JAI HIND COLLEGE

Progress report under Star College Scheme

Academic Years: 2018-19 to 2020-2021

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OVERVIEW OF THE COLLEGE

1. Name of the College	:	Jai Hind College, A Road, Churchgate, Mumbai
2. Name of Departments supported	:	Botany Chemistry Microbiology
3. Name of Coordinator, designation, address, phone no.	:	Dr. B.K.N. Singh Head, Associate Professor, Department of Chemistry Email: brijesh.singh@jaihindcollege.edu.in Phone No: 022-22040256
4. Number of regular faculty with Ph.D. in each participating department	:	Botany: 05 Chemistry: 07 Microbiology: 02
5. List of courses (B.Sc./M.Sc./PG Diploma) run by different participating departments	:	Botany: B.Sc., M.Sc. (research), Ph.D. Chemistry: B.Sc., M.Sc. (papers), M.Sc. (research) Microbiology: B.Sc.
6. Cut off percentage for admission in different courses in participating departments, positions in university, percentage of result in 2018-2021 academic sessions	:	Cut off percentage: 50% **Results** Department of Botany- 2018-19: 100% 2019-20: 100% 2020-21:100% Department of Chemistry: 2018-19: 79.5% 2019-20: 80% 2020-21: 93.1% Department of Microbiology: 2018-19: 100% 2019-20: 100% 2020-21: 100%

REVIEW FROM STAR COORDINATORS

Dr. B.K.N. Singh – Coordinator DBT-STAR Scheme

The experience of heading the Star DBT Scheme for Jai Hind College & popularizing Science amongst students and to enhance their skill towards doing science has been very rewarding and encouraging.

The aims and objectives of Star DBT have been well defined and pragmatic and doable with able guidance and financial support. It has made the implementation of the scheme easy and effective. The financial support has gone a long way in equipping the labs with multiple instruments and equipment to cater to the growing strength of undergraduate students in science disciplines. The thrust on trying some new experiments has broadened the thinking ability of students and teachers alike. This approach of trying something new has culminated in many new experiments which could be incorporated in curriculum designing and better understanding of scientific concepts and applications in future. The Star College Scheme at JHC was ably headed by Dr. Ambika Joshi, then HOD of Botany during the start in the year 2018 and it was transferred to Dr. B K N Singh, HOD Chemistry on her superannuation.

The plan for 3 years of Star for the departments of Botany, Chemistry & Microbiology was meticulously designed by our Principal Dr. A G Wadia and Dr. Ambika Joshi and then carried forward by me. The staff of all the three departments under Star has risen to the challenges and successfully mitigated the task. The advent of Corona in 2020 did not dampen the spirit of the Star College Scheme but it led to opening new doors and ideas of approaching the aims and objectives with a difference. The departments with the help of IT and other science departments collectively organized events on virtual platforms for students of the college as well as other colleges and Universities. The experiments were done virtually and experts in the field of biological sciences, chemical sciences were brought in to introduce developments in science in recent times. The meeting with executive members held on 24th November 2020 at 12.30pm was a source of inspiration and the comments of appreciation from respected Dr. Minakshi Munshi (Advisor/Scientist G, Head, HRD, DBT) and Dr. Garima Gupta (Scientist E, DBT) were so empowering that it has inspired our science departments to be part of Star College Scheme in the future too. The guidance rendered by experts Dr. Ambika Joshi (Ex Head, Botany, JHC), Prof. Sunita Shailajan (External expert, Ex-Head, Botany, Ruia College), Dr. Surekha Zingde (External expert, Director, IWSA), Dr. Madhura Ghayal (Ex Head, Microbiology, JHC), Mrs Petra Sequiera (Ex Head, Microbiology, JHC) and Dr. Deepa Khushalani (External expert, Scientist, TIFR) from time to time has always put us on the right track to successfully cover the journey of Star College Scheme.

The Accounts Department and Finance Committee of our college for Star College Scheme has done a fabulous job in controlling the expense and purchase of equipment with justification and maintaining the accounts.

Finally, the students from all science departments came together with full zeal to learn and enjoy every bit of proposal put forward in the form of all endeavors of experiments, seminar, workshop, webinars, scientific talks, exhibitions, research discussions, extension work,outreach programs involving teaching school children and the inclusiveness to all other non-science students to experiment in the labs under star.

I am sure that the scheme is a boon to all colleges under it and is definitely helping to enhance science and popularizing it. This is evident from the increasing number of students taking up science and it will continue to attract many more in future. Finally, it has made us believe in “Be Good, Do Good and Serendipity will automatically follow”

Dr. Sangeeta Godbole – Coordinator, Department of Botany

The department of Botany Jai-Hind College is overwhelmed by the effect of funding received under starDBT. It was a new adventure for this Dept which slowly unfolded towards benefitting both the student’sas well as teachers of this institution. We often used to experience a shortage when funds were requiredto buy chemicals and equipment to match current technology and decide on experiments to beincorporated in syllabi. Star DBT funding suddenly equipped us with the ability to design newexperiments as per current scenario especially without worrying about the cost of carrying moreinteresting experiments for large number of students. All teachers of the dept utilized their maximumstrength and knowledge to use this opportunity for the benefit all students. Each teacher in the deptdesigned basic experiments as per her specialization. All this was possible only with the variety of newequipment purchased in the department in enough numbers. The ability to have hands on trainingwith every possible instrument, while performing these set of experiments and projects furtherincreased student’s confidence level. In due course of three years, they continued to take part inseveralcompetitions and also won several prizes. It changed their perspective towards science as theystarted understanding the subject and were always eager to learn more. Several courses could also beconducted to benefit all students of Jai-Hind College. This practice will be now continued every year as base equipment are already present.Thank you Star DBT.

Dr. Sajith Chandran – Coordinator, Department of Chemistry

The Star-DBT scheme has been a very rewarding experience for the Chemistry Department. It was well received by students and teachers alike. Various programs held under the auspices of Star DBT provided a platform for the students to engage in various scientific activities and venture into areas which are normally introduced to them during higher studies. We could introduce them to research activities, reading and comprehending publications, present them as reviews and participate in exhibitions and engage in projects. This would not have been possible without the momentum provided by Star DBT and the suggestions and support extended by the advisory committee members, Principal and college coordinator. The new experiments introduced under the Star banner could increase inquisitiveness among the learners, explore new Chemistry, learn new techniques and develop skills. The instruments and chemicals procured under Star DBT could drive this to fruitful implementation. Our department saw an increase in the student enrollment and their participation in courses and activities of the department in last three years. Another commendable outcome of Star DBT is the convergence of star supported departments to venture into interdisciplinary projects and exchange of ideas. As coordinator, I have great satisfaction in the progress of the department for providing experiential learning for the students through Star scheme. I take this opportunity to thank DBT for providing this opportunity to my department and college.

Roonal Jain – Coordinator, Department of Microbiology

The DBT STAR fund has helped in the overall growth of the Departments. With the increase inthe number of instruments bought, the ratio of student to instrument greatly reduced. The rangeof auto-

pipettes funded by DBT- Star helped in inculcating good lab practices. With themolecular biology experiment kits purchased, students could get hands on training in theseotherwise difficult to perform experiments. Research culture has enhanced. The researchexposure in the initial years encouraged the students to work in association with other institutes.It was possible to extend the activities to other college faculty and students. The students areencouraged to connect to society and use their skills in helping the society. The motivation toconduct several online webinars during this pandemic was because of DBT.

6. List of projects undertaken by students, industrial visits by students, summer training in last one year:

DEPARTMENT OF BOTANY

Year 2018-19

Projects and posters			
SNo	**Title**	**Beneficiaries**	**Description**
1	A natural antioxidant alternative from *Ficus sps* for synthetic dyes.	02	**Outcomes:** *Ficus sp*. barks were collected from waste from trimming and road side.Natural dyes were extracted and were tested for fastness on various fibres using natural mordents. The project won several awards including the prestigious Avishkar (silver medal) and ultimately resulted in a start-up.
2	Insecticidal activity of *Centratherum anthelminticum* (L) extracts	02	**Outcomes:** Plant extract was found to be very effective against insects and mosquito larvae.
3	Incorporation of silver nanoparticles coated with antimicrobial essential oil extracted from *Ocimum sps* in a moisturizer	02	**Outcomes:** Essential oil extracted from Tulsi tulsi leaves was coated on silver nanoparticles to enhance its ability as an antimicrobial agent. The prepared nanoparticles were mixed in a moisturizer and also a sanitizer.
4	Cosmeceutical preparation of Beet peel	03	**Outcomes:***Beta vulgaris* L. (Beet root) peel waste was collected from college canteen, juice centers and household for this project. The tint prepared was checked for its efficiency as a natural pigment and microbial load was also carried out.
5	Environmental Audit of a South Mumbai College	04	**Outcomes:** A survey was carried out and inventory was made on electricity consumption by all electrical appliances used in college to understand and provide effective ways to reduce more power consumption.
6	Chemical composition and anti–microbial activity of Essential oil from *Callistemon* sp.	04	**Outcomes:** The oil extracted from *Callistemon* was tested for its antimicrobial efficacy against five common pathogens.
7	Extraction and isolation of Ursolic acid from a few Apocynaceae leaves.	02	**Outcomes:** Ursolic acid was extracted by Solvent extraction method and purified the sample was identified by Thin layer chromatography.

Visits: 2018-19

SrNo	Name of institution	Date	Beneficiaries
01	Go Green Nursery, Panvel	02 - 08 - 2018	43
02	Sanjay Gandhi National Park	17-09-2018	80
03	Mumbai Port Trust Garden	03-10-2018 & 09-10-2018	120
04	Kamla Nehru Park and Hanging Gardens	20-12-18	46
05	Botanical Survey of India, Pune Agriculture College, Pune Empress Botanical Garden, Pune	10-08- 2018 & 11-08-2018	18
06	Tea and Coffee Estate/ Plantation, Wayanad, Kerala	20-11-2018 & 21-11-2018	45
07	Soonabai Pirojsha Godrej Marine Ecology Centre	22-02-2019	64

Year 2019-20

Projects and posters

SNo	Title	Beneficiaries	Description
1	Extraction and isolation of Ursolic acid from a few Apocynaceae leaves.	03	**Outcomes:** Ursolic acid was extracted by Solvent extraction from new sources. The extracted Ursolic acid was compared to standard Ursolic acid by TLC and was also checked for antioxidant activity.
2	Analysis of water samples from different water bodies in Mumbai	02	**Outcomes:** Students assessed the extent of pollution in a few water bodies in Mumbai.
3	Isolation and estimation of Caffeine from locally available coffee brands	02	**Outcomes:** Students were able to isolate Caffeine and compare Caffeine content in different coffee brands using standard Caffeine.
4	Determination of tannin content and antioxidant activity from the tea samples	02	**Outcomes:** Students compared tannin content in terms of gallic acid and checked antioxidant activity of different tea brands.

5	Comparative study of Fe in common green leafy vegetables.	05	**Outcomes:** Iron content of different green leafy vegetables was compared to understand the source of Iron rich vegetable
6	Pigment extraction from flowers.	05	**Outcomes:** The extracted pigments were used to check pH of unknown solutions.
7	Essential oil extraction from 4 different leaf samples of *Murraya paniculata, Citrus limon, Murraya koenigii* and *Aegle marmelos*.	05	**Outcomes:** Students quantified essential oils and performed TLC to separate the components of the essential oil.
8	Estimation of protein from different legumes using 3 different methods for protein.	05	**Outcomes:** estimation and Comparison of results obtained with different protein estimation methods
9	Estimation of vitamin C content from indigenous and exotic fruits using DCPIP titration method and a comparative account studied.	04	**Outcomes:** Vitamin C content of various fruits was compared seasonally to understand the best season for consumption of those fruits.

Interdisciplinary Projects

SNo	Title	Beneficiaries	Description
1	Chemical composition, antimicrobial & Larvicidal activity of Essential oil from *Callistemon* sp.	03	**Outcomes:**The extracted oil was tested for its antimicrobial efficacy against five common pathogens and Larvicidal activity against larvae of *Aedes* mosquito was checked.
2	Amalgamation of crude leaf extract with essential oil to make aromatic/ organic soap.	03	**Outcomes**: Antibacterial and antifungal properties of the extract were studied and soap was made from essential oils and pigments.
3	Extraction and comparison of protein profile from 5 different legumes on native PAGE.	05	**Outcomes:** Students learned to compare protein profiles using Native PAGE.

Visits			
S.No.	**Name of institution**	**Date**	**Beneficiaries**
01	Yusuf Meherally Centre, Panvel	10/08/19	37
02	Go Green Nursery, Panvel	10/08/19	37
03	Excursion to Pachmarhi, Madhya Pradesh	11/11/19 to 17/11/19	51
04	Visit to Silk Board Centre, MadhyaPradesh	15/11/19	51
05	P.D Hinduja Hospital	04/02/20	10
06	Annual fruit, flower and vegetable show by Friends of Trees at Ruparel College, Mumbai	08/02/20	37

Year 2020-21

Projects and posters			
SNo	**Title**	**Beneficiaries**	**Description**
1	Threats to coral reefs of Andaman and Nicobar Islands.	01	**Outcomes**: The student learnt an applied aspect of environmental pollution. Marine environment forms an important region in the ecology of earth and corals.
2	Antibacterial properties of black pepper	01	**Outcomes**: In this era of immunity development the student decided to do a literature survey on key ingredients used in decoctions made at home.
3	Antidiabetic activity in seeds of *Syzygium*	01	**Outcomes:** The student compared the different animal studies performed

	cumini		using extracts of jambul seeds for their various outcomes.
4	Extraction of vitamin C from unconventional leaves	01	**Outcomes:** The student decided to see sources for extraction of vitamin C from plants other than regular citrus sources.
5	Estimation of protein from pulses	01	**Outcomes**: The students decided to find the content of proteins in different pulses and study comparative methods of estimation of proteins.
6	Essential oil of *Murraya koenigii*	01	**Outcomes:** The student studied the method used for extraction of essential oil from Murraya.
7	Production of biogas from flower waste	01	**Outcomes:** The student raised a research question on the problem of wasted flowers in our country and decided to scout the literature for the same. She came across biogas production and did a review on the same.
8	Turmeric: The Golden Spice	01	**Outcomes:** In the era of covid, majority of the students wanted solutions in home remedies and ancient ayurveda. The student worked on papers in the last few years about the use of this spice and its uses.
9	Pothos - The Fortune Clover	01	**Outcomes:** The student decided to explore the fact that the usual plants that are kept for decorative purposes in our house could be of any potential use medicinally.
10	Immunity boosters for covid-19 : Ayurveda & Yoga	01	**Outcomes:** The student was prompted to take up this literature survey because of the use of both the sciences in this pandemic. It was a successful attempt to establish a connection between the two
11	Benefits of polyphenols on gut flora	01	**Outcomes:** The student not only studied about the various types of polyphenols but also established a correlation of their consumption to our regular gut flora.
12	Vegetable Microbiome	01	**Outcomes:** The microbiome of vegetables serves as a habitat for a variety of opportunistic and evolving pathogens. Opportunistic pathogens can cause serious infections in immunocompromised individuals. Probiotics, prebiotics, and synbiotics can provide biotechnological solutions while multiomics integration provides technical solutions.
13	Gut microbiota and immunology	01	**Outcomes:** The gut microbiome plays a very important role in your health by helping control digestion and benefitting your immune system. In

			addition to the impacts of host-microbiota interaction on innate immune function, recent research also discloses mechanisms governing mutualism between the microbiome and adaptive immune system.
14	Aromatherapy in stress and anxiety management	01	**Outcomes**:Aromatherapy works in different ways for different people, it is based on their preferences, the problem they are facing, the intensity of the oils and the area of application. Accounting the research and the survey conducted on the same, it is proven to work for the maximum number of the population. Hence, aromatherapy does help reduce stress and anxiety.
15	GM crops grown as a food security solution.	01	**Outcomes:** GM crops will improve food security and in broader terms that can alter the food problems that will be faced by the world. Developing nations should adopt this methodology for correct cultivation of foods for their ever-growing population and their needs.
16	Papaya leaf can cure malaria	01	**Outcomes:**Various research on papaya leaf show that it enhances the platelet count of blood which decreases during mosquito bite infection. Different concentrations of extract show different results. Also, moderate concentration is known to exhibit good antiparasitic effects and promising inhibitory activity.
Interdisciplinary Projects: NIL			
Visits: NIL			

DEPARTMENT OF CHEMISTRY

Year 2018-19

Projects			
SNo	**Title**	**Beneficiaries**	**Description**
1	Acid content in soft drinks by pH metry.	04	**Objectives:** To understand the concept of pH and its application on a daily basis. To analyze the acid content (pepsi, cola, sprite etc) present in various beverages and to understand the limit of the acid content. **Outcomes:** The student analysed the acid content by pH measurements of the samples. They understood the amount of acid present in various beverages and their limits. The project helped to familiarize the application of pH measurements and their application in food analysis. Mentor: Ms. Khatija Attar
2	Extraction of essential oils from natural sources (jasmine, rose) by Soxhlet apparatus/Steam distillation apparatus.	02	**Objectives:** To train the students on extraction of essential oils and other components from natural resources thereby they understand the laboratory method & industrial application of the process. **Outcomes:** Students learned extraction of essential oils and natural compounds by Soxhlet extraction and steam distillation methodologies. They developed the skill of using various extraction apparatus, especially Soxhlet apparatus. Selection of suitable solvents of extraction were also learned. They were also thinking about the extension of the methods to scale up/industrial applications. Mentor: Dr. Sangeeta Parab
3	Study of effect of addition of solute (urea) on the freezing point of solvent by Beckmann thermometer.	02	**Objectives:** To make students understand the effect of solute/impurities on physical constants of the solvents. Knowledge of Beckmann thermometers and their use.

			Outcomes: Students learned the thermodynamic properties and colligative properties and their effect on physical constants. They learned to identify the extent of impurities by recording the physical parameters. To extend this concept towards assessing impurities in solutions. They learned about Beckmann thermometers and their use by reaction in Dewars flask. Mentor: Dr. Sangeeta Parab
4	Determination of absorption maxima and molar absorption coefficient of tetraammine copper (II) complex.	05	**Objectives:** To have hands-on experience on UV-Visible spectrophotometer and to understand its theoretical principles. To learn the concept of λ_{max}, molar absorption coefficient and their significance on the properties of complexes. **Outcomes:** Students acquired awareness about spectrophotometer, the parts of the instrument and theory. Applications of absorption spectrophotometer in measuring λ_{max} of UV-Visible active solutions. They were familiarized with the advantage of the instrument in chemical analysis. Mentor: Ms. Khatija Attar
5	Verification of Nernst equation using Daniel Cell & to study the effect of concentration on potential by potentiometry.	03	**Objectives:** To give knowledge on theoretical principles of various electrochemical cells. Outcomes: Students learned the setup of electrochemical cells. Determination of emf. Effect of concentration on emf. Calibration of potentiometer. Learned the theory of cells, their construction and hands on experience on potentiometers. Mentor: Ms. Khatija Attar
6	Extraction of soya oil from soya bean seeds (solvent extraction).	03	**Objective:** To teach students the methods of extracting oils from seeds by solvent extraction methods.

