



**RISHI DAYARAM AND SETH HASSARAM NATIONAL COLLEGE  
AND SETH WASSIAMULL ASSOMULL SCIENCE COLLEGE**

## **Annual Progress Report** **(2020-21)**

of

## **DBT Star College Scheme**

**Supported by Department of Biotechnology (DBT),  
Government of India**

### **Departments Supported By The Scheme**

- Department of Biotechnology
- Department of Botany
- Department of Chemistry
- Department of Mathematics and Statistics
- Department of Physics
- Department of Zoology

**R.D. & S. H. National College Of Arts And Commerce And S.W.A. Science College,  
Bandra West, Mumbai, Maharashtra. 400050  
Affiliated To University Of Mumbai Linking Road, Bandra (W),  
Mumbai - 400050 Maharashtra, India  
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**Annual Progress Report of DBT STAR SCHEME (2020-21)**

- 1 **Name of the College** : RISHI DAYARAM AND SETH HASSARAM NATIONAL COLLEGE AND SETH WASSIAMULL ASSOMULL SCIENCE COLLEGE
- 2 **Name of Programme Coordinator for Star College Scheme** : Dr. Mona Kejariwal, Assistant Professor  
a) Complete Address: Department of Botany, R.D. & S. H. National College Of Arts And Commerce And S.W.A. Science College, Bandra West, Mumbai, Maharashtra, 400050  
b) Phone: 02226004434  
c) Email: monabansal@gmail.com
- 3 **Assessment duration** : 01/04/2020 to 31/03/2021  
**Duration in years:** : One Year
- 4 **Details of Departments** :

S No.	Name of Department	Courses (B.Sc./M.Sc./PG Diploma, certificate etc.) offered	Regular Faculty members	
			With Ph.D.	Without Ph.D.
			Total = 29	
1.	BOTANY	B.Sc., Ph.D.	04	NIL
2	BIOTECHNOLOGY	B.Sc., M.Sc.,	02 (01 ongoing)	03
3	CHEMISTRY	B.Sc., M.Sc., Ph.D.	05	01
4	MATHEMATICS & STATISTICS	B.Sc.	01	01
5	PHYSICS	B.Sc., M.Sc.( by papers)	05 (02 ongoing)	02
6	ZOOLOGY	B.Sc.	03 (02 Ongoing)	01

5. **Number & Date of Advisory committee meeting:**

S.No.	Name of Dep.	Date	Name of advisor/expert	No. of faculty
1	Quarterly Advisory meeting	19/01/2021	Internal meeting with Principal Dr. Neha Jagtiani & Vice Principal Dr. Kiron Jathar	25
2	Annual progress Review meeting	26/03/2021	Internal meeting with Principal Dr. Neha Jagtiani & Vice Principal Dr. Kiron Jathar	25
2.	Annual Advisory Meeting	03/05/2021	<b>Externals:</b> Dr. Anamika Gambhir, Scientist E, National Advisor, DBT Star College Scheme Dr. Garima Gupta, Scientist 'E', National Program Officer, DBT STAR College scheme. Dr. Vinita Deshpande (Former Head, Department of Physics, ICT) Dr. Rajesh Singh, (Director, IIL, R T M Nagpur University, Nagpur) Dr. Indu Shastri (Former Head, Chemistry, RDNC)	27

*Mona Kejariwal*

Course Coordinator

1

*Neha Jagtiani*

Head of the Institution

**Dr. Mona Kejariwal**  
Coordinator  
DBT Star Scheme,  
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**DR. NEHA JAGTIANI**  
I/C Principal  
Rishi Dayaram and Seth Hassaram National College  
and  
Seth Wassiamull Assomull Science College  
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## 6. Qualitative improvements due to DBT support.

- i. **Creation of Academic resources** for demonstration and teaching practical exercises. Major highlights include a comprehensive and pictorial booklet on taxonomy to study plant families, Pictorial student handbook to study Forest types, Ecological adaptations, Algae, Fungi, Bryophytes according to respective prescribed practical courses. Students of Biotechnology were provided with a Question Bank of more than 6000 MCQs. A number of exhibits in form of posters, live specimen plants, Herbarium specimens and preserved specimens of Algae, Fungi and Lichen are created, an yearly E-newsletter "NEEV" is published and electronically circulated to >500 people and a Herbal calendar 2021 is created by SYBSC students with immune boosting herbs to create awareness about the same. A worksheet for *identification of bacteria* was introduced with all the resource links of essential morphological and biochemical parameters needed. A book named 'Essentials of Nutrition'. A comprehensive Laboratory Manual has been developed with the help of WRIC team for maintenance of instruments in all science departments. Provided downloaded teaching material to children of govt. school at the adopted village Pansai, from online resources like Diksha.
- ii. **Online Teaching, Learning and Research Tools** were procured to facilitate a creating a more robust and dynamic system of education. Procurement of tools like *Wacom pen tabs, Matlab, Maple, Plagiarism Checker, Zoom*(video conference platform), mathematical models etc. are a few that have immensely helped the teachers in improving the teaching methods, assistance in online teaching-learning and research projects etc. The teaching and learning experienced a paradigm shift to online platforms to which both teachers and students were adaptive. The college subscribed *Gsuite* in order to circumvent the challenges posed by lockdown. Students and teachers were also introduced to many free online education and research tools like *Mendeley, Zotero, Geogebra, R, Python, SageMath, E-Bird app, xeno-canto (website), Anglcam, Google classroom, Googlesheets, GoogleForms, GoogleDocs*, etc. To make exercises more engaging, tools like *Kahoot* and *Quizziz*, were also promoted by faculty. Also, web-based resources like research articles, protocol sheets, etc., were discussed using *Insert learning* application and curated lessons.
- iii. **Student Training Sessions and Intercollegiate Workshops** were arranged for the students, support staff and teachers to ensure regular upgradation, psychological health and technical acquaintance. *5-Days Basic Molecular biology and genetic engineering workshop* in association with Merck Innovation lab and five day workshop on *Innovative mind-set: LAB TO LAND* in association with discoverSTEM, USA to inculcate innovative thinking among students and one day Assistant Facilitator's Workshop to train the teachers were organised. An online course of 10 days on *Flow Cytometry* was also organised in association with Flowcytometry Solutions(FlowSols) Pvt. Ltd. A 3 day *Labview Training* on imitation based software solutions of by Blauplug Innovations Pvt. Ltd. was organised for students and teachers for acquaintance with recent advancements in virtual physics. One week Interdisciplinary training for support staff on *Maintenance and Repair of Laboratory Equipment* was organised keeping the reopening of college in mind with Western Region Instrumentation Centre (WRIC), University of Mumbai. *Cyber Suraksha* seminar was arranged for support staff in the current situation to secure them for any kind of cyber fraud. A 4 - days workshop on *Python* was conducted in association with Datamatics Global Services Pvt Ltd, Mumbai so that students and teachers keep pace with the everchanging technological advancements. 2 days workshop on *Preparation of Thin Films* was conducted with resource persons from Saurashtra University and Institute Of Technology (ICT), Mumbai and the samples are in the process of characterization and publication. Many workshops and expert sessions were organised like *Cyber Suraksha* for support staff, 2 days expert sessions on *Yeast Two Hybrid Systems*, . Many one day online workshops were organised such as *Solar: the Renewable Energy Resource, Workshop on Chromatography& UV-Visible, IR Spectroscopy, Basics of Conductometry and its Applications, Advanced practicals of Physical and analytical Chemistry, Career at DRDO, How To Write*

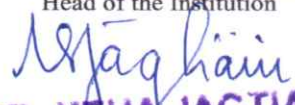
  
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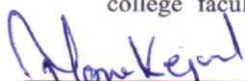
  
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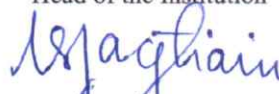
*Research Proposal At Undergraduate Level, Nature in the City, Understanding Invertebrates, Spinal Connection, How to be a Discoverer, Photography as a Skill for Research & Documentation, Learning Lessons from Nature(Outreach Activity- Popular Lecture) , Gardening for Butterflies (Interdisciplinary Guest Lecture) Learning Lessons from Nature, Gardening for Butterflies, Introduction to Habitats, History of Indian Mathematics.*

