

College Profile

The inception of college dates back to 1948 & is one of the oldest & premiere multi-faculty colleges in the city of Mumbai.

The college is a recipient of the Best College Award from the University of Mumbai, DST-FIST, DBT-STAR & RUSA funding for autonomous colleges.

The Science Departments of Jai Hind College are popular centers for education in pure & applied sciences, the strength of which has been pursuit of excellence in teaching and research. The institution strives to inculcate scientific temper amongst its students.

B.Sc. Students' Projects

Dept. under STAR Scheme	Botany	Chemistry	Microbiology
Number of Projects	9	18	7

Students' Achievements

- "A natural antioxidant alternative from *Ficus sps* for synthetic dyes" won (a) **First prize** in international conference at Patkar College.; (b) **Second prize** at Avishkar.
- "Cosmeceuticals preparation of Beet peel" won **Third prize** at international conference at Patkar College.
- "Incorporation of silver nanoparticles with antimicrobial essential oil extracted from *Ocimum sps* in a moisturizer" won **consolation prize** in international conference at Patkar College.
- "Chemical composition and antimicrobial activity of essential oil from *Callistemon sp.*" won **Second prize** at Xplore-2019.
- "Determination of sodium content in potato chips" won (a) **Third prize** at UG research meet Jigyasa at K.C. College & (b) **Second prize** at Xplore 2019.
- "Synthesis of biodiesel from used cooking oil" won **First prize** at Xplore 2019.

Interdisciplinary Projects

Title	Departments	Work
A natural antioxidant alternative from <i>Ficus sps</i> for synthetic dyes	Botany	Identification of plant sp, collection & extraction
	Chemistry	Spectrophotometric analysis of extracts
Incorporation of silver nanoparticles with antimicrobial essential oil extracted from <i>Ocimum sps</i> in a moisturizer	Botany	Extraction of essential oil
	Microbiology	Antimicrobial testing
Synthesis of potential drug scaffolds based on triazoles	Chemistry	Synthesis, purification & characterization
	Microbiology	Antimicrobial testing
Preparation of soap enriched with essential oils	Botany	Extraction of essential oils for enrichment
	Chemistry	Soap preparation by saponification of oils

Environmental & Societal Projects

Title	Departments	Work
Biocomposting	Microbiology	Microbial composting
	Chemistry	Chemical Analysis of compost
Microbiological and Chemical analysis of water from neighboring societies (Periodically)	Microbiology	Microbial parameters for quality of water
	Chemistry	Physicochemical parameters

Awareness Programmes

- **Ambassadors for promoting science among school children:** T.Y. & S.Y. B.Sc. Students of Dept. of Microbiology visited Girton School & Abhinav Vidya Mandir to popularize science among school children by exposing them to wonders of microbiology.
- **Annual science exhibition on National Science Day- Xplore 2018-19:** Students presented posters, models and live experiments to junior college students and school children.
- **Selfie with plants:** A social media awareness drive initiated by Botany department with respect to conservation.

Faculty skill development

- PFMS Workshop for office & teaching staff.
- Training on HPTLC instrument at Anchrom Enterprises.
- Training in Pharmaceutical management at ICT Matunga under PMMMMTT scheme.
- Training of Jai Hind faculty on ICT in Education: MOOC's, Google classroom
- Training on HPLC instrument at LCGC.
- Training on measurement of physicochemical parameters of water.
- Integrating applied bioinformatics in undergraduate life science education.
- Cellular and molecular biology- from gene cloning to protein expression and localization at UM-DAE CBS
- Research methodology and research data analysis organized by University of Mumbai
- Training workshop on innovative experiments in biological sciences for college teachers organized at HBCSE, TIFR Mumbai
- Extraction and isolation of phytoconstituents at ICT, Mumbai

Visits to research Institutes

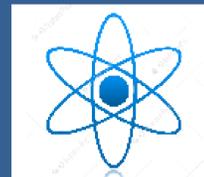
- Two visits to SAIF- Sophisticated Analytical Instrumentation Facility, IIT Bombay on 5th December & 7th February attended by 100 students accompanied by 8 faculty members.
- Visit to Go Green nursery Panvel on 1st August 2018 wherein 43 students were accompanied by 2 staff members.
- Visit to Soonabai Pirojsha Godrej Marine Ecology Centre on 25th February 2019 which was attended by 64 students and 3 faculty members.
- In addition to the above, students were taken to short visits for experiential learning to Sanjay Gandhi National Park, Kamla Nehru Park & Hanging garden among others.
- Morarka Foundation, Saras Dairy & Elcon Drugs & formulations from 20th to 24th January 2019 for a visit attended by 28 students.
- Visit to Water treatment plant at Bhandup on 31st October 2018 attended by 22 students.
- Students also visited the microbiology department at Breach Candy Hospital & TIFR.

