

Annexure I

1. Name of the College:

Ramniranjan Jhunjhunwala College of Arts, Science and Commerce

2. Status:

Govt. Aided College

3. Women's College or Co-educational:

Co-educational

4. Urban/Rural:

Rural

5. No. of departments supported:

Four

- Physics
- Chemistry
- Botany
- Zoology

6. NAAC Ranking + Year:

A Grade 2014 (CGPA 3.50)

7. Details of extramural funding received in the last 3 years:

Sr. No.	Academic Year	Project	Type (Major/Minor) and Funding Agency	Grant Amount Sanctioned	Status (Ongoing/ Completed)
1	2014-15	B.Voc	UGC	18,50,000/-	Ongoing
2.	2014-15	Ad Hoc Grant	UGC	28,95,000/-	Ongoing
3.	2014-15	Career oriented Courses	UGC	10,00,000/-	Ongoing
4.	2014-15	FIST Program	DST FIST	70,00,000	Ongoing
5.	2015-16	Analysis of Synchronization in Coupled Nonlinear Systems using Invariant Measures	Major DST	18,54,370/-	Ongoing

6.	2013-14	Disruption of microstructure of tea using exogenous enzymes	Hindustan Unilever project	13,02,/-000	On going
7.	2015-16	Maintenance and Analysis of Tea Culture	Hindustan Unilever project	1,50,000 /-	On going
8.	2014-15	Tree census and effective CO2 Sequestration at 'N ward, BMC' Mumbai region	Minor, UGC	2,00,000/-	Completed in 2015-16
9.	2014-15	Investigation and Evaluation of Haemostatic properties of some Ethnobotanicals	Minor U.G.C.	2,40,000/-	Completed in 2015-16
10.	2015-16	Forensic study of CNS drugs in food samples in duping cases by using TLC, HPTLC and HPLC.	Minor U.G.C.	2,85,000/-	Ongoing
11.	2015-16	Effect of solvent on micelles of binary surfactant systems	Minor U.G.C.	1,60,000/-	Ongoing

12.	2015-16	Synthesis, characterization & Evaluation of new triazole derivatives and evaluation of their antimicrobial activity	Minor U.G.C.	4,00,000/-	Ongoing
13.	2015-16	Improving Management and trade of ornamental fish keeping by early diagnosis and treatment of diseases"	Minor U.G.C.	2,35,000/-	Ongoing

8. No. of applicants vs No. of seats in each department:

For First year B Sc. 2000 applications are received for 480 seats

9. Number of students admitted year wise in different courses supported under the Star College Scheme:

Class	2015-16	2014-15
Physics	53	42
Chemistry	124	123
Botany	45	40
Zoology	43	48

10. Change in the cut off percentage/admission:

Cut off percentage is applicable at first year level

11. Change in the dropout rate:

There is negligible drop out

12. Data on pass percentage (UG level):

Stream	Total			Total			Total Passing		
	Appeared			Passed			Percentage		
	M	F	Total	M	F	Total	M	F	Total
Physics	25	17	42	7	7	14	28%	41%	33%
Chemistry	45	57	102	37	52	89	82%	91%	87%

Botany	9	29	38	5	23	28	56%	79%	74%
Zoology	5	43	48	4	38	42	80%	88%	88%

13. Data on how many students opted for PG courses:

- Chemistry 60 students
- Botany: 25 students
- Zoology: 25 students
- Physics: 5 students

Department of PHYSICS

14. List of additional practicals introduced

For T.Y.B.Sc.: Student beneficiaries: 42

1. Hands on training on instruments used for Synthesis of Nano-materials
2. Four Probe method for characterization of nano-materials
3. Low cost experiment for measuring Speed of Light
4. Detection and comparison of positive and negative crystals using Double Refraction

For S.Y. B.Sc.: Student beneficiaries: 111

1. Launching of light in an Optical Fiber
2. Determination of (i) Angle of Prism (ii) Wavelength of LASER using Laser Attached Spectrometer

For F.Y. B.Sc. : Student beneficiaries: 358

1. Newton's Rings with least aberration effects
2. Variation of intensity with distance using cylindrical wavefront.
3. Determination of low resistance using bridge network with Post Office Box
4. Characteristics of Solar Cell

15. List of minor projects implemented, name of students and supervisor

Nil

16. Faculty improvement activities such as training courses, seminars etc conducted and their impact

Workshop in Advanced Excel – Three days rigorous workshop for Teaching and Supporting Staff – Beneficiaries - 16

17. Outreach activities conducted and their impact/ follow-up

Following activities were open to students of all faculties and all subjects and also for junior college students along with Degree college students for the popularization of the subject:

1. **“Fun with Physics – For the students, By the students”**:Exhibition of Physics Experiments by 26 students of S.Y.B.Sc was arranged on 1st December 2015
[171 students and 14 staff members visited the exhibition] Experiments demonstrating principles of Optics such as 2D diffraction, Total Internal Reflection, Optical Phenomena Using Laser, Optical Illusion, principles and applications of electromagnetism such as Oersted Experiment, Faraday's laws, Magnetic Levitation, were demonstrated by the students. It helped the students to clear their basic understanding of these phenomena and they also learnt to explain their basics to other students.
2. **‘Mobile Planetarium’** was set up, in which many shows like ‘Secrets of the Sun’, ‘Black Holes’ were screened in mobile dome theatre arranged in Gymkhana of the College. 630 students + 30 staff members enjoyed the exciting experience of a mini planetarium on 2nd December 2015.
3. **“Physitech 2015-16”**- This festival was organized on 20th January 2016 by the Physics Department for the first time.
It included many interesting events:

[a] Poster Competition based on the themes 'Physics in Everyday Life', 'International Year of Light and 'Dr. A.P.J. Abdul Kalam' . Poster that bagged the first prize demonstrated how blood circulation process involves various concepts in physics related to fluids.