- iv. **Skill Development Centered Projects** have been initiated so that the students can work and add to their skills even from their home. A few of the minor research and skill development projects include preparation of E-herbarium making and Bio enzyme, Know Your Surroundings, training on literature survey from NCBI portal, etc. Science Literature based dissertation project of 1 month was organized for 39 students of Biotechnology with unique topics and submission of detailed project report with data presentation to external experts that helped in developing the science reading, review and writing skills of the students. Exercises pertaining to training in understanding scientific literature and writing extended abstracts, review reports and book chapters were also conducted. TYBSC physics student have performed energy audit of their individual houses to understand the basics of energy conservation. Through various online presentation and projects, students have learnt several basic software, like Excel, Powerpoint, Canva, Photoshop, OpenShot, Google doc, sheet etc. Macro-faunal diversity observation out of the window by more than 100 students of FYBSc Zoology and uploading reports of documentation on Google Classroom. Purchased instruments were demonstrated like use of Semipro Camera, Optical zoom and use of tripods.
- v. **Field Visits** could have been challenging but online solutions like association with like National Agriculture Biotechnology Institute (NABI) and Center of Innovative and Applied Bioprocessing (CIAB) autonomous institute of the Department of Biotechnology, Govt. of India, facilitated virtual tour to their institution, in form of virtual visit to URU Brewpark, J.P. Nagar, Bengaluru for providing field based knowledge on bioprocess technology & Virtual tour of Bhandup pumping station to study avifauna & Juhu Beach – marine fauna for understanding the expertise needed in wildlife conservation have been conducted for students of varied interest and aspirations.
- vi. **Inauguration of Ramanujan Mathematics & Statistics laboratory** could be possible due to a range of equipment and consumables procured from the DBT Star grant. The laboratory is equipped with high-end computers, softwares and mathematical models procured from Vikram A Sarabhai Community Science Centre (VASCS), Ahmedabad, Gujarat.
- vii. **Participation in State Level and National Level competitions** has been seen as a motivational outcome due to extensive training provided in research. Students actively participated at the Inter University research convention AVISHKAR and submitted 7 POCs at the convention.
- viii. **5 Star Rank Awarded** to the college Institution's Innovation Council (IIC2.0) by the Ministry of Education's Ministry's Innovation Cell (MHRD MIC) Govt. of India for the year 2019-20 which was largely possible due to ease of facilitating and organizing programs owing to availability of equipment, logistics and funds through the DBT STAR College scheme. With an eye of benefitting maximum students by effectively engaging them in creative thinking and innovation during these challenging times of the Covid-19 lockdown, College has proposed the establishment of the '**Vidyasagar Principal Kundnani Innovation and Entrepreneurship Centre**' (VPKIEC) Bandra Campus. FICCI has also recommended two projects for further evaluation related to 'Sign to Speech Converter' and 'Portable Hand Mouse for Divyaang People'. The objective of this center will be to providing various skill-oriented programs and courses to students/ staff pertaining innovation (technology, process or business innovation) to solve the problems of the society and consumers. A start-up on *herbal cosmetics* has already initiated where 31 students have completed their initial training on herbal formulations, one student has built her own startup and getting mentorship from college faculty. Two patents are in the process under various innovation projects. The Departmental

  
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herbarium RDNCP made its place on International Database "Index Herbariorum" partially with the encouragement and support from Star College Scheme.

### 7. Novel aspects introduced and innovative activities planned during the Scheme duration.

#### Department of Biotechnology

- i. An Innovative internal project was conducted in T.Y.B.Sc. (Sem-VI) for enhancing research skills like literature survey and review, data interpretation and analysis, plagiarism and ethics etc. in scientific writing and presentation to external experts. A software – Plagiarsim Checker was used to check plagiarism in the project reports and was one of the assessment parameters.
- ii. Introduction and practice of research writing pertaining to reference and citation styles, and their tools like Mendeley, Zotero etc. in F.Y.B.Sc. and S.Y.BSc.
- iii. A book writing exercise has been initiated with students and should complete by June 2021.
- iv. All teachers of the department were trained as facilitators for inculcating STEM based approaches in the students.
- v. Department plans to organize an international online conference on 'Frontiers in Biological Science Research' for all the UG and PG students of Biology in the country.
- vi. An innovative exercise was conducted to comprehensively understand the different morphological, staining and biochemical tests for identification of bacteria using GoogleSheets.
- vii. Use of we-based interactive platforms like Vlab, Kahoot, Quizziz, Insert learning were employed.

#### Department of Botany

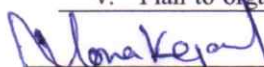
- i. Use of virtual tools for facilitating online practical for giving hands on experience to students.
- ii. Creation of digital repository of first hand reference materials in the field of classical as well as applied aspects of Botany.
- iii. Hands on experiments to study properties of medicinal plants.
- iv. Enhance the scope of a classical botany demonstration practical with additional scientific literature survey by the UG students
- v. Student training on nutraceutical formulation of probiotics utilizing indigenous varieties.
- vi. Digital education portal for undergraduate Botany courses.
- vii. Facility on Bioinformatics and Information Retrieval.
- viii. Minor research project cum internship on 'Medicinal Botany' (blended course) for students is being planned.

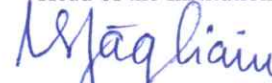
#### Department of Chemistry

- i. A session to discuss awareness and opportunities in the sector of Solar energy was organized for all the students.
- ii. A workshop for frequently used analytical methods like Chromatography, UV-Visible spectroscopy and IR Spectroscopy was organized for UG and PG students of the department.
- iii. A full day workshop on First Aid was planned for the Non Teaching and Teaching staff of the college in March that has been postponed, due to 2<sup>nd</sup> wave of COVID-19, to a later date.

#### Department of Physics

- i. Promoted Industry – Academia partnership with having our TYBSc students and MSc students placed by Blauplug Innovations Pvt. Ltd.
- ii. Created digital repository of various UG & PG experiments and uploaded the same on YouTube.
- iii. Online practical manuals for all UG classes with active links created as per the syllabus of University of Mumbai.
- iv. Interdisciplinary training workshop on Maintenance and Repair of Lab Instruments in association with WRIC for training the Support Staff of Departments of Physics, Chemistry, Botany, Zoology and Biotechnology. A Lab Manual has been prepared on the training provided during the workshop.
- v. Plan to organize hands on training on mathematical techniques for students to develop analytical skills

  
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for understanding physics

- vi. Internships and projects for the UG students will be arranged with Applied Optical Technologies Pvt., Ltd.
- vii. Lab Manual to be designed on Laboratory Safety especially with respect to Electrical Hazards.

**Department of Zoology**

- i. Introduction to Virtual Field visits through virtual platforms like Zoom for understanding the importance, safety and utilization of equipments needed for Bird watching (apps, book – Grimmett, binoculars, camera, spotting scope, GPS, and related instruments such as Digital Thermometer, salinometer, DO meter, pH meter, NPK meter, sieves, forceps, gumboots, gloves, magnifying glass, field microscopes and skills to use every tool needed for Biodiversity study on field.
- ii. 360° angle of teaching binding Field experience to lab work, lectures, workshops, training, skills development, introduction to stalwarts of the field, e-resources, internship and job opportunities in short time without losing the attention of students through icebreaking interactive group discussion, problem solving, quizzes, activities, crosswords, word search, trivia, etc.

**Department of Mathematics and Statistics**

- i. Introduction to free softwares for Mathematics and Statistics (Geogebra, R, Python, SageMath etc.).
- ii. Comparative study of free and paid softwares to be done.
- iii. Projects are planned to develop software programs useful in studying Mathematics and Statistics.

**8. Lessons learnt/difficulties faced/suggestions/challenges experienced in implementation of the program and utilization of DBT grant.**

- i. The COVID-19 pandemic could have made the teaching-learning process ever more challenging but the scheme has given enough opportunities to the departments to enhance the process through conducting online guest lectures, training sessions and field visits. Clarity on procurement of software under recurring grant can further enhance the process in these challenging times. Moreover, due consideration is needed for purchase of software equipment in recurring grant due to unforeseen circumstances and largely online mode of teaching.
- ii. Since the Laboratories and instruments are on a halt for over a year, defects and damages are expected. The DBT Star Scheme shall address these challenges, so that the procured equipment can be repaired and maintained.
- iii. Procurement procedures are elaborate and thus time becomes a bottleneck when the grant is received much later in the year. Time constraints and uncertainty of the grant have largely affected planned organization of workshops and trainings for the students.
- iv. The pandemic of Covid-19 and the resultant lockdown has made a drastic change in teaching methods. Skilled professional with abilities to adapt to soft skill based setup has become indispensable. Hence, a dedicated, committed and skilled support staff shall be incentivized through the DBT star grant.
- v. Buffer period may be granted for processing the accounts, asset certificate and utilization certificate particularly for a city like Mumbai during looking at the current scenario of Covid-19 and difficult working conditions.

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## 9. Key performance indicators

9. (1.) **No of Students admitted:** Following is the data of admission divided into pre-support (2018-19) and after support for the year (2020-21). The same for the year 2019-20 was submitted in the last year's annual report.

