



University of Mumbai



**BHAVANS COLLEGE, ANDHERI  
MUMBAI (AUTONOMOUS)**

**BHARATIYA VIDYA BHAVAN'S**

M. M. College Of Arts, N. M. Institute Of Science,  
H. R. J. College Of Commerce

**Bhavan's College**

**(AUTONOMOUS 2020-30)**

Munshi Nagar, Andheri (W), Mumbai - 400058

**DEPARTMENT OF BIOTECHNOLOGY, GOVERNMENT OF INDIA**

**DBT STAR COLLEGE SCHEME**

(Reference- Your Letter No- HRD-11011/2/2022-HRD-DBT dated 11/02/2022)

**Submission of Progress Report**

**For**

**THE PERIOD- 11/02/2022 TO 31/3/2023 (1<sup>st</sup> Year)**

**PARTICIPATING DEPARTMENTS**

**BOTANY**

**CHEMISTRY**

**MICROBIOLOGY**

**PHYSICS**

**STATISTICS**

<p><b>Prof (Dr) Shruti L. Samant</b> <b>Co-ordinator,</b> <b>DBT-STAR COLLEGE SCHEME</b></p>	<p><b>Prof (Dr) Z.P. Bhathena</b> <b>Principal,</b> <b>Bhavan's College, Andheri</b></p>
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1. **Name of the College:** M.M. College of Arts, N.M. Institute of Science, H.R.J. College of Commerce (Bhavan's College-Autonomous), Andheri-Mumbai

2. **Name of Coordinator, Designation:** Prof (Dr) Shruti L. Samant (Retd), C/20 Mrugendra CHS, Borivali, Mumbai 400092. Contact Number- [022 2625 6452](tel:02226256452)

S.N.	Name of Departments supported	Name of Departmental Coordinator	Designation	Address, phone nos.
1.	Botany	Prof (Dr) Nitin Labhane	Professor & Dean (R&D)	Department of Botany, Bhavan's College, Andheri-West, Mumbai-58 <a href="mailto:nitin.labhane@Bhavan's.ac.in">nitin.labhane@Bhavan's.ac.in</a> (Contact Number- <a href="tel:02226256452">022 2625 6452</a> )
2	Chemistry	Dr Ajay Patil	Head & Associate Professor	Department of Chemistry, Bhavan's College, Andheri-West, Mumbai-58 <a href="mailto:ajay.patil@Bhavan's.ac.in">ajay.patil@Bhavan's.ac.in</a> (Contact Number- <a href="tel:02226256452">022 2625 6452</a> )
3	Microbiology	Prof (Dr) Shruti L. Samant (Retd)	Professor	Department of Microbiology, Bhavan's College, Andheri-West, Mumbai-58 <a href="mailto:shrusam16@gmail.com">shrusam16@gmail.com</a> (Contact Number- <a href="tel:02226256452">022 2625 6452</a> )
4	Physics	Rajesh Mudaliar	Assistant Professor	Department of Physics, Bhavan's College, Andheri-West, Mumbai-58 <a href="mailto:rajesh.mudaliar@Bhavan's.ac.in">rajesh.mudaliar@Bhavan's.ac.in</a> (Contact Number- <a href="tel:02226256452">022 2625 6452</a> )
5	Statistics	Mr. P. G. Patki	Head & Associate Professor	Department of Statistics, Bhavan's College, Andheri-West, Mumbai-58 <a href="mailto:prasad.patki@Bhavan's.ac.in">prasad.patki@Bhavan's.ac.in</a> (Contact Number- <a href="tel:02226256452">022 2625 6452</a> )

3. **Assessment duration:** 11/02/2022 to 31/03/2023

**Duration in years:** 01

4. **Details of Departments Supported-**

Sr. No	Name of Department	Courses (B.Sc./M.Sc./PG Diploma, certificate etc) offered	Regular Faculty members	
			With Ph.D.	Without Ph.D.
1	Botany	B.Sc., M. Sc, Ph.D	02 Dr Nitin Labhane Dr Asmita Mestry	02 Mr. Vishal R. Kamble Mr. Dinesh G. Agre
2	Chemistry	B.Sc., M. Sc, Ph.D	08 Dr. A D Patil Dr. M P Trivedi Dr. U M Yadav Dr. S T Tajane Dr. P U Singare Dr. A N Patange Dr. A Kochrekar Dr. P A Lokhande	03 Mr. R Bharsat Mrs Kundan Mewada Mr. Ravi Mishra
3	Microbiology	B.Sc., M. Sc, Ph.D	03 Dr Z.P. Bhathena	None

			Dr. R. C.Patil Dr. S.V.Raut	
4	Physics	B.Sc., M. Sc.	02 Dr Kushal Mude Dr Raunak Atram	04 Mr. Ashok Koli Mr. Ashok Pawar Mr. Varsha Patil Mr. Rajesh Mudaliar
5	Statistics	B.Sc., B.Com, Basic & Advanced Ms-Excel (one-credit value added certificate course) for under graduate students of Statistics and Psychology	01 Dr. Ujjvala Phatak	02 Mr. Prasad Patki Mr. Rakhi Kamble

5. **Number & Date of Advisory committee meeting:** One meeting held on 10/3/2023 (Each Department has conducted meetings with respect to the proper implementation of the DBT-STAR scheme prior and after the receipt and application for the grants).

6. **Qualitative improvements due to DBT support. Please highlight 5 salient points (within 500 words).**

- i. The DBT-Star grant allowed the beneficiary departments to purchase basic to advanced instruments. As a result, the students could handle and perform experiments individually. This overwhelming experience motivated the faculty and stirred the students to perform better and boosted their confidence.
- ii. The students while executing research projects understood the importance of planning, preparation, literature survey, noting of results & discussing them when the results were otherwise too. Example- Students from Botany department published 1 research paper and 13 papers were presented in national and international conferences/ seminars (Annexure-II).
- iii. The Department of Physics purchased 19 ExpEyes devices which are used along with the 26 Raspberry Pi systems as a data acquisition and capturing device to conduct experiments. This eliminated the need of using Power Supply, CRO and Signal generator for most experiments. These systems can be used as a computer when practicals are not been conducted. As a result, students who did not have access to computers can use them in college during non-practical work time.
- iv. Interdisciplinary efforts made the students learn from each other, broaden their horizons of understanding leading to achieving the objectives of DBT-Star scheme.
- v. The internship program in Collaboration with IWSA gave students exposure to various scientist with National & Global recognition. Some of the interns were invited to help in social programs which offered stipends. Outreach program for schools (secondary school children) on Bhavan's Campus made efforts on campaigning the importance and future of pure science as career options.
- vi. Writing picture-based books for secondary school children was another innovative & creative venture tapping different potentials of the students. The internship programs were learning

experiences to gauge prospects, need for skill acquisition, networking and self-inclination to national & global opportunities.

- vii. Conduction of “**One-credit value-added certificate course**” in Basic & Advanced Excel by the statistics department with the help of 18 advanced computer system purchased under DBT. Statistics and psychology department students are highly benefitted.

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

- a. Since the **RaspberryPi single board computers come with an academic license of Mathematica, the Department of Physics has nearly 25 licensed devices with Mathematica.** The Department plans to introduce a course on computation using Mathematica in the coming Academic Year for Faculty and students as an add on course with extra credits.
- b. **A Beowulf Cluster for computation is also planned and currently the Department has built a 24-core cluster (as on 2 May 2023) with SSH, Python, Mathematica, Fortran, C and C++ libraries for parallel Computing.** It has plans to expand the cluster up to 100 cores and utilize the same for Astrophysics/ Nuclear and other theoretical Computational Physics problems if necessary.
- c. **Most experiments which require signal generators, CRO’s, Power supplies etc.** are now replaced with the newly Developed ExpEyes kits along with the Raspberry Pi in the laboratory. **The Department of Physics is the only Department which has such a laboratory in Mumbai and nearby Colleges**
- d. With **Internship at the Enviro Policy Research India Pvt. Ltd., students of Botany understood how EIA reports** are prepared and how Botanical knowledge is useful in the management of various developmental projects supported in Mumbai Metropolitan region.
- e. Stat-O-Verse on Applications of Statistics in real life draws the student’s attention to prospects of the subject.
- f. Involving students for small research projects and encouraging them for participation and presentation for intercollegiate, national, and international conference/ seminar etc. The result was publication of one paper and 13 paper presentations in national and international seminars and conferences by the students.
- g. Students went on internship programs with Indian Women Scientist Association (IWSA), where they were groomed by scientist of repute (many being retired BARC Scientist) in the conceptualisation and implementation of research project.