			Outcomes: The students learned how to extract oil from soya bean seeds and further the methodologies related to the same. They also learned about selection of solvents, isolation and quantification which help them to understand the various industrial methodologies. Mentor: Dr Sangeeta Parab
7	Determination of sugar content in various soft drinks -refractometer.	02	**Objective:** To teach students on refractometry and analyzing samples for sugar content using the methodology. **Outcomes:** The students learned the method and analysed various soft drinks available in the market to determine the sugar content. The sugar content in the drinks is a health hazard due to the overuse in present times. The analysis made the students aware of the amount they consume while drinking these beverages. Mentor: Dr. Sangeeta Parab
8	Extraction of essential oil from orange peel and champa flower by soxhlet extraction.	03	**Objective:** To acquaint the students with the methodology of soxhlet extraction and to apply the method to extract essential oils from various natural sources. **Outcomes:** Students learned the method and efficiently extracted essential oil from orange peel. They learned that the method can be applied to other samples. Mentor: Dr. Sajith Chandran
9	Preparation of soap enriched with essential oils.	03	**Objective:** To acquaint the students with the methodology of soap preparation and to apply essential oils in formulations. Outcomes: Students learned the method of soap preparation – both soft and hard soaps. They learned the method of making soap and formulation by addition of colour and essential oils to give the look of soaps available in the

			market. They learned that the method can be applied to other samples. Mentor: Dr. Sajith Chandran
10	Preparation of methyl orange indicator and measurement of wavelength in acidic and alkaline medium.	03	**Objective:** To acquaint the students with the industry and application-based product synthesis. To teach them the reaction methods based on stoichiometry, isolation of product and purification. **Outcomes:** Students successfully synthesized methyl orange indicator and purified for use in laboratory. They learned the theory of indicators and their colour changes under acidic and basic conditions. The indicators made can be used in the laboratory for analysis, thereby learning the preparation methods and use of indicators. Mentor: Dr. Sreela Dasgupta
11	Extraction of caffeine from tea and coffee - soxhlet apparatus.	03	Objective: To teach the extraction methodologies for obtaining natural constituents from foods/beverages. The student is expected to learn the methodology and should be able to apply to real sample analysis. Outcomes: Students successfully isolated the compounds and learned the technique of isolation and acquired knowledge to apply to other samples. They learned the various theoretical principles on solvent selection, extraction methodology, and isolation which can be applied to real samples. Mentor: Ms. Unnati Maru
12	Preparation of Werners complexes & using it prepare linkage isomers.	03	**Objective:** The objective of the experiment was to teach the students with the preparation of Werner's complex and to learn Werner's theory. **Outcomes:** The complexes were synthesized by the students successfully and the expected knowledge has been acquired on Werner's theory. Mentor: Ms. Khatija Attar

13	Preparation of methyl salicylate and using it for formulating pain balm.	03	**Objective:** The experiment expected the students to learn the preparation of methyl salicylate, an active medicinal compound used in anti-inflammatory/pain relieving formulations. **Outcomes:** The students are made familiar with the preparation methods and use of it as a formulation similar to few formulations available in the market. Mentor: Mr. Gokul Ganesan
14	Sodium content in chips – flame photometer.	04	**Objective:** The objective of the experiment is to teach analysis of commercial products for the contents. The experiment also is framed so as to teach the students the theory, instrumentation and application of flame photometer. **Outcomes:** Students acquired the requisite knowledge of the methodology and instrument. They analysed potato chips of various brands available in the market and established the sodium content. They also learned the method of sample preparation for a real sample. This group won third prize at Intercollegiate Research meet, “Jigyasa”, held at K.C. College. Mentor: Dr. Sangeeta Parab
15	Extraction of flowers by soxhlet method	04	**Objectives:** The aim of the project was to familiarize the students with solvent extraction methods to isolate essential oils by Soxhlet methodology. **Outcomes:** The students successfully extracted oil from rose petals and used it as fragrance. Mentor: Dr. Sreela Dasgupta
16	Preparation of soap with flower extracts.	03	**Objectives:** The aim of the project was to familiarize the students on commercial formulations with natural substances. **Outcomes:** The students successfully formulated soap in which extracted oil from rose petals were used as fragrance.

			Mentor: Dr. Sreela Dasgupta
17	Synthesis of potential drug scaffolds based on triazoles.	03	**Objectives:** The objective of the project was to teach research and development methodologies of synthesis, isolation and purification of biologically active scaffolds which can be further developed to new chemical entities/drug molecules. The student is expected to be familiar with stoichiometry, reaction conditions, volumes, TLC, work-up methods and purification. **Outcomes:** The objectives were accomplished as the students learned various synthetic methodologies, the way of doing reactions in a commercial lab, the various parameters to be observed while planning the synthesis, the potential drug systems and their synthetic routes. They learned to synthesize, isolate, purify and run multistep synthesis. Mentor: Dr. Sajith Chandran
18	Extraction of nicotine from tobacco as insecticides - soxhlet extraction.	03	**Objectives:** To familiarize students with the method of extraction and to obtain active ingredients as natural pesticides, which is a need of the time. **Outcomes:** Students learned the technique of extraction of nicotine and to isolate the active ingredient of natural pesticide formulations. Mentor: Dr. Sreela Dasgupta
Models			
01	Fluorescence of highlighter ink.	03	**Objectives:** To understand the concept about fluorescence and phosphorescence relating it to the jabloski diagram. Further, the students I expected to understand the application based on this. **Outcomes:** Florescence compound of highlighter ink helped the students to understand the change in the colour of the solution when put in the UV-

			chamber. They were familiarized with the applications. These types of inks are mainly used for warning signs and safety information such as automobile indicators, ambulances, fire engines or breakdown services. Another common application is warning signs and danger symbols. In addition, fluorescent colours, also known as luminous colours, play an important role for advertising purposes. The student also learned about biofluorescence and the use of these compounds in medicine.
02	Theory of Carnot's engine.	03	**Objectives:** To familiarize students with Carnot's theorem and so as to understand the practical applications of the theorem. **Outcomes:** The poster prepared by the students met the objective. They depicted the theoretical principles and practical applications of Carnot's theorem. Mentor: Dr. Sangeeta Parab
03	Stereochemistry concept of diastereomers.	03	**Objectives:** To understand the three-dimensional orientation of groups in space leading to formation of different stereoisomers through models and to understand and explain the differences between enantiomers and diastereomers. **Outcomes:** A 3-D model approach to stereoisomerism of organic compounds instilled a greater level of understanding among students in the principal differences between the two types- enantiomerism and diastereomerism. The exercise was also inductive in the sense that students were able to make more models for representative compounds and judge the stereochemical relationship between structures. Mentor: Ms. Unnati Maru
04	Periodic table with colored boxes.	03	**Objectives:** To understand the long form of periodic table and their trends across and down the group. Adding the newly discovered elements in the periodic table.

			Outcomes: periodicity of the elements was understood well by placing the correct element in an appropriate block and also according to its increasing atomic number across the period. Mentor: Ms. Khatija Attar
05	Colorimetry instrumentation.	04	**Objectives:** To teach Beer Lambert's law and instrumentation of Colorimeter. To use to understand internal components & its theory of the instrument. **Outcomes:** The students gained the expected knowledge and created a model of the internal components of colorimeter. Mentor: Ms. Khatija Attar
06	Chemical bonding.	03	**Objectives:** To understand the concept of different types of chemical bonding and studying its examples. **Outcomes:** The students learned various examples of types of chemical bonding and its application. Mentor: Ms. Khatija Attar
07	Bohr atomic structure.	03	**Objectives:** To understand how the Bohr model of the atom marked an improvement over earlier model. **Outcomes:** students could draw the structure of elements upto 20 elements. Mentor: Ms. Khatija Attar
Posters:			

01	Colours of d-transition elements.	04	**Objectives:** to understand the characteristic of d-block elements and their change in colour when acting as a complex ion. **Outcomes:** change in the colour of metal solution on addition of ligand solution indicates there is a d-d transition. Mentor: Ms. Khatija Attar
02	Quantum concepts.	03	**Objectives:** To understand the quantum concepts related to Schrodinger wave equation. **Outcomes:** The students gained the understanding of the Schrodinger wave equation and its importance. Mentor: Dr. Sangeeta Parab
03	Electrochemistry.	03	**Objectives:** to understand the concept of electrochemistry and its application to various fields. **Outcomes:** standard reduction potential of the elements differing in the E_{cell} and its application in various areas to prevent corrosion. Mentor: Ms. Khatija Attar
Visits:			
01	Visit to Sophisticated Analytical Instrumentation Facility (SAIF).	98	**Objectives:** To familiarize students with the advanced analytical methodologies and to observe real time sample preparation and analysis. SAIF Centre: Two visits to Sophisticated Analytical Instrumentation Facility (SAIF) at IIT-B were conducted. The visit was conducted on 5th Dec 2018 & 12th feb 2019 to familiarize students on advanced analytical methods. Students were introduced to various advanced analytical methods such as NMR, Mass Spectrometry, ICP-MS etc.

			Outcome: The students gained a fair amount of knowledge about the latest sophisticated instruments towards analyzing samples by various methods.

Year 2019-20

Models			
1	Colorimeter model	F.Y.B.Sc 4 Students	Students replicated the instrument of the colorimeter into a model to further understand the working of the instrument. **Learning Outcome**: Students were able to understand the principle of colorimeter & could also distinguish the difference between absorption and transmission of light along with the understanding of Beer-Lambert law.
2	Stereochemistry	F.Y.B.Sc 2 students	Students made use of balls and sticks to prepare a model of various molecules with different conformation. **Learning Outcome**: Students were able to understand the spatial arrangement of atoms in a molecule. Students were able to recognize the molecule and distinguish it in isomerism.
3	Breathalyzer model	F.Y.B.Sc 2 students	Students prepared an alcohol detector model. **Learning Outcome**: Students got exposure to the day-to-day life application of chemistry. Students studied the reaction that took place in the alcohol detection test
Posters			
1	VSEPR Theory	S.Y.B.Sc 2 students	Apart from their syllabus students took a due interest in elaborating the examples and put them on a poster. **Learning Outcome**: Students were able to understand that each molecule has a different geometry/shape & the effect of lone pairs/bond pairs on the geometry of a molecule.
2	Fun with Dyes	F.Y.B.Sc 4 students	Students used various colours on a fabric and displayed it on a poster. **Learning Outcome**: Students were able to understand the importance of dyes in

			various fields.
3	Biginelli Reaction using green catalyst	S.Y.B.Sc 4 students	Students used apple and pineapple fruit juices as an acid catalyst to carry out Biginelli Reaction. **Learning Outcome:** Students were trained for carrying out organic reactions using green catalysts. They were also introduced to Multicomponent reactions. They were made familiar with research papers.
4	Adsorption studies	TYBSc 2 students	Students used orange and lemon peels to remove transitional metal ions from wastewater names as per consultation with the botany department. **Learning Outcome:** Students learned the adsorption theories in depth and the factors affecting adsorption/desorption. They also could learn that adsorption is possible with naturally derived materials.
5	Dyes Preparation and Application	T.Y.B.Sc 2 students	Students prepared Eosin as a dye using fluorescein and its application was studied on a piece of cloth. Different parameters like temperature, concentration of dye, pH; were studied to dye a cloth piece. Students also tried synthesis of sulphur dye but they were unsuccessful. **Learning Outcome:** Students learned various synthetic methodologies, the way to carry reactions in a commercial lab, the various parameters to be observed while planning the synthesis. They were made familiar with research papers.
Interdisciplinary Projects			
1	Preparation of Schiff's base & determination of Anti-bacterial activity	SYBSc 4 students	Different Schiff's bases were synthesised by students of S.Y.BSc, (Microbiology-Chemistry) to study their antibacterial properties. **Learning Outcome:** Students were trained for synthetic methodologies, theoretical aspects of schiff's base formation and their use as potential antimicrobial agents. They were also made familiar with the scaffolds which can act as antimicrobial agents. They also learned the methods of carrying out antimicrobial trials from the Microbiology department.
2	Analysis of phytochemicals of *Mahua longifolia* & its application in synthesis of silver nanoparticles using green method	TYBSc 4 students	The project involved extraction of secondary metabolites using Soxhlet from dried Mahua flowers. The T.Y.BSc students were guided by the Botany department in identification as well as phytochemical screening. Thereafter the student used these extracts in reducing silver to make silver nanoparticles. **Learning Outcome:** The students received training on performing soxhlet

			extraction and the methods of effectively extracting natural products. The use of active components/molecules in natural products in propelling chemistry reactions, nanoparticle synthesis in particular, were understood by the students.

Visits			
SrNo	**Name of institution**	**Date**	**Beneficiaries**
01	Anchrom Laboratories Private Limited for HPTLC demonstration	02/03/2019 & 21/09/2019	21
02	Institute of Chemical Technology, Mumbai for demonstrative workshop on GC-MS	29/09/2019	20
03	Forensic Science Laboratory, Kalina, Mumbai	22/01/2020	24
04	IRMRA (Indian Rubber Manufacturers Research Association) lab.	13/01/2020	45

Year 2020-21

Projects			
SNo.	**Students Name**	**Year**	**Title & description**
	Avishkar Projects:		
1	Abbas Attarwala	TYBSc	Design of Antibacterial analogues by Computational Evaluation
2	Anjitha Puthillam Aditi Oza Kashish Sagar	TYBSc	A questionnaire based survey on diabetes and blood pressure medicine and its chemical study
	Research Projects:		
1	Abbas Attarwala	TYBSc	Computational study of Azo compounds. **Objectives:**To study pharmacokinetics and drug likeness properties of molecules. **Outcomes:** Students got exposure to new software like ADMETsar, Dockthor and understood concepts like pharmacokinetics and molecular docking.
2	Fatema Somjee	TYBSc	Purification of water using waste materials from the kitchen.

	Seeta Varma		**Objectives:** To study various methods to purify water using ecofriendly methods and also convert wasteful material into useful materials. **Outcomes:**Students learned various methods to purify waste water using waste material from the kitchen. They also learn how to be ecofriendly.
	Literature Review:		
1	Anshika Jain Shalini Mishra	TYBSc	Spiro compounds and their applications in pharmaceutical chemistry. **Objectives:** As apart from their syllabus students took a due interest in elaborating the examples and put them on a poster. **Outcomes:**Students were able to understand that spiro molecule & its application in pharmaceutical chemistry.
2	Anjitha Puthillam	TYBSc	Green Synthesis of Silver Nanoparticles **Objectives:** To study new and green methods to synthesize nanomaterial. **Outcomes:** Students got exposure to new concepts like nanoparticles and green synthesis.
3	Shrivastav Priya Santosh Shaikh Bushra Shahid	FYBSc	Impact of Graphene in Nanotechnology. **Objectives:** Introduction to nanotechnology **Outcomes:** Students could understand the importance & application of graphene and graphene based nanostructure.
4	Heena Tahsildar Sakina Dantawala	TYBSc	Ionic Liquid and its application. **Objectives:** To study new material used for synthesis in chemistry. **Outcomes:** Students understood the concept of Ionic Liquids and its application in the field of chemistry.
5	Pranshu Das Vidhi Garg	TYBSc	Conducting polymers **Objectives:**As apart from their syllabus students took a due interest in elaborating the examples and put them on a poster. **Outcomes:**Students were able to understand the working and concept of conducting polymers along with new examples.
6	Virali Soni Kashish Sagar	TYBSc	Materials absorbing RADAR **Objectives:** To study the specialist class of polymer-based material applied to surfaces **Outcomes:**Students got exposure to the material chemistry and application of polymers in advanced functional materials.
	Presentations:		
1	Sanjana Gohil Jyoti hazra	TYBSc	Boron Chemistry and Applications in cancer treatment **Objectives:**As apart from their syllabus students took a due interest in elaborating the examples and put them on a poster. **Outcomes:** Students were able to understand the chemistry of Boron and its potency to treat cancer.
2	Rushabh Chheda Fatema Pardawala	SYBSc	Aerogel- The Frozen Gas **Objectives:** To study new innovations in recent years chemistry **Outcomes:** Students got introduced to new concepts of aerogel its preparation, mechanism and application

			in the field of chemistry.
3	Meher.V.Bhagwagar Jafrin Sayad	SYBSc	Dye-Sensitized Solar Cells (DSSCs) **Objectives:** To study the emerging renewable field of energy and chemistry behind DSSC. **Outcomes:** Students were able to understand the fundamentals of photovoltaics, thin-film solar cells and the advantages of DSSC over silicon counterparts.
4	Aarti Raksha Shetty	SYBSc	Multicomponent Reaction a blessing in organic chemistry. **Objectives:** To understand the new synthetic methodologies in organic chemistry **Outcomes:** Students were able to understand the concept and importance in synthetic organic chemistry.
5	Mahenoor Khan Athira nair	SYBSc	LIQUID CRYSTALS **Objectives:** To understand the state of matter which has properties between those of conventional liquids and solid crystals. **Outcomes:** Students were able to understand the concept and its extensive application specially in pharmaceuticals.
6	Shubham Jagtap Poornima Bisoi	SYBSc	Nanomedicine **Objectives:** To understand the medical application of nanomaterials. **Outcomes:** students can understand the use of nanomaterials for diagnosis, monitoring, control, prevention and treatment of diseases.
7	Rakshita Shetty Khushi Sharma	SYBSc	Crown ethers **Objectives:** To understand the chemistry and applications of crown ethers. **Outcomes:** Students were able to understand the working and concept of crown ethers and their potential application in various fields.
8	Sakshi Bhise	SYBSc	Cosmetic Chemistry **Objectives:** To understand the principles and basic chemistry involved in cosmetics **Outcomes:** Students could understand the theory and application to cosmetics chemistry.
9	Laxmi Kaundar Shreya Mishra	SYBSc	Nuclear waste and its disposal **Objectives:** To understand the waste management system generated by Nuclear power plants **Outcomes:** Students were able to understand the importance of nuclear waste management.
10	Suwaiba Sopariwala	SYBSc	Belousov-zhabotinsky Reaction **Objectives:** To understand non-equilibrium thermodynamics in a chemical reaction. **Outcomes:** Students got to know Belousov- zhabotinsky reaction mechanism.
11	Abhay Rajak Natasha Narkar	FYBSc	Nanochemistry **Objectives:** To understand scope and applications of nanochemistry **Outcomes:** Students were able to explore the world of nanochemistry.
12	Shaikh Abdul Azeem	FYBSc	Hydrogen as fuel **Objectives:** To introduce students with the energy crisis and how to deal with it. **Outcomes:** Students were able to understand the importance of Hydrogen gas as a fuel.

13	Samreen Mirza	FYBSc	Antipsychotics- the "anti-mental"pills **Objectives:** To introduce students with medicinal chemistry. **Outcomes:** Students could understd the drug and its physico-chemical effect.

Trainings			
1	Online Laboratory Training on HPLC using Agilent Infinity 1220 instrument of Central Instrumentation Facility of the College.	30/01/2021	An online training for sample preparation for HPLC & analysis was conducted by Mr. Gokul Ganesan followed by a talk on principles of chromatography by Dr. Ragni Desai. The session involved preparation of mobile phase, set up of the instrument including base line stabilization & correction, sample injection and analysis of chromatogram. 23 students of T.Y. & M.Sc. classes attended the session.