F.Y.B.Sc.	Pre-support (2018-19)							During /After Support (2020-21)						
	Enrolled				Category			Enrolled				Category		
	T	M	F	G	SC	ST	OBC	T	M	F	G	SC	ST	OBC
Botany	119	45	74	108	5	0	6	113	24	89	103	5	0	5
Zoology	119	43	76	110	4	0	5	116	28	88	107	4	0	5
Chemistry	173	72	101	161	6	0	6	164	55	109	147	7	0	10
Physics	96	56	40	92	2	0	2	87	52	35	76	5	0	6
Mathematics	62	40	22	60	1	0	1	48	38	10	40	2	3	6
Statistics	25	20	5	24	0	0	1	18	16	2	16	1	0	1
Biotech	37	8	29	35	0	0	2	38	9	29	31	5	0	2

S.Y.B.Sc.	Pre-support (2018-19)							During /After Support (2020-21)						
	Enrolled				Category			Enrolled				Category		
	T	M	F	G	SC	ST	OBC	T	M	F	G	SC	ST	OBC
Botany	69	26	43	62	3	0	4	60	18	42	53	4	0	3
Zoology	80	22	58	73	2	1	4	97	32	65	89	4	0	4
Chemistry	69	31	38	64	1	1	3	110	40	70	102	3	0	5
Physics	38	23	15	35	1	0	2	56	39	17	50	1	0	5
Mathematics	13	9	4	13	0	0	0	23	18	5	19	1	0	3
Statistics	19	9	10	17	1	0	1	8	6	2	5	1	0	2
Biotech	32	8	24	23	3	0	6	39	10	29	34	3	0	2

T.Y.B.Sc.	Pre-support (2018-19)							During /After Support (2020-21)						
	Enrolled				Category			Enrolled				Category		
	T	M	F	G	SC	ST	OBC	T	M	F	G	SC	ST	OBC
Chemistry	50	17	33	49	0	1	0	64	26	38	60	4	0	0
Physics	20	11	9	17	1	0	2	42	22	20	40	1	0	1
Biotech	30	9	21	26	1	0	3	39	8	31	36	0	0	3

Remark: College has T.Y.B.Sc. in the mentioned subjects only, therefore students who have Zoology & Botany combination in SYBSC have to change their college in TYBSc.

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**9. (2-5) - 2. Passing out (pass %); 3. Drop-out rates; 4. No. of students opting for MSc; 5. Average marks:**

Following is Result: pre-support (2018-19) and post-support (2019-20). The results for the year 2020-21 will be generated after final semester in May, 2021 and shall be included in the next Half Yearly Report in (2021-22)

Class	Departments (RA=Result Awaited)	Pass Percentage		Drop out %		Average marks		Student opting for MSC	
		Pre- support (2018- 19)	During /After Support (2019- 2020)*	Pre- support (2018- 19)	During /After Support (2019- 2020)*	Pre- support (2018- 19)	During /After Support (2019- 2020)*	Pre- support (2018- 19)	During /After Support (2019- 2020)
F.Y.B.Sc	Botany	89	82	11		60%	68%		
	Zoology	88	85	7		63%	66%		
	Chemistry	54	77	46		53%	60%		
	Physics	86	74	14		67%	68%		
	Maths	30	37	70		45%	50%		
	Statistics	70	65	30		55%	56%		
	Biotechnology	93	96	7		69%	72%		
S.Y.B.Sc.	Botany	86	89	14		70%	71%		
	Zoology	92.5	98	15		71%	71%		
	Chemistry	91	95	9		60%	62%		
	Physics	82	94	18		66%	67%		
	Maths	38	93	62		45%	46%		
	Statistics	58	90	42		49%	52%		
	Biotechnology	95	95	5		70%	72%		
T.Y.B.Sc.	Chemistry	67	64	21		65%	65%	16	16
	Physics	50	69.5	25		69%	71%	15	16
	Biotechnology	100	100	0		70%	89%	20	20

Due to COVID-19 students have been provided 120 days to clear their  
ATKT exams so no drop out ratio can be generated.

\* All results for 2020-21 will be prepared after even semester in May, 2021 as due to Covid-19 situation all exams postpone to May-2021.

**9.(6) No. of hands-on experiments being conducted: (Upgraded)**

All the practical exercises mentioned below have been upgraded to some additional techniques with the financial support and motivation extended by the DBT Star College Scheme and performed individually by students rather than demonstration. Instrument based exercises in working laboratory could not be performed due to Lockdown in Mumbai for almost one year. The department list is as follows:

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**Upgraded(Hands-on) Experiments**

<b>Department of Biotechnology</b>		
S.No.	Name of upgraded practical	Class & No. of Beneficiaries
1.	Multiple Sequence Alignment Clustal – Omega for Albumin in serum albumin [ <i>Alligator mississippiensis</i> (American alligator)] & albumin [ <i>Mus musculus</i> (house mouse) lbumin [ <i>Homo sapiens</i> (human)]	S.Y.B.Sc. – 38
2.	Plant tissue culture process and culturing GMOs; process of making GMOs with vector, pros and cons of using genetically modified plants.	F.Y.B.Sc. – 35
3.	CATH SCOP for Human Insulin	S.Y.B.Sc. – 38
4.	Primer-BLAST for Albumin [ <i>Homo sapiens</i> (human)]	S.Y.B.Sc. – 38
5.	Online Worksheet for Identification of Bacteria with various staining, morphological and biochemical tests and links for videos for ready reference.	S.Y.B.Sc. – 38 F.Y.B.Sc. – 35
<b>Department of Botany</b>		
1.	Garden Plan and management	S.Y.B.Sc. – 60
2.	Herbarium making	S.Y.B.Sc. – 60 F.Y.B.Sc. – 110
3.	Study of Leaf Morphology Inflorescence	F.Y.B.Sc. – 110
4.	Study of Plant Families	S.Y.B.Sc. – 60 F.Y.B.Sc. – 110
5.	Economic importance of Brown algae	S.Y.B.Sc. – 60
6.	Herbal cosmetics	S.Y.B.Sc. – 60
<b>Department of Chemistry</b>		
1.	Spectroscopic study by instrumental technique	T.Y.B.Sc. – 32
<b>Department of Physics</b>		
1.	Thermistor Characteristics, using virtual lab	F.Y.B.Sc. – 80 S.Y.B.Sc. – 50
2.	Plotting of the graph of various experimental data using Microsoft Excel	F.Y.B.Sc. – 80
3.	8085 Microprocessor Programming	S.Y.B.Sc. – 35
4.	Resolving Power of Grating as an extension of R. P. of Prism	T.Y.B.Sc. – 37
5.	Energy band gap of Germanium using 8epts. tools of virtual lab	T.Y.B.Sc. – 24
6.	Hall Effect using virtual lab	T.Y.B.Sc. – 37
7.	LASER beam profile using virtual lab	S.Y.B.Sc. – 38
8.	Cauchy's Constant using virtual lab	S.Y.B.Sc. – 38
<b>Department of Zoology</b>		
1.	Study of equipment needed for bird watching.	FY & SYBSc. -72
2.	Study of Tools to be used during a visit to marine habitat for studying different animal groups such and precautions to be taken.	FY & SYBSc.- 85
3.	How to identify and list Biodiversity observation such as reptiles, frogs, etc sighted in a study tour through apps, websites, portal and databases.	FY & SYBSc.-72
4.	How to use of Semipro Camera, mobile, spotting scope, binoculars, tripods for Filming and photography during field visits.	FY & SYBSc.-74
5.	Study of Morphology and Classification of Invertebrates (Protozoans, Porifera, Mollusca, Echinodermata, Arthropoda and their planktonic forms )	FY & SYBSc.-81
6.	Study of Morphology and Classification of Vertebrates (Fishes to Primates)	FY & SYBSc.-78
<b>Department of Mathematics &amp; Statistics</b>		
1.	Computation, Visualization, and Programming using Matlab	FY & SYBSc.- 65
2.	Computation, Visualization, and Programming using Maple	FY & SYBCom – 110

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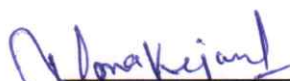
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**9.(7). No. of new experiments/exercises introduced:**

Pre-support (2018-19) these experiment were not being conducted due to lack of instruments/chemicals/technical skill. Some practical exercises have been added which were not mentioned in syllabus but have appropriate curriculum connect. This has imparted application-based skills to students in basic sciences. The Department wise list for these exercises conducted in 2020-21 is as follows:

<b>Department of Biotechnology</b>		
S.No.	Name of Extra practical/exercise	Class & No of Beneficiaries
1.	Biotechnology Journal Club	S.Y.B.Sc. – 38 M.Sc.-II – 22
2.	Book Chapter writing exercise on topic 'Essential of Nutrition'	T.Y.B.Sc.– 35
3.	Business proposal writing	F.Y.B.Sc. – 35
4.	Abstract writing: Learning concise scientific writing, intext citation and reference lists using reference tools.	T.Y.B.Sc. – 39
5.	Interactive Online Lessons created on webpages using Insert Learning app.	F.Y.B.Sc. – 35
<b>Department of Botany</b>		
1.	Study of Plant Morphology: Introduction of Morphometry to analyze Leaf shape, Leaf Apex and Leaf Base using the plant samples collected by the students	F.Y.B.Sc. – 110
2.	Documentation of Plant Diversity: Use of geotagging using mobile phone based App "Angle Cam"	F.Y.B.Sc. – 110
3.	Neutraceuticals: Cultivation of Microgreens from commonly available seeds and using it for daily food – a practice to create healthy food habit	S.Y.B.Sc. – 60
4.	Natural living: A demonstration of use of various home-based environment friendly herbal cosmetics	F.Y.B.Sc. – 110
5.	Bio-enzyme making: During the pandemic, students were provided with demo video demonstration for making Natural cleaner from citrus fruit peels	F.Y.B.Sc. – 110
6.	Herbal Calendar: SYBSC Students compiled a 2021 calendar selecting 32 herbs	S.Y.B.Sc. – 32
<b>Department of Chemistry</b>		
1.	Material Safety Data sheets for chemicals for students	F.Y.B.Sc. – 110
2.	Instrumentation of Conductometer for SYBSc 80 students	S.Y.B.Sc. – 80
3.	UV IR spectrophotometry using virtual lab	T.Y.B.Sc. – 50
4.	Analytical Techniques: HPLC and TLC	T.Y.B.Sc. – 50
<b>Department of Physics</b>		
1.	Applications of LDR	F.Y.B.Sc. – 35
2.	Surface tension of different liquids	S.Y.B.Sc. – 30
3.	Logarithmic decrement in amplitude of an oscillating system using laser	T.Y.B.Sc. – 36
4.	Velocity of sound using CRO	T.Y.B.Sc. – 40
<b>Department of Mathematics &amp; Statistics</b>		
1.	Geogebra in calculations of Continuity and differentiability, Curve Sketching, Normal distribution, Improper Integrals	FY & SYBSC Maths – 56 &
2.	Mathematical problem solving using Sagemath for Continuity and differentiability of Vector fields & Calculations of Taylor Series	Statistics – 31 Students and
3.	Mathematical calculations and solving problems using python	college faculty
4.	Correlation and regression problems using R in online lectures/practical.	

  
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**9. (8) – Publications and Patents**

Publications		
S.No.	Citation	Department
1.	Vijay D. Mendhulkar, Laukik A. Shetye & Omkar Khot (2020). Modulation of the anti-cancer activity of sulfated polysaccharides, synthesized in <i>Spirulina platensis</i> , due to varying degree of sulfation induced by nutrient and physical stress. <i>Journal of Biologically Active Products from Nature</i> . 10(4): 275-284.	Biotechnology
2.	V. D. Mendhulkar, L. Shetye (2021). Investigation of the anti-cancer potency of nanomedicine, green synthesized from <i>Spirulina platensis</i> , against breast cancer. <i>International Journal of Pharmaceutical Science and Research</i> . 12(6).	Biotechnology
3.	Mansuri, S. Q. (2020). Stop Child Sexual Abuse: Youth Centric Measures, Methods and Social Action Plan at Community Level. <i>Social Service Practices And Community Development Journal</i> , 1(1), 37-44.	Biotechnology
4.	Mona Kejariwal. Antioxidant potential of polysaccharide from <i>Murraya koenigii</i> (Linn.) Spreng. <i>Bull. Env. Pharmacol. Life Sci.</i> , Vol 10[1] December 2020 : 98-105.	Botany
5.	Pradhan Shashwati. Comparative analytical study of Furosemide from various diuretic formulations using titrimetric and UV-Visible Spectroscopy technique. <i>Journal of The Maharaja Sayajirao University of Baroda</i> . Vol. 54 No.2(IV)2020-2021.	Chemistry
6.	Patil Nilesh, Synthesis and biological evaluation of novel 3-aryl-4-methoxy n-alkyl maleimides. <i>Indian Journal of Chemistry</i> , Vol. 60B, March 2021, pp. 473-478.	Chemistry
7.	Suchandra Dutta, & Subir B. Proposal to add a new paragraph to Recommendation 31B. Taxon (in press)	Botany
8.	Suchandra Dutta . Botanical denizens of India. Pleione (in press)	Botany
Patents		
9.	Nagpure, Vincet Santosh; Subhash Nikam, Dattatreya; Kejariwal, Mona; Deepak Nagvekar, Yogesh; Sukhadeo Thorat, Vinesh; Ajay Rudrawar, Ajinkya; Vinayak Joshi, Girish; Shashikant Gangatire, Omkar; Harun Shaikh, Sharif and Kumar, Shiv. Low-cost Brick: Environment-Friendly Low-Cost Multi Color Brick. Patent number: 2020104381; 17 March 2021.	Botany

*Note: Two patents are under process of filing.*

**9. (9) – Training received by faculty:**

Prior to support (2018-19) there were few trainings planned by institution. It was challenging to 10epts.10e structured training programmes prior to DBT support for non-teaching staff. During the support (2020-21) departments have initiated various interdisciplinary training at institutional level, which has significantly contributed to upgradation of the non-teaching staff. Following is a list of trainings received by the faculty and support staff. The list also mentions few lectures delivered by college faculty at other institutes on invitation.

S.No.	Name and details of training course	Faculty who received training
1	• Assistant Innovator's Workshop and Induction for Land, 28 <sup>th</sup> October 2020, Organised in association with discoverSTEM, LLC, USA	20 faculties (All Science dept. faculty)
2	• Faculty development program for non-teaching faculty organized under scheme for Cyber Suraksha, 11 <sup>th</sup> March, 2021	Non-teaching staff from all the departments
3	• Instrument maintenance training for non-teaching staff organized under scheme by WRIC, University of Mumbai, 10 <sup>TH</sup> to 16 <sup>TH</sup> February, 2021	Non-teaching staff of college
4	• First aid training – Interdisciplinary	Entire Zoology Staff

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5	• Python workshop and training on MATLAB, MAPLE	Mathematics and statistics faculty
6	• One day online workshop on "SOLAR: The Renewable Energy Resource" Dr. Sudesh Bhagwat, Solar PV specialist, Expert DABS (ADB funded project) (6 <sup>th</sup> March, 2021)	All physics faculty
7	• Online One-Day Workshop on Chromatography & UV-VIS, IR Spectroscopy (13 <sup>th</sup> March 2021, 9:30 AM – 5:30 PM)	All Science Faculty

**9.(10) – Exhibitions/seminars/training courses conducted:**

Prior support (2018-19) very few interdisciplinary National level Training programs were hosted by science departments. The grant has facilitated various exhibitions, Interdisciplinary seminar and training sessions through fostering associations, linkages and collaborations. The details are enlisted in the following table:

S.No.	Detail of Exhibition/training/Seminar with the Name of Department(s)	Resource Person(s)	No. of Beneficiaries
1.	4 – Days Intercollege Training and Workshop on Innovation Mindset for Lab to Land Time: 7:00 p.m. to 9:00 p.m., Online Platform: Google meet, Date: 30 <sup>th</sup> October to 5 <sup>th</sup> November 2020	Mirza Faizan and Mirza Rizwan, discoverSTEM, LLC, USA	42
2.	Training of College Teachers as Assistant Innovators 28 <sup>th</sup> October 2020	Training of College Teachers as Assistant Innovators 28 <sup>th</sup> October 2020	14
3.	One – Week Intercollege Workshop in Molecular Biology and Genetic Engineering. Time: 3:00 p.m. to 5:00 p.m., Online Platform: BlueJeans, Date: 22 <sup>nd</sup> to 26 <sup>th</sup> March 2021	Dr. Ankur Gautum MERCK High-End Skill Development Centre, IMTech, Chandigarh	300
4.	Online Flow Cytometry Course Multicolor Flow cytometry: Principles, Experimental designing and Data Analysis Time: 2:00 p.m. to 6:00 p.m., Online Platform: Zoom Date: 10 <sup>th</sup> – 20 <sup>th</sup> December, 2020	Dr. Hemant Agrawal Director, Flowcytometry Solutions (FlowSols) Pvt. Ltd., India	150 students of UG and PG Biotech & Faculty 50 students of FYBSc and SYBSc
5.	Yeast Two Hybrid Systems: Studying Molecular Interactions Within the Cells Session 1 –27 <sup>th</sup> Feb. 2021 – 6:30 p.m. to 8:00 p.m. Session 2 –28 <sup>th</sup> Feb. 2021 – 5:00 p.m. to 7:00 p.m.	Dr. Hashim Reza, Research Associate, Jawaharlal Nehru Centre For Advanced Scientific Research (JNCASR), Bengaluru	90 students of UG and PG Biotech & 5 faculty
6.	Online training on Intellectual property right (IPR) 22 <sup>nd</sup> February, 2021	Dr. Ashwini Sandu, Strategic IP Advisor with iTAG Business Solutions	100
7.	Hydroponics Workshop 25 <sup>th</sup> March, 2021	Dr. Shubham, Merck high end innovation Laboratory, IMTECH, Chandigarh	125
8.	Use of Foldscope 22 <sup>nd</sup> February, 2021	Mr. Kiran Chakral, Assistant professor, Viva College	60
9.	Workshop on Scientific Photography 15 <sup>th</sup> February, 2021	Mr. Hensel Rodrigues, Assistant professor, Viva College	60
10.	Cyber Suraksha: An awareness session on cyber crimes for the support staff of the college.	Ankit Joshi Cybernetics Pvt. Ltd.	110
11.	National level Lecture Series on Frontiers in Botany:		