8. **Lessons learnt/ difficulties faced/ suggestions if any in implementation of the program and you utilization of DBT grant Max 3 points within 300 words.**

- i. Due to ongoing Russia- Ukraine war, the shipment of Raspberry Pi devices was delayed and hence almost all systems for conducting practicals were built in the Second half of the year 2022. A course on Computational Physics was to be introduced in the curriculum at the TYBSc level but the BOS believed that with NEP implementation around the corner it would not be advisable to change the TYBSc syllabus just for a couple of years. The receipt of grant post COVID had apprehension in the students while participating in co-curricular activities.
- ii. The grant capping of below one Lakh made it difficult or impossible to purchase high end instruments. So, purchase of Thermal cyclers, Gel documentation units, high end UV-Vis Spectrophotometer etc was not possible. Purchase of these instruments would be appreciated as science is progressing speedily both Nationally & Globally.
- iii. Grant should also include a component for infrastructure & IT. The PFMS portal supports transparency in payments however, the portal comes with many glitches

9. **Key performance indicators**

1. **No. of students admitted**

Indicator	Pre-support		During /After Support		Remarks
	TOTAL		TOTAL		
Botany	FY-	104	FY-	27 (Major) + 30 (Minor)	Due to NEP structure of FYBSc, the students strength changed
	SY-	20	SY-	40	Increased due to DBT-STAR
	TY-	22	TY	13	Marginally reduced since less students were there in SY BSc.
Chemistry	FY	227	FY	59 (Major)+ 50 (Minor)	Due to NEP structure of FYBSc, the students strength changed
	SY	123	SY	98	Marginal Change
	TY	57	TY	59	
Microbiology	FY	44	FY	40 (Major) + 40 (Minor)	Due to NEP structure of FYBSc Number changed
	SY	40	SY	34	
	TY	34	TY	36	Marginal Change
Physics	FY	201	FY	46 (Major) + 31(Minor)	Due to NEP structure of FYBSc number changed
	SY	83	SY	53	
	TY	21	TY	22	Marginal Change
Statistics	FY	37	FY	19(Major) + 15 (Minor)	Due to NEP structure of FYBSc number changed
	SY	38	SY	30	Marginal Change
	TY	36	TY	23	Marginal Change

2. **No. of students passing out (%) Students Admitted/passing out (pass %)**

Indicator	Pre-support		During /After Support		Remarks
<b>No. of students passing out(%) students admitted/ passing out (pass%)</b>	<b>TOTAL</b>		<b>TOTAL</b>		
Botany	FY-	40%	FY-	60%	<b>The students are showing incremental progression as they move from lower to higher semester. The same trend is continued even after DBT-STAR scheme. Only difference the DBT-STAR scheme made is that students had chance to do several experiments individually.</b>
	SY-	60%	SY-	90%	
	TY-	90%	TY-	95-100%	
Chemistry	FY	40%	FY	60%	
	SY	90%	SY	90%	
	TY	95-100%	TY	95-100%	
Microbiology	FY	40%	FY	60%	
	SY	90%	SY	90%	
	TY	95-100%	TY	95-100%	
Physics	FY	40%	FY	60%	
	SY	90%	SY	90%	
	TY	97.73%	TY	97.76%	
Statistics	FY	40%	FY	60%	
	SY	90%	SY	90%	
	TY	95-100%	TY	96%	

### 3. Drop-out Rate-

Indicator	Pre-support	During /After Support	Remarks
<b>Drop-out rate</b>	<b>TOTAL</b>	<b>TOTAL</b>	
Botany	Nil	NIL	
Chemistry	Nil	NIL	
Microbiology	Nil	NIL	
Physics	2.27	2.5	
Statistics	Nil	NIL	

### 4. No. of students opting for MSc- (The number indicates the students admitted for MSc from TYBSC class of our college)

Indicator	Pre-support	During /After Support	Remarks
<b>No. of students opting for MSc</b>	<b>TOTAL</b>	<b>TOTAL</b>	
Botany	4	8	<b>Almost doubled</b>
Chemistry	8	8	<b>Constant</b>
Microbiology	15 (11+4)	20 (11+9)	<b>Significant increase</b>
Physics	9	13	<b>Significant increase</b>
Statistics	21	12	<b>Marginal decrease</b>

**5. Average Marks- (TYBSC Final semester is only considered)**

Indicator	Pre-support	During /After Support	Remarks
Average marks	<b>TOTAL</b>	<b>TOTAL</b>	
Botany	72%	77.03%	<b>Marginal Increase</b>
Chemistry	63%	64%	<b>Marginal Increase</b>
Microbiology	82%	84%	<b>Marginal Increase</b>
Physics	79%	74.36%	<b>Covid and Post covid</b>
Statistics	84%	86%	<b>Marginal Increase</b>

**6. Number of hands on experiments conducted-**

Indicator	Pre-support	During /After Support	Remarks
<b>Number of hands- on experiments conducted</b>	<b>TOTAL</b>	<b>TOTAL</b>	
Botany	<b>NIL</b>	<ul style="list-style-type: none"> <li>• Summer training Internship at EPRI to understand how to prepare EIA reports and use Botanical knowledge. (May-June 2023)</li> <li>• Botanical Visit to Keshav Srishti SYBSc &amp; FYBSc to study various aspects like Field identification of plants, Vegetable Garden, Fruit garden, Gobar Gas, Handmade Paper making, etc. (28/1/23)</li> <li>• The internship commenced under the guidance of IWSA (Indian Women Scientist Association) members. (May-June 2022)</li> </ul>	<ul style="list-style-type: none"> <li>• Total-9 students (6 SY and 3 TY BSC)</li> <li>• Total-90 students of FY and SY class</li> <li>• Six (6)- 5 students SYBSC and 1 FY BSc.</li> </ul>
Chemistry	<b>NIL</b>	<ul style="list-style-type: none"> <li>• Proving Beer Lamberts Law with a prepared solution of Methylene blue using colorimeter.</li> <li>• Estimation of Ascorbic Acid content in Vitamin-C tablets of different pharmaceutical brands.</li> <li>• Estimation of Vitamin C from lemon juice, orange juice and sweet lemon pH metrically.</li> <li>• Determination of standard potential of Cu and Ag electrode potentiometrically.</li> <li>• Determination of relative strength of weak Acid conductometrically.</li> <li>• To study consequence of antacids and acidic components on a standard HCl solution.</li> <li>• Industrial visit to Tarapur Boisar Industrial estate in March 2023.</li> </ul>	TY- 15 Students TY- 15 Students TY- 10 Students TY- 10 Students TY- 10 Students SY- 35 Students Benefited. SY-50 & TY-50 students
Microbiology	<b>NIL</b>	<ul style="list-style-type: none"> <li>• Microbiological analysis of the street foods commonly sold in the open aired markets in the Andheri neighborhood of Mumbai city.</li> </ul>	<b>TY-33</b>  <b>SY-20</b>

		<ul style="list-style-type: none"> <li>Isolation &amp; study of soil microflora from areas, and identification of potent organisms for soil fertility.</li> <li>Phytochemical screening for antimicrobial property of Zingiber officinale [ Ginger] and Allium sativum [ Garlic] raw and processed samples Mother's recipe.</li> <li>Project on Mushroom cultivation in collaboration with Indian women scientist association</li> <li>Project on Litter leaf decomposition in collaboration with Indian women scientist association</li> <li>Students outreach program in collaboration with schools and Indian women scientist association</li> <li>Industrial visit to Garwardhan cheese Factory, Pune TYBSc students internship in Arti Pharma lab</li> <li>TYBSc students internship in University of Mumbai Marine Microbiology</li> </ul>	<p><b>SY-20</b></p> <p><b>Sy &amp; TY- 13</b></p> <p><b>Sy &amp; TY- 13</b></p> <p><b>Sy &amp; TY- 13</b></p> <p><b>SY-23 &amp; TY-24 students participated.</b></p> <p><b>26-30<sup>th</sup> Dec 2022.</b></p>
Physics	<p><b>6</b></p> <ol style="list-style-type: none"> <li>Determination of Cauchy's constant</li> <li>Determination of R.I. of liquid by laser</li> <li><math>\mu</math> by total internal reflection</li> <li>Double refraction</li> <li>Solar cell characteristics</li> <li>Study of JFET characteristics</li> </ol>	<p><b>9</b></p> <ol style="list-style-type: none"> <li>Counters mod 2, 5 and 10</li> <li>Transistorised astable multivibrator</li> <li>Transistorised monistable multivibrator</li> <li>Transistorised bistable multivibrator</li> <li>Passive high/low pass filters using Expeyes</li> <li>Study of 8085 kits and commands</li> <li>8 -bit addition, subtraction, multiplication</li> <li>Two digit Decimal addition, subtraction.</li> <li>Basic circuit design by using Tina or circuit makers software.</li> </ol>	SY & TY students benefited
Statistics	<b>NIL</b>	<ul style="list-style-type: none"> <li>Project on PGD in Data Science and Artificial Intelligence</li> <li>Industrial visit on 2-4th Feb.2023 Agricultural University, Dapoli, to understand the use of ANOVA and Designs Of Experiment in agricultural field.</li> </ul>	<p>SY BSc (12 students) &amp; TY BSc (29 students)</p> <p>TY BSc (28 students) attended</p>

#### 7. No. of new experiments introduced-

Indicator	Pre-support	During /After Support	Remarks
<b>No. of new Experiments introduced</b>	<b>TOTAL</b>	<b>TOTAL</b>	<b>16 New Experiments done by all departments.</b>
Botany	<b>Since under University system, the</b>	<ul style="list-style-type: none"> <li>The separation of seed Protein using vertical gel electrophoresis (PAGE).</li> <li>The separation of DNA using Agarose horizontal gel electrophoresis (AGE).</li> <li>Preparation of Stock solutions</li> <li>Preparation of MS medium.</li> </ul>	<b>6 EXPT- Botany Students from FY-82, SY- 20, TY-22 performed these experiments/ workshop and got benefitted.</b>