[b] Demonstration Experiments by T.Y. B.Sc. Students – Several interesting experiments with electronic circuit soldered by the students such as Water Level Indicator, Burglar Alarm for a Safe as well as experiments like Resonance Waves demonstration etc. were demonstrated. The participants learnt basic skills such as circuit building, trouble shooting and demonstrating different phenomena in Physics using simple instruments and techniques. The visitors on the other hand could understand the concepts and enjoyed the demonstrations.

[c] Games involving intellectual, numerical skills, promptness and steadiness were developed and arranged by students of T.Y.B.Sc. e.g. A conducting wire loop with non conducting handle was to be taken around a small current carrying wire having curves and bends without touching it. If touched, an alarm was heard. These ideas were greatly appreciated by the crowd visiting Physitech.

[31 students were involved in the demonstration experiments and in games whereas 16 students participated in the poster competition]

[Physitech attracted a crowd of about 200 student visitors and many staff members]

18. Any outstanding achievement by student/faculty (merit, award, research paper, presentation in national/international conference/ etc; full citation to be provided)

Dr. Neeta Srivastava

1. "Effect of Ca ion substitution on order disorder temperature in ole doped $\text{Ln}_{0.7}\text{Sr}_{0.3-x}\text{Ca}_x\text{MnO}_3$ nanomagnite"
Conf. proceedings-102nd Indian Science Congress, 3-7 Jan 2015
2. "Structural and Electrical Transport Properties of Solgel Prepared Nanostructured $\text{Nd}_{0.7}\text{Sr}_{0.3-x}\text{Ba}_x\text{MnO}_3$ ($0 \leq x \leq 0.3$)"
Conf. proceedings-27th Annual General Session of MRSI-North East Symposium, :Jorhat, February 18-20, 2016.
3. "Transport mechanism in sol-gel prepared $\text{Nd}_{0.7}\text{Sr}_{0.3-x}\text{Ba}_x\text{MnO}_3$ ($0 \leq x \leq 0.3$) nanomagnite"
Conf. proceedings-2nd International Conference on Magnetism and its Allication, February 28 – 3 March, 2016, Beijing, China .

Dr. Kiran Kolwankar

1. Kolwankar K. M., Separable Local Fractional Differential Equations, to appear in Fractals

Dr. Vaishali Raikwar

1. "Synthesis, Characterization and photoluminescence in novel Lead Calcium diborate doped with Mn^{2+} "
Optik-International Journal for Light and Electron Optics 126 (2015) 4813-4816

2. "Facile combustion derived $\text{LaPO}_4:\text{Eu}^{3+}$ nanosystem and its photoluminescence properties"
Indian Journal of Physics 90(1) (2016) 49-56.

19. List of Short term training courses/workshops conducted for students and faculty, including title, duration, no. of beneficiaries

Summer Course in Physics - Organized for students of S.Y.B.Sc. after their semester examinations – Student beneficiaries – 30, Duration : 5 Days

20. Guest Lectures (details like name of scientist, topic, no. of students)

1. Dr. Devayani Awade from G.N.Khalsa College delivered a lecture on "SSL: A New Era in Lighting ", to celebrate The International Year of Light – 2015. The lecture enlightened the students with the various LED manufacturing criteria using solid State Technology and the efforts for obtaining perfectly white LEDs.
2. Dr. Sarmistha Sahu, Associate Professor, Maharani Lakshmi Ammanni Science College for Women, Bangaluru, delivered a lecture on "Quantum Mechanics through Computational Physics" , for students of S.Y. B.Sc. and T.Y. B.Sc The lecture illustrated how the basic concepts of Quantum Mechanics emerged through data analysis and how graphical representation of the same using computers can help for better understanding of the topic.
3. Dr. Shirish Pathare, Homi Bhabha Centre for Science Education, delivered a continuation lecture, on 'Principles of Thermodynamics' in the premises on 19th March 2016.
4. Dr. Sudhir Jain, Shanti Swaroop Bhatnagar Awardee from BARC, delivered a lecture on 'Complex Systems' in which he explained the complexity of nature through simple phenomenon.

21. Visits to industries, institutes etc (name of place, duration of visit and no. of students)

1. A visit to Centre of Development of Advanced Computing [CDAC], Pune was organized for students of T.Y.B.Sc. [Physics] in September 2015 (45 students) The students gained the knowledge about the frontiers which our Indian Computing Research has conquered.
2. Visit to Homi Bhabha Center for Science Education was arranged for students participating in the Summer Course in Physics on 17th March 2016 (38 students). Thermodynamics is a topic, which the students learn theoretically but they got their understanding cleared through involvement in lecture and practical sessions at HBCSE. Concepts of Isothermal and Adiabatic processes, which are otherwise difficult to visualize, were explained using accurately designed experimental demonstrations.

22. List of Lab manuals/SOPs generated for all participating departments

- SOPs for F.Y.B.sc Practical Setup
- SOPs for S.Y.B.sc Practical Setup
- SOPs for T.Y.B.sc Practical Setup

23. Feedback mechanism adopted (to be indicated in term of how the quality of teaching and hands on training improved)

- Student feedback taken from students
- Teachers feedback after conducting Workshops

24. Any special innovative approach adopted by the college in improving the UG education

- Visit to C-DAC so that students get exposure to super computer
- Visit to HBCSE for innovative experimental techniques in physics
- Mobile Planetarium to introduce the students to COSMOS
- FUN with Physics and Physitech to give an opportunity to students to showcase their innovative projects.