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i.	Chemotaxonomy and Bioprospecting	Dr. M. Daniel, Managing Director, Daniel's Laboratory, Baroda	90 (55 Teachers + 05 Research Students + 30 UG Students) from 7 states of India
ii.	Current Developments in Indian Lichenological Research	Dr. D. K. Upreti Former Director & Chief Scientist, NBRI, Lucknow	
iii.	Ethnobotany	Dr. A. K. Jain S. K. Jain Institute of Ethnobiology, Lucknow	
	How to read scientific literature MANAV- The Human Atlas Initiative: Training and Project Awareness Session	Dr. DharaLakhkar has Ph.D. from New York Medical, College, New York, USA. & IISER Pune	205 UG students 12 Faculty
	Orientation session on Rainwater Harvesting	Dr. Umesh Mundlye Director, OIKOS Group of Companies (Environment Management), Pune	58 (30 UG+5 research scholars+23 Faculty)
	Flow Cytometry Lecture	Dr. Hemant Agrawal & Dr. VijendraShekhawat	97
15.	Career in Science	Dr. Hemant Agrawal & Dr. VijendraShekhawat	151
16.	Biodegradable Sulfate Free Natural Pigments Handwash Preparation And Distribution	Dr. Mona Kejariwal, Mrs. Rashmy Pandey and student team	Presented to BMC corporator and other dignitaries by students
17.	2021-Herbal Calender: A 2021 Calendar has been prepared for 32 immune boosting herbs as per seasonal dietary requirement from Ayurveda	Edited by Dr. Mona Kejariwal and a team of 32 SYBSC Students	Circulated amongst more than 500 individuals in India and other countries.
18.	Workshop On Python – 4 sessions conducted February 20 <sup>th</sup> & 27 <sup>th</sup> and March 06 <sup>th</sup> & 13 <sup>th</sup> , 2021 Time: 3.00 pm to 5.00 pm	Mr. Gundappa Gavandi (Data Scientist, Datamatics Global Services Pvt Ltd, Mumbai)	90
19.	LabVIEW Basics Training – Online 2 <sup>nd</sup> June, 2020 to 4 <sup>th</sup> June, 2020	Mr. Pradeep Nair (Alumni), Managing Director, Blauplug Innovations & Team	65 UG & PG of 07 Colleges & 20 teachers
20.	Half day session on “How to use various software to create experiments for Virtual Lab” – 26 <sup>th</sup> December, 2020	Prof. Vidula Kulkarni, Associate Professor, Vidyalankar College	60 UG Junior College and 18 faculty members
21.	One day online workshop on “SOLAR: The Renewable	Dr. Sudesh Bhagwat Solar PV specialist Expert DABS	120 UG students
22.	Interdisciplinary Training Workshop on Maintenance and Repair of Laboratory Equipments in association with Western Regional Instrumentation Centre (WRIC) 8 <sup>th</sup> Feb. to 12 <sup>th</sup> Feb., 2021	Resource Persons (WRIC, Mumbai): Mr. N. N. Rao, (Co-ordinator) Ms. Sunita Batra, Mr. Govind Chitte, Ms. Sarita Thopte, Ms. Minal Tamankar, Ms. Asmita Newaskar, Mr. Swapnil Jadhav, Mr. Sudhir Kumar, Mr. Millind Sidruk, Mr. Devendra Gunde Mr. Gauresh Gunde	36 Non-teaching Staff from science 12epts.. Including IT and CS
23.	Career in DRDO 14/06/2020	Dr. Raj Bazil, Scientist F, DRDO, India	70 UG students 7 faculty
24.	How To Write Research Proposal At Undergraduate	Dr. Meenakshi Gurav: Associate	83 students

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**Annual Progress Report of DBT STAR SCHEME (2020-21)**

Supported by Department of Biotechnology (DBT), Government of India

	Level 15/03/2021	Professor, D. G. Ruparel College	6 faculty
25.	Nature in the City on 12/03/2021	Mr. Anand Pendharkar Ms. Amruta Padgaonkar	78 students 4 faculty
26.	Understanding Invertebrates 16/03/2021	Mr. Anand Pendharkar Ms. Amruta Padgaonkar	81 students 4 faculty
27.	Spinal Connection 18/03/202	Mr. Anand Pendharkar Ms. Amruta Padgaonkar	78 students 4 faculty
28.	How to be a Discoverer Friday 26/03/2021	Mr. Anand Pendharkar Ms. Amruta Padgaonkar	72 students 4 faculty
29.	Photography as a Skill for Research & Documentation Wednesday 31/03/2021	Mr. Saurabh Sawant (Founder: Tethys Creation & Expedition)	30 students 4 faculty

**9.(11) – Books/journals subscribed from grants:**

Following is the list of books procured for the year 2020-21 by all the departments. The departmental libraries are flourishing with addition of significant literature in form of reference books, journals, resource books, laboratory manuals, experimental handbooks etc.

S.No.	Title of Book	No. of Copies	Cost (Rs.)
<b>Department of Biotechnology</b>			
1	Molecular Biology of the Cell	01 copy	3846.15
2	Physical Biochemistry: Principles and Applications	01 copy	6704.1
3	The Cell: A Molecular Approach -	01 copy	5600
4	Guyton and Hall Textbook of Medical Physiology -	01 copy	2306.15
5	Biostatistics: The Bare Essentials	01 copy	2621.25
6	Bioinformatics: Sequence and Genome Analysis	01 copy	1478.1
7	Immunology by David Male	01 copy	2306.15
8	Microarray Bioinformatics	01 copy	962.5
9	Culture of Animal Cells: A Manual of Basic Techniques	01 copy	5986.704
<b>Department of Botany</b>			
1	Fungi of India	01 copy	2450
2	Manual of Ethnobotany	01 copy	850
3	Flavouring and Fragrant Resources of India	01 copy	1450
4	Analytical Methods for Medicinal Plants and Economic Botany	2 copies	3900
5	Useful Herbs of Planet Earth	2 copies	4900
6	Natural Dyes : Scope & Challenges	2 copies	3700
7	Medicinal Plants of Bombay Presidency	01 copy	1850
8	Leafy and Edible plants of North – East India	01 copy	850
9	Identification of The Larger Fungi	01 copy	1750
10	Bulbous and Rhizomatous Plants	01 copy	1995
11	Biodiversity Traditional Knowledge Intellectual Property Right	01 copy	2450
12	Journal of Economics & Taxonomic Botany ISSN-0250-9768 UGC Approved 2020	Annual subscription	9,900
<b>Department of Chemistry</b>			
1	Textbook Of Pericyclic Reactions : Concept And Application (Pb)	01 copy	351.00
2	Organic Synthesis Through Disconnection Approach 2 <sup>nd</sup> Revised Edition (Pb)	01 copy	409.50
3	Catalysis : Principles & Basic Concepts {Pb}	01 copy	464.10
4	Water Chemistry (Pb)	01 copy	1010.10
5	Chromatographic Separations (Pb)	01 copy	2414.10
6	Solid State Chemistry	01 copy	2376.90