Extension Projects (Societal Outreach Projects)		
Science Popularization Program with students of Swami Shyamanand High School	SY, TY classes	The department of Chemistry organized an online outreach program for school children on 5th December 2020 wherein students of the SY & TY class had prepared videos on different concepts under the guidance of the teachers of Chemistry department. Some scientific games were arranged for the students to get them excited about science through fun facts. 54 school students of classes 9 & 10 had participated in all the activities and gave a positive feedback of their experiences. https://drive.google.com/file/d/127DjdYREXYQLMjRhDvt3sDWJF0DL9kR8/view?usp=drivesdk

DEPARTMENT OF MICROBIOLOGY

Year 2018-19

Projects			
SNo	**Title**	**Beneficiaries**	**Description**
1	To determine the efficiency of honey dip treatment as a method of preservation of fruits	TY- 04	**Outcomes**: Students could appreciate the role of a natural preservative like honey in enhancing the shelf life of cut fruit
2	To study the Antibacterial activity of citrus peel extract against spoilage organisms .	TY- 04	**Outcomes:** Students learnt the control of food spoilage organisms using extract from the citrus fruit peels. It was found to inhibit the growth of the spoilage organisms and hence it could be used as a dip in enhancing the shelf life of foods
3	To study the microbial load present in a convenience food (paratha) before and after its expiry date	TY- 04	**Outcomes:** Created awareness amongst students about the shelf life of convenience foods like parathas which were wrapped and stored at low temperatures of 8 to 10 degree centigrade. An increase in the microbial load was observed towards the expiry date. Maybe better methods of packaging would increase the shelf life.
4	To study the antibacterial synergistic effect of Sodium benzoate and sodium sulphite on the organism isolated from spoilt Pomegranate juice .	TY- 04	**Outcomes:** Use of preservatives in combination to reduce the individual concentration in the final product thus reducing the side effects of higher concentrations of preservatives. This was not conclusive indicating that All combinations need not be synergistic in action.
5	To study the shelf life and microbial fauna of baked bread	TY- 04	**Outcomes**: The shelf life of the experimental baked bread was much shorter in comparison to the commercially available cake. This may be due to the use of chemical preservatives in commercial products.
Extension Projects (Societal Outreach Projects)			
1	Science Awareness Program	TY and SY- 44	The TYBSc students visited Girton High School in south Mumbai and the SYBSc Students visited 'Arya Vidhya Mandir' at Borivali, a suburb in Mumbai. The Students interacted with the 9th and 10th standard students. With the help of posters, actual microscopic observations and lectures they gave them an insight into the 'Wonders of Microbiology. As a follow up the school students visited the Microbiology laboratory at Jai Hind College to perform basic hands-on experiments

			in microbiology. The SY and TY students in turn learnt the art of teaching and interacting with young students. They were the ambassadors for promoting science. With a very Encouraging feedback the department intends to extend this activity further to other schools
2	Microbiological and Chemical Water analysis of the drinking water of neighbouring societies	SY-22	**Objectives**: To determine whether the drinking water was potable or not according to said standards. It was done once during the monsoons and once during winter for 5 of the residential societies around Jai Hind College **Outcomes**: CSR activity was undertaken by the students. This helped in inculcating social relevance of the topics studied and apply their knowledge for a social cause
3	Biocomposting of canteen waste	FY- 33	**Objectives**: To inculcate in students the importance of reusing and recycling. Segregation of Waste was done and organic waste was used for biocomposting. Microbiological and Chemical Analysis of the compost were performed. **Outcomes:** This will help the students in spreading awareness about waste segregation in their homes and societies and also using this method to carry out biocomposting of their kitchen waste at home or in their communities on a larger scale. Furthermore, the compost generated can be used for gardening and the excess generated could also be sold as fertilizer
Visits:			
1	Breach Candy hospital (30/8/18)	TY-20	**Outcomes:** The students learned about the various microbiological, serological and biochemistry diagnostic tests being carried out with the use of sophisticated automated machines in the hospital.
2	Water purification plant at Bhandup (31/10/18)	SY- 22	**Outcomes:** The students were shown the entire process of purification of drinking water right from the source, which enabled them to understand the sequence better as they help this in theory
3	TIFR (29/9/18)	FY-24	**Outcomes:** This visit was a part of the process of sensitization to the INDIA INTERNATIONAL SCIENCE FAIR to be held at Lucknow that was being sponsored by DBT. The students were given of glimpse of how research is carried out in eminent institutions increasing their curiosity and knowledge also exposing them to various newer fields of science
4	4 days industrial visit to Jaipur (20/1/19 to 24 /1/19)	SY & TY- 28	**Outcomes:** At' Elcon Drugs and formulations' they saw the processing and packaging of drugs and formulations. A visit to 'Morarka foundation' gave an insight to the methods of organic farming that were practiced by farmers. Students also

			learnt the various methods of packaging the range of food products that were being marketed by Morarka Foundation. 'Saras Dairy the third visit at Jaipur gave an experience as to how a very large dairy produces pasteurized milk and other milk products like ghee, paneer, butter, dahi flavoured milk etc.
Summer Training:			
1	Lab trainee to Export Inspection Agency, Andheri (1st Nov to 20th Nov 2018)	SY-3	**Outcomes:** They learnt about testing antibiotic levels in foods like fish, honey and milk. They also learnt the working of instruments like HPLC, GC etc

Year 2019-20

Projects			
SNo	**Title**	**Beneficiaries**	**Description**
1	Antimicrobial activity of active components present in Leaves and Seeds of *Carica papaya*	SY- 05	**Outcomes:** Students studied the antimicrobial properties of papaya leaves and seeds extract which can be used for various applications.
2	Antimicrobial activity of spice extract against bacterial and fungal opportunistic pathogen in food as Food Preservative	SY- 05	**Outcomes:** Students learnt the use of Soxhlet apparatus to prepare solvent extracts. They also showed that use of these extracts can control the growth of pathogens
3	Comparative study of antimicrobial properties of leaves and petals of *Nyctanthes arbortristis* using different solvents	SY- 04	**Outcomes**: Studentsstudied the use of some natural products which is easily available and check its antimicrobial properties so that can be further used in some medicines.
4	Extraction of pigments from microorganisms that are UV resistant and further dying clothes with them.	SY- 05	**Outcomes:** Students learnt the role of UV rays to generate mutants and the application of microbial pigments in dyeing.
5	Optimization of growth parameters for microalgae	SY- 05	**Outcomes:** Students learnt the technique to isolate and cultivate microalgae. The significance of optimization of microalgae is highlighted by the fact that microalgae have adapted to a diverse range of environments and so are likely to have different growth requirements.

6	Prevalence of Gram Positive organisms in Dairy products and study of their Antibiograms	TY- 04	**Outcomes:** The findings of this study suggested that in South Mumbai *Staphylococcus* species are not only potential threat for food borne infections but may also be responsible for spreading drug resistance through the food chain.
7	Presence of *Staphylococci* on raw Vegetables and it's Biofilm forming Potential	TY- 04	**Outcomes:** Students learnt that organisms residing on the surface of the fruits and vegetables have the potency to form biofilm layers and can be detrimental to the shelf life of the food product.
8	Studying Antimicrobial activity of *Trachyspermum ammi* and *Foeniculum vulgare* on gut pathogens	TY- 04	**Outcomes:** Students could appreciate theimportance of household remedies and herbal treatments are used to treat stomach disorders using carom seeds and fennel seeds.
9	Development of a Natural Growth enhancing Powder	TY- 04	**Outcomes:** Awareness was created amongst students about using "at home, in kitchen" ingredients as a good source of Calcium Protein and Iron.
10	Detection of Milk Adulterants in Commercial and Local sample	TY- 02	**Outcomes:** Students were able to use simple ways to identify and estimate commonly used chemical adulterants in milk and their impact on human health.
11	Making of Herbal Fruit face mask	TY- 03	**Outcomes:** Students were able to understandthe use of natural ingredients such as papaya, orange peel powder, rose powder and multani mitti and analyze the contents.
Interdisciplinary Projects:			
1	Preparation of Schiff's base & determination of Anti- bacterial activity	SY- 04	Different Schiff's bases were synthesized by students of S.Y.BSc, (Microbiology-Chemistry) to study their antibacterial properties.
2	Comparative study of antimicrobial properties of leaves and petals of *Nyctanthes arbortristis* using different solvents	SY- 04	Extraction and antimicrobial studies were carried out in Microbiology Lab whereas the phytochemical analysis was carried out in collaboration with Botany lab
3	Antimicrobial activity of active components present in Leaves and Seeds of *Carica papaya*	SY- 05	Extraction and antimicrobial studies were carried out in Microbiology Lab whereas the phytochemical analysis was carried out in collaboration with Botany lab
4	Antimicrobial activity of spice extract against bacterial and fungal opportunistic pathogen in food as Food Preservative	SY- 05	Extraction and antimicrobial studies were carried out in Microbiology Lab whereas the phytochemical analysis was carried out in collaboration with Botany lab

Extension Projects (Societal Outreach Projects)			
1	Science awareness programme	SY- 24	This activity is conducted to promote science amongst school students. The students get an opportunity to teach and interact with youngsters. As a part of this activity S.Y.BSc students visited Diamond Jubilee School and Abhinav Vidya Mandir, they gave insights to the school students on the subject of Microbiology. As a follow up the school students visited the Microbiology Lab to perform basic hands on experiments in Microbiology
2	Routine analysis of water from neighboring societies	SY- 24	Routine analysis of water carried out by SYBSc students for societies around the college periodically and the reports provided. This activity helped the students to apply their practical knowledge gained for the welfare of society
Visits:			
1	BARC (27/06/2019)	TY-20	**Outcomes:** The students visited different departments at BARC and learnt about the use of radiation technology for sterilization of certain food commodities, creating mutated desirable crop variety and also extending the shelf-life of Ready to Cook (RTC) foods, vegetables, meat, legumes, etc. They also got an opportunity to visit Dhruv reactor, robotics instruments and supercomputer
2	Institute of Chemical Technology (13/8/19)	TY- 20	**Outcomes:** At ICT, series of lectures by eminent scientists were planned for the students throughout the day along with the laboratory visits such as DBT-ICT Centre for Energy Biosciences, Dept. of Oils, oleochemicals & surfactants, Dept. of Chemical Engineering and Dept. of Pharmaceutical sciences & technology. They had the privilege to observe various high-end instruments. They also learned about mass scale cultivation of algae and their application
3	Water treatment plant, Bhandup (14/8/19)	SY-24	**Outcomes:** They got an insight as to the actual purification steps taken to make water potable
4	Wine Information Centre and Sahyadri Farms, Nashik (10th- 11th Feb, 2020)	SY & TY- 37	**Outcomes:** The students got an opportunity to visit Sahyadri Farms and Vinsura Winery. They got a live view of the fermentors and the industrial parameters followed in processes under wine making and food production and processing which they learnt in theory
5	ACTREC (28/11/2020)	TY- 15	**Outcomes:** The visit was held on the open day of the research institution. The students visited several departments and labs situated in the premises such as the radiology department, HPLC Proteomics department, Nano-drop spectrophotometer

			instrumentations, Protein diagnostics using advanced PAGE techniques
6	Sri. C. B. Patel Research Centre, NMIMS, Vile Parle (2/12/2020)	TY- 15	**Outcomes:** The demonstration of different biological tools were done by the PG and PHD students of the institution after an introduction session. Some of the important methods like Western blotting, RT- PCR and tissue culture were described in detail. The field trip exposed the students with future career prospects and a clearer picture of the courses available in the postgraduate level
Summer Training:			
1	NCMR, Pune 3 months	SY-2	**Outcomes:** 3 months internship offered to Microbiolympiad winners by Dr Y Souche. They learnt about various microbiology and molecular biology techniques. They also learnt about working of instruments such as PCR thermocycler, VITEK.
2	Breach Candy hospital- 1 month internship	SY-2	**Outcomes:** The students visited various departments where they got to operate mechanical instruments and also performed different staining techniques. They also learnt the collection and processing of different types of samples
3	Bombay hospital- 2 weeks to 1 month	SY- 2	**Outcomes:** Internship in Microbiology and Biotechnology Lab. In microbiology lab students learnt about the specimen types, processing and staining techniques. In biotechnology lab students got an exposure to the different automated systems for diagnostics. Got an insight about laboratory techniques, understood the basis of microbiological and serological diagnostics

Year 2020-21

Projects			
SNo	**Title**	**Beneficiaries**	**Description**
1	Review Writing: Major developments in Alzheimer disease therapeutics and future implications	SY- 05	**Outcomes:** Learned about Alzheimer and therapeutics available for it. Students learnt to differentiate between a research paper and a review article. Learnt about literature review, plagiarism
2	Review Writing: Genome imprinting	SY- 05	**Outcomes:** Gained insight into epigenetics and genetic disorders. Students were exposed to learning skills like how to find good research papers, use the right keywords for searching information on the internet.

3	Review Writing: Influence of gut microbiota in mood disorders	SY- 05	**Outcomes:** Gained insight into the world of microbiome. This helped them in understanding the role of normal flora and its implications. Soft skills like communication, team building and time management were improved
4	Review Writing: Foodborne pathogens associated with semi hard cheese made from raw milk	SY- 04	**Outcomes:** Learnt about various foodborne pathogens, methods to isolate and identify them. Understood the microbiology of cheese making. Students learnt to differentiate between a research paper and a review article.
5	Survey: Dependency and Psychotropic(stimulating) effects of coffee among youth	TY- 05	**Objectives:** ● To figure out the different factors that cause addiction or rather dependence on coffee among people ranging from 15 to 30 years of age group. ● To find out their daily coffee consumption habits during Pre and Ongoing COVID period. ● To figure out whether people are aware of their daily caffeine intake doses. ● To check the effects on people when they don't consume coffee **Outcomes:** Gained insight on the coffee consumption habits of a person and also the effects on a person's physical and mental health were studied. Dependency of people on coffee before and during the COVID period was studied Awareness of coffee addiction in the population was noted
6	Survey: Health impact of processed food	TY- 05	**Objectives:** ● To understand the perception of society towards processed food. ● To assess the food intake pattern in the population and determine the prevalence of processed food consumption. ● To evaluate and study the correlation between the processed food intake and the prevalent health conditions. ● To study the importance of nutrient rich diet from the collected data. **Outcomes:** Based on the responses it was concluded that due to changing lifestyle there was a rise in processed food consumption. Also, the consumption of processed food affects the health on a large scale. The most common were obesity, acidity, skin problems. In the end, we were able to conclude that the people are now adapting to healthy ways of living. They prefer healthy, nutrient rich food over convenience food.
7	Survey: Effects of spicy food on health	TY- 05	**Objectives:** ● To evaluate the association between the frequency of consumption of spicy foods

			and the prevalence of common health ailments associated with spicy food intake. **Outcomes:** This survey provided us knowledge about the consumption of spicy food and the various health effects that could be caused by it. Also it was noted that the consumption of spicy food was not the major cause of the health effects in healthy people but there could be other factors which need to be studied.
8	Survey: Comparative study of human population consuming balanced diet in pre and during lockdown periods	TY- 05	**Objectives:** ● To check awareness about a balanced diet. ● To study dietary patterns in pre and during lockdown period. ● To study the effect of lockdown and changes in diet. **Outcomes:** Dietary habits and food quality play an important role in improving the overall health and immunity that will help to tackle the virus. This study provided insights on how people are reacting to the pandemic with respect to their dietary habits. Though people incorporated healthy food in their diet, consumption of junk was the same during both the periods.
Extension Projects (Societal Outreach Projects)			
1	Science awareness programme	SY-20	Continuing the programme, the students of SYBSc were distributed in groups of 5 students. Each group was to make a presentation on the role of Microbiology in day-to-day life and careers in microbiology/ allied fields and interact with school students through Google meet. School students from standard 8th, 9th and 10th from the following schools were invited. Mother Haleema Public School, BHADOHI, UP St. Peter's School, Mazgaon, Mumbai Abhinav Vidya Mandir, Borivali, Mumbai
2	Digi-Diwali	TY-10 More than 50 people from different housing societies	An initiative to bring together traditions and technology for a celebration. Diwali is a festival which celebrates the triumph of good over evil and keeping this in mind we Jai Hindites didn't let the pandemic crush our festive spirits and suggested joyous but safe ways to celebrate Diwali to various housing societies over Google Meet. Number of beneficiaries- More than 50 people from different housing societies attended the webinar on 10th November, 2020.
3	Video Making on Food Adulteration	TY- 21	TYBSc students made videos to detect common food adulterants at household level **Objectives and Outcomes:** ● To help students improve their creative skills

			● To help them build confidence (Facing the camera) ● Apply the different adulteration tests using household items ● Learn skills of video making and video editing ● The idea was to create social awareness ● Links of few videos on our Social Media account: https://fb.watch/5g1KxHN2-c/ https://fb.watch/5g1NNh3gyT/ https://fb.watch/5g1OYL2BhS/

7. Training received by faculty from participating departments:

DEPARTMENT OF BOTANY

Year 2018-19

A] Hands -on Training Workshop on Innovative experiments in Biological Sciences for College Teachers
Date: 29th August to 04th September 2018.
Affiliation: Dr Sunita Shailajan , Homi Bhabha Centre For Science Education, TIFR Mumbai
Beneficiaries: 01

B] Two-day workshop on Extraction and Isolation of Phytoconstituents
Date: 8th and 9th December 2018.
Affiliation: Dr K. L. Laddha , Institute of Chemical Technology
Beneficiaries: 01

C] Participated in 2-day workshop on Research methodology and research data analysis organized by on
Date: 25th and 26th February 2019
Affiliation: From Department of Biotechnology, University of Mumbai.
Beneficiaries: 01

D] Two-day Faculty development workshop on ICT in Education.
Date:15th March 2019
Affiliation:Jai Hind College
Beneficiaries: 05

E] Two-day Faculty development workshop on Synergy – the path to academic excellence.
Date: 25th and 26th March 2019
Affiliation:Jai Hind College
Beneficiaries: 05

Year 2019-20

A] Hands on workshop on: Rapid screening of bioactive compounds from medicinal plants using bio-autography technique (HPTLC)
Date: 29th February 2020.
Affiliation: Dr Prashant Hande, BVG Life Sciences Limited, Pune
Beneficiaries: 01

B] Faculty Development Program on online teaching and E-content conducted by HSNC /IIDE
Date: 16th and 17th May 2020
Affiliation: HSNC /IIDE
Beneficiaries: 01

C] Skill development initiative - A webinar on The Future of Presentations: PREZI
Date:28th May 2020
Affiliation: Jai Hind College, Mumbai.
Beneficiaries:05

D] Attended a training organized on Moodle Learning Management System
Date: 30th Jan 2020.
Affiliation: Vidyavardhini College of Engineering and Technology and University of Mumbai
Beneficiaries: 01

Year 2020-21

A] Course on "Excel Skills for Business - Essentials"
Date: Jan 2021
Affiliation: Macquaire University, offered through Coursera.
Beneficiaries: 03

B] Online workshop on "Techniques in Field Biology
Date: 30th and 31st May 2020.
Affiliation: Department of Zoology, K.J. Somaiya College of Science and Commerce & Hemchandracharya North Gujarat University
Beneficiaries: 01

C] Online FDP on Statistical Analysis of Quantitative data using advanced excel for research scholars
Date: 3rd and 4th June 2020

Affiliation: Department of Mathematics, Rizvi college.
Beneficiaries: 01

D] National online seven-day workshop on "Research methods and Techniques".

Date: 6th to 12th June 2020
Affiliation: Ramanand Arya D.A.V. College in Association with University of Mumbai
Beneficiaries: 03

E] Course on "Introduction to Forensic Science"

Date: May 2020
Affiliation: Nanyang Technological University, Singapore offered through Coursera
Beneficiaries: 01

F] Course on "Understanding Plants - Part I: What a plant knows" and "Understanding Plants - Part II: "Fundamentals of Plant Biology"

Date: June 2020
Affiliation: Tel Aviv University offered through Coursera
Beneficiaries: 01

G] National webinar series on "Instrumental techniques in analysis"

Date: 27th-30th May 2020
Affiliation: Department of Chemistry, Jai Hind College Mumbai
Beneficiaries: 04

H] National Workshop on "Techniques in Field Biology"

Date: 30 -31st May 2020
Affiliation: K.J. Somaiya College of Science and Commerce Mumbai
Beneficiaries: 01

DEPARTMENT OF CHEMISTRY

Year 2018-19

PFMS Workshop for office & teaching staff

a) Name: Mr. Pramod Manghi
b) Affiliation: Government representative for PFMS
c)Beneficiaries: Dr. B.K.N. Singh, Dr. M.Ghayal, Dr. S.Parab, Dr. S.Jain, Non-teaching office staff from accounts departmentof Jai Hind College headed by Mr. S.Pereira and also accounts department of K.C. College was in attendance and benefitted from the workshop.