	<b>experiments prescribed by the board of studies of different subjects were only conducted.</b>	<ul style="list-style-type: none"> <li>• Seed sterilization</li> <li>• Different types of Microscopy</li> </ul>	
Chemistry		<ul style="list-style-type: none"> <li>• Analysis of Talcum powder for estimation of Magnesium content by titrimetric method.</li> <li>• Analysis of Vitamin-C in Ascorbic acid tablet by pH metric method.</li> <li>• Analysis of acetic acid in Vinegar sample by potentiometric method.</li> <li>• Analysis of chromium content in the industrial samples by colorimetric method.</li> </ul>	<b>4 EXPT- 54 students of TY Chemistry</b> got benefitted.
Microbiology		<ul style="list-style-type: none"> <li>• Isolation of genomic DNA , Plasmid</li> <li>• DNA Electrophoresis</li> <li>• Spectrophotometric detection</li> </ul>	<b>3 EXPT- SY &amp; TY Microbiology 40 &amp; 33 students</b> were benefitted.
Physics		<ul style="list-style-type: none"> <li>• Counters, mod 2 , mod 5 and mod 10 in 2x5 and 5x2 configuration</li> <li>• Passive high / low pass filter using Expeyes</li> </ul>	<b>2 EXPT-</b> conducted by <b>Physics department for TYBSc (20 students) &amp; SYBSc (70 students)</b>
Statistics		<ul style="list-style-type: none"> <li>• Correlation and Regression Using Excel.</li> <li>• Curve Fitting and Time Series using Excel</li> <li>• Practical using spreadsheets on <ul style="list-style-type: none"> <li>○ Graphical and diagrammatic representation</li> <li>(iii) Measures of central Tendency</li> <li>(iii) Measures of Dispersion.</li> </ul> </li> <li>• Use of R-Software in ANOVA and DOE.</li> <li>• Use of R-Software in Decision Theory and Game Theory</li> </ul>	<b>5 EXPT-</b> conducted by <b>Statistics department</b> benefitting <b>77 students of FY and 38 students of SYBSc class.</b>
	2- PYTHON & MS-Excel courses were conducted by Finstat Inst.		

#### 8. Publications (scopus indexed) /patents, if any.

Indicator	Pre-support	During /After Support	Remarks
<b>No. of new Experiments introduced</b>	<b>TOTAL</b>	<b>TOTAL</b>	
Botany	1-2	Jha Apurva, Gupta G, Raut S, Meshram P, <b>Labhane Nitin.</b> (2022) Green computing approach in ICT components. <i>Vidyabharati International Interdisciplinary Research Journal.</i> Pp. 564-569.	<b>DBT-STAR outcome</b>
Chemistry	Nil	Nil	<b>Covid effect</b>
Microbiology	Nil	Nil	<b>Covid effect</b>
Physics	Nil	Nil	<b>Covid effect</b>
Statistics	Nil	Nil	<b>Covid effect</b>

#### 9. Training received by faculty-

Indicator	Pre-support	During /After Support	Remarks

Training received by faculty			
Botany	NIL	<p>1. Dinesh Agre received training in Plant Tissue Culture training at Department of Botany, Shivaji University, Kolhapur (Self Funded).</p> <p>2. Sharayu Raje and Taufiq Shaikh- Hands on training on Electrophoresis conducted at Department of Botany, Bhavan's College, Andheri. Mustafa Motiwala, <b>Proprietor, Tech Resource &amp; Director of Natural Dyes Pvt. Ltd</b> was the resource person. (21/01/2023)</p> <p>3. Dr. Nitin Labhane successfully completed <b>International Fellowship granted by Tempus Public Foundation Hungary</b> for a period of above one month. He received training on various aspects of Draught and salt resistant mutants of <i>Arabidopsis</i> along with hands on training on Laser Scanning Electron Microscopy. (6<sup>th</sup> Oct- 3<sup>rd</sup> Nov 2022).</p>	<p><b>Some of the Activities done under DBT-STAR</b></p> <p><b>International fellowship</b></p>
Chemistry	NIL	Mr. Rahul Bharsat undergone the FIP conducted by the UGC, HRDC, Gujarat University.	-
Microbiology	NIL	None	-
Physics	NIL	Faculty members : Prof. Ashok Pawar and Prof. Ashok Koli attended the for star gazing and Astrophotography.	<b>Activity done under DBT-STAR</b>
Statistics	NIL	None	-

#### 10. Exhibitions/seminars/training courses conducted-

Indicator	Pre-support	During /After Support	Remarks
<b>Exhibition/ seminar/ Training course conducted</b>			
Botany	NIL	<p>I.16/2/2023-17/2/2023- Two day Inter-collegiate Botany Fest was organized by the Bhavan's Botanical Society (BBS) under the rubric of "<b>PhoolAura</b>". The fest included the events like Flower Rangoli, Salad making, Phyto-treasure hunt, Photography competition etc.</p> <p>II.21/01/2023.-Hands on training on Electrophoresis conducted at Department of Botany, Bhavan's College, Andheri.</p> <p>III.23/01/2023.-Hands on Training on different types of Microscopies.</p>	<ul style="list-style-type: none"> <li>● Intercollegiate Fest from different UG and PG programs. Around 100 students participated.</li> <li>● 44 students of SY, TY and Msc benefitted.</li> <li>● 82 students of FY &amp; SY benefited.</li> </ul>

Chemistry	NIL	Workshop in “Dyeing of fabrics”, 10 <sup>th</sup> Feb. 2023	TY-54 students attended
Microbiology	NIL	I. Protein Structure Bioinformatics- Organized by Codon Biosciences Goa, recognized by DSIR, Govt of India on 17/02/23 II. Open day Introduction of Microbiology 20 <sup>th</sup> January 2023- Models & poster making & presentation on Viruses	TY & MSc  Students of Junior college & schools
Physics	NIL	I. ExpEyes workshop for TYBSc & SYBSc- taught to use the ExpEyes kit for a number of experiments like emf induced in pipe, low/high pass filter, diode rectifier etc., data acquisition, plotting in Open Source Libre Office software was explained and taught. (24-11-22, 26-11-22, 1 <sup>st</sup> , 2 <sup>nd</sup> , 5 <sup>th</sup> , 6 <sup>th</sup> , 8 <sup>th</sup> , 9 <sup>th</sup> Dec 22. II. A one night tour for star gazing and Astrophotography on 25-02-2023, students were taught how to use the telescope, Newtonian refractors and Reflectors, Dobsonians and basics of astrophotography	TYBSc & SYBSc
Statistics	NIL	Stat-O-Verse on Applications of Statistics in real life	FY-5, SY-25 & TY-24 students participated

#### 11. Books/journals subscribed from grants-

Indicator/ Departments	Pre-support	During /After Support	Remarks
<b>Books/ Journals Subscribed from grants</b>			
Botany	Grants from MU for backward class and privileged students	No provision in grant in DBT-STAR college scheme	<b>External advisor shared their views that there is no provision to buy books under the scheme</b>
Chemistry			
Microbiology			
Physics			
Statistics			

#### 12. Outreach activities (Popular lectures)-

Indicator	Pre-support	During /After Support	Remarks
<b>Outreach activities (Popular Lectures)</b>			

Botany	NIL	<b>Prof (Dr) Nitin Dongarwar</b> , Prof & Head, Dept of Botany, RTM Nagpur University, gave Lecture on <b>“Orchid Conservation” on 24/12/23</b>	His lecture is very famous for HRDC, RTMNU Nagpur
Chemistry	NIL	NIL	
Microbiology	NIL	Under outreach program, the students have gone to Rajhans Vidhyalaya to educate students about importance of Science.	20-25 students from Rajhans Vidhyalaya attended the session.
Physics	NIL	NIL	
Statistics	NIL	<b>One-credit value-added certificate course”</b> in Basic & Advanced Excel by the statistics department with the help of 18 advanced computer system purchased under DBT. <u>Statistics and Psychology</u> department students are highly benefitted.	

**13. Colleges mentored to apply for DBT Star College grants- Wilson College, Girgaon, Mumbai**

**14. Invited Lectures-**

Indicator	Pre-support	During /After Support	Remarks
<b>Invited Lectures</b>	Seldom held		Due to DBT-STAR it was conducted judiciously.
Botany	Seldom held	<ul style="list-style-type: none"> <li>• <b>Avenue in Abroad (06/08/2022)- By Jagruti Penkar (University of Berlin)</b></li> <li>• <b>Cracking of Competitive Exams in Biological Sciences (05/12/2022)- by Lalji Kannoujiya, IFAS, Pune</b></li> <li>• <b>Avenues in Indian Premier Institute for Research (03/01/2023)- Yadvendradatta Yadav (PhD student at ISER, Bhopal)</b></li> <li>• <b>Electrophoresis (21/01/2023)- by Mustafa Motiwala, Proprietor, Tech Resource &amp; Director of Natural Dyes Pvt. Ltd</b></li> <li>• <b>Microscopy (23/01/2023)- by Dr Nitin Shelke, IY College, Jogeshwari.</b></li> </ul>	<b>Due to DBT-STAR it was conducted judiciously.</b>
Chemistry	Seldom held	<ul style="list-style-type: none"> <li>• <b>Career in Chemistry by Dr. Bhushan Popatkar, Mumbai University</b></li> <li>• <b>Overview of industry aspects by Mr. Kishor Nivalkar (Manager, CO)</b></li> <li>• <b>Career opportunities in foreign country- Ms. Uma Iyer (Teacher in Florida, US)</b></li> </ul>	<b>Due to DBT-STAR it was conducted judiciously.</b>
Microbiology	Seldom held	<ul style="list-style-type: none"> <li>• <b>Guest lecture on IPR in education on 20<sup>th</sup> August 2022- Mr. Pratik Hendre (Examiner of Patents)</b></li> <li>• <b>Digital Data storage in DNA22<sup>nd</sup> August 2022- by Dr. Ubaid Qaayoom (Scientist, CIFE)</b></li> </ul>	<b>Due to DBT-STAR it was conducted judiciously.</b>