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7	Advanced Inorganic Chemistry	01 copy	2691.00
8	Concepts and Models of Inorganic Chemistry	01 copy	3081.00
9	Advanced Organic Chemistry Part A	01 copy	4755.80
10	Advanced Organic Chemistry Part B	01 copy	4755.80
11	March's Advanced Organic Chemistry: Reactions, Mechanisms and Structure	01 copy	3896.10
12	Mechanism in Organic Chemistry	01 copy	1131.00
13	Modern Methods of Organic Synthesis	01 copy	741.00
14	Spectrometric Identification of Organic Compounds	01 copy	3896.10
15	Name Reactions	01 copy	7473.80
16	Fundamentals of Analytical Chemistry	01 copy	975.00
17	3000 Solved Problems In Chemistry: Schaum's Outline	01 copy	1521.00
18	Instrumental Methods of Analysis	01 copy	741.00
19	Stereochemistry of organic Compounds	01 copy	440.00
20	Organic reaction and their Mechanism	01 copy	479.20
21	Quantum chemistry	01 copy	380.00
22	Organometallic compounds –A unified approach	01 copy	380.00
23	Stereochemistry conformations and mechanism	01 copy	380.00
24	International Journal of Pure & Applied Chemistry	4 issues	4500
25	International Journal of Wastewater Treatment and Green Chemistry (IJWTGC)	2 issues	3600
26	International Journal of Applied Chemistry	2 issues	3600
27	Journal of Modern Chemistry & Chemical Technology	2 issues	4500
28	International Journal of Analytical and Applied Chemistry (JP)	2 issues	3600
<b>Department of Physics</b>			
1	Understanding Physics (Student Guide)	01 copy	1160
2	Semiconductor Physics: An Introduction	01 copy	1020
3	3000 Solved Problems in Physics (Schaum Outline Series)	01 copy	980
4	Selected Problems in Physics (Dover Books on Physics)	01 copy	879.2
5	Introduction to Mathematical Physics	01 copy	1560
6	Schaum's Outline Of Mathematics For Physics Students	01 copy	740
7	Engineering Practical Physics	01 copy	177.1
8	Quantum Mechanics (Pb 2019)	01 copy	396.55
9	Elements Of Nuclear Theory	01 copy	396.55
10	Introduction To Quantum Mechanics With Applications To Chemistry	01 copy	458.51
11	Data Reduction And Error Analysis For The Physical Sciences 3 <sup>rd</sup>	01 copy	654.5
12	Optics And Modern Physics For JEE (Advanced)	01 copy	720
13	33 Years Neet-Aipmt Chapterwise Solutions – Physics 2020	01 copy	280
14	71 JEE Main Physics Online (2020 – 2012) & Offline (2018 – 2002) Chapterwise + Topicwise Solved Papers 4 <sup>th</sup> Edition	01 copy	420
15	From Astronomy to Astrophysics: An International Journal (FAA)	2 issues	3400
16	Indian Journal of Physics and Applications	2 issues	3400
17	Indian Journal of Materials Physics	2 issues	3400
18	International Journal of Physics(IJPG)	2 issues	3400
19	Asian Journal of Pure and Applied Physics	2 issues	3400
<b>Department of Zoology</b>			
1	Fish Biology	01 copy	8709.6
2	New Frontiers in Zoology	01 copy	8709.6
3	Vertebrates: Comparative Anatomy, Function, Evolution	01 copy	7087.5
4	Marine Ecology and Biodiversity	01 copy	6300
5	Collection to Preservation Techniques INSECTS A Field Handbook	01 copy	5118.75
6	Quantitative Zoology: Revised Edition (English) Revised Edition	01 copy	2117.24
7	Animal Biology: Taxonomy, Anatomy and Physiology	01 copy	1496.25
8	Animal Genetics: Epigenetics and Chromatin	01 copy	1496.25
9	Invertebrate Reproduction and Development	01 copy	1496.25
10	Mammalogy: Adaptation, Diversity and Ecology	01 copy	1496.25

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11	FISH PATHOLOGY 4ED (PB 2016)	01 copy	1196.25
12	Animal Physiology, 5/Ed {Pb}	01 copy	712.5
13	Animal Cell Culture & Technology, 2Ed (Pb)	01 copy	671.25
14	Animal Behaviour (Pb 2018)	01 copy	543.75
15	Animal Nutrition And Immunity (Pb 2020)	01 copy	412.5
16	Handbook Of General Animal Nutrition (Pb-2015)	01 copy	386.25
17	Handbook Of Wild And Zoo Animals (Pb 2015)	01 copy	273.75
18	A Dictionary Of Zoology (Pb 2004 )	01 copy	251.25
19	Zoology: Textbook For Schools	01 copy	120

**Department of Mathematics and Statistics**

Nil: Department had purchased books in the previous year, more books will be procured in the following year 2021-22.

**9 (12). Outreach activities:**

Prior to DBT Support (2018-19) all science department used to have Annual festival for popularization of basic sciences but after DBT support this has extended to various popular lectures/workshops/training of faculty/students/villagers of adopted village across India even in lockdown period. The details are as follows for 2020-21:

S.No.	Details of popular lecture/workshop/ training	Resource Person	Students Class No. & Beneficiaries
<b>Department of Biotechnology</b>			
1.	Introduction to Flow Cytometry	Dr. Hemant Agrawal & Dr. Vijendra Shekhawat	97 across Mumbai
2.	Career in Science	Dr. Hemant Agrawal & Dr. Vijendra Shekhawat	151 across Mumbai
3.	Question Bank of Biotechnology with more than 6000 MCQs	Biotech faculty	100 FY, SY and TYBSc students of Biotechnology
4.	Provided downloaded teaching material from online resources like <b>Diksha</b>	Biotech faculty	60 Children of adopted village in govt school Pansai (Karajcwadi)
5.	Online Awareness Campaign of AIDS using social media and recording shares, likes, comments, reposts etc. (Dec. 2020)	Biotech faculty	35 students of FYBSc Biotech
6.	Online Awareness Campaign on Child Sexual Abuse using social media and recording shares, likes, comments, reposts etc. (Dec. 2020)	Biotech faculty	35 students of FYBSc Biotech
7.	Online Awareness Campaign on Drug Abuse using social media and recording shares, likes, comments, reposts etc. (Dec. 2020)	Biotech faculty	35 students of FYBSc Biotech
<b>Department of Botany</b>			
1.	Chemotaxonomy and Bioprospecting Current Developments in Indian Lichenological Research Ethnobotany	Dr. M. Daniel, Managing Director Daniel's Laboratory, Baroda Dr. D. K. Upreti Former Director & Chief Scientist, NBRI, Lucknow Dr. A. K. Jain S. K. Jain Institute of Ethnobiology, Lucknow	90 (55 Teachers+ 05 Research Students+ 30 Undergraduate Students)
2.	How to read scientific literature, MANAV- The	Dr. DharaLakshkar has Ph.D. from	205

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	Human Atlas Initiative: Training and Project Awareness Session *College has been given appreciation certificate for the same	New York Medical, College, New York, USA. & IISER Pune	(FY+SY+TY+Faculty from our college and other colleges)
3.	Orientation session on Rainwater Harvesting	Dr. Umesh Mundlye Director, OIKOS Group of Companies (Environment Management), Pune	58 (30 UG students, 5 research scholars, 23 Faculty)
4.	Establishment of Nursery for vegetable and tree species saplings and plant propagation techniques for mitigation Nutritional Poverty	Dr. Vijendra Shekhawat	Adopted village farmers and locals, Indapur, Raigad, Maharashtra
5.	Biodegradable sulfate free natural pigments handwash distribution	Dr. Mona Kejariwal, Mrs. Rashmy Pandey and student team	Presented to BMC cooperator and other dignitaries by students
6.	Celebration of ARMY DAY	A Google form designed by FYBSC BOTANY students	65 students attended the quiz
7.	NEEV: An yearly E-Newsletter is published jointly by the Department of Botany & The Nature Club	Edited by Dr. Suchandra Dutta	The newsletter is electronically circulated amongst more than 500 people in India and other countries.