Year 2019-20

a) Training for Financial Software	PFMS Workshop for office & teaching staff

Year 2020-21

Title	Description
Transition to online facilitation	Mr. Gokul Ganesan successfully completed a blended online workshop organized by NPTEL team of IIT, Madras from 6th May 2020 to 3rd June 2020. The workshop covered a variety of aspects of online education and the transition from traditional classroom to e classrooms.
TEACH: Technology in Education for Active Content Harmonisation	The initiative was kick started on 21st April 2020 & periodic tutorials were sent to all faculty members of the college to help them get started with online education. Mr. Gokul Ganesan was one of the facilitators of TEACH initiative and all the faculty members of the Chemistry department were a part of the training sessions.

DEPARTMENT OF MICROBIOLOGY

Year 2018-19

Faculty trained for skill improvement	Name of training modules	Outcome
Dr. Shuchita Deepak	Cellular and Molecular Biology – from gene cloning to protein expression and localization at UM-DAE Centre for excellence in basic sciences Kalina (4 days workshop). Integrating Applied Bioinformatics in undergraduate Life Science Education at St. Xaviers college. (3 days workshop) Under DBT-STAR.	Learnt the various molecular biology techniques and further trained the department colleagues and conducted practicals for the TY students. The knowledge gained helped in teaching Bioinformatics to the undergraduate students. The students benefited by doing hands-on practicals on the computers.
Ms Petra Sequeira, Ms. Roonal Kataria and Ms. Candida Silveira	ICT in Education at Jai Hind College	Teachers learnt how to use 'Moodle' and 'Google Classroom' to enhance their teaching and evaluation skills. These skills will help teachers in generating curiosity among science students. Which definitely has helped in the pandemic times.

Year 2019-20

Faculty trained for skill improvement	Name of training modules	Outcomes
Ms. Roonal Kataria	Workshop on Molecular and Immunological Diagnostic techniques organized by K.C.College from 10th-12th July, 2019	Learned the various molecular biology and immunology techniques and further trained the department colleagues and conducted practicals for the TY students.

	Workshop on "Recent advances in Stem Cells Research- Biomedical applications" organized by the Dpt of L.Sc on 13th July, 2019 Workshop on IPR organised by Jai Hind College on 10th December, 2019	Gained an insight about the advances in stem cell research and its application Learnt about the types of IPR, requirements and steps involved in the patenting process
Dr. Shuchita Deepak	Attended workshop on "Recent advances in Stem Cells Research- Biomedical applications" organized by the Dpt of L.Sc on 12th and 13th July, 2019.	Gained an insight about the advances in the stem cell research and its application
Ms. Candida Silveira	Workshop on "Recent advances in Stem Cells Research- Biomedical applications" organized by the Dpt of L.Sc on 12th and 13th July, 2019. Workshop on IPR organised by Jai Hind College on 10th December, 2019.	Gained an insight about the advances in stem cell research and its application. The latest finding in the field of stem and tissue engineering Learned about the types of IPR, requirements and steps involved in the patenting process. Which was helpful in providing latest information and to students

Year 2020-21

Faculty trained for skill improvement	**Name of training modules**	**Outcomes**
Ms. Roonal Kataria	Coursera Courses: Completed Course on Summary Statistics in Public Health, Johns Hopkins and Understanding Research Methods, University of London FDP: Trained under the TEACH (Technology in Education for Active Content Harmonization) initiative of Jai Hind college 3 days Workshop on Online college management and online	The various workshops/ FDPs and webinars: helped in gaining newer knowledge of various topics in science Improved the ability and confidence of teaching online Provided better resources that can be shared among students and fellow colleagues Helped in building contacts even during the pandemic situation

	content creation tools from 30th Apr to 2nd May 2020. 2 Days Workshop on 'Online teaching and E-Content' organized by HSNC University and IIDE on 16th and 17th May, 2020 3 days Workshop on New Age tools for teaching Online organized by Academisthan from 28th-30th June, 2020 Webinars: Fine tuning Research Planning using Elsevier tools: Science Direct, Scopus and Mendeley organized by K.J. Somaiya College in collaboration with Elsevier on 25th April, 2020 HPTLC- Method Development and Validation organized by IOS And Anchrom on 20th- 21st May, 2020 Instrumental Techniques in Analysis organized by Dpt of Chemistry, JHC from 27th to 30th May, 2020 Changing Roles of Digital Platform organized by TAF, JHC on 8th June, 2020 Bioinformatics: Concepts, Tools and Database organized by K.J. Somaiya College on 27th and 28th July, 2020	
Dr. Shuchita Deepak	Did course on Fundamentals in Immunology- Innate immunity and B cell function from Rice University under Coursera FDP/Workshop Trained under the TEACH (Technology in Education for Active Content Harmonisation) initiative of Jai Hind college	

	Attended IIDE's Online teaching masterclass on 25th April 2020 Attended 3 days FDP on Online college management and online content creation tools from 30th Apr to 2nd May 2020. Webinar Attended Webinar symposium on Taming the beast of inflammation-COVID-19 on 29th April 2021	
Ms. Candida Silveira	Course Completed Course on Ecology: Ecosystem Dynamics and Conservation, American Museum of Natural History through Coursera Completed Course on Summary Statistics in Public Health, Johns Hopkins through Coursera FDP/Workshop Attended A 2 Days Workshop on 'Online teaching and E-Content' organised by HSNC University and IIDE Trained under the TEACH (Technology in Education for Active Content Harmonisation) initiative of Jai Hind college Attended the following Webinars: On New age tools for Teaching Online: Academisthan Changing Roles of Digital Platform: Teacher's Forum, Jai Hind College Patent and Patent Processing, Varde College High Performance thin layer Chromatography: Anchrom and IY College	

8. List of exhibitions/seminars/training courses conducted by the college:

DEPARTMENT OF BOTANY

Year 2018-19

Exhibitions:			
SrNo	**Title**	**Description**	**Beneficiaries**
1.	**Exhibition: Xplore:** An exhibition by all science departments was conducted on National Science Day (28th Feb 2019). Large number of students participated with exhibits consisting of posters, working & non-working models, products and projects. The following are the exhibits by various classes.	FYBSc • Commercial aspects of Medicinal Plants • Medicinal Botany:Grandma's Pouch SYBSc • Antimicrobial activity of Bottle brush oil • Extraction and estimation of Ursolic acid from a fewmembers of Apocynaceae TYBSc • Dye from Ficus • Silver Nano particles from Ocimum • Insecticidal activity of Kali jeeri • A cosmetic preparation from beet peel	4 4 4 2 2 2 2 2

Seminars:

SrNo	Title	Description	Beneficiaries
01	Seminar of TY B.Sc. Horticulture students.	Presentations in groups on Nursery and Garden Management on the basis of their visit to Go Green Nursery in August 2018	35

3. Dr. Sunita Shailajan, Head, Department of Botany , Ramnarain Ruia College with her team of students gave a lecture on their work on HPTLC. She also emphasized on importance of inter-disciplinary research for ex:

Number of modules: 01

Details of each module-

a. Name: Dr. Sunita Shailajan
b. Designation: Head, Department of Botany
c. Host institute: Ramnarian Ruia College
d. Duration of visit: 3 hours

Topic of lecture/discussion: Role of HPTLC in Herbal science.

Year 2019-20

Exhibitions:

SrNo	Title	Description	Beneficiaries

01	An exhibition by all science departments was conducted on National Science Day (28th Feb 2020). Large number of students participated with exhibits consisting of posters, working & non-working models, products and projects. The following are the exhibits by various classes.	FYBSc: ● Medicinal Plants ● Symbiosis ● DNA SYBSc: ● Estimation of Vitamin C ● Study of leafy vegetables for their iron content ● Starch extraction ● Pigment extraction ● Extraction of oil from leaves ● Pigments Extraction from flowers ● Estimation of Protein from Lentils TYBSc: ● Amalgamation of crude leaf extract with essential oil to make aromatic soap ● Larvicidal: a natural approach & antimicrobial & antioxidant activity of Callistemon sp. ● Extraction and isolation of ursolic acid from few apocynaceae leaves	 4 4 2 4 4 2 4 4 4 4 3 3 3

Seminars:

SrNo	Title	Description	Resource Person/s	Beneficiaries
01	"**To mitigate problems arising out of malnutrition"**	Students understood the dietary intake of Indian population and how cyanobacteria can be used to improve nutritional value of food items under cultivation. A research attitude was inculcated in their minds and they gained information about how a research laboratory with govt funding.	**Dr. RutwikThengodkar**, Co-founder of Cyanofarm Research Center, KeshavShrushti, Bhayandar. [5th February 2020]	125

02	"**Role of plant DICER like genes and RDR 6 in DS RNA induced protection against CMV"**	Students were guided on prospects for applying to countries abroad for postgraduate studies and the research environment in international laboratories.	**Mr. Mehershad Wadia,** M.Sc. Molecular Biology **and** a Jai Hind Alumnus and active researcher [5th February 2020]	125
03	**"Bioinformatics" Its scope in India & abroad and career paths"**	On 25th February 2020.by Mr Mannan Shah, a Jai Hind Alumnus, M.Sc. in Bioinformatics. Students gained knowledge on Overview of bioinformatics work done in India and its scope.	**Mr Mannan Shah,** M.Sc., Bioinformatics and a Jai Hind Alumnus	37

Training Programmes:

SrNo	Title	Description	Resource Person/s	Beneficiaries
01	**Hands on training for permanent slide preparation**	Students are being trained to prepare the permanent slides by processing the plant material with a few chemicals, block making and ribbon cutting along with staining. Duration of course/ program: 5 weeks duration (Thrice a week for 1 hour per day)	**Dr. Devangi Chachad,** Assistant Professor, Jai Hind College, Mumbai	30

02	**Short term skill development course in perfumery**	Students will be trained to extract essential oils and use them in making products that are used on a day-to-day basis and spark an entrepreneurial streak in the students. Duration of course/ program: 5 weeks duration (once a week for 3 hours per day)	**Mr Nishit Doshi** , Perfumer, Keva flavours and fragrances, Mumbai	25
03	**Dish Garden and Miniature landscape making**	Make the base of the landscape in attractive shapes and designs using marble and granite or tiles; Make use of ceramic pots for making smaller Dish garden landscapes;Construct various artifacts used in landscapes; Understand soil structure, types and its use; Judge the placement of plants with aesthetic sense; Beautify landscape with stones, clay models and other paraphernalia; Maintain the beauty of Landscape with proper after care. Duration of course/ program: 8 days duration (3 hours per day)	1) **Dr Sangeeta Godbole,** Head and Associate Professor 2) **Mr. Rajiv Kori**, Field collector for Biology.	20
04	**Vegetable carving**	Students learnt the use of tools and basic skills and techniques of vegetable and fruit carving. They were exposed to hands on training for cultivating their interest in this field. Duration of course/ program: 1 day duration (3 hrs)	**Dr Meenakshi Vaidya** Associate Professor Dept of Botany, Mithibai college, V Parle Mumbai	50

Year 2020-21

Exhibitions:			
SrNo	**Title**	**Description**	**Beneficiaries**
01	XPLORE, an intra-collegiate online science exhibition held on 27th February, 2021 FY, SY and TY students took part putting up 30 exhibits in the form of research posters and paper reviews in the form of a poster. XPLORE helped students in enhancing their scientific curiosity, their creativity, confidence levels, team work, and competitive spirit besides others.	FYBSc: ● Photosynthesis in plants ● Difference between DNA and RNA ● Biofertilizers ● WEEDS AS MEDICINES ● Environmental Sustainability ● Plant Hybrid ● Lichens SYBSc: ● Hydroponics: Gardening without soil ● Production of alcohol using fermentation ● Applications of biotechnology in agriculture ● THE EFFECTS OF PLANT HORMONES ON ROOT INITIATION. ● Bioremediation TYBSc: ● Ideal farm ● Bio accumulation of iron in leafy vegetables ● Lab grown meat ● Plant with antimicrobial property ● Extraction of natural dyes ● Extraction of Starch	2 2 2 2 2 2 2 2 2 2 4 2 2 2 2 2 2 2
Seminars:			

SrNo	Title	Description
01	E – SHODH,	E – SHODH, an online student research meet, organized by Research committee, IQAC, JAI HIND COLLEGE.
02	Guidance talk “Review - new norm in scientific research” on 21st October 2020.	Science club organised the guidance talk “Review - new norm in scientific research” on 21st October 2020. It was organized to address young minds and to quench their thirst for research in the new normal the world is subjected to because of COVID 19, by Star college scheme initiative by Science Club under Jai Hind College (Autonomous).

DEPARTMENT OF CHEMISTRY

Year 2018-19

SrNo	Title	Description	Beneficiaries
01	**Exhibition: Xplore:** An exhibition by all science departments was conducted on National Science Day (28th Feb 2019). Large number of students participated with exhibits consisting of posters, working & non-working models, products and projects. The following are the exhibits by various classes.	FYBSc • Fluorescence of highlighter ink • Theory of Carnot's engine – model • Steroechemistry concept of diastereomers – model • Periodic table with colored boxes – model • Colours of d-transition elements – poster • Colorimetry instrumentation - model • Acid content in soft drinks by pH metry • Quantum concepts – poster • Green Chemistry – poster • Chemical bonding - model • Bohr atomic structure - model • Electrochemistry – Cathodic protection SYBSc • Extraction of soya oil from soya bean seeds. • Determination of sugar content in various soft drinks -refractometer • Extraction of essential oil from orange peel by soxhlet extraction. • Preparation of soap enriched with essential oils - soxhlet extraction • Preparation of methyl orange indicator and measurement of wavelength in acidic and alkaline medium – Visible spectrometer • Extraction of caffeine from tea and coffee -soxhlet apparatus • Preparation of Werners complexes & using it prepare linkage isomers • Preparation of methyl salycilate and using it for formulating pain balm • Preparation of Hippuric acid – heating mantle & stirrers	112 Students (FY - 60, SY-40 & TY-12)

		• Sodium content in chips – flame photometer TYBSc • Extraction of flowers by soxhlet method. • Preparation of soap with flower extracts - soxhlet extraction. • Synthesis of potential drug scaffolds based on triazoles – heating mantle, magnetic stirrer & vacuum pump • Extraction of nicotine from tobacco as insecticides - soxhlet extraction.		
Seminars:				
SrNo	**Title**	**Description**	**Resource Person/s**	**Beneficiaries**
01	**ChemInfo:**The Department of Chemistry organized 'Cheminfo', an interactive event by alumni of the department on Saturday, 22nd December 2018. The event was aimed at fruitful deliberation of ideas, Challenges & Opportunities in the field of chemistry. The alumni had cleared NET/SET examination multiple times and stood high in their studies. The seminar discussed various opportunities for chemistry students, preparing for competitive examinations and various methods of preparation required for various examinations.	Details of each module- a) Name of alumini: Mr. Gokul Ganesan & Ms. Unnati Maru b) Designation: Assistant Professors c) Duration: 4 hrs d) Topic of lecture/discussion: Challenges & Opportunities in the field of chemistry.	Mr. Gokul Ganesan Ms. Unnati Maru	50

02	**Entrepreneurship in Chemistry:** Faisal Ansari, co-founder of Nova Surface Care and an alumnus of Jai Hind College conducted an interactive talk on possibilities of entrepreneurship in chemistry.	Name: Dr. Faisal Ansari b) Designation: Founder c) Company: Nova Surface Care d) Duration: 4 hrs	Dr. Faisal Ansari	70

Year 2019-20

Exhibition		
Explore	112 – Students FY - 60 SY-40 TY-12	An exhibition by all science departments was conducted on National Science Day (28th Feb 2019). Large number of students participated with exhibits consisting of posters, working & non-working models, products and projects. The following are the exhibits by various classes.

Seminars

Sr No	**Title**	**Resource Person**	**Beneficiaries**
01	'Practicing Science- Scope, Perspectives & Vision'- 26/04/2019 & 27/04/2019 **Sessions:** Science- Relevance & the way forward- Dr. Chobe Scientific Communication- Dr. Khushalani Coming of Age in the world of science- Dr. Trivedi	Dr. Prabodh Chobe BASF, Dr. Rajesh Vatsa BARC, Dr. Deepa Khushalani TIFR, Dr. Sandip Trivedi Director TIFR	132
02	Hands-on training workshop on 'HPLC –Principle, Instrumentation and applications' - 18/09/2019	Dr. Rajesh Vagdama, Scientist, DBT-DAE division, ICT, Matunga	34
03	Workshop on 'GC-MS- Technique and applications'-27/09/19	Dr. Pavan More, Assistant Professor, ICT, Matunga	22

04	Workshop on 'DSC- Principle, Instrumentation and applications' - 11/02/2020	Dr. Avinash Kale, Reader, University center for excellence at common Instrumentation facility (CIF)	24

Year 2020-21

Seminars		
Title	**Beneficiaries**	**Description**
e-Shodh - **Online Research Meet** "Impact of COVID – 19 on economy, society, international politics, Higher education, literature, media, personal or Public Health, Psychology, Management, e–commerce, Mobility, technology, research, entrepreneurship, Tourism, Research and Innovation." 11 th May to 13 th May 2020.	Total papers - 131 (all streams) Total registrations - 308	It was a national level research meet where students all across India got an opportunity to present their research work.
I**nstrumental Techniques In Analysis** Day 1: Flash & preparative chromatography Day 2: Flow Chemistry, BT- NMR & Compact- MS Day 3: Thermal methods of analysis	Total registration- 1768	"The Department of Chemistry organized a Webinar series from 27th to 30th May 2020 on instrumental techniques. **Resource Persons:** ● Mr. Karthik Bhat, Product Manager Inkarp Instruments Mumbai, Industry Experience: 14 years ● Dr. Premchand Jain, GM Thermal Analysis Division, Hitachi High-Tech; Industry Experience: 35 years ● Dr. Manjusha Phanse, Application Specialist, Anchrom Enterprises Pvt. Ltd.

A one-day webinar on 'Review - New Norm in Scientific Research'.	158	Webinar on the recent trends and how to start a scientific research. Arriving at a scientific problem to solve and developing into a research topic.
Science popularization program - Swami Shyamananda High School, Bhatwadi. **(Chemistry Outreach Program)**	78	Graduate level students participated and showed experiments virtually followed by a quiz to around 78 participants including school science teachers.