		<ul style="list-style-type: none"> <li>• Graphology- 14<sup>th</sup> January 2023- Mr. Prajesh Trotsky</li> <li>• Guiding students regarding MBA in health care- <b>Dr. Rohan (Welingkar Education)</b></li> </ul>	
Physics	Seldom held	<ul style="list-style-type: none"> <li>• A lecture on “<b>Remote Sensing and its applications in the agriculture industry</b>” was conducted on 30-09-2022 by Dr. Suraj Yadav, IIT-BHU alumni and currently post-doctoral research fellow at <b>Mississippi State University</b>.</li> </ul>	<b>Due to DBT-STAR it was conducted judiciously.</b>
Statistics	Seldom held	<ul style="list-style-type: none"> <li>• Beginner’s guide on <b>how to Excel in Interview-</b> by Ms <b>Ruheen Qureshi</b></li> <li>• <b>Career Prospects in Data Science-</b> by Ms <b>Priyanka Sakhardande (IRACLE)</b></li> <li>• Introduction to <b>Data Science &amp; its Applications in the BFSI Domain</b> with a case study- by <b>Gaurav Chettiyar (Transunion CIBIL)</b></li> </ul>	<b>Due to DBT-STAR it was conducted judiciously.</b>

#### 10. Self-evaluation-

Department	*Objective (as stated in proposal)	% Achieved	Reasons for underachievement / If achieved, state in quantitative metrics
Botany	Hands on training in scientific techniques Enhance skill sets, know contemporary research, address societal disparity through scientific development, develop creativity after acquiring skills in S&T	60-70% (7marks)	Covid after effects. Being first year after covid, it became difficult to realise the all objectivs.
Chemistry	Upgradation of lab infrastructure & equipment, sensitise students on safety procedures, SOP writing, create e-content learning module, undertake interdisciplinary projects	60-70% (7marks)	Covid after effects, students less confident
Microbiology	Hands -on training through lab bench work, indulge students in short research projects and summer training, use e-platform learning and educational software, Visits to industry	60-70% (8marks)	Covid effects were inherent problems
Physics	Initiate course on Computational physics using Mahematica, Initiate course on experimental physics using ExpEyes, course on Electronic Circuit Simulation using the latest software, Develop PCB designs	95-98% (8marks)	Parents are reluctant to send their wards for Astrophotography workshops conducted in remote areas with clear skies.
Statistics	Develop better theoretical & analytical skills so students are better able to pursue Masters’ program, procure additional computers & software for adequate hands-on experience, design experiments for understanding statistics, create discussions regarding predictions on existing data using statistical models.	80- 90% (8marks)	Covid after effects

**11. Two (2) new dimensions that shall be added (within 200 words).**

- \* Interdisciplinary ventures between Physical and Biological science departments, also between Arts subjects and Statistics, will surely add more value to the collaborative research. This will also appreciate the desired focus and achievement by the New Education policy to be implemented from 2023-24. Students can do summer internships in these departments as also take up small research projects.
- \* The Physics department of the College will uniformly institute the mode of using the **RaspberryPi single board computers with an academic license of Mathematica** for the benefit of student community who wishes to use computational applications.

<p><b>Prof (Dr) Shruti L. Samant</b> <b>Co-ordinator,</b> <b>DBT-STAR COLLEGE SCHEME</b></p>	<p><b>Prof (Dr) Z.P. Bhatena</b> <b>Principal,</b> <b>Bhavan's College, Andheri</b></p>
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## **DBT Star College Scheme**

### **Advisory Committee Meeting With the External Experts**

#### **Minutes of the Advisory committee meeting of DBT Star College Scheme conducted on 10/3/2023**

A meeting of the DBT Star College Committee members with the Advisory Committee members (External experts) was conducted on 10/03/2023, before the start of the program.

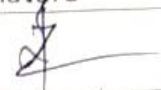
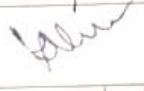



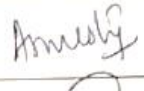
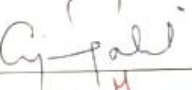

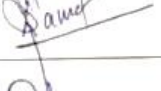

Principal, Prof (Dr) Zarine Bhathena welcomed the Advisory committee members, Prof (Dr) Sunita Chahar from Ratman College and Dr Kiran Kolwankar, Vice Principal, Ramniranjan Jhunjhunwala College, Ghatkopar.

- The external advisors had emphasized the need to document all the activities and beforehand had told the coordinator to prepare the power point presentation by each beneficiary departments of Bhavan's college.
- To judiciously utilize the funds giving examples of their own experiences.
- To conduct all the extra practicals, project work as mentioned in the proposal.
- To lay more focus on interdisciplinary activities.
- Some staff members had queries related to the amount to be utilized by the different departments for activities such as field trips.
- Utilization of grants for the purchase of books was one of the queries by the beneficiary department. The external advisors said that there are no such provisions and since they brought books in their colleges under the scheme, they were questioned by the DBT advisor.

The meeting ended with vote of thanks by the DBT Star College Scheme Co-ordinator Prof (Dr) Shruti Samant.

### Signature Sheet

Meeting of the Star DBT Committee held on Friday, 3.00p.m. in the Board Room,  
Bhavan's College, Andheri(W)

S.N.	Name of the member	Signature
1.	Prin.Dr.Z.P.Bhathena	
2.	Dr. Kiran Kolwankar, R J College, Ghulokapur	
3.	Prof (Dr) Sumita Chakar, Ralman College, Bhandup.	
4.	Prof (Dr) Shruti Samant, DBT coordinator Bhavan's College.	
5.	Prof (Dr) Nitin Labhane, Botany coordinator Bhavan's College.	
6.	Dr. Asmita Mesly, HOD Botany	
7.	Dr. Ajay <del>Kumbhar</del> <sup>Patil</sup> , HOD Chemistry	
8.	Mr. Rajesh Mudaliar, Physics Coordinator	
9.	Dr Shreshth L. Samant	
10.	Dr. Ujala Phathak	
12.		
13.		
14.		



**BOTANY DEPARTMENT- NON-RECURRING EXPENDITURE**

	<b>Equipment Name</b>	Sanction Amount	Qnt	Actual Cost	Order date	Date of receiving order	Date of Payment-PFMS
1	Wensar UV-Visible Spectrophotometer single beam	94577	1	92354	23.03.22	29/03/22	PFMS Payment date 27/04/2022 of Rs- 4,99,403/- to Medi Equip for vou no-1012
2	Micro Compound Microscope	905423	1	7646	23.03.22	29/03/22	
3	Remi Magnetic Stirrer Hot Plate With Digital Speed		6	47538	23.03.22	23/03/22	
4	Water Distillation Apparatus		2	3912	23.03.22	23/03/22	
5	Kjeldahl's Distillation Apparatus & Soxhlet Extraction Apparatus		1	40957	23.03.22	23/03/22	
6	Essential Oil Clevenger		2	7593	23.03.22	23/03/22	
7	Slotted Angle Rack		2	100000	22.03.22	23/03/22	
8	KG5Micron Compound Microscope		13	99403	22.03.22	23/03/22	
9	Borosil Essential Oil Determination Apparatus		2	17096	23.03.22	23/03/22	
10	Electric Distillation Assemblies With Auto Cutoff Double Stage 5ltr		1	37206	23.03.22	23/03/22	
11	Micron Compound Microscope		3	22849	23.03.22	23/03/22	
12	Biotechnic Water Still (Manesty Type )		1	22849	23.03.22	23/03/22	
13	Vertical Electrophoresis Single Sided Systems		17	100000	21.03.22	29/03/22	PFMS Payment date 29/06/2022 of Rs- 1,00,000/- to Tech Resource for vou no-1006
14	Uv-Opaque Tray Apparatus With Male Connectors	19	100000	21.3.22	29/03/22	PFMS Payment date 06/05/2022 of Rs- 2,00,000/- to Tech Resource for vou no-1005	
15	Electra volt 2.0 Power Supply Rane 80v,110v,140v,200v Single Output	18	100000	21.03.22	28/03/22		
16	Harvesto Digital Soil Testing Min Lab	2	187520	21.03.22	21/03/22	PFMS Payment date 11/04/2022 of Rs- 2,00,000/- to WS Telematics for vou no-001	
17	Extra Reagents Kit + courier	1	12480	21.03.22	21/03/22		
				<b>999403</b>			

**CHEMISTRY DEPARTMENT- NON-RECURRING EXPENDITURE**

	Equipment Name	Sanction Amount	Qnt	Actual Cost	Order date	Date of receiving order	Date of Payment- PFMS
1	Contech Electronic Balance	10,00,000	8	200000	14.03.22	28/03/22	PFMS Payment date 01/04/2022 of Rs- 2,00,000/- to Contech Inst. for vou no-1016, 1017
2	Conductivity Meter		10	103840	14.03.22	23/03/22	PFMS Payment date 01/04/2022 of Rs- 4,09,420/- to Universal Entp. for vou no-1028
3	Centrifuge Machine REMI C304		10	123900	14.03.22	23/03/22	
4	Distillation Water Plant Unit Cap 10 Ltr		4	82600	14.03.22	23/03/22	
5	Digital Ph Meter		10	99080	14.03.22	23/03/22	PFMS Payment date 01/04/2022 of Rs- 3,90,580/- to Universal Entp. for vou no-1031
6	Suction Vacuum Pump		8	138768	14.03.22	23/03/22	
7	Potentiometer (Labtronics Make)		11	109032	14.03.22	13/04/22	
8	Centrifuge Machine (Remi MakeC 852)		10	67260	14.03.22	23/3/22	
9	Digital Colorimeter (Labtronics)		10	75520	14.03.22	13/04/22	
	<b>Total</b>			<b>1000000</b>			