Invited Talks

- Role of HPTLC in herbal science by Prof. Sunita Shailajan.
- GenNext Mass Spectrometers by Dr. Vijay Gupta, VP Advion.
- Entrepreneurship in chemistry by alumnus Dr. Faisal Ansari.
- Cheminfo: an informative session.
- Advanced technology in composting by Dr. Darshana Salaskar, Scientific officer BARC.
- Public health and epidemiology by Dr. Vinita Sangtani.

DBT Star Funding Salient Features

- Enhanced the experiential learning of students through various activities.
- Skill enhancement initiatives by teachers.
- Increase in undergraduate research activities.
- Fruitful teaching-learning environment.
- Provided an impetus to the growth of the science departments.



EXPERIMENTS INTRODUCED

Botany Department:

- To study activity of enzyme nitrate reductase from plant tissue.
- Stomatal mounting from Bignonia and Dracaena
- Estimation and comparison of protein content from different pulses
- Estimation of vitamin C from different fruits (seasonal variation)
- Preparation of permanent slides for maize stem (double staining)
- Effect of 2,4-D on in-vitro pollen germination.
- Ecological adaptations for xerophytes
- Beer Lambert's law and estimation of λ_{max} for various fruit and vegetable extracts.
- Study of growth curve of E.coli to be studied at varying temperature conditions.

Chemistry Department:

- Gravimetric estimation of Nickel (II) as Ni-dmg and calculation of % error.
- Vacuum distillation of high boiling organic liquids and low boiling solids.
- Study of enthalpy of dissolution of potassium nitrate.
- Simultaneous determination of Fe (II) & Cr (III) by potentiometric titration.
- Determination of percentage composition of strong & weak acid in a mixture by conductometric titration.
- Estimation of barium from the given sample conductrometrically by precipitation titration with sulfuric acid.
- Estimation of aspirin in drug samples.
- Estimation of physico-chemical parameters of water samples: TSS, TDS, TS by water analyzer.

Microbiology Department:

- Use & handling of auto pipettes.
- Western Blot technique.
- Preparation of stains.
- Effect of antiseptics on organisms on skin
- MIC of crystal violet.
- Minimal growth requirements of bacteria
- Effect of desiccation on bacteria.
- Effect of various growth parameters (pH, minimal media, temperature, & age of culture) on generation time of bacteria.
- Isolation of sulphur reducing bacteria from soil
- Enrichment and isolation of anaerobic organisms using GasPak system.
- Ouchterlony double immunodiffusion.
- Bioautography of Vitamin B₁₂.
- Synergistic activity of Antibiotics.
- Biostatistics.



BOTANY

- **Research aptitude:** Students have been trained in extraction of industrially important phytochemicals.
- **Awareness drive:** Selfie with plants drive was initiated by the department of Botany to emphasize on protection and conservation of plants through social media & to create awareness of the role of mangroves and its conservation. Trained students on use of Garmin's GPS instrument to map the vegetation of specific areas.
- **Entrepreneurship:** Students have been exposed to opportunities in the field of Horticulture like vegetable carving, biojewellery, floral arrangements & nursery management.

CHEMISTRY

- **Chemoinformatics:** The department has taken several initiatives like Virtual lab, representing chemical structures on software, use of excel for the treatment of experimental data etc and the use of computers to solve chemical problems.
- **Good Laboratory Skills:** Introduction to GLP to students in terms of energy efficient designs, techniques & green practices: vacuum filtration, vacuum distillation, calibration and its application, safety in laboratory.
- **Entrepreneurship:** Students have been exposed to opportunities in the field of marketing science & successful alumni have been invited to motivate and give a sense of direction to the students to become entrepreneurs in their field.

MICROBIOLOGY

- **Biocomposting:** The department is committed to continue its efforts towards **environment protection** through biocomposting in multiple dimensions- involving awareness among people, sustaining a biocomposting site and also application of the compost to improve quality of soil.
- **Awareness Programs:** Students of the department are involved as **ambassadors of science** by taking some time from their schedule to spread awareness among school children. We have received a positive feedback from the beneficiaries.
- **Water quality:** Students of the dept. are also involved with sampling water from co-operative societies to check for microbial and physico-chemical parameters. A social responsibility initiative by the dept.

OUTCOMES OF STAR-DBT SUPPORT

- Higher instrument to student ratio ensured performance of more number of experiments beyond curriculum.
- Equipment with varying degree of automation has (a) helped increase the accuracy of results & (b) increased students' exposure, skills & employability.
- Good laboratory practices like (a) use of pipette pumps and autopipettes (b) use of bottle top dispensers ; (c) use of melting point apparatus vacuum filtration, vacuum distillation.
- Better understanding of science subjects which helped the departments to fill the lacunae in their respective syllabi.
- Research aptitude was developed as a result of all departmental activities.

FUTURE DIRECTIONS

- Develop better scientific skills
- Develop challenging experiments
- Promote entrepreneurship
- Spread awareness about science and its applications across the faculties.
- Interpretation using data analytical tools.
- Awareness programs among society addressing problems.