25. A summary on “how the Scheme helped in strengthening of the UG education and what would not have been possible without this” (not more than 1000 characters)

During the year 2015-16 under the DBT Star College Scheme the Department of Physics organized various activities like, Guest lectures, Industrial visits, exhibition etc, to create an interest amongst the students and for the popularization of the subject. This would not have been possible without the scheme, one of the reasons being limitations of funds. Because of the scheme, the department could get the experimental set-ups necessary to exhibit several new experiments, extensions or modifications of existing experiments. These were performed by F.Y., S.Y.B.Sc. students having Physics as one of their subject of choice and T.Y.B.Sc. students graduating with Physics. This helped the students in gaining an insight in the theory and understanding the concepts better. Teaching and supporting staff of many departments also got the advantage of learning software that will help them in their administrative duties. Students of all the faculties could get a chance to see interesting physics experiments and astronomy shows.

26. Suggestions/feedback for improving the scheme

- The grant for instruments should be spread uniformly into three years.
- The amount of grant should be increased.

Department of Chemistry

14 List of additional practicals introduced

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A. For F.Y.B.Sc. Students

1.

Aim: Introduction to Indian Pharmacopoeia.

Purpose: Students were introduced to Indian Pharmacopoeia (I.P) Vol.-I, Vol-II and Vol-III, 2010 edition.

Outcome: Students became aware about the meaning of I.P & I.P. standards.

2.

Aim: Determination of the percentage purity of L.R. and A.R. grade Na_2CO_3 , by I.P. method.

Purpose: Students were made aware about the difference in purity of LR and AR grade chemicals. Na_2CO_3 being the most commonly used chemical in chemistry laboratory was selected for this purpose.

Outcome: Students understood the difference between the LR and AR grade chemicals and how to perform the assay by I.P method.

3.

Aim: To prepare solutions of different concentrations from the given stock solution.

Purpose: Usually the undergraduate students are supplied with the solution of known concentration for the regular practical. It was felt necessary to make the students aware of the concept and method of preparing a solution, of a required concentration from the given stock solution.

Outcome: Students first calculated the volume required for the preparation of solution. Then prepared the solution of the said concentration.

4. Aim: To check the concentration of various solutions, prepared by diluting stock solution, by titrating against primary standard.

Purpose: To make students aware about the concept of primary standard.

Outcome: Students acquired the skill of preparing primary standard solution & using this primary standard solution, they could calculate the concentration of the solutions prepared by dilution of stock solution.

B. For S.Y.B.Sc. students

1.

Aim: To synthesize Acetanilide from Aniline using Microwave

Purpose: Students have been exposed to newer methods of organic synthesis using a microwave.

Outcome: The product obtained showed higher yield, was prepared in a shorter time and consumed lesser energy compared to the conventional method.

2.

Aim: Assay of baking soda by Indian Pharmacopoeia (I.P.) method.

Purpose: The experiment is based on IP method of assay where a comparison was done between LR & AR grades of baking soda with respect to purity.

Outcome: The results obtained were in accordance with the expected values. The IP method gives an accurate analysis of purity of a given sample

3.

Aim: To Estimate amount of vitamin C in the given sample.

Purpose:

- (i) To prepare a sample solution of vitamin C from the given source
- (ii) To estimate the amount of vitamin C by using ceric ammonium sulphate.

Outcome: Students were made to understand the concept of standardization. The results obtained were matching with the expected value. This method is more superior to other available methods such as since it involves minimum experimental errors.

4.

Aim: To estimate the amount of lead in the given sample using EDTA.

Purpose: To understand formation of Pb – EDTA complex at acidic conditions using Hexamine. Xylenol orange was used as an indicator.

Outcome: A few metal – EDTA complexes are stable at acidic conditions. The amount of Pb obtained was compared with the available values obtained from various industrial effluent samples.

5.

Aim: To study the inversion of cane sugar solution using polarimeter.

Purpose: Students were introduced to digital polarimeter and made to understand the measurement of optical activity.

Outcome: The phenomenon of inversion of cane sugar was investigated by recording optical rotation at regular time intervals till the reaction mixture showed laevo rotation.

6.

Aim: To study the separation of Cu(II) and Fe(II) from a given mixture using solvent extraction.

Purpose: Students were introduced to the technique of solvent extraction using an aqueous and organic phase.

Outcome: Using ethyl acetate as organic phase it was possible to extract Fe(II) to the organic phase from the mixture, leaving Cu(II) in the aqueous phase. Each of metal ions were estimated by suitable methods. The experimental exercise was an attempt to expose students to application of chemistry in industries, w.r.t. solvent extraction technique.

C. For T.Y.B.Sc. students

1.

Aim: Separation of Ternary mixture.

Purpose: In T.Y.B.Sc syllabus students are performing separation of binary mixture. The objective was to introduce the concept of ternary mixture.

Outcome: Enhanced skill of separation techniques of organic components.

2.

Aim: Estimation of paracetamol by Indian Pharmacopoeia (I.P.) method.

Purpose: In T.Y.B.Sc syllabus students are learning structure, synthesis and therapeutic uses of paracetamol. The idea was to introduce estimation of drug.