**MICROBIOLOGY DEPARTMENT- NON-RECURRING EXPENDITURE**

	Equipment Name	Sanction Amount	Qnt	Actual Cost	Order date	Date of receiving order	Date of Payment- PFMS
1	Horizontal Gel Apparatus Ready To Use System With UV Transparent Tray With Gel Gripping Design	1000000	10	79237	5.3.22	19/03/22	PFMS Payment date 01/04/2022 of Rs- 3,27,400/- to Technocraft for vou no-1001
02	Ready To Use System Vertical Electrophoresis Single Sided System		10	84252	5.3.22	19/03/22	
03	UV-T 8 UV Transilluminator With Diffusing UV Transparent Window		1	49648	5.3.22	19/03/22	
04	Power Supply 80v, 110v,140v,200v Single Output		10	58174	5.3.22	19/03/22	
05	DC Power Supply Model Electra-Supreme -100		1	26580	5.3.22	19/03/22	
06	Gel Casting Set (Tray )		10	29509	5.3.22	19/03/22	
07	Vertical Autoclave		1	59000	5.3.22	19/03/22	
08	Multipurpose Platform Shaker		1	70800	5.3.22	19/03/22	PFMS

09	Universal Platform With Adjustable Bars		3	23010	5.3.22	19/03/22	Payment date 01/04/2022 of Rs- 6,72,600/- to Technocraft for vou no-1002
10	Multipurpose Platform Shaker		1	70800	5.3.22	19/03/22	
11	Micro Centrifuge		2	35400	5.3.22	19/03/22	
12	Gel Rocker 3d Shaker		2	106200	5.3.22	19/03/22	
13	Tube Roller		1	38940	5.3.22	19/03/22	
14	Tube Roller Platform		2	14160	5.3.22	19/03/22	
15	Centrifuge Model Ifuge 400		2	148680	5.3.22	19/03/22	
16	Fixed Angle Rotor For Model Ifuge L400p		2	20060	5.3.22	19/03/22	
17	Micropipette Variable Range 5-50ul		9	26550	5.3.22	19/03/22	
18	Micropipette Variable Range 20-200ul		10	29500	5.3.22	19/03/22	
19	Micropipette Variable Range 100-1000ul		10	29500	5.3.22	19/03/22	
	<b>Total</b>			<b>1000000</b>			

**PHYSICS DEPARTMENT- NON-RECURRING EXPENDITURE**

	Equipment Name	Sanction Amount	Qnt	Actual Cost	Order date	Date of receiving order	Date of Payment-PFMS	
01	Telescope 100cm Focus	1000000	10	23600	19.03.22	11/04/22	PFMS Payment date 11/04/2022 of Rs- 2,96,770/- to Ajanta Inst for vou no-1001	
02	Spectrometer 7 Superior		5	61950	19.03.22	11/04/22		
03	Hall Effect Kit		2	64900	19.03.22	11/04/22		
04	Digital Storage Oscilloscope		3	92040	19.03.22	11/04/22		
05	Microcontroller Kit Anshuman		4	54280	19.03.22	11/04/22		
06	Raspberry Pi4 Model B 4gb Starter Kit		13	91572	21.03.22	27/04/22	PFMS Payment date 27/04/2022 of Rs- 1,85,750/- to Ajanta Inst for vou no-1038	
07	Raspberry Pi4 Model B 4gb Starter Kit		12	84528	21.03.22	27/04/22		
08	Raspberry Pi4 Model B 8gb Starter Kit		1	9650	21.03.22	27/04/22		
09	DC Voltmeter Digital In Stand			10	7080	23.03.22	27/04/22	PFMS Payment date 27/04/2022 of Rs- 77,573/- to Arbon Export for vou no-1035
10	Galvanometer In Stand			3	13452	23.03.22	27/04/22	
11	Tunning Fork St Of 8			9	2761	23.03.22	27/04/22	
12	Sv Lamp 35w + Box Chowk Sodium			3	24780	23.03.22	27/04/22	

13	Power Supply Misc		10	29500	23.03.22	27/04/22	
14	Seet Lab 3 Latest Version Expeyes 17		19	77900	24.03.22	27/04/22	PFMS Payment date 27/04/2022 of Rs- 77,900/- to S2S2 for vou no-1040
15	8085 Microprocessor Kit		10	50050	29.03.22	27/04/22	PFMS Payment date 27/04/2022 of Rs- 50,050/- to Salicon Nano for vou no-1036
16	Ac Voltmeter 20 Volts Digital		10	11800	19.03.22	06/05/22	PFMS Payment date 06/05/2022 of Rs- 2,50,219/- to Ajanta Inst for vou no-1034
17	Pic Burner Pic Kit 3		3	4956	19.03.22	06/05/22	
18	Arduino Uno		6	3894	19.03.22	06/05/22	
19	Hall Effect Kit		2	64900	19.03.22	06/05/22	
20	Digital Thermometer		9	4779	19.03.22	06/05/22	
21	Digital Storage Oscilloscope		3	92040	19.03.22	06/05/22	
22	Microcontroller Kit Anshuman		5	67850	19.03.22	06/05/22	
23	Logic analyser hosted universal dev system and accessories		04	61737	26.09.22	09.02.23	
	<b>Total</b>			<b>999999</b>			

**STATISTICS DEPARTMENT- NON-RECURRING EXPENDITURE**

	<b>Equipment Name</b>	Sanction Amount	Qnt	Actual Cost	Order date	Date of receiving order	Date of Payment-PFMS
1	Intel Core I5 11 <sup>th</sup> Generation Processor & 18.5" + LED Monitor	10,00,000	18	864468	18.3.22	29/03/2022	PFMS Payment date 01/04/2022 of Rs- 9,66,420/- to Solnet Syst. for vou no-001
2	Ms Office Ltsc Standard 2021 Educational Paper License		18	101952	18.3.22	29/03/2022	
3	HP laser jet and inktank printers with cartridges		10	26200	18.3.22	18/03/2022	
	<b>Total</b>			<b>992620</b>			

**ANNEXURE-2 LIST OF PAPERS PRESENTED BY THE STUDENTS & STAFF**

SR. NO	LIST OF AUTHORS	NAME OF THE CONFERENCE	CLASS OF PRESENTING AUTHOR	TOPIC	TYPE
1	Apurva Jha, Taufiq Shaikh	Recent Advances In Chemical And Biological Sciences	TYBSC	The Ethnobotanical Knowledge Of The Warli Tribe: A Folklore Worth Remembering	<b>International</b> Gokhale's Education Society's Nb Mehta (Y) Science College, Bordi
2	Kunal Dhanmeher, Sharayu Raje	Recent Advances In Chemical And Biological Sciences	TYBSC	Ethnobotanical Knowledge Of Malhar Koli Tribe	<b>International</b> Gokhale's Education Society's Nb Mehta (Y) Science College, Bordi
3	Gaurav Salaskar, Asmita Mestry	Recent Advances In Chemical And Biological Sciences	TYBSC	The Hidden Treasure Of Plants With Thakar Tribe: An Ethnobotanical Study	<b>International</b> Gokhale's Education Society's Nb Mehta (Y) Science College, Bordi
4	Apurva Jha, Nitin Labhane	Environment: Issues, Challenges, Impact And Steps Towards Sustainable Development	TYBSC	Green Computing Approach In Ict Components	<b>International</b> Yavatmal Zilha Akhil Kunbi Samaj's Gopikabai Sitaram Gawande Mahavidyalaya, Umarkhed
5	Apurva Jha, Taufiq Shaikh, Sharayu Raje, Asmita Mestry	Basic Sciences For Sustainable Development	TYBSC	Role Of Modern Plant Propagation Techniques In Achieving Sustainability	<b>International</b> Patkar College Of Arts And Science, Goregaon (W), Mumbai
6	Apurva, Disha, Rishona, Kunal, Risha, Ifat, Raj, Saima, Chinmayee, Manali, Gaurav, Alfiya, Mohammed Taher, Kiran, Prachi, Arjun, Kuldeep, Sangeeta, Manisha, Sumedh, Taufiq Shaikh, Sharayu Raje, Sonal Vishwakarma.	Recent Innovations In Science And Technology	TYBSC	Bhartiya Vidya Bhavan, Andheri Campus: A Tale Of Urban Forestation	<b>International</b> <b>Iy College, Jogeshwari</b>
7	Amita Sarswal, Tanveer Yusufzai, Rohit Panchal, Harim Shaikh, Sunita Chauhan, Taufiq Shaikh	E-Rist	Teaching Staff	Review On Biological Approaches For Remediation Techniques Of Vaitarna River And Its Tributaries	<b>International</b> <b>Iy College, Jogeshwari</b>
8	Amita Sarswal, Taufiq Shaikh, Sharayu Raje, Nitin Labhane,	International Conference On Millets	Teaching Staff	Analysis Of Statewise Production Of Hybrid Varieties Of Pearl And Finger Millets In India	<b>International</b> Ruia College, Mumbai

