Quality in Analytical Chemistry Practical
Advanced Instrumental Techniques Practical
Selected Topic in Analytical chemistry Practical
Project Work

III BOS composition

Name	Designation
Dr. Prabha Shetty	Chairperson

Dr. P. Sirisha Murthy	Faculty Member
Ms. Tanaz Asha	Faculty Member
Ms. Lynelle Jeysus	Co-opted Member
Sr. Rajani Khandagale	Co-opted Member
Dr. Harichandra Parbat	Vice-Chancellor's Nominee
Dr. R.M. Patil	Subject Expert, The Institute of science, Dr. Homi Bhabha State University
Prof.I. N.N. Namboothri	Subject Expert, IIT Mumbai
Dr. Rajiv Kothurkar	Industry Expert
Ms. Ankita Yadav	Illustrious Alumni

IV Dates of BOS meetings

14th December 2023

22nd April 2024

Report

1. Activities Conducted by the department:

Name of activity		N u m b e r o f s t u d	Guest Speaker Description Proof

		e n t s	
Exploring Opportunities in Higher Education: scholarship and Funding		3 5	<p>Ms. Rochelle Ferns Certified career counsellor, Life Sciences Lead, International College Dundee, University of Dundee, Scotland Session to expose students to the various opportunities available and the protocols to follow when trying to acquire admission for higher studies overseas</p> <p>https://docs.google.com/document/d/1KYZYAIhbouYBz_uBe7rm-x5cFk9ScXDNOa1y5-9vYC4/edit?usp=drive_link</p>
Chemical Sciences and Career Opportunities		3 6	<p>Dr. Dimple Dutta Professor (Chemical Sciences) Homi Bhabha National Institute Bhabha Atomic Research Centre Mumbai Session to make students aware of the various opportunities available after pursuing a degree in Chemistry.</p> <p>https://docs.google.com/document/d/1XNjNah-8WV3L6fPhKroKBve1VQ6T_C8zzI1mv0oJ11U/edit?usp=drive_link</p>
Discovery of Quantum Dots		3 1	<p>Dr. Arindam Chowdhury Professor, Department Of Chemistry, IIT Bombay Nobel Oration Lecture.</p> <p>https://docs.google.com/document/d/1GsdehqjIDWph3EzTmT0xrCgrYpVpZHJ1eEjE3DVHN3A/edit?usp=drive_link</p>

Chemscope

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Inter collegiate fest consisting of four events viz. Quiz, relay, poster competition and treasure hunt organised by student organisers with the help of volunteers.

https://docs.google.com/document/d/1Ohb_Vf0aQGti-tqUf0g77YKsYtxo4HrMmHr1rtTD9PY/edit?usp=drive_link

		teers 4 5	
Towards sustainable green heat generation with nanostructured porous carbon		3 8	Dr Chandramouli Subramaniam Professor, Department Of Chemistry, IIT Bombay Popular series lecture organised by the dept of chemistry in collaboration with IWSA https://docs.google.com/document/d/1zHS2UFdFxiUvmGujBPqxjZ8eYI3BuBqI7oEwrVXD1UM/edit?usp=drive_link
Internet of Chemistry Things: IoT enabled AI application in Chemistry		3 6	Prof. Karthikeyan, Chief Scientist NCR-NCL, Pune https://drive.google.com/drive/folders/1A2mlIEWgpukT_LNSkm_u0SSWHvUZd-gx?usp=drive_link

2. Field trips done by the department :NIL

3. Special pedagogical tools used, other than the lecture method

I] Teaching Aids used: In order to make the study of chemistry simple and interesting, a variety of teaching aids are used by the staff. These include:

i. Ball and stick, molecular models, solid state models, chemistry molecular model kit:

Molecular models give a 3-D view of the molecule and thus help students to visualize the molecule and understand the molecular structure better. These were used for topics like:

- Stereochemistry -FYBSc-LJ
- Stereochemistry -FYBSc-LJ
- Solid State Chemistry-TYBSc-SA

ii. Practical demonstrations:

FYBSc

- Demonstrated capillary action, viscosity of different liquids, the use of Oswalds viscometer in the FYBSc-SEC class for a better understanding of the topic on 12th and 19th January 2024-LJ
- Demonstrated Mohr's and Volhard's method for determination of chloride in the TYBSc class on 23rd February 2024.-PS

TYBSc

iii. Use of PowerPoint presentations by staff:

FYBSc

- Chemistry of the universal solvent water-LJ
- Journey of metals: Ores to alloys-TA
- Optical activity, aromaticity-LJ

TYBSc

- Dyes used in food and cosmetics-LJ
- Thin layer chromatography-PS
- Paper chromatography-PS
- Gas chromatography-PS
- Thermal methods of analysis-PS
- Complexometric and precipitation titrations-PS
- Mass spectrometry and radio-analytical methods-PS

MSc Part I

- Electroanalytical techniques- TA
- Thermal methods of analysis-PS
- Chromatographic methods-PS

MSc Part II

- Spectral Methods -IV-TA

iv. Creative activities/methodologies used for teaching chemistry:

Creative Activities

- Creation of Comic strips for mechanisms of reactions by TYBSc students.-LJ
- Venn diagram to depict similarities and differences between Mohr's, Volhard's and Fajan's methods of detecting end point in precipitation titration by TYBSc students-PS
- Preparation of pH indicator from natural sources and testing pH of household articles by FYBSc class-TA
- Poster presentation on serendipitous discoveries by FY students-RK
- Infographics on various topics in industrial Chemistry by SYBSc students-RK

Experiential learning

- The students of the TYBSc class in group performed separation of food colours/ink using chalk as a stationary phase.-PS
- The students of the SYBSc class brought various coloured juices and predicted its λ_{max} using the colour wheel which they had drawn.

Later they verified the claim by measuring the absorbance of juices at different wavelengths using a colorimeter. -PS

- Students of TYBSc class were assigned to make molecular models and perform the mechanism and predict the toxicity/stereochemistry of the product.-LJ
- Students of FYBSc class were assigned to make molecular models to learn the various projections and conformational analysis. -LJ

- Group Activity on preparation of buffers and measuring its pH using a pH meter and later the pH was theoretically calculated using Henderson Equation by the FYBSc students on 10th January 2024-TA

Inquiry Based Learning:

- The students of SYBSc were divided into groups and were asked to draw a colour wheel and then the complementary colours concept was explained.-PS

POGIL

- On oxidation numbers and balancing redox reactions for FYBSc class -TA

Open book test

- Stereochemistry for FYBSc students. -LJ
- Crystal field theory and VSEPR theory for TYBSc class.-VG

Peer Learning:

- Students presented on topics related to environmental Chemistry to the MSc class.-LJ
- TYBSc students presented on topics like carbohydrates, proteins and nucleic acids to the class.-LJ
- Students of TYBSc class worked in groups to solve numericals in spectroscopy. -SM
- TYBSc students explained synthesis of drugs to the class.-SM
- A group of 4 to 5 students of SYBSc class were allotted a group leader to help them with difficulties. The leaders ensured that their group completed the assigned work. -SM

Use of digital resources

- Videos on topics like S_N1 and S_N2 reactions, Merrifield solid phase synthesis, hair dyes, and lipsticks were shown to the TYBSc class.-LJ
- Simulation on Beer Lambert Law was used and the students were asked to identify dependent and independent variables and to study the effect of dependent variables on the absorption of light using the simulation. -PS
- Simulation on interaction of light and matter was shown where the students were asked to watch the simulation and solve the worksheet in groups.-PS
- Videos on pH(use and application) were uploaded on the G-Classroom and the topic was discussed in the FYBSc class on 20th December 2023.-TA.
- Simulation for TYBSc class on electroanalytical technique-polarography-TA
- Videos on Spectroscopy were shown during lectures to the TYBSc class.-SM
- Videos on Crystal Field Theory and Molecular Orbital Theory for TYBSc class.-VG