Outcome: Students learn the concept that anilide group can be hydrolysed and further oxidized using ceric ammonium sulphate. Thus paracetamol can be estimated by this method given in I.P

3.

Aim: Condensation of benzaldehyde and aniline using microwave.

Purpose: Same experiment students performed in traditional way so comparative study of two methods could be achieved.

Outcome: Yield of both the experimental methods and energy requirements were compared. Importance of green method was established.

4.

Aim: Estimation of Pb^{2+} in the given effluent sample.

Purpose: Lead is sometimes present in food samples as impurity which can be hazardous to health. By EDTA titration lead in an effluent sample can be estimated.

Outcome: A few metal – EDTA complexes are stable at acidic conditions. The amount of Pb obtained was compared with the available values obtained from various industrial effluent samples.

5.

Aim: Molecular modeling exercise in stereochemistry.

Purpose: To construct 3- dimensional structure by using models. Both configurational isomers and conformational isomers were explained

Outcome: Better understanding of concept of Enantiomers, meso, diastereomers, cis-trans isomerism. The difference between configuration and conformation could be explained with the help of models.

6.

Aim: Synthesis of coumarin derivative using microwave method.

Purpose: To have an alternative green synthetic procedure. Coumarin is important synthetic compound.

Outcome: Its green method as time taken is just 1 minute & yield is also appreciable.

7.

Aim: Titration of Maleic acid (dibasic acid) against NaOH pH metrically

Purpose: Titration of dibasic acid was performed by students for the first time.

Outcome: A graphical determination of equivalence point were carried out. pK_1 and pK_2 were calculated

8.

Aim: Titration of Phosphoric acid (tribasic acid) against NaOH pH metrically **Purpose:** Titration of tribasic acid was performed by students for the first time.

Outcome: A graphical determination of equivalence point were carried out. pK_1 , pK_2 and pK_3 were calculated

15 List of minor projects implemented, name of students and supervisor

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For F.Y.B.Sc Students

Part A

Aim: Preparation of Reagent papers to be used as sensors, for detection of various metal ions

Purpose: To make the students aware of the preparation technique of different reagent papers required for the regular practicals.

Outcome: Students prepared the reagent papers such as turmeric, potassium thiocyanate, ferrocynide, ferricynide, DMG, potassium dichromate, lead acetate, blue litmus paper, red litmus dried, labeled and stored.

Part B

Aim: Detection of various metal ions using reagent papers sensors prepared by the students.

Purpose: Use of reagents could be minimized as the test for the detection of ions could be performed using a drop of salt solution.

Outcome: Students could perform the test on the reagent papers prepared by them. Only one third of the reagent paper was used and the remaining was preserved for the regular practicals. The concept of green chemistry was also observed

The above minor project was done by almost all F.Y.B.Sc. students (about 450 students)

All 21 teachers of the department were involved in supervision of the above project.

For T.Y.B.Sc students

Aim: Comparative study of yield in the reaction of condensation of benzaldehyde and aniline using:

1. Microwave method
2. Traditional method.

Outcome: students were introduced to carry out one reaction by two different methods and students could compare the time factor, yield and energy requirements of these two methods.

The above project was done by 115 T.Y.B.Sc students in different batches and 20 staff members supervised the project.

16 Faculty improvement activities such as training courses, seminars etc conducted and their impact

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1. On 7/12/2015, one day training program was arranged on "Fire Fighting and Safety"

The activities included:

- Lecture by Mr. Ravindra Ashok Shelar from civil defence vikroli, on "Fire Fighting and Safety"
- Film show on fire fighting & talk by Mr. Manoj Kadam, administrative officer, civil defence, Mumbai.

- Live demonstration of fire fighting was arranged for students, non teaching staff of various science departments and teaching staff of chemistry.

About 150 students, teachers and non teaching staff members of various departments were benefited from the training.

Impact: Teaching and non teaching staff members along with students could learn the causes of fire, types of fire, accidents that take place in the laboratory and how to avoid them.

They also got opportunity to use fire extinguisher during the live demonstration of fire fighting

2. One day seminar was arranged on “Safety Handling laboratory Glassware”, on 12/1/2016

Mr. Gopal Sabe, Manager from Borosil glass works Ltd. handled the session.

About 150 students, teachers and non teaching staff of various departments were benefited from the training.

Impact: Teaching and non teaching staff members along with students could learn the types of glasses, their strength and what type of glasses are suitable for particular use in the laboratory.

They also learnt safety handling of laboratory glasswares.

3. A workshop on T.Y.B.Sc. Sem V & Sem VI revised syllabus of chemistry of Mumbai university, to be effective from 2016 -17 was held on 4/3/2016.

About 125 teachers from various colleges of Mumbai University attended the workshop.

Impact: Teachers from various colleges shared their experience of F.Y., S.Y.,T.Y., students and they shared the various measures that their implementing in their colleges. This healthy academic discussion gave many new ideas .regarding how to make chemistry interesting at UG level.

17 Outreach activities conducted and their impact/ follow-up

CHEM-BOND, organization run by the chemistry department conducted following activities for the students during the year 2015 - 16

Sr. No	Name of the Program	Date	Topics	No. of students participated	Overall Outcome
1	Chemtalk (Elocution Competition)	6 th August , 2015	1) Buffer solutions 2) Quantum number 3) Order of reaction 4) Free energy 5) Inductive effect	55	Public speaking experience (For many students it was first time)

			6) Optical isomerism 7) Chromatography 8) Standard solutions		
2	Group Presentation (Team Activity)	1 st Dec. 2015	"Nobel award winning catalysts"	39	Use of electronic media, audio-video skills for effective presentation, team work
3	Poster Competition (1-3 students per poster)	2 nd Dec. 2015	"Chemistry in day to day life"	80	Creativity & Effective Communication

The above activities help the students to get confidence to participate in various intercollegiate events conducted by different colleges in Mumbai University. Students are given all the encouragement and help to participate in different intercollegiate activities related to chemistry field.