Training Courses/Bridge Courses

Sr.No	Title	Resource Person	Beneficiaries
1.	Bridge course in Mathematics for Chemists from 02/02/2021 to 22/02/2021. Link: Detailed Schedule	Dr. Sangeeta Parab Dr. Shilpa Jain Ms. Aksh Hina Shaikh	51 Beneficiaries Course Objectives Attendance

Lectures

Sr.No	Title	Resource Person	Beneficiaries
1	Career Opportunities in Perfumery on 05/12/2020	Mr. Nishit Doshi	66
1	Career Prospects In Pharmaceutical Industry on 12/12/2020	Dr. Rajiv Desai	229
2	EDUBOARD on 19/12/2020	Devyani Bhandari Mehershad Wadia Janhavi Damani Ankur Awasthi	180
3	CHROMA-GRAPHY on 30/01/2021	Dr. Ragni Desai	23
4	Research in Material Science on 06/02/2020	Dr. V.R.Patil	231
5	HPTLC	Prof. Dr. Sunita Shailajan	181
6	Career Opportunities in Biological Sciences and Chemistry	Dr.Purvi Bhatt Dr. Sudeshna Chandra	450

DEPARTMENT OF MICROBIOLOGY

Year 2018-19

SrNo	Title	Description	Outcome
1	**Exhibition: Xplore:** An exhibition by all science departments was conducted on National Science Day (28th Feb 2019). Large number of students participated with exhibits consisting of posters, working & non-working models, products and projects.	13 posters put up by students of Microbiology from FY, SY and TY **A SYBSc team won a first prize for their work on: Extraction of Pectin from orange peels.** Few of the exhibits presented by Microbiology students: **FYBSC:** 1. Stem cells 2. Commercial aspects of Medicinal Plants 3. Human Microbiome **SYBSC:** 1. Microbial Fuel 2. Dental plaque and biofilm formation 3. Application of facultative anaerobes 4. Extraction of Pectin from orange peels	Helped students in enhancing their scientific curiosity, their creativity, confidence levels, team work, competitive spirit besides others.

		5. Catechizing *E.coli* **TYBSC:** 1. Gut microbiota and hormones 2. Quorum sensing inhibitors to inhibit biofilm formation 3. Preparation of cotton nanoparticles using green technology	
2	**Workshops/ Training Programmes (For Students)**	**Beneficiaries**	**Outcome**
	Use and Handling of Auto pipettes	82	All students of FY, SY and TY (82) were taught the right way of handling micropipettes. There is a conscious attempt to stop the practice of 'mouth pipetting' and also use auto pipettes for better accuracy as with bioassays and to learn best laboratory practices.
	Western Blot Technique	44	Workshop was conducted for SY and TY BSc students .To expose the students to molecular diagnostics and understand the working of PAGE and nanoblot apparatus
3	**Workshops/ Training Programmes (For Non- Teaching Staff)**	**Beneficiaries**	**Outcome**
	For Non-Teaching Staff: Workshop was organized for office staff and teachers involved	Teaching and Non- Teaching Staff	This was to train the non-teaching staff, how to make money transfers etc.

	in STAR activity related to payment module as per BDT directives from State Project management Unit (SPMU) PFMS, Maharashtra, Mumbai on 29th September 2018.		
	Workshop was organized related to pension for the benefit of teachers and non-teaching staff who will get pension in future by Vasant Chaudhari -deputy secretary to government(retired)formerly," officer on special duty" university of Mumbai.	Teaching and Non- Teaching Staff	This was to give an insight about the pension related issues

Year 2019-20

	Exhibition		
	Title	**Description**	**Outcome**
01	Xplore: An exhibition by all science departments was conducted on National Science Day (28th Feb 2020). Large number of students participated with exhibits consisting of posters, working & non-working models, products and projects.	FY, SY and TY students took part putting up 12 exhibits in the form of posters, exhibits, models, experiments, and paper reviews in the form of a posters **2 FYBSc teams won first and second prize for their work on Industrial fermenter and Sanitary Practices respectively**	Helped students in gaining knowledge, exploring new areas of science. Building up their critical thinking skills, presentation and scientific communication skills.

		List of exhibits 1. Sanitary practices 2. Model of an Industrial fermenter 3. Red algae (poster) 4. Medicinal Uses of protozoa(poster) 5. Cosmetic Microbiology 6. Pigment extraction from UV resistant microbes(poster) 7. Optimisation of Growth Parameters for Microalgae(poster) 8. Antimicrobial Activity of Spices(poster) 9. Antimicrobial Property of Parijata (poster) 10. Presence of Staphylococci on raw vegetables and its biofilm forming potential (poster) 11. Study of antimicrobial activity of carom and fennel seeds on gut pathogens (poster) 12. Prevalence of Gram positive organisms in dairy products and study of their antibiogram (poster)	
02	**Workshops/ Training Programmes (For Students)**	**Beneficiaries**	**Outcome**
	Basic techniques in chromatography on 24th July, 2019.	44	This workshop was conducted to provide hands-on training for the various types of chromatographic techniques such as ion exchange, affinity and gel filtration chromatography which are done in theory and that can be applied in projects. With the help of

			the kits purchased the workshop was easily conducted.
	Clinical Research	40	The aim of this workshop was to expose the students to Clinical Research as a career option and help them understand how drugs are introduced in the market.
03	**Workshops/ Training Programmes (For Teaching Staff)**		
	Metagenomics: Exploring Microbial Diversity using Metagenomics: An Introductory Workshop' was organized by the Department of Microbiology, Jai Hind College	30	It was a three-day hands-on workshop consisting of several lectures by renowned scientists from reputed institutes like FMR, NIRRH.The workshop covered several Next Generation Sequencing, Applications of Portable sequencer, nanopore sequencer, microbiome characterization
04	**Workshops/ Training Programmes (For Non- Teaching Staff)**	**Beneficiaries**	**Outcome**
	Workshop on Basic Training in MS Word and Excel under STAR DBT Scheme, organized on 21st and 22nd Aug, 2019.	22	This workshop was conducted to make them efficient in handling data and analyze them using computers

Year 2020-21

	Exhibition		
	Title	**Description**	**Outcome**
01	Xplore: An exhibition by all science departments was conducted on National Science Day (28th Feb 2021). Large number of students participated with exhibits consisting of posters, working & non-working models, products and projects.	FYBSc 1. Alzhiemer's disease - i 2. Difference between DNA & RNA 3. Renewable energy resources 4. Phage display	XPLORE helped students in enhancing their scientific curiosity, their creativity, confidence levels, team work, and competitive spirit besides others. Also helped in enhancing their skills of critical thinking, online presentation and scientific communication

		5. Biofertilizers 6. Environmental sustainability 7. Plant hybrid 8. Lichens 9. Neuroscience SYBSc 1. CRISPR 2. Bioplastics 3. Moody microbes 4. Microbial evaluation of raw milk from dairy farm 5. Innate Immunity 6. Bioremediation TYBSc 1. Health impact of processed foods	
02	**Workshops/ Training Programmes (For Students)**	**Beneficiaries**	**Outcome**
	Introduction to Data Analysis for Biologists: The speakers for the workshop were - Dr. Sonal Dasani (PassionEdx foundation) and Dr. Rohan Gavankar (Asst. Prof. - Viva College).	The workshop was conducted in two batches and over 100 participants. First batch (25th & 27th January, 2021) consisted of the students & teachers of Microbiology & Botany depts. The second batch (15th & 16th of February 2021), consisted of the teachers and students of the Life Sciences & Biotechnology depts. respectively.	Students and teachers were introduced to basic Biostatistics tests (t- test, ANOVA, chi square analysis. etc) Hands on experience in use of MS Excel to collate data and use statistical tools Use of Biostatistics in Science, Data Representation, Interpretation and Problem solving

9. Name, designation, host institute of guest faculty invited:

DEPARTMENT OF BOTANY

Year 2018-19

Dr. Sunita Shailajan

Designation: Head, Department of Botany, Ramnarain Ruia College

with her team of students gave a lecture on their work on HPTLC.
Duration of course/ program: 1 day duration (2 hrs)

Topic: She also emphasized on importance of inter-disciplinary research for ex: Role of HPTLC in Herbal science

Year 2019-20

Dr. RutwikThengodkar
Designation: Co-founder of Cyanofarm Research Center, KeshavShrushti, Bhayandar.
[5th February 2020]
Duration of course/ program: 1 day duration (2 hrs)
Topic: "**To mitigate problems arising out of malnutrition"**
Number of Beneficiaries: 125

Mr. Mehershad Wadia
Designation: M.Sc. Molecular Biology **and** a Jai Hind Alumnus and active researcher
[5th February 2020]
Duration of course/ program: 1 day duration (2 hrs)
Topic: "**Role of plant DICER like genes and RDR 6 in DS RNA induced protection against CMV"**

Number of Beneficiaries: 125

Mr Mannan Shah
Designation: M.Sc., Bioinformatics and a Jai Hind Alumnus
[25th February 2020]
Duration of course/ program: 1 day duration (2 hrs)
Topic: **"Bioinformatics" Its scope in India & abroad and career paths"**
Number of Beneficiaries: 37

Dr Meenakshi Vaidya
Designation: Vice Principal, Head, Department of Botany, Mithibai College,
Duration of course/ program: 1 day duration (3 hrs)
Topic: Vegetable carving.
Number of Beneficiaries: 50

Year 2020-21

"The Fascinating Forests"	On 28th July 2020 Awareness among students was created regarding the role of a layman in conservation of forests, nature and the significance of conservation was established through visuals.	Dr. Parag Mahajan	115 Undergraduate and Postgraduate students from different streams
"Mangroves- Life guards of Mumbai"	Significance of presence of mangroves along the coastal areas and their impact on city dwellers.	Dr Hemant Karkhanis, Head of Soonabai Pirojsha Godrej Marine Ecology Centre, Mumbai, on 5th August 2020.	95 Undergraduate and Postgraduate students from different streams

"Nature Driven Life Journey"	Students gained perspective on Entrepreneurship development.	By Rahul Kolekar was held by the Department of Botany and Microbiology in association with Nature club, Jai Hind College on 22nd September 2020.	235
" POLLUTION- KNOW ALL ABOUT IT"	The main purpose was to create awareness about the hazards of pollution on the environment and health of mankind.	Dr. Ambika Joshi, Ex Head, Botany Dept Jai Hind College and an active researcher in Ecology andEnvironmental Botany on 10 February 2021.	50
"EXTRACTION AND SEPARATION OF PHYTOCHEMICALS USING HPTLC"	Students were able to learn the technique which is a part of the curriculum.	Dr Aparna Saraf, Associate Professor, Institute of Science on 13 February 2021	70
A practical demonstration and lecture on "A journey from Kitchen WASTE to Kitchen GARDENING"	**Learning outcome:** Simplicity of the process of conversion of Wet waste into a usable manure was explained and demonstrated to participants.	Ms Rashmi Joshi, an environmental consultant was conducted on 3rd April 2021.	63 All the lectures were kept open for participants from Inhouse and other colleges as well.
"QUALITY CONTROL OF	Students could understand the importance of Quality control in the food and medicine	Dr. Sunita Shailajan, a dedicated researcher with varied	48

HERBAL DRUGS”	industry**.**	experience of strong Industry-Academia linkage Nationally and Internationally and the advisory panel for STAR-DBT funding at Jai Hind College on 19 February 21.	
“BIOINFORMATICS-PRESENT AND FUTURE”	Students gained the knowledge of scope and career in Bioinformatics in day to day life.	Dr. Sagarika Damle, Head, LifeSciences Dept., KC College on 26 February 2021**.**	48

DEPARTMENT OF CHEMISTRY

Year 2018-19

Number of modules: One
Details of each module-
a) Name: Dr. Vijay Gupta
b) Designation: Director
c) Host institute: Advion, Sweden
d) Duration of visit: 4 hrs

Topic of lecture/discussion: GenNext Mass Spectrometers

Lecture titled ‘GenNext Mass Spectrometers’ was conducted on 23rd January 2019 to introduce benchtop mass spectrometers. This helped students to understand the principles of mass spectrometry and the recent development in instrumentation and use of mass spectrometers. Approximately 155 students of all science departments benefitted from the talk.

No of Beneficiaries: 155 (FYBSc, SYBSc, TYBSc & MSc-I & II)

Year 2019-20

Nil

Year 2020-21

Name	Designation	Host institute
Mr. Nishit Doshi	Perfumer	S.H. Kelkar & Company, Mumbai
Dr. Rajiv Desai	Head, Corporate Quality Manager	Lupin India Limited, Mumbai
Ms. Devyani Bhandari	Pursuing MS in Biomedical Forensic Sciences	Boston University, USA
Mr. Mehershad Wadia	Pursuing MS in Molecular Biology	University of Queensland, Australia
Ms. Janhavi Damani	Pursuing Ph.D. in Physiology	Pennsylvania State University, USA
Mr. Ankur Awasthi	Pursuing Ph.D. in Chemistry	University of Victoria, Canada
Dr. Ragni Desai	Officer- Technical Analyst	Amvigor Organics Pvt. Ltd, Mumbai
Dr. Vishwanath R. Patil	Associate Professor	University Department of Chemistry, University of Mumbai
Dr. Sunita Shailajan	Associate Professor & Head	Department of Botany, Ramnarain Ruia College
Dr. Purvi Bhatt	Professor at Sunandan Divatia	NMIMS, Mumbai
Dr. Sudeshna Chandra	Professor at Sunandan Divatia	NMIMS, Mumbai

DEPARTMENT OF MICROBIOLOGY

Year 2018-19

Sr. No	Details	Beneficiaries	Outcome
1.	'Public Health and Epidemiology' by Dr Vinita Sangthani, Associate Professor, University of North Georgia , USA	56	Interactive session wherein the students were made aware of the aspects of disease transmission with the help of case studies
2.	Advanced Technology in Composting' by Dr Darshana Salaskar , Scientific Officer , BARC Mumbai	62	Students gained an insight on the benefits of Biocomposting process at the community level.

Year 2019-20

Sr. No	Details	Beneficiaries	Outcome
1.	'Preparation of Diet Chart' on 20th July, 2019 by Dr Veena Yardi, Rtd Associate Professor, Foods, Nutrition & Dietetics, Nirmala Niketan College.	20	This was an interactive session planned for TYBSc class, to help students build their own diet charts keeping in mind all the necessities of a balanced diet.
2.	'Man, mosquito and malarial parasite: Who is ahead?' by Dr Shobhona Sharma, Rtd Professor, Department of Biological Science, TIFR on 3rd August, 2019.	149	The speaker explained the recent advances in the field of designing vaccines against malarial parasite
3	How to write a research paper? by Dr. Shruti Samant, Associate Professor, Bhavan's College on 18th February, 2020.	24	This talk was organized for SYBSc class to give them an insight about research papers. Stepwise process to write a good quality research paper was discussed. This lecture helped the students to write their own research papers on the research projects conducted by them.

Year 2020-21

Sr. No	Details	Beneficiaries	Outcome
1.	Topic of Lecture/discussion: Relevance of Microbiology in changing Times Name: Mr Amit Rao Designation: Director, Sai-Biotech Host institute: Jai Hind College Duration of visit: 4th May, 2020	54	The speaker gave a brief about the relevance of Microbiology post COVID Different fields allied to Microbiology were discussed by the speaker Different skills required by students was discussed along with some learning and studying strategies/ techniques
2.	Topic of Lecture/discussion: How to read scientific literature Name: Dr. Anupama Harshal W Designation: Consultant, Science Communication and Public Engagement Host institute: IQAC and Bioscience Departments, Jai Hind College Duration of visit: 29th May, 2020	190	The speaker explained the entire process of how scientific literature is read and understood in a lucid manner.
3	Topic of Lecture/discussion: Building your path: Career opportunities for Bioscience graduates in industries Name: 1)Dr. Vishal Dawkar and 2) Mr. Nitin Mali Designation: 1)Senior Research Scientist, Mitcon Biopharma 2) Manager, Mitcon Biopharma Host institute: IQAC and Bioscience Departments, Jai Hind College	108	The speakers gave a brief description about different aspect of a pharmaceutical industry (Mitcon) and pointed out the different avenues opened for all Bioscience students Explained in brief the Clinical research feature of drug trials Talked about the different fields eg. Tissue culture, Health care, Agriculture Spoke about the skills and strength needed by students when pursuing a career in industry Gave a detail explanation on different entrance exams and fellowships/

	Duration of visit: 06th June, 2020		scholarships for higher education and academic research both in India and Abroad Also informed about the Incubator centres for Entrepreneurs
4	Topic of Lecture/discussion: Molecular Diagnostics Name: Dr. Mrunal Warke Designation: Dy. QA Manager, HiMedia Laboratories Host institute: IQAC and Bioscience Departments, Jai Hind College Duration of visit: 17th June, 2020	85	The speaker gave an overview of different techniques used for Molecular diagnostics Applications of different molecular techniques in diagnostics were discussed by the speaker Principles of kits developed for Covid detection by Himedia were discussed by the speaker
5	Topic of Lecture/discussion: Nature Driven Life Journey Name: Mr Rahul Kolekar Designation: Owner of Conservada Aquatics and Conservada Outdoors Host institute: Dpt of Botany and Microbiology in association with Nature Club Duration of visit: 22nd September, 2020	169	This was an interactive session where the speaker provided solutions for problems encountered during farming. Students were encouraged to follow a minimalistic lifestyle where one uses whatever is needed and doesn't waste resources. Also simple ways for setting up a kitchen garden, kitchen compost and butterfly garden was explained
6	Topic of Lecture/discussion: Diet Planning Name: Ms. Tasneem Ravat Navagharwala Designation: Visiting Faculty, Nirmala Niketan College Host institute: Dept of Microbiology Duration of visit: 22nd October, 2020	60	Role of different food groups and their proportions required in diet was explained Students were taught to calculate the calorie intake based on their lifestyle and accordingly plan a menu chart, distributing the different food groups

7	Topic of Lecture/discussion: A Peep into the World of the Mighty Microbiome Name: Dr Vikrant M. Bhor Designation: Scientist (Department of Molecular Immunology & Microbiology, ICMR-NIRRH, Parel, Mumbai) Host institute: IWAS, BRNS-DAE and Dept. of Microbiology Duration of visit: 30th Jan, 2021	100 (Students, Teachers and Others)	The students had a chance to interact with Dr. Bhor who explained very systematically the role of Microbiome Its role and impact especially in the medical field (including diagnosis and therapy of human and animal diseases as well as environmental remediation) Recent advances in sequencing technologies that has revolutionized the field The development of non-culture-based approaches such as 'metagenomics' Cataloging microorganisms present in different environmental niches Next generation sequencing (NGS)' technology and data analysis
8	Topic of Lecture/discussion: Vaccines: Types and Manufacturing Name: 1) Dr Neelam Sirsat, 2) Dr Sunil Prabhu Designation:1) ACTREC 2) Vaccine facility startup and Sterile Manufacturing Host institute: IQAC and Dpt of Microbiology Duration of visit:15th March, 2021	66	Students were made aware about the different types of vaccines available for Covid-19 and the various aspects involved in large scale production of vaccines
9	Topic of Lecture/discussion: Entrepreneurship and Tech Startups: Challenges and Opportunities Name: Dr Rahul Nabar Designation: Consultant & Chemical Engineer Host institute: IQAC and Dpt of Microbiology Duration of visit: 24th March, 2021	28	The speaker discussed the various challenges one may face while initiating a start -up and ways to go about the process. He also enlightened the participants about the different agencies working in the sector to help small startups. Case studies involving successful entrepreneurs with Indian perspective were discussed

10. Date of Advisory committee meeting:

Year 2018-19: 21st August 2018

Members in attendance: Dr. D. Khushalani; Dr. S. Zingde; Dr. S. Shilajan; Dr. Ashok Wadia; Dr. B.K.N. Singh; Dr. A.Joshi; Dr. D.Chanchad; Dr. S.Chandran; Dr. S.Dasgupta; Mrs. P.Sequeira; Dr. S.Deepak; Ms. C.Silveira; Dr. M.Ghayal; Dr. P.Rane; Mr. G.Ganesan

Year 2019-20: 28th February 2020

Members in attendance: Dr. Ashok Wadia, Dr. Sunita Shailajan, Dr. Surekha Zingade, Dr. Ambika Joshi, Dr. Madhura Ghayal, Dr. Petra Sequeira & all the members of Botany, Chemistry & Microbiology Departments.