Other methods:

- The following applications were used for making lectures more interactive: Mentimeter, G-form for FYBSc class.-LJ

v. Other teaching strategies

Worksheets were provided to students on topics like:

FYBSc

- cis-trans, E/Z and R/S nomenclature, Numericals on optical activity-LJ
- numericals for water parameters-LJ
- Oxidation number -TA/RK
- Balancing redox reactions-RK

SYBSc

- VBT with respect to coordination chemistry.-VG

TYBSc

- Carbohydrates and interconversions of Haworth and Fischer Projections-LJ
- Numericals on spectroscopy-SM
- Numericals on Polymers-RK
- Numericals on Quantum Chemistry-SA
- Crystal field theory, VSEPR theory and MOT.-VG

MSc Part I

- UV, IR, PMR C-13 and Mass spectrum of compounds were assigned to the M.Sc students to interpret the data and determine the compound.-SM

II] Teaching learning in the laboratory (Star College Experiments) :

Teaching chemistry- Beyond the classroom: In working towards the College mission of providing holistic growth to students, the chemistry department organises a variety of activities for the students. These activities aim at exposing students to frontier areas of chemistry beyond the syllabus.

- Estimation of Aspirin content from commercial drug samples for SYBSc class. PS, SM, LJ and VG
- Assay of some commercially available drugs for TYBSc students.-LJ
- Project work on preparation of azo dyes, checking its potential as an indicator for acid base titrations and/or as a dye for fabric for the TYBSc class.-LJ
- The students of TYBSc analysed various brands of talcum powder for magnesium content; various parameters were altered like buffer, indicator etc. to study its effect on the end point detection and finally concluded the most suitable buffer and indicator for the magnesium estimation.-PS,TA
- Estimation of fluoride in various brands of toothpastes using spectrophotometry for TYBSc students.-PS
- Estimation of glucose in various brands of honey samples by TYBSc students.-PS
- Phosphoric acid determination in various brands of cola samples by TYBSc students. -PS
- Vitamin C content in food and drug samples by pH meter by TYBSc students.-PS
- Sodium content in different brands of edible salt sample by ion exchange chromatography by TYBSc students.-PS
- The students of TYBSc used the ash of dried leaves to prepare potash. The presence of potassium ion and carbonate ion was confirmed using a qualitative analysis method and the percentage of potash was determined by estimating potassium content using a flame photometer.-PS
- Estimation of hardness content of water samples from different sources by SYBSc students, the water quality was determined based on the hardness values.-PS
- Different samples were analysed by the SYBSc students and identified based on the specific rotation values.-PS
- Estimation of bleaching powder in various brands of detergents by TYBSc Students-RK
- Estimation of amount of copper in copper wires from unused earphones by TYBSc students-RK
- Separation of food dyes and plant pigments using TLC for TYBSc students.-RK
- Separation of food dyes using TLC for TYBSc students.-SA
- Detection of pesticides in vegetables and fruits by FYBSc students-RK
- Determination the pH and thereby classification of daily use products into acidic, basic and neutral by FYBSc students-RK

4. Any special programs conducted for either /both slow learners and advanced learners. NA

5. Mentor Mentee programs conducted by the department.

Every student studying chemistry is assigned a contact teacher who follows up their academic progress/ problems through the year.

At FY and SY level the practical teacher is the contact teacher whereas T.Y.B.Sc. students are divided into groups and assigned one staff member each as the contact teacher.

6. Research Papers Presented

Two TYBSc students Ms.Vaishnavi Subramaniam and Ms. Padmakeerti Yeleswarapu of batch 2022-23 presented their work at 18th Aavishkar: Inter-collegiate zonal round on 9th December 2023. Guide Dr Prabha Shetty

7. Research Grants Received NIL

8. Research Guide for PhD students NA

9. National or International awards/fellowships received. Ms Safia Batatawala got selected for Indian Academy of Sciences -SRFP 2024 Chemistry.

10. Department/ lecturers having research projects funded by Government (include RUSA), Non-Government agencies, college during the year.