Following are various intercollegiate activities in which our students participated.

Intercollegiate Events

1) 32nd Aptitude Test in chemistry organized by Indian Chemical Society (ICS) on 6th September 2015 (Sunday) at Ruia College.

Total 65 students appeared for the aptitude test and 5 students were rank holders and they were awarded certificate of merit

SR. No.	Name	College	Class
1	Vanessa Rasquinha	R.J College	FYMSc
2	Vijay Bahadur P Patil	R.J College	TYBSc
3	Rahul Bhaskar Hazare	R.J.College	TYBSc
4	Anuj Shrikumar Tiwari	R.J.College	SYBSc
5	Khan Rukhsar Shamsul Q.	R.J.College	TYBSc

2) "CHELAS", Intercollegiate Chemistry Laboratory Safety Workshop-2015 at Maharashi Dayanand College, Parel, on 27th August 2015(Thursday).

Sr. No.	Name of Candidate	Class/Division	Roll No.
	Poster Competition		
1	Namrata Khot	S.Y.B.Sc (C)	529
2	Harshada Mahadik	S.Y.B.Sc (C)	531

Mr. Sachin Dathkhile, Lab Assistant from chemistry department also participated in the poster competition and exhibited poster on **“Chemical Handling, Chemical Incomatability & Chemical Transportation”**

His efforts were highly appreciated by M.D. college.

3) “CHEM-FUN 2015-16”, Intercollegiate Chemistry festival organised by N.G.Acharya & D.K.Marathe College, Chembur at Maharashi Dayanand College,Parel held on Thursday 17th December 2015.

Total 56 students participated

Sr. No.	Name of Candidate	Class/Division	Roll No.	Achievement
	CHEM-MASTER,CHEM-O-AD			
1	Ravi Dubey, Sunil Chaurasiya, Sayli Parab	F.Y.B.Sc (C)	524 518 605	2 nd Prize Chem Master
2	Neeraj Chaudhary Aditya Karanje	T.Y.B.Sc (A)	8 44	1 st prize Chem-O-Add
3	Neeraj Chaudhary Pooja Chavan	T.Y.B.Sc (A)	8 11	1 st prize Chem- Rangoli
4	Arbaz Dharekar	S.Y.B.Sc. (C)	606	1 st prize Chem- Games Periodic Table

4) Intercollegiate chemistry festival ‘RASAYANAM 2016’ organized by Dept. of Chemistry I.C.T. Mumbai on 15th & 16th January 2016.

4 students from R.J. College participated.

18 Any outstanding achievement by student/faculty (merit, award, research paper, presentation in national/international conference/ etc; full citation to be provided)

Research Papers Published in international journals/ presented in national/ international conference:

• Dr. Dubey R.S. (Associate professor)

1. B. D. Ambhore & R S Dubey, corrosion Inhibition of mild steel by ceftriaxone in 1M sulphuric acid medium, International journal of Current Research, Vol.8,Issue 01, (January,2016) 25260-25265.

2. B. D. Ambhore & R S Dubey, Effect of 2-(4-hydroxyphenyl) benzimidazole on Corrosion control of mild steel in sulphuric acid media, International Conference on Corrosion and Its control, organized by NACE International Gateway India Section, CORCON 2015, during 19-21 November, 2015 Chennai, India.
3. R S Dubey & B. D. Ambhore, Anticorrosion performance of 2-Propyl benzimidazole in 1M sulphuric acid on mild steel, International Conference on Corrosion and Its control, organized by NACE International Gateway India Section, CORCON 2015, during 19-21 November, 2015 Chennai, India.
4. R S Dubey & B.D. Ambhore, Role of 2-Chlorobenzimidazole to control corrosion of mild steel in sulphuric acid solution, International Conference on Corrosion and Its control, organized by NACE International Gateway India Section, CORCON 2015, during 19-21 November, 2015 Chennai, India.
5. R S Dubey & B. D. Ambhore, Inhibitive action of 2-Benzylbenzimidazole towards corrosion of mild steel in H₂SO₄ solution, International Conference on Corrosion and Its control, organized by NACE International Gateway India Section, CORCON 2015, during 19-21 November, 2015 Chennai, India.
6. R S Dubey, Chemistry of Aging, Good health and extension of human life, National Seminar on " Geriatric Concerns in India- Past, Present and future, Organized by Department of Sociology, R .J. College, Ghatkopar(W), Mumbai-400086 during 07-08 January, 2016.

List of teachers who have attended a conferences/short term courses.