9	Rohit Panchal , Taufiq Shaikh, Nitin Labhane, Asmita Mestry	International Conference On Millets	Teaching Staff	Growth Anomolies In Average Millets Production In Maharashtra	<b>International</b> Ruia College, Mumbai
10	Gaurav Salaskar, Nihal Kamle, Kajal Yadav, Nitin Labhane	International Conference On Millets	TYBSC	Evaluating Nutritional Potential Of Millets And Oats	<b>International</b> Ruia College, Mumbai
11	Sunita Chauhan, Rohit Panchal, Taufiq Shaikh	Basic Sciences For Sustainable Development	Teaching Staff	Bioplastic- As Future Alternative To Plasc	<b>International</b> Patkar College Of Arts And Science, Goregaon (W), Mumbai
12	Ashlesha Kamble, Taufiq Shaikh, Sharayu Raje, Nitin Labhane, Asmita Mestry	International Conference On Millets	Teaching Staff	Distribution Of Millets For New Mothers Under Pds Through Public Hospitals	<b>International</b> Ruia College, Mumbai
13	Apurva Jha, Ifat Khan, Taufiq Shaikh, Nitin Labhane, Sharayu Raje	G-20 Summit On Environment Sustainability And Bioenzymes	TYBSC	Phytoremediation Of Water Polluted With Hydrocarbon Rich Oil Using Dried Leaf Powder Of Carica Papaya.	<b>International</b> University Of Mumbai Kalina Campus

## DEPARTMENT OF MICROBIOLOGY

### Activities conducted under DBT STAR COLLEGE SCHEME AY 2022-2023

#### WORKSHOPS ORGANIZED (03)

##### 1. Protein Structure Bioinformatics- Dr. Archana Thakur (65 STUDENTS)

**Objective :** Enhance participants understanding of protein structure and bioinformatics.

##### 2. Open day- Introduction of Microbiology (250 STUDENTS)

**Objective :** Introduce visitors to the fascinating world of microbiology, providing a comprehensive overview of key concepts.

OPENDAY FOR STUDENTS OF SCHOOL AND JUNIOR COLLEGE on 20<sup>th</sup> January 2023 Friday 11am to 3pm  
Organized under DBT STAR scheme



Poster presentation on Diversity of microorganisms by F.Y.B.Sc. Students

### MICROBIOLOGY Department



Model presentation on microbiological aspects of fermented foods by S.Y.B.Sc.



Virus model presentation by T.Y.B.Sc. Students



Diseases and its prevention poster presentation by T.Y.B.Sc. Students



Display of microorganisms under the microscope by M.Sc.I Students



Demo on Hi-tech instruments working by M.Sc.I Students



Cultured microbes on mediums by M.Sc.I Students



Faculty Incharge: Dr. Zarine Bhatena, Dr. Rajesh Patil, Dr. S. V. Raut, Mr. Rutam Mulay, Mrs. Madhvi Sagvekar, Mrs. Arati Potphode, Ms. Leena Pilankar



Events management by Ph.D. Students

##### 3. Model and poster making and presentation on Viruses (250 STUDENTS)

**Objective :** Develop participants creative and conceptual skills by guiding them in the design and construction of informative and visually appealing virus models and posters.



### **GUEST LECTURES CONDUCTED (05)**

1. **IPR in Education-** Mr. Pratik Hendre (Examiner of patents and design, Indian patent office , Mumbai) (58 STUDENTS)

**Objective:** Provide insights into the importance of Intellectual Property Rights.



2. **Digital Data storage in DNA-** (55 STUDENTS)- Dr. Ubaid Qaayoom (Fish genetics and biotechnology,CIFE,Versova)

**Objective:** Foster a deeper understanding of the interdisciplinary nature of DNA data storage.



3. **Guidance for hygiene & disinfection in healthcare and pharmaceutical industry** (40 students)- Ms. Dhanya Shivaprasad(Asst.Manager-Sirmaxo Chemicals Pvt. Ltd.)

**Objective :** Provide knowledge regarding hygiene and disinfection practices followed in healthcare sector.





**INDUSTRIAL VISIT**

**Name of Place:** - “GOWARDHAN Cheese Factory” Manchar, PUNE, Maharashtra (T. Y. B. Sc and S. Y. B.Sc – 47 STUDENTS)

**Objective:** Offer participants a firsthand experience of the cheese manufacturing process at Gowardhan Cheese Plant

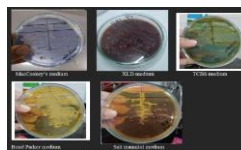


**STUDENTS OUTREACH PROGRAMME :-** Students outreach program for schools on Bhavan’s Campus – IWSA Writing picture-based books for secondary school children - IWSA

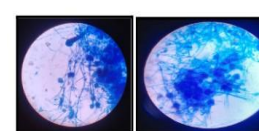
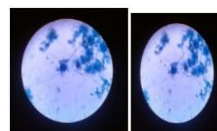


**DEPARTMENTAL PROJECTS :- UG students**

1. Microbiological analysis of the street foods commonly sold in the open aired markets in the Andheri neighborhood of Mumbai city. [TYBSc Students]



2. Isolation & study of soil microflora from areas, and identification of potent organisms for soil fertility. [SYBSc Students]



(Wet mount of isolate R3)

(Wet mount of R2 isolate)

3. Phytochemical screening for antimicrobial property of *Zingiber officinale* [ Ginger] and *Allium sativum* [ Garlic] raw and processed samples Mother’s recipe [SYBSc Students]



# INTERDISCIPLINARY PROJECT – 03

## Participating Departments- Microbiology, Botany & Biotechnology



# MUSHROOM CULTIVATION

TEAM MEMBERS- AARTI DULAM, SANIKA NAIK, SUJAL SOMAY, YUGA GAIKAR, DEEPSHIKA PILLAI.

IWSA MENTORS :- DR. RITA MUKHOPADHYAY, DR.PARAMJIT ANTHAPPAN, VIJAYA CHAKRAVARTHY.

BHAVANS MENTOR :- DR. VEENA MAHESHWARI



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### 01. Introduction

Mushrooms are from the Basidiomycetes family. Mushroom farming is one of the most profitable agri-business requiring a low investment and space. Oyster mushrooms are a popular type of mushroom linked to several health benefits. In addition to being highly nutritious, they may promote heart and immune system health, encourage healthy blood sugar control, and provide antioxidant and anti-inflammatory effects. Mushrooms degrade lignocellulosic substrates through lignocellulosic enzyme production and utilize the degraded products to produce their fruiting bodies. Lignocellulose are recalcitrant in environment and can be efficiently utilized in an economical way for production of mushroom thus removing the Recalcitrant in an ecofriendly way.

### 02. Objective

Cultivation of edible *Pleurotus ostreatus* Mushroom (Oyster mushroom) using different lignocellulosic substrate and selection of substrate which results in good efficiency of mushroom cultivation

### 03. Materials and Methods

**BASIC SUBSTRATE** :- Straw, **OTHER SUBSTRATES** :- Tea leaves, coffee grounds, tree twigs, sawdust, cardboard, icecream sticks **SPAWN** :- Blue and Gray Oyster Mushroom **PACKING MATERIAL** ( 50 micron Biodegradable bag or bottle )

Pressure cooker or Autoclave  
 1) Straw: Spent Tea Leaves (1:1) 2)Straw : Coffee grounds (1:1)  
 3) Straw: Cardboard (1:1)  
 4) Straw: Small twigs (1:1)  
 5) Straw: Ice cream sticks (1:1) 6)Straw : Saw dust (1:1)



### METHODOLOGY



### 04. Results

The mushrooms took about 20 – 25 days to grow and mature completely with first 8 to 10 days for appearance of mycelium and then Day 14 to Day 17 one could observe a small bud formation after which it matured into the crop (mushroom).

### Oyster Mushrooms



### 05. Conclusion

Mycelium growth was observed better in bottle containing straw and cardboard in ratio ( 1:1) as compared to other substrates, the pinheads also matured faster. Oyster mushrooms are wood-loving species that can get all the nutrients they need from cardboard and hence the mycelium is quick to colonize cardboard.

Cellulose content in the cardboard is the main component which leads to growth of mushroom

### 06. Reference

- 1) Lignocellulosic biomass understanding recalcitrance and predicting hydrolysis on NCBI website.
- 2) Cultivation of Mushroom and their lignocellulosic enzyme production through the utilization of agro- industrial waste on NCBI website
- 3) 7 Impressive Benefits of Oyster Mushroom on healthline.com
- 4) Research article on topic Oyster Mushroom and its value added products
- 5) The world mushroom industry: Trends and technology Development

### 07. Acknowledgement

Thanking all the IWSA and Bhavans mentors for conducting this fruitful internship and giving us hands on experience in various fields as well as Thanking Lalit from MSC and all the non-teaching staff of Microbiology and Biotechnology department for helping us through out the journey of internship.





**Team Members:**  
 1. Yagnesh Desai, Student at Bhavans College  
 2. Friti Saravak, Student at Bhavans College  
 3. Salsant Sarva, Student at Bhavans College  
 4. Afshan Khan, Student at Bhavans College  
 5. Shruti Fel, Student at Bhavans College  
 6. Sharadha Dubey, Student at Bhavans College

## Rapid Decomposition of Dry Leaves

**Members:**  
 Dr. Anil Mahalingappa, IYSA  
 Dr. Vijaya Chaitanya, IYSA  
 Ms. Indira Godbole, IYSA  
 Ms. Kavita Jadhav-Jambhale, KJSP College  
 Dr. Shweta Soman, Faculty at Bhavans College  
 Ms. Charvya Raja, Faculty at Bhavans College



### Objective

- The present experiment was conducted for identification of the fungal flora responsible for dry leaf litter composting; to check the effect of the *Trichoderma* spp. when added in the composting drums (November and July); the test experimental drums (November and July) were then compared with control bucket.
- Through the process, different parameters were monitored which were pH, temperature, physical appearance, moisture, odour of the experimental drums and control bucket.