**Department of Chemistry**

1.	National level webinar on Ongoing Strategies for Drug Designing for Covid-19	1. Prof. Dr. A. D. Sawant Former V.C. Mumbai university 2. Dr. Urmila Joshi Principal, K. M Kundnani College of Pharmacy, Mumbai 3. Dr. Rupali Tasgaonkar Principal, Tasgaonkar Institute of Pharmacy, Karjat, MS 4. Dr. Anthony Melvin Crasto Principal Scientist, Glenmark	250 students of college
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**Department of Physics**

1.	Interdisciplinary Training Workshop on Maintenance and Repair of Laboratory Equipments Regional Instrumentation Centre (WRIC) supported by IQAC (8 <sup>th</sup> Feb., 2021 to 12 <sup>th</sup> Feb., 2021)	Resource Persons (WRIC, Mumbai): Mr. N. N. Rao, (Co-ordinator) Ms. Sunita Batra, Mr. Govind Chitte, Ms. Sarita Thopte, Ms. Minal Tamankar, Ms. Asmita Newaskar, Mr. Swapnil Jadhav Mr. Sudhir Kumar, Mr. Millind Sidruk, Mr. Devendra Gunde Mr. Gauresh Gunde)	26 Support Staff (Non Teaching laboratory staff) of Departments of Physics, Chemistry, Botany, Zoology, Biotechnology
2.	Energy Audit of Babasaheb Gawde Institute of Management Studies Mumbai Central - 400 008	10 Students of TYBSc + 1 Teaching staff	R. D. National College, on Electrical Energy audit of Educational Institutions
3.	Career in DRDO - (14/06/2020)	Dr. Raj Bazil, Scientist F, DRDO, India	70 students from Degree College, R. D. National College & 10 Faculty from Colleges across Mumbai
4.	How To Write Research Proposal At	Dr. Meenakshi Gurav: Associate	83 students from

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	Undergraduate Level – (15/03/2021)	Professor, D. G. Ruparel College	TYBSc, MSc Physics, Chemistry and Biotechnology 06 Staff members from Physics, Chemistry, Biotech and IT
5.	Asteroid search is being carried under the INTERNATIONAL ASTERIOD SEARCH COLLABORATION (IASC) funded by NASA. Using software detect the moving objects in space and maintain a record of the same. Searching & finding the preliminary objects, of the Near-Earth Orbits and farther ones.	MARS INDIA OBSERVATORY, consisting of Amateur Astronomers Enthusiasts,. In association with a foreign agency IASC (International Astronomical Search Collaboration)	18 students and 1 faculty member participated in this event in the month of march and successfully listed 15 objects as preliminary detections under their name.
6.	Participation of students in in Envisage 2021 An online Conference held by BAF Dept.	1 Student of TYBSc won Second Place in paper presentation	10 TYBSc students of physics.
<b>Department of Zoology</b>			
1.	Learning Lessons from Nature	Dr Parvish Pandya (Consultant Vice – President – HR with Davé Law Group, USA. Consultant- Sanctuary Nature Foundation , Director- Science & Conservation Former Vice-Principal & Associate Professor in Zoology) on 16th February 2021	58 FYBSc/SYBSc students. + Faculty
<b>Department of Mathematics &amp; Statistics</b>			
1.	Workshop on Python	Mr. Gundappa Gavandi (Data Scientist, Datamatics Global Services Pvt Ltd, Mumbai)	150 students and faculty

### 9. (13) - Colleges mentored to apply for DBT Star College grants:

This is the second year of grant so college is taking mentoring from the institutions having star status scheme. However, the process has been shared with other college as follows:

S.No.	Name of College Mentored	Name of the mentor	Date & Place
1.	Doongarsee Gangjee Ruparel College, Senapati Bapat Marg Mahim, Mumbai 400016 Maharashtra, India	Dr. Mona Kejariwal	January, 2021 (online)
2.	Patkar-Varde College, S. V. Road, Goregaon (West), Mumbai - 400062	Dr. Mona Kejariwal	3 <sup>rd</sup> February, 2021 (Through phone)

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**9.(14) - Invited Lectures:**

Prior to DBT Support (2018-19) all science department used to arrange one guest lecture per semester which has increased significantly after the support enlisted as following (2020-21):

S.No.	Detail of Invited Lecture	Resource Person	Students/Class No. & Beneficiaries
<b>Department of Biotechnology</b>			
1.	Messing With The Signals – A Small Aspect Of How <i>Mycobacterium tuberculosis</i> comes around host signal transduction	Dr. Sarita Kamat, Research Associate, Homi Bhabha Centre for Science Education, TIFR Date: July 3, 2020	All biotechnology student
2.	Yeast Two Hybrid Systems: Studying Molecular Interactions Within the Cells <b>Day and Date:</b> Session 1 - Saturday 27th Feb. 2021 Session 2 - Sunday 28th Feb. 2021	Dr. Hashim Reza, Research Associate, Jawaharlal Nehru Centre For Advanced Scientific Research (JNCASR), Bengaluru	87 faculty and students
3.	Flow Cytometry and Its Applications	Dr. Hemant Agrawal, Director, Flowcytometry Solutions (FlowSols) Pvt. Ltd., India Date: June 16 <sup>th</sup> 2020	100 faculty and students
4.	How to be Successful in Science?	Dr. Hemant Agrawal, Director, Flowcytometry Solutions (FlowSols) Pvt. Ltd., India Date: June 18 <sup>th</sup> 2020	100 faculty and students
<b>Department of Botany</b>			
1.	In quest of inculcating creativity and Innovation along with New Education Policy	Dr. Arun Pratap Sikarwar, Dayalbaugh education Institute, Agra, India	65 faculty and students
2.	Basic of Molecular Biology: Practical approach	Dr. Ankur Gautam, Merck High-end Innovation lab, Chandigarh, India	115 faculty and students
3.	Role of Microbes in the Today's world	Dr. Janhavi Raut, Director, Unilever Research, Bangalore and Industrial Society for Chemicals	100 (FY+ SY Botany & Biotechnology Students) + 15 Industrial Society for chemicals Members
4.	Molecular Taxonomy & DNA Barcoding- Concepts, Methods & Application	Dr. Arun Pandey, Vice Chancellor, Mansarovar Global University, M.P	2082 participants (Botany students, faculty, scientists, research scholars) from 20 states of India
5.	Costa Rica – A Biodiversity Hotspot: - On 25th May, 2020	Dr. Werner Huber, Department of Botany, University of Vienna, Austria	650 students, Faculty & Researchers and Naturalists from 10 different states of India
<b>Department of Chemistry</b>			
1.	Lecture on Organic Chemistry Practicals Date: April 13th, 2021	Dr. Rajesh Masurkar, Rizvi College Bandra(W)	All chemistry students
2.	Basics of Conductometry and its Applications Date: April 7th, 2021	Dr. Amol Kharche, Tasgaonkar College of Engineering	All chemistry students
3.	Advance practical's of Physical and analytical Chemistry	Dr. Harishchandra Parbat, Assistant Professor,	All chemistry students

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	Date: April 10 <sup>th</sup> , 2021	Wilson College, Mumbai	
4.	Lecture on Laboratory Safety 10 March, 2021	Mr. Vikas Yadav Research Scholar, Ruia College, Dadar	All chemistry students
<b>Department of Physics</b>			
1.	Industrial applications of Color Physics 5 <sup>th</sup> September, 2020	Dr. Amit Joshi, Chief Manager · Asian Paints	10 Teachers, 140 Students from Physics, Chemistry, Maths & Statistics
2.	Dye Sensitized Solar Cell 15 <sup>th</sup> June, 2020	Dr. Suraj Soman Scientist, Council of Scientific & Industrial Research (CSIR), Ministry of Science and Technology, Govt of India, Thiruvananthapuram	Online Webinar 60 students and 15 Teachers from Colleges of Mumbai
3.	Applications of Particle Accelerator 2 <sup>nd</sup> June, 2020	Dr. Naresh D Research Scientist, University of Louisiana, US	Online International Webinar Series 39 students and 15 Teachers from Colleges of Mumbai
4.	X-ray diffraction & its industrial applications 6 <sup>th</sup> June, 2020	Dr. Sandeep Nagar PhD in Malvern Panalytical as an application specialist	Online International Webinar Series, 60 students and 12 Teachers from Colleges of Mumbai
5.	Real life applications of Neural Network: 3D Audio AI 7 <sup>th</sup> June, 2020	Nikhil Javeri Research Engineer, USC, Los Angeles	Online International Webinar Series 60 students and 15 Teachers from Colleges of Mumbai
6.	Atomic Force Microscopy 13 <sup>th</sup> June, 2020	Dr. Sujit Kumar Dora Research Scientist Institute of Experimental & Applied Physics, Kiel University Germany, Manager, Nanosurf, Switzerland	Online International Webinar Series 60 students and 15 Teachers from Colleges of Mumbai
7.	Use of Virtual Lab Platform 26 <sup>th</sup> December, 2020	Prof. Geetha Narayan Thekkedath Head of Department, Oriental Institute	Online International Webinar Series 60 students and 15 Teachers from Colleges of Mumbai
<b>Department of Zoology</b>			
1.	Gardening for Butterflies (Scientific approach towards selecting National Butterfly) – Interdisciplinary in collaboration with The Nature Club, RDNC on 28 <sup>th</sup> Sept, 2020	Mr. Isaac Kehimkar (iNaturewatch Foundation)	82 students
2.	Introduction to Habitats on 12 <sup>th</sup> March 2021	Mr Anand Pendharkar (Wildlife Biologist & CEO, SPROUTS)	78 Zoology students
3.	Introduction to Invertebrates 16 <sup>th</sup> March 2021	Ms Amruta Padgaonkar (MSc. Wildlife Conservation & Management, Associate Educator -	81 Zoology students
<b>Department of Mathematics and Statistics</b>			
1.	A Guest Lecture on 'History of Indian Mathematics' on 24 <sup>th</sup> February 2021.	Prof. Salil Sawarka of Smt Chandibai Himathmal Mansukhani College, Thane District, Ulhasnagar, Maharashtra - 421003	95 Mathematics and Statistics UG students