Sr. No.	Name of the teacher	Title of the activity	Duration	Name of the host institute
1	Prof. P.T.Singh	Attended 'train the trainers'	one day (11/07/2015)	IBS Powai
		Coordinator for intercollegiate seminar on 'value based education'	One day (20/10/2015)	R.J.College, Ghatkopar
2	Dr. Manisha Bhattacharya	Sort term Course on " E-Content Developmnet and E-Learning"	Six days (17/08/2015 to 22/08/2015)	UGC-HRDC, Sardar patel University, Gujrat
3	Dr. Abhay Sawant	Seminar on "Scientific Writing"	One day (16/01/2016)	K.J.Somaiya College, Vidyavihar
4	Dr. Asawari Mokal	Seminar on "Scientific Writing"	One day (16/01/2016)	K.J.Somaiya College, Vidyavihar
5	Prof. Jitendra Girase	Short term Course on " Reserch Methodology in Baic Science"	Six Days (14/02/2015 to 19/12/2015)	R.J.College, Ghatkopar
6	Prof. Pratap p. Kamble	Short term Course on " Reserch Methodology in Baic Science"	Six Days (14/02/2015 to 19/12/2015)	R.J.College, Ghatkopar

19 List of Short term training courses/workshops conducted for students and faculty, including title, duration, no. of beneficiaries

1. Workshop on "Basic Techniques and Safety Aspects In Laboratory" was conducted for F.Y.B.Sc students (About 600 in number) between 20th july to 25th july 2015.

Following aspects were discussed, demonstrated by teachers and carried out by the students.

*** Project No. 1:**

Aim: To explain the steps involved in the preparation of primary standard solution.

Purpose: To make the students aware of the importance of preparation of standard solution accurately, it was necessary to demonstrate each step right from weighing, transferring, washing and diluting. All the steps involved in the preparation were demonstrated by the teacher.

Outcome: Students understood the concept of primary and secondary standard solutions. Students could prepare the standard solution with the correct technique.

***Project No. 2:**

Aim: Explanation of safety rules and precautions to be observed in the chemistry laboratory.

Purpose: In chemistry laboratory as the students are constantly handling the chemicals and burners it was essential to make them aware of the safety rules and precautions to be observed in the laboratory.

Outcome: Students observed the given instructions and carried out the practicals with great care throughout the year.

***Project No. 3:**

Aim: Explanation and demonstration of the techniques in the measurement of physical constant of an organic compound.

Purpose: In the regular practicals as students have to determine the physical constant of various organic compounds, the knowledge of proper technique and skill for the same is of great importance.

Outcome: It was observed that students carried out the melting and boiling point of the solid and liquid organic compounds quite accurately (up to the error of $\pm 2^{\circ}\text{C}$).

***Project No. 4:**

Aim: Principles involved in green chemistry and practicing green chemistry in laboratory.

Purpose: To make students aware about the importance and use of green chemistry in the laboratory.

Outcome: It was observed that students minimized the use of reagents, followed micro techniques wherever possible, the burner kept off when not required etc.

2. Workshop on "Basic Techniques and Safety Aspects In Laboratory" was conducted for S.Y.B.Sc students (About 250 in number) between 15th june to 20th june 2015.

Following aspects were discussed, demonstrated by teachers and carried out by the students.

- 1) Introduction to Instruments such as
 - a. Potentiometer
 - b. Conductometer
 - c. Colorimeter
 - d. pH meter
- 2) Techniques involved in inorganic and organic experiments.
- 3) Industrial and environmental aspects.

3. Workshop on “Basic Techniques and Safety Aspects In Laboratory” was conducted for T.Y.B.Sc students (About 120 in number) between 12th june to 13th june 2015.

Following aspects were discussed, demonstrated by teachers and carried out by the students.

1. Details about the principle, working, graphical methods used in detection of equivalence point, advantages and limitations of the instrument along with precautions to be observed during the experiment were discussed, w.r.t. following instruments.
 - a) potentiometer
 - b) Conductometer
 - c) Colorimeter
 - d) pH meter
2. e) Spectrophotometer
3. Various aspects of quantitative analysis were explained and demonstrated to the students and finally students carried out these experiments in presence of teachers.
4. Qualitative aspects in inorganic preparation were discussed along with basic qualitative aspects involved in organic experiments were discussed.
5. Principles of green chemistry and how to practice green chemistry in laboratory were discussed in details

20 Guest Lectures (details like name of scientist, topic, no. of students)

Sr. No.	Name of the Guest Speakers	Title of the Lecture	Duration	Organized by the Dept.
1.	Dr. Lalitha Rege (Glenmark) &	“Regulatory Affairs”	One Day 4/7/15	Chemistry
2	Dr. Deepak Tripathi (Johnson & Johnson)			
3.	Dr. Anuradha Mujumdar (Assoc. Prof. in dept. of Pharmacology, Bombay college)	“Drug Development and Discoveries”	One Day 22/8/15	Chemistry

4.	Dr. R. K. Vatsa (BARC)	“Spectroscopy” (light and its interaction with matter)	One Day 24/8/15	Chemistry
5.	Dr. Sharmistra Choudhary (BARC)	Molecular fluorescence spectroscopy		
6.	Ravindra Ashok Shelar (Post Warden Civil Defence, Vikhroli ‘N’ Div)	“Fire fighting & Safety”	One Day 7/12/15	Chemistry
7.	Mr. Manoj Kadam Administrative officer Civil Defence	Film show on fire fighting		
8.	Live demonstration of fire fighting was arranged for students, non teaching staff of various science departments and teaching staff of chemistry.			
9.	Mr. Sawe (Manager, Borosil glass works - Ltd)	“Safety Handling Laboratory Glassware”	One Day 12/1/16	Chemistry

21 Visits to industries, institutes etc (name of place, duration of visit and no. of students)

- Students visited the exhibition of "Minerals" at the University of Mumbai, Kalina campus arranged by the Department of Geology & center for extra Mural studies, University of Mumbai on 19/12/15.
Minerals from different parts of the world were displayed in the exhibition.
Total **102 students** from F.Y, S.Y & T.Y.B.Sc visited the exhibition along with **seven teachers & two lab assistants**.
- Two sets of minerals were purchased for Department of Chemistry & converted in to mini museums of minerals, which are displayed in chemistry Lab No, 1 & Lab. No.2.