### Result & Analysis



Drums / Buckets	Protein	Fiber				
	Day 0	Day 15	Difference	Day 0	Day 15	Difference
Control	2.93	2.17	0.76 ↓	14.3	12.39	1.91 ↓
July	2.95	3.52	0.57 ↑	15.6	18.58	3.42 ↑
November	2.91	2.48	0.45 ↓	13	11.98	1.02 ↓

### Introduction

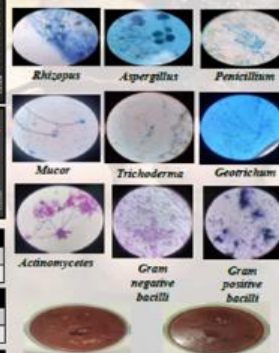
A large amount of waste is generated due to falling leaves from the trees, this leaf litter can be useful to us if managed properly. Amongst a few traditional ways of waste management, composting is considered as a suitable option for leaf litter. However, it is a time consuming process, which by natural means takes about half a year. The final product can be added to soil. As and when added to the soil it will increase the water holding capacity of the soil which can reduce drought damage; can increase the nutrient value of the soil which increases the quality of the crop; acts as a source for desirable soil micro-organisms; it improves the soil's physical condition making it easier to cultivate.

### Materials & Method

- Dry Leaves – Crushed dry to be added in the drums and the bucket.
- Drum & Bucket – 2 Experimental Drums (Labelled as July and November), 1 Bucket (Labelled as Control)
- Two Batches of Inoculum (*Trichoderma* spp.) – 1 prepared in July and other in November for July and November drums respectively.
- Water – To be added regularly to keep the leaves moist.
- Addition of Inoculum - 4 wells are made in the drums; in those wells inoculum mixed in water is added and then the substrate and the culture is mixed by mechanical stirring.
- Samples were collected at an interval of 5 days and isolated on plates of PDA, Kenknight's and Munsair, LB, Bennett's medium.
- The isolated colonies are then identified microscopically.
- Protein and Fiber estimation is carried out of Day 0 and Day 15 samples.

### Conclusion & Discussion

**Discussion:** Rapid composting technology involves inoculating the plant substrates used for composting with cultures of *Trichoderma*, a cellulose decomposer fungus [1] that, which is very important in rapid composting, is supplied by the reproduction of the microorganisms as they break down the organic material. [2] We can observe in July and November drums inoculated with *Trichoderma* spp. that the maximum temperature reaches up to 48°C and 50°C respectively. Whereas a control bucket where no microorganism is added is just around 39°C. The change of mesophilic to thermophilic conditions of a compost pile results in the more alkalinity of pH. (Sandberg et al., 2004). The rate of organic waste decomposition is slow at low pH conditions. With pH's in the range of 5.5 - 8. Again inoculated November and July drums show an average pH of 6.75. And the control bin shows a pH of 6.5. The pH for all 3 drums is in ideal range. The Protein and Fiber content decreased in November and Control drums while in July drum it showed an increase.



Observations for Cellulose Degradation Assay (Congo red) (Plates assay showing the CMC degrading ability of the fungus)

### References

- Paik, Abhad V. S. P. M. Prince, Jagdish Gokhane and Hira Dhan. "MICROBIAL-ASSISTED RAPID COMPOSTING OF AGRICULTURE RESIDUES." (2014).
- Boake R.D. "The rapid composting method Cooperative extension," University of California.
- Azam, Ayesh, Jafar Ahmad and Shalid Raza. "Effect of pH and moisture content on composting of Municipal solid waste." International journal of scientific and research publications 6 (2014): n. Pag.

### Acknowledgement

We thank Bhavans College and IYSA for giving us this wonderful opportunity to learn something new. We also thank all the members from Bhavans College and IYSA who guided, encouraged and motivated us throughout our internship.



# BIOINFORMATICS



Group members - Madhavi Pat, Gaurav Salaskar, Raj Garasia, Sarthavi Waze, Shivani Nanavare, Niranjan Kathavate, Mahtab Alam  
 Mentor-M/s Leena Pitankar  
 Project coordinator - DR. Shruti Samant

### INTRODUCTION

The huge demand for analysis and interpretation of biological data has led to the development of bioinformatics. Bioinformatics is essential for management of data in modern biology and medicine. In laboratory work as a decomposing process using fungi was taking place, we tried to build up our knowledge in some basic techniques. We retrieved most common fungi genome data from NCBI and used various bioinformatics tools to find genome similarities, phylogenetic evolution, etc. The idea was to amplify the isolated fungal DNA from the composting pit and further amplify the DNA using fungal universal primers. Primer designing, gave us the ideal primer for genome amplification. These amplified DNA would later be sequenced and identified using Nucleotide Basic local alignment search tool of NCBI. Further to analyze the sequence similarity of the isolated fungi with the known fungi, tools like Multiple Sequence Alignment, phylogenetic tree, using Clustal omega was performed. The bioinformatics solutions helped us to integrate and analyze complex data easier.

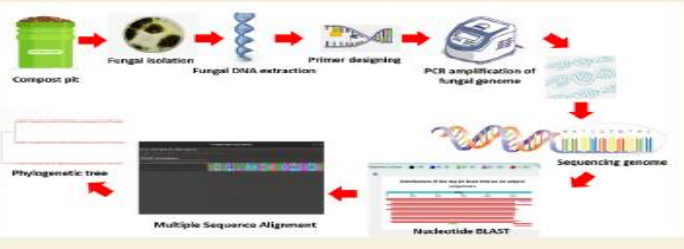
### BIOINFORMATIC TOOLS

- Useful bioinformatics websites:
  - National Center for Biotechnology Information (www.ncbi.nlm.nih.gov)
  - National Center for Genome Resources (www.ncgr.org)
  - Genbank (www.ncbi.nlm.nih.gov/genbank)
  - TranScribe (www.ncbi.nlm.nih.gov/TranScribe)
  - European Bioinformatics Institute (www.ebi.ac.uk)
  - BLAST (www.ncbi.nlm.nih.gov)
  - EMBL-EBI (www.ebi.ac.uk/embl)
- A comprehensive website for biologists including:
  - Biological related databases. Tools for reviewing and analyzing.
  - Specialized software to compare query (proteins or DNA) against database.
- Clustal W is a general purpose multiple alignment program for DNA or proteins.
- The Interactive Tree Of Life is an online tool for the display, manipulation and annotation of phylogenetic and other trees.

### RESULTS



### METHODOLOGY



### CONCLUSION

We presented bioinformatics tools for identification and classification of fungal species. DNA sequencing techniques is being very useful to many practical application and studies in related to research field. Bioinformatics is genetic and applicable to broad variety of organisms.

### FUTURE PERSPECTIVE

- Advance life sciences and biology field in "omics" disciplines the scale and complexity of "Big data" and growing demand for training and education in field of bioinformatics.
- Bioinformatics has become important scientific field to use of bioinformatics resources and research and the application for the analysis of complex "Big data" volume.
- In research point of view bioinformatics tools need to be improved for analysis of "Big data" there is need "effective tools" to perform better genomics assembly.
- Future aspects of bioinformatics in field of:
  - Metagenomics of fungal ecosystems
  - Fungal and bacterial, transcription, proteomics and metabolomics
  - Genetic editing of novel fungal database

### ACKNOWLEDGEMENT

We would like to express our special thanks of gratitude to IYSA FORTNIGHTLY for giving us such an amazing opportunity to learn something new. We appreciate and thank BHAVANS COLLEGE for providing us with all the support and leadership during our internship. We are glad that we had guidance of Dr. Desai on this topic. We would also like to extend our gratitude to all the members from Bhavans College and IYSA for their constant support and guidance. Our deepest thanks to Dr. Shruti Samant ma'am for her consistent support and supervision and also this ma'am for her motivation throughout the internship.

## BOTANY

### IWSA SUMMER INTERNSHIP



**STUDENTS WORKING IN THE LABORATORY  
PREPARING MEDIA**



**PREPARING SUBSTRATE FOR MUSHROOM  
CULTIVATION**

### INTERDISCIPLINARY RESEARCH PROJECTS

- The Department of Botany under DBT Star College Scheme Grant has worked on various interdisciplinary project in field of Nanotechnology, Environmental Sciences and Plant Biotechnology.
- The has assisted undergraduate and graduate students with a range of research projects by offering the necessary supplies and infrastructure.
- Department of botany has present 13 research topics in various international/ national conference some of which is are completed or partially possible because of DBT star college scheme.
- Ultimate result of this research work are 3 papers published as book chapters. While one paper is selected for publication.



**STUDENTS OF BOTANY DEPARTMENT AT  
INTERNATIONAL CONFERENCE ON MILLETS AT  
RUIA COLLEGE MUMBAI**

**d. Workshops and seminars organized in topical areas for students by the Depts. supported under the scheme**

- Department of Botany has organized **Two Hands on Training workshops** under the aegis of DBT STAR College Scheme, IQAC and BBS, one on **“Electrophoresis” and other on “Microscopy.”**
- Approx 80 students were benefitted by this workshop.
- Mr. Mustafa Motiwala (Proprietor, Tech Resource & Director of Natural Dyes Pvt) was called as Guest lecture for Electrophoresis workshop
- Dr. Nitin Shelke (Assistant Professor, Department of Botany, Ismail Yusuf College Mumbai) invited as Subject expert for Microscopy Workshops.