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## 10. Self-evaluation

Departments	Objectives (1-5) % (achieved)	Reasons for underachievement / If achieved, state in quantitative metrics
<b>(I). To create and strengthen the existing academic and physical infrastructure for achieving excellence in teaching and learning.</b>		
BOTANY	(2/2) 100%	Online Training imparted to UG students in foundation of core lab skills in following areas Basic Molecular and Genetic engineering, E-herbarium making, Leaf Morphology parameters, Bioenzyme, microgreens and herbal cosmetics preparations
BIOTECHNOLOGY	(1.6/2) 80%	The Covid-19 pandemic could have hit the teaching learning process but the scheme has given enough opportunities to the department to enhance the process through conducting online guest lectures, training sessions and field visits. Purchase of software-based tools has helped in delivery of curricular and extracurricular content with much ease and comfort.
CHEMISTRY	(1.6/2) 80%	The pandemic bought a difficult scenario to the teaching process, but with the help of the scheme the department was able to hold guest lectures, workshops training sessions online.
MATHEMATICS & STATISTICS	(1.6/2) 60%	Despite pandemic, department Lab is ready and available from this year. Once college reopens in offline mode the department can start making use of it.
PHYSICS	(2/2) 100%	Invited talks by eminent International & National guest speakers, scientists on various branches & applications of Physics in the fields of Physics like material science, color Physics, Characterization techniques, electricity and electronics.
ZOOLOGY	(2/2) 100%	All consumables were purchased as per practical mentioned in projects.
<b>(II). To adopt experiential learning as part of teaching process to stimulate original thinking through 'hands-on' exposure to experimental work and participation in summer schools.</b>		
BOTANY	(2/2) 100%	Training imparted in Innovative mind set to ignite ideas and implement them in start-ups: 195 Beneficiaries were trained by International mentors. Undertaken field projects by the students following COVID Protocols to ignite interest on basic aspects of field botany among undergraduate students which are reviewed by international experts from the field
BIOTECHNOLOGY	(1.4/2) 70%	The scheme has also motivated the teachers to employ innovative methods to circumvent the challenges of online teaching through the tools that can be procured with the help of the scheme.
CHEMISTRY	(1.6/2) 80%	The guest lecturers ,workshops and training programs, have provided new insight and help raise awareness on current ongoing topics like the pandemic, renewable source of energy etc.
MATHEMATICS & STATISTICS	(1.2/100) 60%	Mathematical models and high end software were purchased and demo practical were taken which will all lots of hands on experience to the subject.
PHYSICS	(2/2) 100%	To improve proficiency in teaching and research activities like the two day Faculty Improvement Program on 'Innovative Experiments Using Open Source Resources for UG Physics Students' in collaboration with UGC-DAE Consortium for Scientific Research, Kolkata Centre, Created digital repository of various UG experiments.
BOTANY	(2/2) 100%	Since lockdown virtual activities for knowledge imparting, curriculum enrichment, training and skill development were conducted such Photography skill development, Biodiversity study and creating awareness about Biodiversity conservation. All interactive activities such as Quiz, Cross word, Films were used to build inquisitiveness in the Youth. Virtual Tour of Bhandup Pumping Station, Mumbai & Juhu Beach was organized to expose

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students to marine & avi fauna and build Analysis skills to make any Environmental Assessment Report.

**(III). To create facility for In-house internships which can be further extended for summer trainings and internship outside.**

<b>BOTANY</b>	<b>(1.6/2) 80%</b>	First-hand experience the following areas: Different Ecological niche, Relevant agro-based industries, research Institute of national repute, Reserve Forest. Industry connect with industry professionals like Merck High-end Innovation lab, DiscoverSTEM USA, NABI, CIAB, DBT, INDIA, Mangrove Foundation, Mumbai, Natural History Museum, London, Arizona State University, USA, Still lot of scope is remaining to connect student with plant science based industries.
<b>BIOTECHNOLOGY</b>	<b>(1.6/2) 80%</b>	Collaborative efforts could be sought with different colleges under the scheme in order to conduct high quality training workshops, which were otherwise difficult to organize.
<b>CHEMISTRY</b>	<b>(1.6/2) 80%</b>	Collaboration with different departments, industries and government bodies was made more accessible due to the scheme. The scheme has given opportunity to procure expensive reference books and Science Journals necessary tools for enhance scientific knowledge.
<b>MATHEMATICS &amp; STATISTICS</b>	<b>(1.6/2) 80%</b>	Department will further coordinate with other department for survey based projects
<b>PHYSICS</b>	<b>(1.6/2) 80%</b>	7 projects have been sent for the State Level Interuniversity Scientific Competition – AVISHKAR at the Zonal Level. One student won the second Place in ENVISAGE 2021 inspite of pandemic. General Physics Lab was done on virtual lab.
<b>ZOOLOGY</b>	<b>(1.0/2) 50%</b>	In house internship was stalled due to Covid Lockdown but Online Internships at various organizations was being sought.

**(IV). To conduct specialized training programs for faculty improvement for teaching and non-teaching staff optimizing technical capabilities**

<b>BOTANY</b>	<b>(2/2) 100%</b>	National level lecture series in the area of chemotaxonomy, ethnobotany and Lichen biology, Virtual trip to NABI and CIAB , DBT, India institution through online videos. Ongoing Minor Research projects in Algae and Fungi, Upcoming activities like establishment of Medicinal and Nutritional plant garden, engagement of non-teaching staff in collection, identification and preservation of samples
<b>BIOTECHNOLOGY</b>	<b>(1.4/2) 70%</b>	Faculty can receive more specialized training to impart technical knowledge to students. Technical training to non-teaching staff for handling chemicals is needed
<b>CHEMISTRY</b>	<b>(1.6/2) 80%</b>	Safe handling of chemical, fire safety training were imparted, more practical session are needed
<b>MATHEMATICS &amp; STATISTICS</b>	<b>(1/2) 50%</b>	The activities only conducted online and hence has restrictions.
<b>PHYSICS</b>	<b>(2/2) 100%</b>	To improve proficiency in teaching and research activities like Virtual Lab Training with IIT, Mumbai & LabView Training, Created digital repository of various UG & PG experiments, Use of Wacom Digi Pen Tab during the COVID period has helped improving online teaching. Workshops on SOLAR, Virtual Lab & Workshop on Maintenance and Repair of Laboratory Equipment for laboratory staff have equipped the students and Staff (teaching & Non teaching) with a lot of skills.

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**ZOOLOGY** (2/2) 100% Use of various methods like quiz, crosswords, word search, etc to improve teaching skills. First Aid workshop for Teaching and Non-teaching staff.

**(V). Development of Academic resources under the DBT STAR Grant.**

**BOTANY**

**BIOTECHNOLOGY**

**CHEMISTRY**

**MATHEMATICS &  
STATISTICS**

(1.2/2) 60%

**PHYSICS**

**ZOOLOGY**

- Addition of Downloaded papers, Archives, Research journal, science magazine, E-Herbarium, Practical manuals for all semesters, Herbal calendar 2021 is created by SYBSC students with immune boosting herbs to create awareness about the same, Pictorial student handbooks on field botany, yearly Newsletter "NEEV" featuring ethnobotany. Traditional knowledge and conservation of plant biodiversity,
- A comprehend Lab manual developed by WRIC for maintenance of instruments which has been uploaded on College website for all science departments.
- Students of Biotechnology were provided with a Question Bank of more than 6000 MCQs to acquaint with new pattern of semester exams and can be used to practice for competitive exams.
- FAQs, study material and study material from various online workshops were made available to all students for reference material.
- Scope of developing SOPs and lab-based manuals, Hand book, Scopus indexed Research papers etc.

**Overall matrix%: Objectives (1+2+3+4+5) = (86.66+85+75+83.33+60) = 77.998% = 78%**

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## Report Submission

*This is to state that the college has submitted the Annual Report on the DBT Activities today, on the 3<sup>rd</sup> May 2021, during the Annual Advisory Meeting of DBT Star College Scheme in the presence of the honorable advisors.*

*The college is thankful and grateful to the honorable advisors for their careful inspection and insightful suggestions, which will help in organizing various activities in the college in near future under the DBT Star College grant and making full utilization of the scheme.*

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