22 List of Lab manuals/SOPs generated for all participating departments

- Manual for "Basic Techniques and Safety Aspects In Laboratory" for F.Y.B.Sc. and S.Y.B.Sc. students
- Manual for "Good Laboratory Practices & Green Chemistry" for T.Y.B.Sc. students.
- Hand book for F.Y.B.Sc. Chemistry practical.
- Hand book for S.Y.B.Sc. Chemistry practical.

- e. Hand book for T.Y.B.Sc. Chemistry practical.
- f. SOP for colorimeter
- g. SOP for Conductometer
- h. SOP for Potentiometer.
- i. SOP for pH meter
- j. SOP for Flame photometer
- k. SOP for spectrophotometer.

23 Feedback mechanism adopted (to be indicated in term of how the quality of teaching and hands on training improved)

After the workshops are conducted for students on GLP, Green chemistry, Safety in laboratory etc. both written and oral feedbacks are taken from the students.

Teachers during regular meetings discuss about the mistakes/ errors committed by the students during regular practicals. These point are taken in to account , while giving instructions for further experiments.

Because of this practice students have improved there ability in:

1. Preparation of primary standard solutions
2. Correct technique of titration.
3. Proper handling of instruments.
4. Avoiding wastage of chemicals, water,gas etc(part of green chemistry)

24 Any special innovative approach adopted by the college in improving the UG education

1. Introducing students of F.Y,S,Y,T,Y,B.Sc with Indian pharmacopeia.
- 2) Using Indian pharmacopeia during regular practicals
- 3) Chem bond activities such as Chemtalk, Group presentation, Poster competition, which are held during the academic year.

25 A summary on “how the Scheme helped in strengthening of the UG education and what would not have been possible without this” (not more than 1000 characters)

- College would not have been in a position to have large number of instruments, sufficient quantity of glasswares and A.R. quality chemicals, for the experimental work at UG level.
- A large number of experiments which are not in the university syllabus could be performed by the students.
- The best part was students could do many experiments, about which they are learning only in theory paper and they do not have any experiments on these in the university syllabus. For Example, in S.Y.B.Sc students have topic on solvent extraction but no experiment on this technique.
- Through DBT Star College Scheme, our college introduced experiment on solvent extraction to S.Y.B.Sc students, in which students could separate the mixture of two cations by solvent extraction, followed by the estimation of metal ion separated from the mixture.
- Like these, almost all experiments done under DBT Star College Scheme where the experiments which are not in the university syllabus and are parallel to what students are learning in theory.
- Without support from DBT, it would not have been possible.

26 Suggestions/feedback for improving the scheme

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- a. The grant for instruments should be spread over for atleast two years, if not three years, so that the new instruments which come in market can be taken into consideration.
- b. The amount of grant should be increased.
- c. The amount of grant should be proportional to the number of students.

Excellent scheme by DBT, highly beneficial for students to enhance their skill in practicals.

Department of BOTANY

14. List of additional practicals introduced

A. FYBSc. : Students performed the following: (Students offering Chemistry, Botany, Zoology, Physics and Biotechnology. Total number of students who participated - 251)

AIM: To prepare leaf herbaria

Objective: Students study leaf morphology and types of inflorescences in theory with examples which many a times are unknown to them. Although they are shown many specimens in the laboratory during practical, there are many more which are not brought to the lab.

Outcome: All F.Y. B.Sc. students got various leaf samples, dried them to make herbaria and to studied the morphology. They submitted the herbaria along with a report on the morphology. This activity helped the students to learn and increase observation power. In the process they also learned the botanical names of the specimens collected by them. They learnt the technique of dry preservation.

AIM: To use natural color as a pH indicator

Objective: To teach students the concept of plant pigments, use of natural pigments as pH indicators.

Outcome: The experiment of Study of effect of change of color of anthocyanin pigment of last year is continued and the extension of this experiment is making of pH indicator paper.

SYBSc. (Students offering Chemistry, Botany and Zoology. Total number of students who participated = 125)

Aim: TO STUDY OF PLANT COMMUNITY BY QUADRAT METHOD

Objective: To teach students field work .

Outcome: Students were also taken to nearby open grassland area to study its vegetation by and document it by the Quadrat method. Students were divided in groups and each group was asked to make a quadrat of 1sq.m to study the vegetation. They were taught to make a list quadrat and a chart quadrat of the same area and reports mentioning about frequency and density of plant species of these quadrats were submitted by them.

Aim: To Study biodiversity of plants on RJ college campus

Objective: To encourage students to identify plants and remember botanical names.

Outcome: Students learnt identification of plants and labelled the plants (Botanical names)

Aim: To Study of Carbon sequestration rate of tree

Objective: Students are highly adaptive to new techniques so use of GPS for plant sciences would be exciting to students.

Outcomes: Students learnt to use the instrument, learnt to identify trees, health of trees, use of GPS system how to position a tree and calculate the CO₂ sequestered by a given tree genus.

Aim: Study of aeromycoflora and aeromicroflora

Objective: To teach students basic microbiology techniques.

Outcomes: Students learnt, media preparation, sterilizing technique, identification of fungi.

Third year B Sc (Total beneficiaries 45 students)

Aim: To study the cell contents (Ergastic matter) in different plant cells.

Objective: To teach students staining techniques, identify reserve, secretory and excretory matter in plant cells.