Year 2020-21: 24th November 2020

Members in attendance: Dr. Ashok Wadia, Dr. Garima Gupta, Dr. Meenakshi Munshi, Dr. Sunita Shailajan, Dr. Surekha Zingade, Dr. Ambika Joshi, Dr. Madhura Ghayal, Dr. Petra Sequeira & all the members of Botany, Chemistry & Microbiology Departments.

11. List of New Practicals/demonstrations introduced in different departments in last one year:

DEPARTMENT OF BOTANY

Year 2018-19

Sr. No.	Experiment	Beneficiaries	Description - Impact/Outcomes
01	Chi Square test	Students of F.Y.B.Sc (140)	More equipped to carry biostatistical analysis
02	Ecological adaptations for Xerophytes	Students of F.Y.B.Sc (140)	To make students aware of different anatomical tissues and their significance in adaptation to the environment.
03	Stomatal mounting	Students of F.Y.B.Sc (140)	To help students use the knowledge of epidermal anatomy in taxonomy
04	Beer Lambert's Law and estimation of λ_{max} for various fruit and vegetable extracts	Students of F.Y.B.Sc (60)	This gave them a practical demonstration of Beer Lambert's Law based on they noticed the absorption of light by pigments extracted from commonly available fruits and vegetables. Handling and working of spectrophotometer and colorimeter.
05	Estimation and comparison of protein content from different pulses.	Students of S.Y.B.Sc. (35)	Students understood that the quantity of proteins may vary in different food sources and they learnt a simple biochemical analysis method to estimate the same. They also learnt to used the micropipettes made available to us in large nos via star DBT
06	Estimation of Vitamin C from different fruits (Seasonal variation)	Students of S.Y.B.Sc. (35)	To understand the impact of seasonal variation on primary and secondary metabolites in plants

07	Preparation of Permanent Slides for Maize stem (Double staining).	Students of S.Y.B.Sc.(35)	Students understood the process of permanent slide making and importance of double staining
08	Effect of 2,4-D on *in vitro* pollen generation.	Students of S.Y.B.Sc.(35)	Students understood the impact of a weedicide (2,4 – D) and also the fact that the impact is not only seen in the present field plants but also passed on to the next generation plants, [implies long term effect]
09	Stomatal mounting from *Bigonia* and *Dracena*	Students of T.Y.B.Sc.(20)	To understand variations in stomata
10	Study of Growth Curve of *E.coli* to be studied at varying temperature conditions.	Students of T.Y.B.Sc.(20)	Students were exposed to the concept of culturing and growing M orgs aseptically and also understood the method of estimating the optimum temperature requirement for growth ofany M orgs
11	Problems based on normality, molarity and molality for preparation of chemical solutions.	Students of T.Y.B.Sc.(20)	Students understood the basic calculations of preparation of chemical solutions. They could now make their own chemical solutions with precision as per analytical procedures that they would follow while carrying out their projects.
12	Activity of enzyme nitrate reductase from plant tissues.	Students of T.Y.B.Sc.(20)	Students were exposed to carrying out an enzymatic assay of an important plant enzyme and could also think about studying the activity of the same in different plant tissues and may be at different times to check for elevation or reduction in its activity. They were familiar with use of micropipettes and spectrophotometers.

Year 2019-20

Sr.No.	Experiment	Beneficiaries	Description - Impact/Outcomes
1	Spectral Analysis of plant pigments from various parts.	Students of F.Y.B.Sc.(115)	This gave them a practical demonstration of Beer Lambert's Law and solvent-solvent extraction based on different polarities of pigments. Handling and working of spectrophotometer and colorimeter.
2	Double staining of plant tissues	Students of F.Y.B.Sc.(115)	Students grasped the concept of double staining and permanent slide making
3	Simpson's Diversity Index	Students of F.Y.B.Sc.(115)	They learnt to do field -like experiments for diversity even while sitting in the lab as going out may not always be possible Students realized the fact that the changes in biodiversity can impact the environment.
4	Vegetation mapping	Students of F.Y.B.Sc.(115)	Use of GPS (with help of Garmin's) instrument in plant census
5	Permanent slide making	Students of F.Y.B.Sc.(115)	Students understood the way in which handcut, stained sections could be preserved for longer times to observe and use later. and they understood the importance of double staining
6	Isolation of chloroplasts using density gradient centrifugation	Students of S.Y.B.Sc.(35)	Students learnt how subcellular organelles like mitochondria, chloroplasts and macromolecules like DNA, RNA and proteins are isolated for molecular biology experiments. Use of centrifuge as a separation tool
7	Chloride uptake from underground plant parts	Students of S.Y.B.Sc.(35)	Students understood the capacity of absorption of chloride ions in different underground organs like stem and root

8	Flavonoid content from tea	Students of S.Y.B.Sc.(35)	Students learnt the methods of estimation of secondary metabolites from plants
9	Phenols from cinnamon	Students of S.Y.B.Sc.(35)	Students learnt the methods of estimation of secondary metabolites from plants
10	Alkaloids content of tea	Students of S.Y.B.Sc.(35)	Students learnt the methods of estimation of secondary metabolites from plants
11	Protein estimation from different pulses by 3 methods and comparison of the 3 estimation methods.	Students of S.Y.B.Sc.(35)	Students understood variation in protein content of different pulses and checked the sensitivity of different methods to estimation of protein.
12	Double staining of plant organs	Students of S.Y.B.Sc.(35)	Students understood the concept of double staining and permanent slide making.
13	Preparation chemical solutions.	Students of T.Y.B.Sc.(18)	Students understood the basic calculations of preparation of chemical solutions . They could now make their own chemical solutions with precision as per analytical procedures that they would follow while carrying out their projects
14	Separation of carotenoids from different plant tissues	Students of T.Y.B.Sc.(18)	The isolation of the pigment carotenoid which is a precursor to synthesis of Vitamin A which is an essential dietary supplement of humans. The concept of TLC as a basic separation tool
15	Extraction and characterization of starches	Students of T.Y.B.Sc.(18)	Concept of different types of starches and characterization of the same from different plant sources.
16	Extraction and estimation of essential oil from different plants	Students of T.Y.B.Sc.(18)	Understand the different methods of extraction of essential oil from plant sources.

Year 2020-21

NIL

DEPARTMENT OF CHEMISTRY

Year 2018-19

SrNo.	Experiment	Beneficiaries	Description - Impact/Outcomes
01	Preparation of potassium trioxalato ferrate (III) complex & determination of its empirical formula.	200	Objectives: To teach preparation of inorganic complexes and to analyse them for their empirical formula by non-instrumental method. Outcomes: The students learned the importance of complexes in chemistry, stoichiometric calculation for the preparation of inorganic metal complexation, methods of synthesizing complexes and the factors affecting the quantitative formation of complexes. They had the experience of preparing water soluble complexes, their precipitation method and filtration and drying to calculate the yield of product.
02	Gravimetric estimation of Nickel (II) as Ni-DMG and calculation of % error.	200	Objectives: To familiarize the preparation of inorganic complexes from ligands, properties of ligands, identification of electron contributing sites, their stoichiometry calculations, theoretical and practical yield calculation. Outcomes: The students learned the stoichiometric calculation for the preparation of nickel complexes, ideas about ligands and their properties, coordination sites, coordinate bonds, methods of synthesizing complexes and the factors affecting the quantitative formation of complexes which are water insoluble. Students also learned the calculation of theoretical and practical yields.
03	Vacuum distillation of high boiling	40	Objectives: To equip & train students with a method (technique) of purification of

	organic liquids & low melting solids.		thermo labile liquids (low melting solid) & concentration of solutions containing biological samples. Outcomes: Concept reinforcement: relationship between boiling point and atmospheric pressure. Principle behind rotary evaporation of solvents.
04	Study of enthalpy of dissolution of potassium nitrate.	200	Objectives: To study change in thermodynamic properties of a system. Outcomes: Students learned thermodynamic variables and their measurements. Conceptual differences between heat & enthalpy. Prediction of the effect of temperature on solubility based on molar enthalpy of dissolution.
05	Simultaneous determination of Fe(II) & Cr (III) by potentiometric titration.	40	Objectives: To teach applications of potentiometer for simultaneous determination of metal ions without separation. Plotting of graph and determination of equivalence point. Outcomes: Students acquired knowledge on set up of electrochemical cell. Simultaneous methods of potentiometric determination. Potential variation and with respect to oxidation-reduction/reactivity of metal species. The students learned the plot of the titration method and to determine the concentrations.
06	Determination of percentage composition of strong & weak acid in a mixture by conductometric titration against strong base.	98	Objectives: To impart knowledge of conductometric titrations, theoretical principles and their use in estimation of acid mixtures. Outcomes: Students learned about Coductometric titration methodology, cell constant determination and factors affecting conductometry. Concept of equivalence point. Estimation of acid mixtures, nature of conductometric plots.
07	Estimation of barium from the given sample conductometrically by precipitation titration with sulphuric acid.	40	Objectives: To teach concepts of conductometric titrations, their applications to various types of titrations and in specific to precipitation titrations. Outcomes: Precipitation titrations, their importance and finding equivalence points.

			Conditions required for precipitation titrations. Nature of plots to determine the amount of sample. Applications of precipitations titrations to various ions.
08	Estimation of aspirin in drug samples.	40	Objectives: To train students on the analysis of pharmaceutical drug molecules and selection of methods. Outcomes: Students learned the analytical methodology for drug analysis and selecting a method. How to prepare sample for analysis and to analyse and calculate the amount of active drug content present in drug formulations. Significance of FDA norms, USP, IP & BP protocols in drug analysis.
09	Physico-chemical parameters of water samples: TSS, TDS, TS by Water Analyzer.	98	Objectives: To train students on physico-chemical parameters of water and methods of water analysis. Collection of samples from various sources, analyse and compare the results with standard values of water parameters. Outcomes: Knowledge on water analysis, physico-chemical parameters of water and their variations depending on sources, approved water analysis manuals and water quality standards. The physico-chemical parameters related to various sources of water and their determination by portable water analyser.
10	To determine the precision of a digital balance by applying statistical methods.	200	Objectives: To acquaint students with errors and approximation in analytical chemistry, statistical methods in quantifying magnitude of errors, acceptance criteria and mitigating errors. Outcomes: Students learned the Identification of determinate and indeterminate errors and their calculations. Calculation of mean, median and standard deviations. Applying statistical methods to mitigate errors.

Year 2019-20

SrNo.	Experiment	Beneficiaries	Description - Impact/Outcomes
1	Virtual Laboratory Experiment: ChemCollective vlab: Acid-base titrations	FYBSc 200	Titration curve, equivalence v/s end point, technique & use of volumetric apparatus. **Learning Outcome:** Students were introduced to simulation experiments and allowed to explore the possibilities of silico studies to ascertain and co-relate the experimental results. How experiments and results using software can be used to support the bench experiments.
2	Comparative assay of the samples of saline IP by volumetric and potentiometric methods.	SYBSc 98	Designing an experiment for assay of saline solution by reaction of the halide. Students could correlate with isotonic intracellular concentration using the formulation. **Learning Outcome:** Theory of potentiometer. The students were trained to compare results of two analytical methodologies and derive conclusions. They were taught about the advantages of advanced method over classical method. They learned about precision accuracy, sensitivity etc.
3	Synthesis of a monoazo dye: methyl orange.	SYBSc 98	Students were exposed to organic synthesis set up in the lab along with the unit operations involved. **Learning Outcome:** Students learned to prepare a dye which is familiar to them. They were trained on synthetic methodologies and purification. They were explained about chromophores and scale up principles.
4	To determine the amount of fluoride in mouthwash (brand: listerine) by colorimetric method.	TYBSc 40	Application of fluoride in dental products & its assay using the alizarin method. **Learning Outcome:** The student learned analysis of a commercial sample. They were also familiarized with the treatment of samples before analysis, their conversions to suit the analytical methodologies.
5	To study the kinetics of decolorization of crystal violet.	TYBSc 40	Use of absorbance of the solution in determination of reaction kinetics. **Learning Outcome:** Students learned the theoretical principles of dye, their decolorization kinetics, reactions and spectrophotometric method of analysis, handling of spectrometer software of spectrometers independently.

6	Estimation of aspirin in drug samples colorimetrically & use to excel for data analaysis	SYBSc 98	Experiment was modified to demonstrate use of excel in plotting calibration curves, getting regression constant & determination of unknown. **Learning Outcome:** The student learned analysis of pharmaceutical samples. They were also familiarized with the treatment of sample before analysis, their conversions to suit the analytical methodologies.
7	Estimation of Nickel (II) from $Ni(en)_2S_2O_3$.	SYBSc 98	Students had prepared a metal complex in FY. They were exposed to complexometric titration for its estimation. **Learning Outcome:** Students were trained to synthesize and analyse the metal content by complexometric titration. They gained knowledge in sample preparation, preparation of solutions and estimation methodologies.
8	Synthesis & characterization of Bis-acetylacetanato copper (II).	TYBSc 40	Students characterized the complex synthesized as a part of their practical coursework to determine the formula of complex ion. **Learning Outcome:** Students were trained on synthetic methodologies, molar calculations, arriving at weights, calculation of theoretical and practical yield. They were allowed to handle magnetic stirrers beyond the general preparations in beakers. Students were explained the complexation theory and the factors which influence effective complexation. Werner's theory.
9	To determine the basicity of citric acid conductometrically.	TYBSc 40	Students used conductometric titration to determine the acid dissociation of citric acid. **Learning Outcome:** The students learned theoretical principles, calibration and instrumentation. application of conductance measurement for real sample, lemon juice, preparation of sodium citrate just by adding lemon juice to sodium hydroxide. They also learned about conductometric curves and establishing equivalence points. Learned theory of acidity and basicity and their significance.
10	To determine the amount of Vitamin C in the squash sample pH-metrically.	TYBSc 40	Importance of vitamins and their sources. Extension of pH metric titration to determination of vitamin C. **Learning Outcome:** Calibration of instrument and theoretical principles involving Nerst equation, its application to arrive pH. They were also made familiar with the pH electrode and pH metric curves in order to find the equivalence point. The students learned the effect of substituents on the

			aromatic systems, particularly related to strength of acid character. The students were trained for analysis of off-the-shelf samples, their sample preparation and analytical methodologies.
11	Thin Layer Chromatography for monitoring progress of reaction	TYBSc 40	As an addition to the determination of purity by TLC, a technique added in the previous year; an additional use of TLC in reaction monitoring was demonstrated. **Learning Outcome:** Theoretical principles of TLC, their wide application and the use of it to monitor chemical reactions.
12	Structure determination from spectra	TYBSc 40	Interpretation of UV, IR, NMR & mass spectra of organic compounds were demonstrated and students were given spectral problems to solve. **Learning Outcome:** Students were trained to determine the structure of the molecule by interpretation of spectra.

Year 2020-21

Sr No	Experiment	Number of participant/ beneficiaries	Description Impact/Outcomes
01	To determine Iron in pharmaceutical preparations by visible Spectrophotometry.	29	Understanding of spectrometry and practical training of determining the sample matrix. To provide knowledge on preparation of analytical reagents, solutions and their molar calculations. Preparation of sample from complex pharmaceutical sample matrix. Understanding the usage of spectrophotometry in commercial analysis. Assay & quantification of samples.
02	To titrate a mixture of weak acid and strong acid against a strong base and estimate the amount of each acid in the mixture conductometrically.	29	To estimate amount of acid present in mixture of acid from conductance measurements. In depth learning of the determination of various physical parameters and using electrometric determination of the concentration of unknown species. Handling of instruments & development of expertise.

03	Virtual Laboratory: pH metric estimation of sodium carbonate. Determination of pH at neutralization & half neutralization points &suggesting suitable indicators for observing them.	123	The experiment was conducted using the virtual laboratory platform of Chemcollective. Use of phenolphthalein and methyl orange indicators was rationalized based on the pH. Students learnt how to plot titration curves using MS excel & identify the equivalence point using the plot. Understanding of calculations involved in the estimation of sodium carbonate in the sample using the equivalence point. Students could correlate the acidity of the base from the nature of the pH metric titration curve with 2 inflection points.
04	Virtual titration of a weak organic acid (acetic acid) against strong base (sodium hydroxide) using indicator & from the graph.	174	A virtual titration experiment was carried out using Model Chem Lab. between acetic acid & sodium hydroxide. Fundamentals of titrations & scientific methods were learnt by students right out of school, including representation of data, significant figures, pilot readings, CBR & an introduction to errors. Understanding of the differences between an equivalence point and an end point in a titration. The buffer action in the initial stages of the titration could be rationalized by the students based on the nature of the titration curve.

DEPARTMENT OF MICROBIOLOGY

Year 2018-19

S.No.	Experiment	Beneficiaries	Description - Impact/Outcomes
01	Preparation of Stains	FYBSc 24	**Outcomes:** Learn the use of weighing balance and understand the concept of concentrations
02	Effect of Antiseptics on organisms on Skin	FYBSc 24	**Outcomes:** To understand the role of antiseptics and their effect on organisms on skin.
03	MIC of Crystal Violet	FYBSc 24	**Outcomes:** Learn the basic technique of dilution and how certain dyes have antimicrobial property.
04	Minimal growth requirements of Bacteria	FYBSc 24	**Outcomes:** To practically see all the ingredients required by bacteria to grow
05	Effect of Desiccation on Bacteria	FYBSc 24	**Outcomes:** To see the effect of drying on bacteria and understand the importance of moisture for bacterial growth
06	Effect of various growth parameters (pH, minimal media, temperature and age of culture) on generation time of bacteria	FYBSc 24	**Outcomes:** Learn the use of colorimeters and also understand how various physical parameters can affect the rate of growth of bacteria
01	Preparation of Solutions	SYBSc 22	**Outcomes:** Understand preparation of stock solutions of various molarity and normality and dilutions of the same
02	Isolation of sulphur reducing bacteria from soil	SYBSc 22	**Outcomes:** Learn the technique of anaerobic cultivation of sulphur reducing bacteria
03	Handling of micropipettes	SYBSc	**Outcomes:** Understand the importance of precision in pipetting and learn modern

		22	technique
04	TLC of lipids	SYBSc 22	**Outcomes:** Learn separation technique used for oils
05	Microbial Analysis of Homemade ghee	SYBSc 22	**Outcomes:** Learn the use of special media like Gorodkowa's agar
06	Rapid platform tests- Specific gravity of Milk, Amount of Acidity, Alcohol Test and Clot Formation	SYBSc 22	**Outcomes:** Understand the tests used for analysis of milk
01	Preparation of Solutions	TYBSc 20	**Outcomes:** Understand preparation of stock solutions of various molarity, normality and ppm and do the dilutions of the same.
02	Quality Assurance of laboratory medium and reagents	TYBSc 20	**Outcomes:** Validating the quality of the reagents prepared in the lab.
03	Enrichment and isolation of anaerobic organisms using GasPak system	TYBSc 20	**Outcomes:** Learn the use of GasPak and anaerobic jar and importance of cultivating anaerobic organisms
04	SRID	TYBSc 20	**Outcomes:** To conceptualize the basic technique in immunology
05	Ouchterlony double immunodiffusion	TYBSc 20	**Outcomes:** Learn the use of antigen antibody reaction
06	Bioautography of Vitamin B 12	TYBSc 20	**Outcomes:** To learn a basic screening technique
07	Synergistic activity of Antibiotics	TYBSc 20	**Outcomes:** Learn swabbing technique and how two drugs can sometimes be better than one