Training for 8th standard teacher of Haregaon and Andheri school under RUSA outreach project on 13th February 2024.-PS

11. Workshops/seminars/ Conferences conducted during the year.

Workshop on “Internet of Chemistry Things: IoT enabled AI applications in Chemistry by Dr M. Karthikeyan on 27th February 2024.

12. Workshops/seminars/ Conferences conducted on Intellectual Property Rights (IPR), during the year. NA

13. Workshops/seminars/ Conferences conducted on Gender related issues (IPR), during the year. NIL

14. Extension activities carried out in the neighborhood sensitizing students to social issues for their holistic development NIL

13 TYBSc students used to teach students of St Stephens school from classes 1st to 4th.

15. E-content development. NIL

16. Capacity Development and Skill Enhancement activities organised for improving students’ capabilities; like Soft Skills, Language and Communication Skills, Life Skills (Yoga, Physical fitness, Health and Hygiene) & Awareness of Trends in Technology.

Name of activity	Date	Number of students	Guest Speaker Description Proof
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Exploring Opportunities in Higher Education: scholarship and Funding	22/12/2023	35	<p>Ms. Rochelle Ferns Certified career counsellor, Life Sciences Lead, International College Dundee, University of Dundee, Scotland</p> <p>Session to expose students to the various opportunities available and the protocols to follow when trying to acquire admission for higher studies overseas</p> <p>https://docs.google.com/document/d/1KYZYA1hbouYBz_uBe7rm-x5cFk9ScXDNOa1y5-9vYC4/edit?usp=drive_link</p>
Chemical Sciences and Career Opportunities	12/01/2024	36	<p>Dr. Dimple Dutta Professor (Chemical Sciences) Homi Bhabha National Institute Bhabha Atomic Research Centre Mumbai</p> <p>Session to make students aware of the various opportunities available after pursuing a degree in Chemistry.</p> <p>https://docs.google.com/document/d/1XNJNah-8WV3L6fPhKroKBve1VQ6T_C8zzi1mv0oJ11U/edit?usp=drive_link</p>
Discovery of Quantum Dots	20/1/2024	31	<p>Dr. Arindam Chowdhury Professor, Department Of Chemistry, IIT Bombay</p> <p>Nobel Oration Lecture</p> <p>https://docs.google.com/document/d/1GsdehqjIDWph3EzTmT0xrCgrYpVpZHJ1eEjE3DVHN3A/edit?usp=drive_link</p>
Chemscope	10/02/2024	Participants 83 from 5 colleges Organising and volunteers 45	<p>Inter collegiate fest consisting of four events viz. Quiz, relay, poster competition and treasure hunt organised by student organisers with the help of volunteers.</p> <p>https://docs.google.com/document/d/1Ohb_Vf0aQGti-tqUf0g77YKsYtxo4HrMmHr1rtTD9PY/edit?usp=drive_link</p>
Towards sustainable green heat	12/02/2024	38	<p>Dr Chandramouli Subramaniam Professor, Department Of Chemistry, IIT Bombay</p>

generation with nanostructured porous carbon			Popular series lecture organised by the dept of chemistry in collaboration with IWSA https://docs.google.com/document/d/1zHS2UFdFxiUvmGujBPqxjZ8eYl3BuBqI7oEwrVXD1UM/edit?usp=drive_link
Internet of Chemistry Things: IoT enabled AI application in Chemistry	27/02/2024	36	Prof. Karthikeyan, Chief Scientist NCR-NCL, Pune https://drive.google.com/drive/folders/1A2mlEWgpukT_LNSkm_u0SSWHvUZd-gx?usp=drive_link

17. Guidance/coaching for competitive examinations and career counseling offered to students.

Seven PMRF (Prime Ministers Research Fellows) students from IIT-B were providing 36 UG and PG students of Sophia College with guidance for competitive examinations via online sessions six days a week.



Dr. Prabha Shetty
Associate Professor
Head Department of Chemistry
Sophia College (Autonomous)
Date:26/04/2024