**Mr. Mustafa Motiwala At Hands on training Workshop on Electrophoresis**



**Dr. Nitin Shelke at Workshop on Microscopy**

**HANDS-ON TRAINING WORKSHOP ON MICROSCOPY**



**Total 65 students registered for the workshop from UG class (FY-34, SY- 16, TY-15).**



**Guest Speaker: Prof. Nitin Shelke delivering his lecture**



**BHARATIYA VIDYA BHAVAN'S**  
M. M. College of Arts, N. M. Institute of Science, H. R. J. College of Commerce  
**Bhavan's College (Autonomous)**  
Munshi Nagar, Andheri (W), Mumbai - 400058



## **INTERNATIONAL SYMPOSIUM ON RECENT ADVANCES IN PLANT SCIENCES**

ORGANIZED BY

**DEPARTMENT OF BOTANY**

IN COLLABORATION WITH

**BHAVANS BOTANICAL SOCIETY, RESEARCH AND DEVELOPMENT CELL & IQAC**

Under the aegis of

**DEPARTMENT OF BIOTECHNOLOGY (DBT) STAR COLLEGE SCHEME**

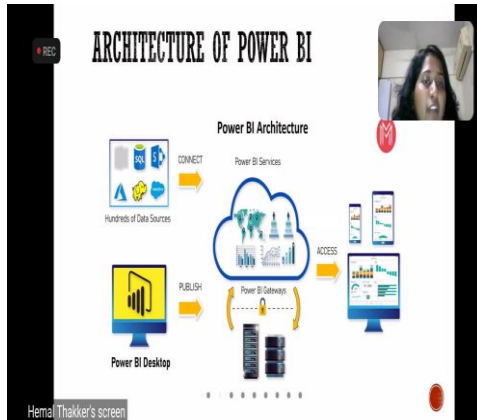
**Date: - 07th December 2023**



# Statistics

## Project undertaken by students

### PGD in Data Science and Artificial Intelligence



## Beginner's guide on how to Excel in Interview

**Bharatiya Vidya Bhavan  
Bhavan's College (Autonomous)**  
M.M. College of Arts, N.M. Institute of Science,  
H.R.J. College of Commerce, Andheri (W)

Department of Statistics is organizing a Skill Development online webinar on "*Beginner's Guide on How to Excel in Interviews*" under the aegis of DBT star status and DBT star scheme.

**Day and date:** Thursday , 28th April, 2022  
**Time:** 10:30 am to 12:30 pm.  
**Resource person :** **Ms. Ruheen Qureshi.**  
*Lecturer,  
Department of Statistics,  
Bhavan's College, Andheri (W)*

*Registration is mandatory to join webinar.*

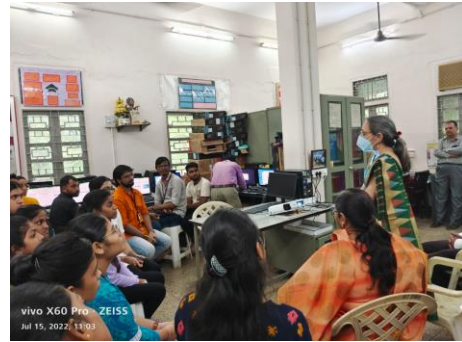
**Program Registration form link:**  
<https://forms.gle/m7YnYWVemQ97ho8m6>  
**Last date of registration:** 27th April, 2022  
**Zoom link to join program:** <https://zoom.us/j/96720994540?pwd=V3lPd2NlZ7Z9aWVFRlYxZSsKlUJlc1ZMd1Z0Z09>

*E-Certificate will be given to the participants after submitting feedback form.*

All are cordially invited to join the webinar.

**PATRONS**  
Prof. Prasad Patil  
Vice Principal,  
Exam controller and  
Head, Department of Statistics  
Dr. (Mrs.) Shruti Samant  
Coordinator,  
DBT star Scheme  
Prof. (Dr.) Zarine Bhatnara  
Principal

## Basic & Advanced Ms-Excel (one-credit value added certificate course) for undergraduate students of Statistics



**Educational visit to Dr. Balasaheb Sawant Kokan Krishi Vidyapeeth  
(Agricultural University) Dapoli, Maharashtra**



**Lecture by Expert on Career Prospects in Data Science**





## Introduction to Data Science & its Applications in the BFSI Domain with a case study



**Bharatiya Vidya Bhavan's**  
MM College of Arts, NM Institute of Science and HRJ College of Commerce  
**Bhavan's College (Autonomous)**  
Munshi Nagar, Andheri W, Mumbai 400058  
Affiliated to University of Mumbai  
Established 1946  
NAAC (Validity extended 2025) "A" Grade CGPA 3.02  
Granted DBT Star College Award

Under The DBT Star College Scheme  
Department of STATISTICS Has Organized a Webinar  
on  
**"Introduction to Data Science & its  
Application in the BFSI Domain with  
a case study"**

Resource Person :- Mr. Gaurav Chettyar 

Date :- Saturday, 10th December 2022  
Time :- 2:00 pm

Zoom ID :- 994 8087 5286  
Password :- 927406  
Link:- <https://zoom.us/j/99480875286?pwd=YmFVZjZ5OUhBOTcxNzBjMEU4TWNNZj09>

Prof. Dr. Zarine Bhatnara- Principal,  
Prof. Dr. Nita Labhane - Dean, Research and  
Development and Convener, Research and Development Cell  
Dr. Ujjwala Phatak - IQAC Coordinator,  
Prof. Prasad Patki- Vice Principal, Controller of Examination  
and Head, Department of Statistics

## Multidisciplinary course in statistics for Psychology using Electronic Spreadsheets



## Intra and Inter-collegiate departmental fest Stat-O-Verse



## Chemistry

### UG STUDENTS OF CHEMISTRY WORKING ON DBT PROJECT



### INDUSTRIAL VISIT TO TARAPORE BOISAR INDUSTRIAL ESTATE IN THE MONTH OF MARCH 2023

STUDENTS AT THE ENTRY GATE OF CHEMICAL INDUSTRY



STUDENTS LEARNING ABOUT THE PRODUCTION PROCESS IN CHEMICAL INDUSTRY





Career opportunities in foreign country



Career Opportunities in various field (Public service commission)



NABL Awareness program



Skill on self management and preparation for group discussion

## CHEM - CRUISE INTERCOLLEGIATE FESTIVAL -2023

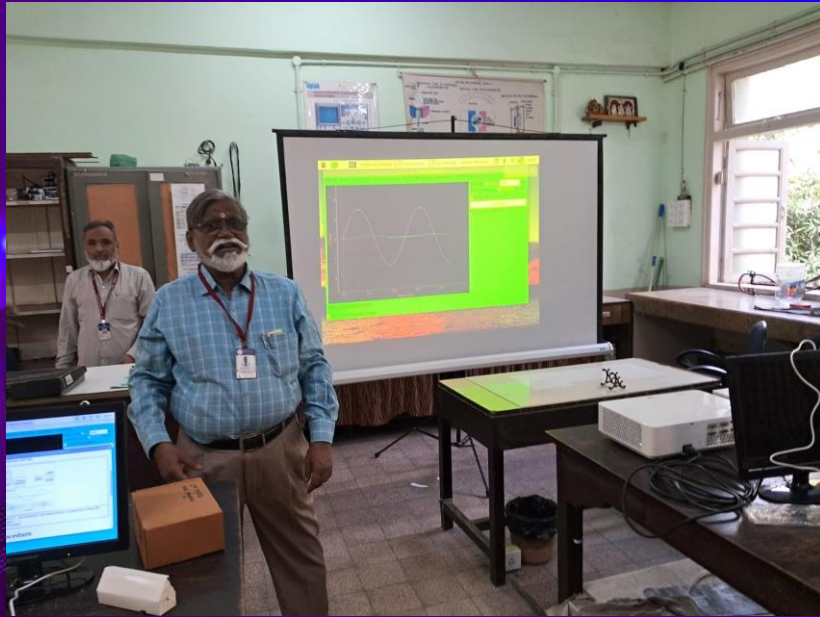


# NABL WORKSHOP



## Physics

Prof. Ashok Pawar, Former Head, Department of Physics, who superannuated in March 2023, addressing the students



Dr. Kushal Mude, Mr. Brijesh Yadav, Prof. Mrs. Varsha P. Patil, during the workshop.





Prof. Ashok D. Koli, who superannuated in September 2023, along with SYBSc students during the conduct of regular practicals.



Mr. Brijesh Yadav and Mrs. Aruna Thaker during the workshop.

Mr. Rajesh Mudaiyar addressing the workshop participants.



Dr. Rounak Atram with students during the workshop.





Outreach Activity

Mr. Rajesh Mudaliyar explaining the use of ExpEyes to students and Faculty members of Ramniranjan Jhunjhunwala College, Ghatkopar



Mumbai, Maharashtra, India

Ghatkopar, Jawahar Rd, Ghatkopar, Saibaba Nagar, Pant Nagar, Ghatkopar East, Mumbai, Maharashtra 400077, India  
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Long 72.909616°  
24/04/23 10:47 AM GMT +05:30

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Mr. Rajesh Mudaliyar explaining the use of ExpEyes to students and Faculty members of Ramniranjan Jhunjhunwala College, Ghatkopar



Mumbai, Maharashtra, India

Ghatkopar, Jawahar Rd, Ghatkopar, Saibaba Nagar, Pant Nagar, Ghatkopar East, Mumbai, Maharashtra 400077, India  
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Long 72.909577°  
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