08	Biostatistics	TYBSc 20	**Outcomes:** Understand the basics of statistics and its role in biological science.

Year 2019-20

S.No.	Experiment	Beneficiaries	Description - Impact/Outcomes
01	Spirochaete staining	FYBSc 24	**Outcomes:** To study the importance of resident flora and learn a special staining technique based on coating of heavy metals
02	Minimal Growth Requirements of Bacteria	FYBSc 24	**Outcomes:** To understand the role of different media constituents and the nutritional requirement of the organisms
03	Preparation of stains	FYBSc 24	**Outcomes:** Basic understanding of preparing solutions and using weighing balance
04	Effect of different parameters on the Growth curve of *E.coli*	FYBSc 24	**Outcomes:** Learn the use of colorimeters and also understand the different factors which can affect the growth of organisms.
05	Effect of Desiccation on bacteria	FYBSc 24	**Outcomes:** To see the effect of drying on bacteria and understand the importance of moisture for bacterial growth
06	Study of oxygen requirements of bacteria	FYBSc 24	**Outcomes:** Gained insight into classification of organisms based on their oxygen requirement.
07	Production of Wine	FYBSc 24	**Outcomes:** To study the role of microorganisms in fermentation
08	Biocomposting of Kitchen waste	FYBSc 24	**Outcomes:** Waste segregation and management
01	Preparation of Solutions	SYBSc 22	**Outcomes:** Understand calibration of weighing balance and carry out preparation of stock solutions of various molarity, normality and ppm and do the dilutions of the same.
02	Cultivation of Sulphate Reducers	SYBSc	**Outcomes:** Understanding growth of Anaerobic microbes and the basic techniques

	Using Anaerobic Jar	22	required for their growth using the anaerobic jar and Gaspak system
03	Comparative Study Of Estimation Of Protein By Using Two Instruments	SYBSc 22	**Outcomes:** To learn the working of a Spectrophotometer and Colorimeter and applying statistics to understand the significant difference between the two methods
04	SDS PAGE For Proteins	SYBSc 22	**Outcomes:** Setting up PAGE to study separation and identification of the protein based on its molecular weight
05	Centrifugation-Ficoll Hypaque	SYBSc 22	**Outcomes:** Separation of blood components using a centrifuge, learn to operate high speed centrifuge machine
06	Auxanography	SYBSc 22	**Outcomes:** To learn a basic technique for screening of amino acid producing organisms using the chromatographic technique
07	Ditch Plate Method	SYBSc 22	**Outcomes:** Learning how to carry out antimicrobial susceptibility testing of an insoluble drug
01	Quality assurance of media and reagents	TYBSc 20	**Outcomes:** Validating the quality of the reagents prepared in the lab
02	Transformation of bacteria	TYBSc 20	**Outcomes:** Understanding how gene exchange in bacteria can transfer genetic traits such as antibiotic resistance
03	Conjugation	TYBSc 20	**Outcomes:** Understanding the need of cell-to-cell contact for gene exchange in bacteria
04	Study of Vibrio cholera	TYBSc 20	**Outcomes:** To learn the conventional as well as methods of diagnosis.
05	ELISA technique	TYBSc 20	**Outcomes:** To understand the principle of sandwich ELISA used in routine diagnostic labs.
06	Curing of plasmids	TYBSc 20	**Outcomes:** To study the role of plasmids in development of antibiotic resistance

07	Synergistic activity of antibiotics	TYBSc 20	**Outcomes:** To understand the need of combination therapy to reduce the individual concentration and development of resistance in organisms
08	Bioautography	TYBSc 20	**Outcomes:** To appreciate the role of microorganisms in screening techniques

Year 2020-21

Sr No	Experiment	Number of participant/ beneficiaries	Description Impact/Outcomes
01	Use of light microscope	FYBSc 37	**Outcomes:** Since this year there was a constraint with doing physical practicals, we shifted to use of Virtual labs. Practicals were done using resources from freely available virtual labs. To understand the role of different parts of microscope
02	Use of micropipettes	FYBSc 37	**Outcomes:** To learn how to use a micropipette virtual demonstration was carried out
03	Differential staining technique - Gram's Stain	FYBSc 37	**Outcomes:** Through virtual labs students learnt to perform gram staining techniques stepwise and also its importance in Microbiology
01	Problem Solving: Normality and Molarity. Revision on ppm, percentage and grams conversion.	SYBSc 20	**Outcomes:** To understand the concept of solution preparation of different concentrations
01	Bioinformatics	TYBSc 21	**Outcomes:** Students learnt the use of online tools available for analysis of nucleotide and protein sequences using NCBI, EBI, SWISS-PROT.

13. Details of books & journals subscribed from DBT grant:

Year 2018-19: Nil
Year 2019-20: Nil
Year 2020-21: Nil

14. Qualitative improvements due to DBT support: Please highlight (5 salient lines)

DEPARTMENT OF BOTANY

Year 2018-19

- Instruments have helped us conduct new experiments
- New techniques introduced

Year 2019-20

- Students have started remaining in an ever grasping and thinking mode
- Peer learning due to connectivity between the students' groups
- Increase in hands on practical experience due to equipment, chemicals and glassware
- Develop scientific temperament and Enriched their basic knowledge
- Start-up–SALRIN by TYBSc students where they use plant pigments for dyeing fabrics.
- Exposure to undergraduate students for presenting papers and posters at national/ international conferences.
- Exhibition on Japanese day celebration · The students presented their innovative beautiful creations of bonsai, hanging baskets, miniature landscapes, dish gardens and flower arrangements and decorations. There was an instant request from teachers and students from all faculties to hold courses to learn the same.

Year 2020-21

- Students have started remaining in an ever grasping and thinking mode
- Peer learning due to connectivity between the students groups
- Increase in hands on practical experience due to equipment, chemicals and glassware
- Develop scientific temperament and Enriched their basic knowledge
- Exposure to undergraduate students for presenting papers and posters at National/ International conferences.

DEPARTMENT OF CHEMISTRY

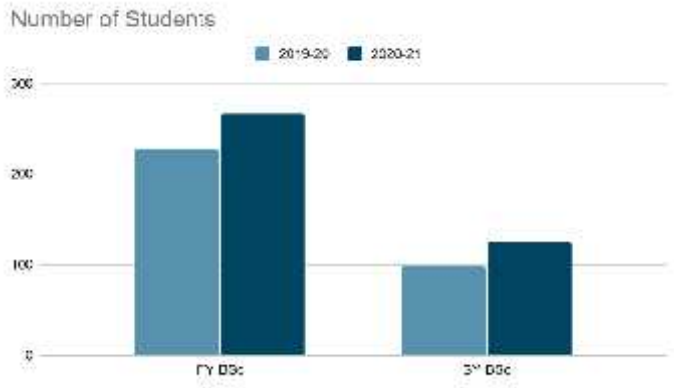
Year 2018-19

a) Student participation in projects: All the interested students could be given an opportunity to work on projects and present their findings in the college exhibition.
b) Lab visits: Visit to SAIF, IITB gave students an exposure to the sophisticated analytical techniques and how many of them are based on the fundamentals being studied by them through their undergraduate studies.
c) Concept building: The additional hours that students invest in the laboratory has proved useful in understanding concepts of their syllabi through experimentation and through discussion with peers and the mentor. This has led to an increase in interest among students for their theory coursework.
d) Designing Experiments: Many of the experiments introduced have estimation of commercial samples. The properties of the analyte are discussed with the students to be able to ascertain the most feasible route of its analysis.
e) Use of Computational tools: Students were also familiarized with computational tools that can be used for plotting graphs or to do calculations as well as electronic record keeping, all of which are extremely useful in today's time.

Year 2019-20

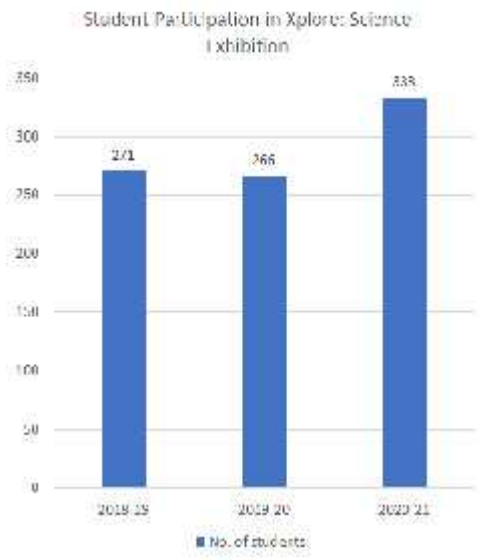
- Rise in the student attendance
- Statistics: 2019-20 Term 1 FY B.Sc. Attendance:
- Theory – 66.7%; Practical – 82.6% against a previous average Theory – 52.8%; Practical – 70.2%
- Rise in enrolments to the UG program. (Graph)
- About 40% of the T.Y students of 2018-19, enrolled for master's program in science in the year 2019-20.
- Increased participation in projects.

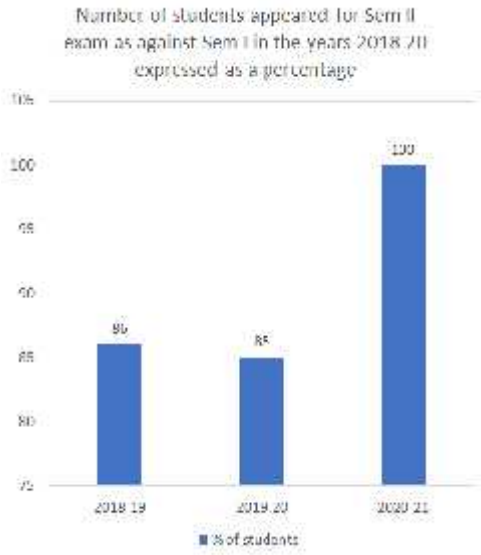
	F.Y. B.Sc.	S.Y. B.Sc.
2018-2019	187	97
2019-2020	228	98
2020-2021	266	125

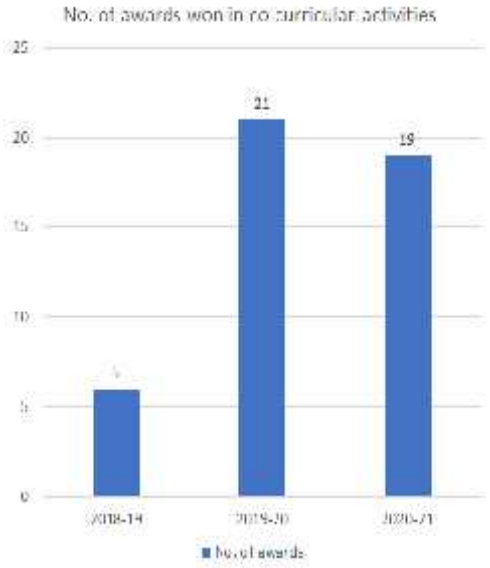


Year 2020-21

1. Student retention: The attrition rate among students in pure sciences to more lucrative professional courses has been a pressing problem. The support from DBT through the STAR scheme and the interest that could be generated among students through experiments and projects has helped us to retain students in the science programs. Interaction with alumni and industry experts in the lectures arranged by the department as well as the seminars and workshops have had a big role to play in assuring the students of the potential of the program.



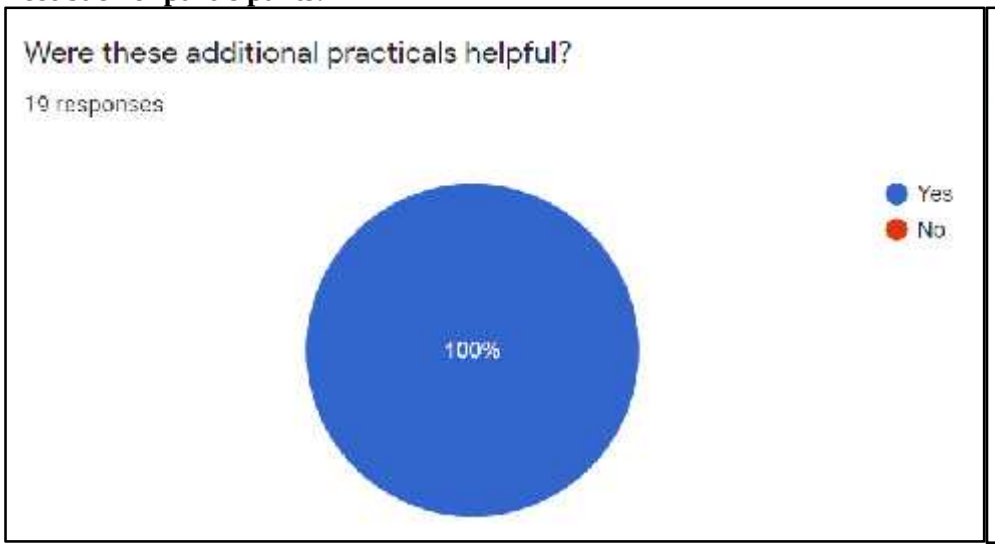


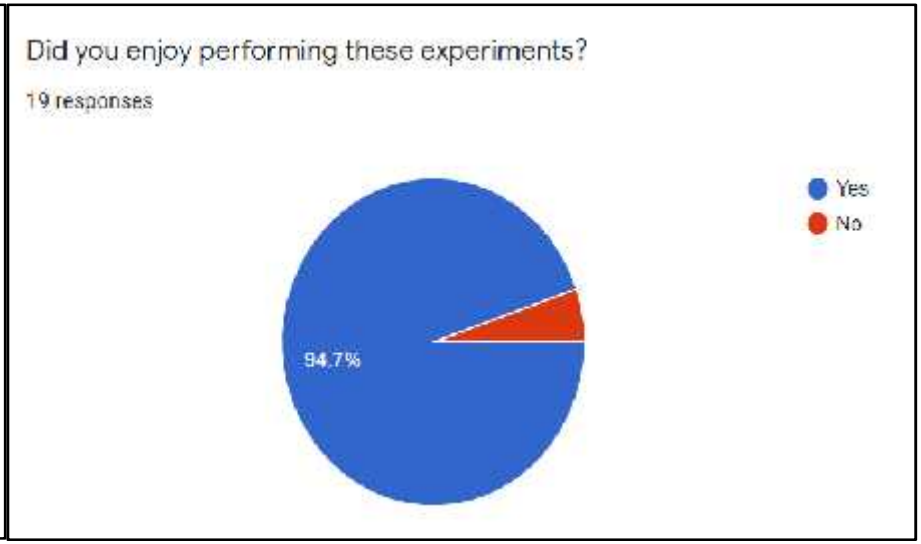


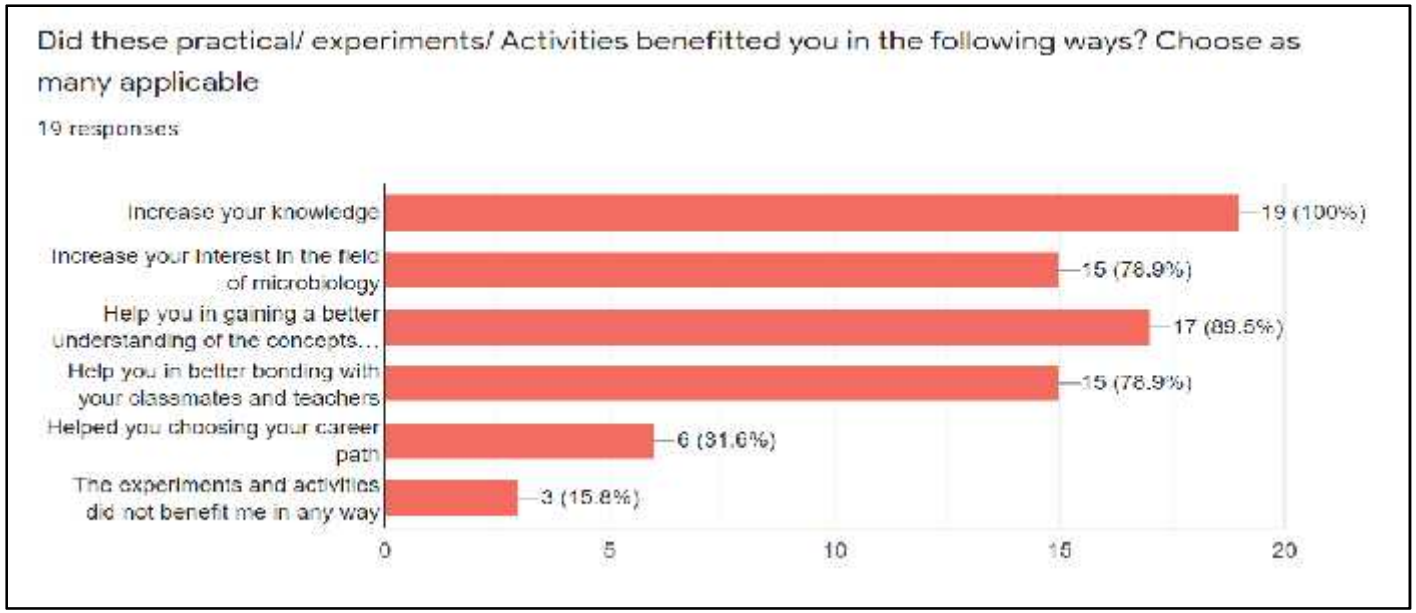
2. Increased engagement of students in practical/experimental sessions: We have found a consistent increase in student numbers for the practical sessions due to growing student interest & the hands-on experience on common laboratory instruments.
3. Higher student participation in review of literature, small projects, exhibitions and research scholar's meet conducted online: The number of student participants in college science exhibition Xplore has steadily increased. Learning through doing has been a big success with the students & has rekindled their excitement. It is also evident in the student participation for Chemistry festivals, aptitude tests & other co-curricular activities.
4. Eager to learn and deliberate in lectures and workshops: The nature of activities that have been possible due to STAR support has stirred the intellect of students where they participate in discussions & deliberations on scientific topics which is evidenced by the level of thorough research that they do for any project/activity that is given to them to do.

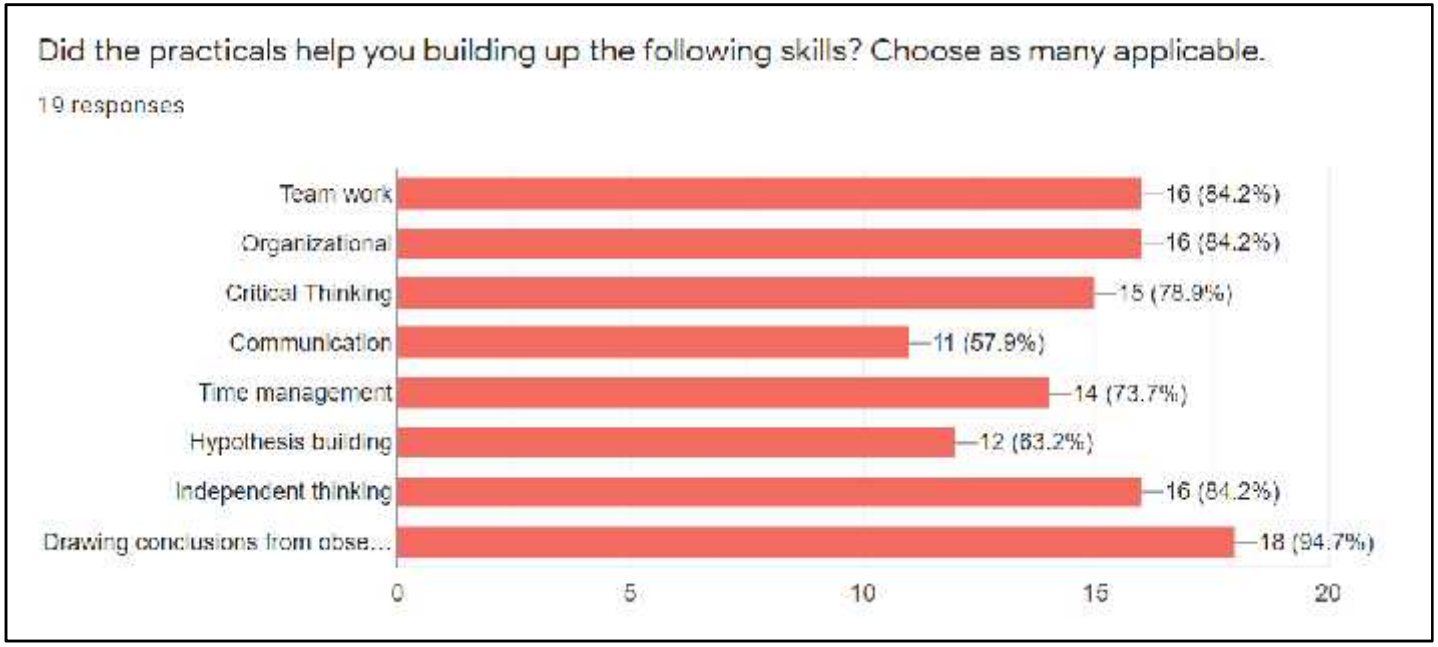
- The range of auto-pipettes funded by DBT- Star helped in inculcating good lab practices.
- With the increase in the number of instruments bought, the ratio of student to instrument greatly reduced to about 3:1.
- With the molecular biology experiment kits purchased, students could get hands on training in these otherwise difficult to perform experiments.
- Research culture has enhanced. The research exposure in the initial years encouraged the students to work in association with TIFR. 24 students from SY and TYBSc class are working on "Comprehensive assessment of literature on malnutrition in both pre-clinical and clinical models for hypothesis generation."
- It was possible to extend the activities to other college faculty and students. (Nirmala Niketan and Metagenomic Workshop)
- The students are encouraged to connect to society and use their skills in helping the society

Feedback of participants:






Did these practical/ experiments/ Activities benefitted you in the following ways? Choose as many applicable
19 responses
Increase your knowledge
19 (100%)
Increase your interest in the field of microbiology
15 (78.9%)
Help you in gaining a better understanding of the concepts...
17 (89.5%)
Help you in better bonding with your classmates and teachers
15 (78.9%)
Helped you choosing your career path
6 (31.6%)
The experiments and activities did not benefit me in any way
3 (15.8%)
0
5
10
15
20


Did the practicals help you building up the following skills? Choose as many applicable.
19 responses
Team work
16 (84.2%)
Organizational
16 (84.2%)
Critical Thinking
15 (78.9%)
Communication
11 (57.9%)
Time management
14 (73.7%)
Hypothesis building
12 (63.2%)
Independent thinking
16 (84.2%)
Drawing conclusions from obse...
18 (94.7%)
0
5
10
15
20

15. Problems faced, if any, in implantation of the programme and utilization of DBT grant (in two-three lines)

DEPARTMENT OF BOTANY

Year 2018-19: NIL

Year 2019-20: NIL

Year 2020-21: Could not acquire due to Pandemic

DEPARTMENT OF CHEMISTRY

Year 2018-19: Nil

Year 2019-20: Nil

Year 2020-21: Nil

DEPARTMENT OF MICROBIOLOGY

Year 2018-19: Nil

Year 2019-20: Nil

Year 2020-21: Nil

Photo Gallery

DEPARTMENT OF BOTANY

Indo Japanese Day

SOME OF THE EQUIPMENT'S PROCURED

WORKSHOPS AND SEMINARS ORGANISED 2018 - 19

Workshop on Fruit and vegetable carving

(50)

Workshop on making of bio jewelry from flowers and leaves

(35)

Workshop on making of jewelry from grains and cereals

(35)

WORKSHOPS AND SEMINARS ORGANISED 2019 - 20

Hands on training for permanent slide preparation

(30)

Dish Garden and Miniature landscape making

(20)

Short term skill development course in perfumery

(25)

Projects – executed by students

Short term skill development course in perfumery

DEPARTMENT OF CHEMISTRY

Dr. Prabodh Chobe, Former Sr. GM & Head R&D, BASF

Dr. Deepa Khushalani, TIFR Mumbai

Mr. Meghani, Freelance entrepreneur

Dr. Rajesh Vatsa, BARC Mumbai

Dr. Sandip Trivedi, Director TIFR Mumbai

Workshop on "Practicing Science: Scope, Perspectives & Vision" on 26th& 27th April 2019

Dr. Rajesh Vagdama, ICT Mumbai

Dr. Avinash Kale, DAE-CEBS, Mumbai

Demonstration of Differential Scanning Calorimetry (DSC) by Mr. Gokul Ganesan

Demonstrative Workshops on HPLC- Introduction, Instrumentation & Applications by on 18th September 2019 &DSC- Principle and applications on 11th February 2020

Visit to Directorate of Forensic Sciences on 22nd January 2020

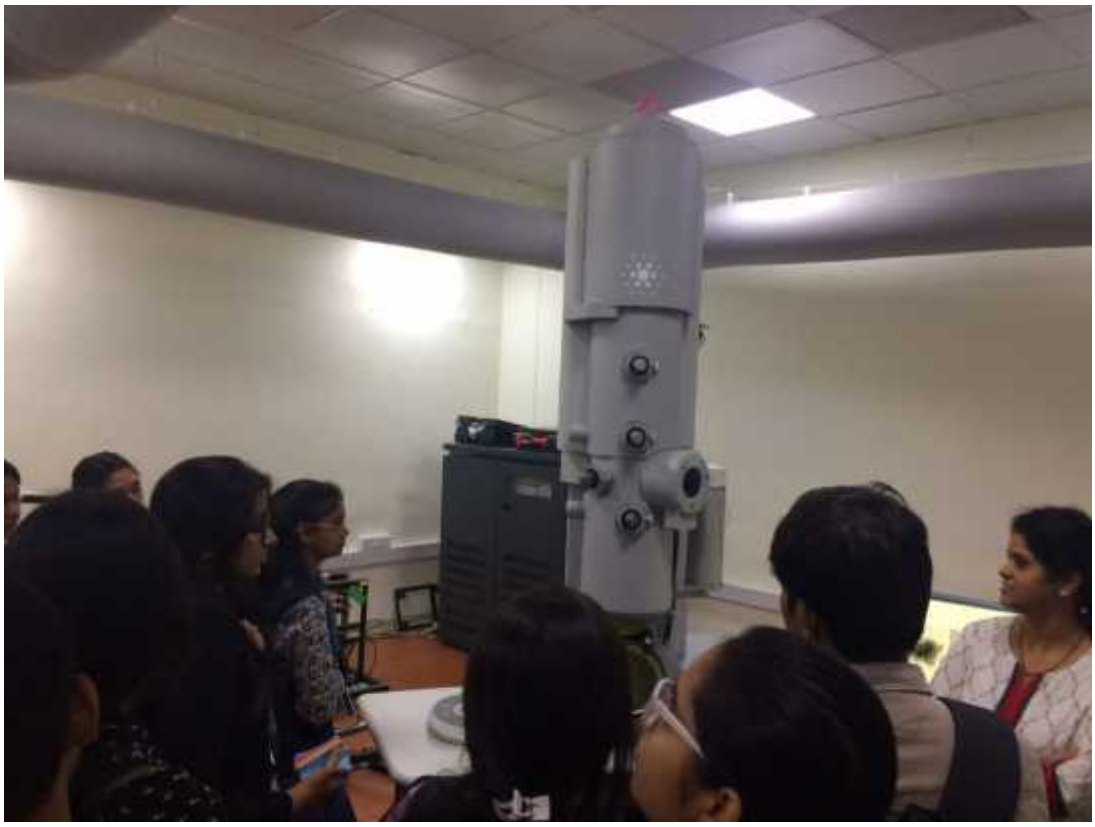
Dr. M.C. Rath, BARC Mumbai **Dr. Adish Tyagi, BARC Mumbai**

Dr. Pravin Walke, National Center for Nanosciences & Nanotechnology, University of Mumbai

Ms. Varsha Vhadge, Sr Research Associate, Ambernath Organics demonstrating alloying process

Student activities & Session by Ms. Neha Shinde, PMATI Mumbai

Dr. Vijay Gupta, Vice-president Advion Sweden & Mr. Karthik Bhatt, Inkarp India invited for a talk on "GenNEXT Mass Spectrometers" on 23rd January 2019



Visit to SAIF (Sophisticated Analytical Instrumentation Facility), IIT Bombay on 5th December 2018 & 12th February 2019



Visit to Indian Rubber Manufacturers Research Association (IRMRA) on 13th January 2020


Visit to (a) Anchrom Pvt. Ltd for demonstration of HPTLC on 21st September 2019


Visit to ICT Mumbai for demonstration of GC-MS on 29th September 2019

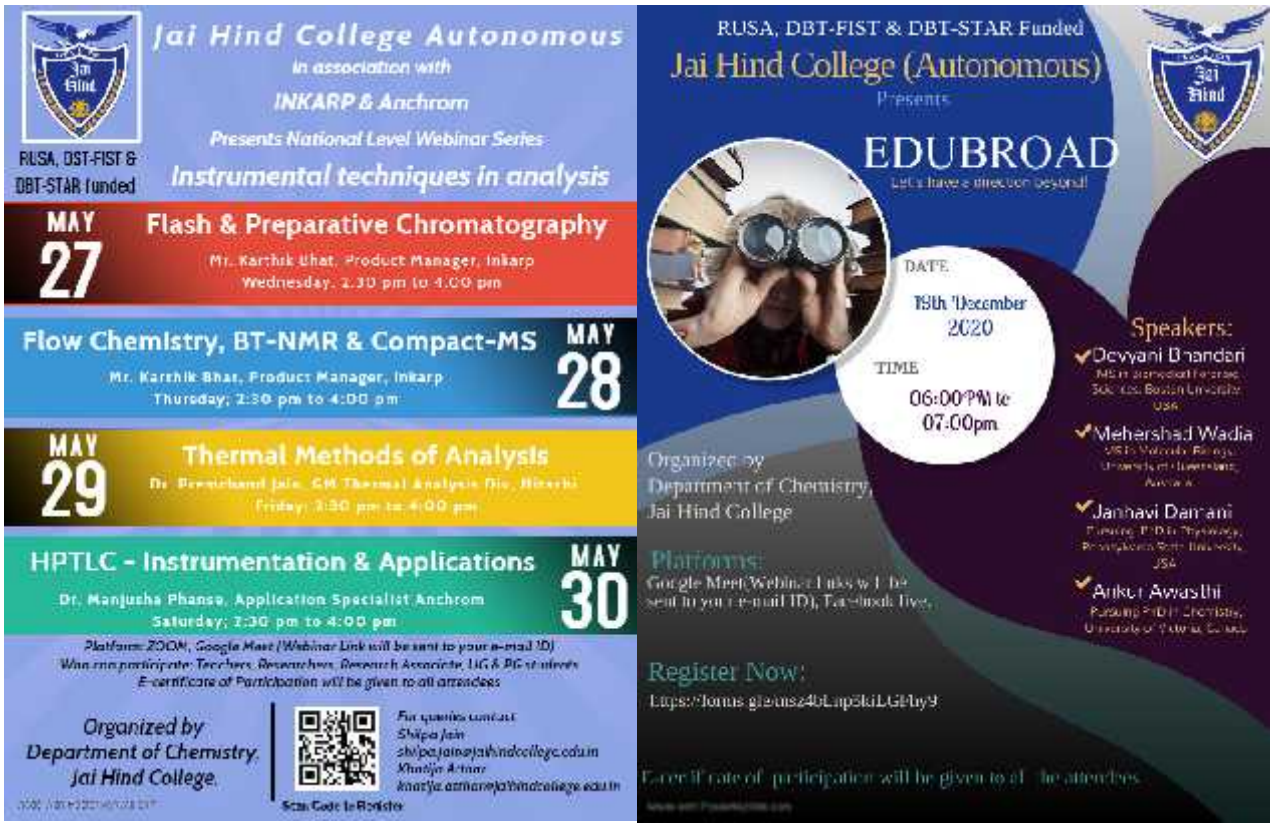

Training of students in use of common laboratory instruments


Batchwise training of students on virtual laboratory experiments in college computer laboratory

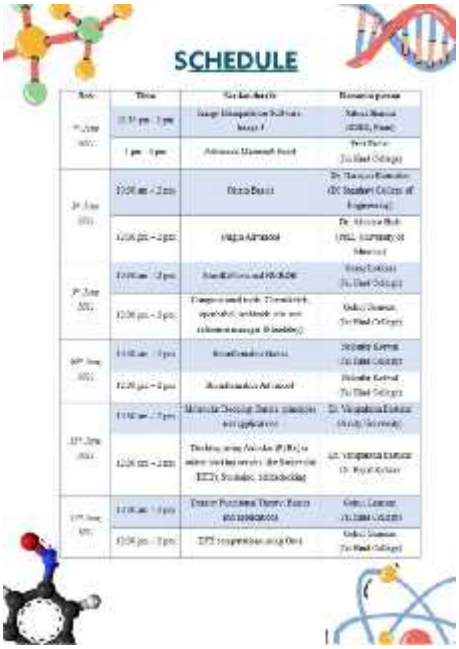

Training of non-teaching lab staff in maintenance & calibration of lab instruments

Some representative instruments procured by Dept. of Chemistry from STAR grant

Mask dyeing activity with TY B.Sc. students using natural dyes available



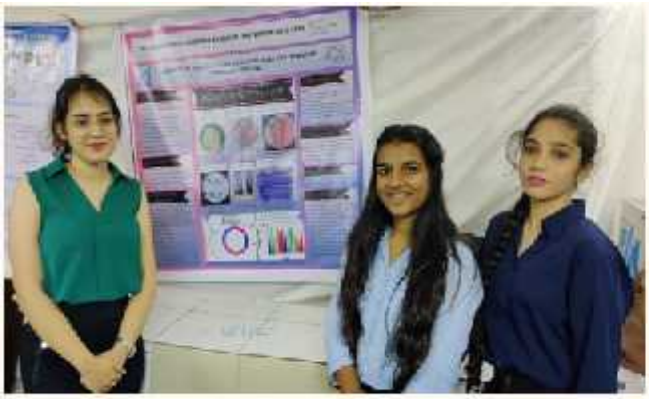
National Webinar Series on "Instrumental Techniques in Analysis" & a session with alumni of Jai Hind College on Education abroad



Activities of Department of Chemistry in year 2020-21

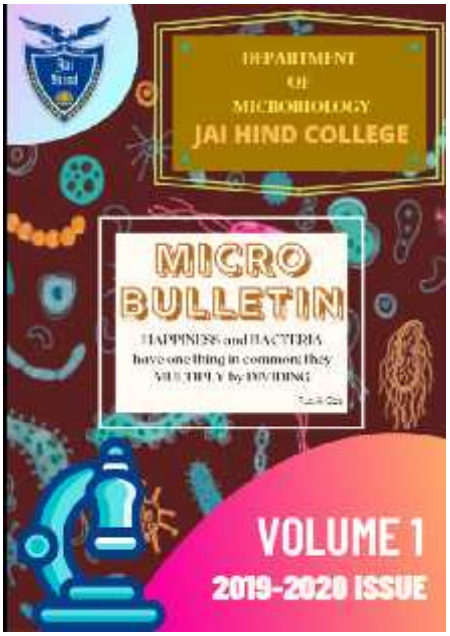
DEPARTMENT OF MICROBIOLOGY

Visits 2018-2019



Aavishkar 2019 2020

MicrOlympiad Winners (2018-2021)



Industrial Visits

Institutional Visits

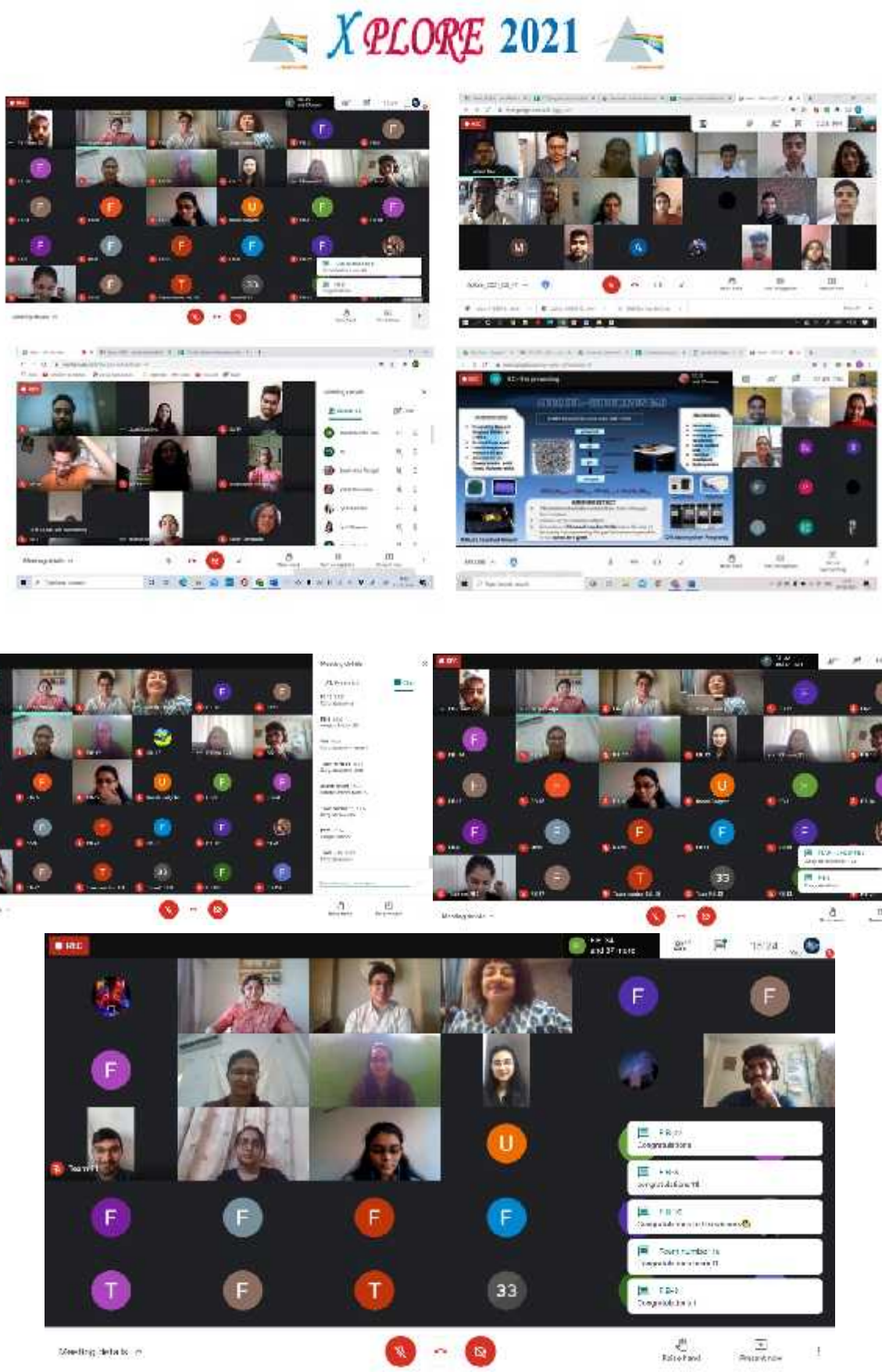
Guest Lectures: 2019-2020

SY students with students at Abinav Vidya Mandir

Outreach activities of the Department of Microbiology

XPLORE: JAI HIND SCIENCE

Xplore Jai Hind Science Exhibition 2019 & 2020



Xplore Jai Hind Science Exhibition 2021