Outcomes: Students learnt preparation of plant material to study types of starch grains, aleurone grains, oil globules, plasmodesmata, raphides, spaeaphides, cystoliths and enjoyed learning the mechanism of mineralization in plants, cytoplasmic streaming.

Aim: Use of IT in plant sciences.

Objective: To teach a multidisciplinary approach to study plant sciences.

Outcome: Students used Bioinformatic tools, statistical analysis of data using Excel.

Aim : Use of of POGIL (Process Oriented Guided Inquiry Learning) for learning Biochemistry.

Objective: To promote self learning, team learning and Inquiry learning

Outcome: Students performed an assay to study enzyme activity and were motivated to draw conclusions using POGIL.

i) **Demonstration**

- Use of Flame Photometer for estimation of Na and K

15. List of minor projects implemented, name of students and supervisor

F Y B Sc (Supervisor : Dr Usha Mukundan)

Name of students: B. Deshmukh, A. Pawar, S. Kamble

A) Bio indicator of Genotoxicity: The *Allium sativum* Test

Abstract: Allium assay is a test used for establishing genotoxicity of various substances like Water, soil, air, different chemicals etc. This test takes into account the action between genotoxic substances and genetic material of a cell. With the ban on animal studies is very difficult to go for any kind of animal studies to study the genotoxic effect. *Allium sps* can be a good bioindicator of genotoxicity. *Allium cepa* is an acknowledged test for biomonitoring. In the current studies we have used *Allium sativum* (Garlic), since it provides large number of plant material, space required is less and the chromosome number and morphology is similar to *Allium cepa*. Plants were grown in different concentrations of lead acetate,

Cupric sulphate and Polluted lake water collected from Thane (talav pali). Water was used as standard. In Lead acetate solution there was no growth of roots, this explains its more genotoxic nature. In cupric sulphate till 0.8 ppm the growth was shown and it showed genetic aberrations. The lake water sample also shows high amount of genotoxicity levels.

Name of students: **A. Pawar, R. Pandey**

Name of supervisor: Dr M K Date

B) Effect of pH on Catalase in Purple Cabbage

Abstract: Catalase is an enzyme that detoxifies hydrogen peroxide and other similar by-products into water and oxygen. An experiment was done to discover the pH at which catalase functions most effectively. In the experiment an aqueous extract purple cabbage was added to buffers of various pH and hydrogen peroxide added to each. Fizzing, foaming and change of color are indications of enzyme activity. Testing seven different variables showed that Catalase functions better in a neutral pH than it does in either acidic or basic pH.

A) ANTIOXIDANT STUDIES OF MIRACLE TREE *Moringa oleifera*

Namrata Jaiswal and Vijay Gupta (TYBSc. Botany)

Abstract: Cellular antioxidants are known to change their redox state and they can be targeted for destruction, regulate oxidative processes involved in signal transduction, effect gene expression and pathways of cell proliferation and death. Oxidants and antioxidants play an important role in maintaining a balance between free radicals produced by metabolism or derived from environment sources. The major sources of antioxidants are natural products there are many plant species which full fill the hunger of antioxidants. *Moringa oleifera* is one of the plant species which are widespread throughout the world. This research focuses on anti-oxidant studies in *Moringa oleifera* leaves. Preliminary qualitative analysis of phyto-chemicals was done. To explore the antioxidant properties free radical scavenging activity of the methanolic plant extract was measured by generating various free radicals, in vitro using different chemical systems, superoxide, nitric oxide, hydroxyl radicle, DPPH respectively, quecertin, BHT, BHA are used as standard . Non enzymatic antioxidants are also considered Vitamin C was estimated with DNPH method.

B) FORENSIC PALYNOLOGY-Nature's fingerprints of plants

Ankit A. Yadav, TYBSc Botany

Abstract: Forensic palynology is the study of pollen and spores considering their morphological features in solving different criminal issues. The research work in this area is not much popular still it is under primordial stage. As this field can play a supporting tool with other forensic techniques this research focuses on studying the morphological features of pollen grain from different plant families. The collected pollen grains were treated by using benzene method after which pollen grains are properly examined under light microscope.

Second Year B Sc

- **BOTANICA GROUP PROJECTS:**

Botanica, an annual exhibition which showcases the diversity of plants and their wide applications was organized on **1st December 2015**. Project competition was arranged for SYBSc students on this occasion. The year 2015 being identified as the International Year of soil students prepared posters and models to show case the importance of soil. The various projects were as follows,

Sr. No.	Student's Projects	Participant students	Supervisor
01	Soil Profile	Amrin Ansari, Afreen Ansari, Mehnoor Ansari, Akash Bhokare, Anushree Chaudhari, Akshay Dandge, Vindheyshwari Dubey, Varsha Dubey, Nikita Dubey and Joyce Fernandese	Prof. Pravin Nayak
02	Soil Biodiversity	Safa Shaikh, Rukhsar Shaikh, Parvinbano Shaikh, Pooja Sharma, Pooja Shinde, Priya Singh, Priti Sonawane, Kavita Thakur, Gopal Pandey, Prathamesh Gaikawad and Nakusha Borhade	Dr. Mrs. Nisha Muni
03	Poor man's food, rich man's diet	Akshna Pathan, Tejas Pathare, Tabassum Quadri, Aniket Rai, Daulat Rane, Sumaiyya Shaikh, Asmabano Shaikh, Shabana Shaikh, Sonali Shinde, Varsha Shrivastav, Inaya Siddiqui and Monika Singh	Dr. Mrs. Mrunalini Date
04	Old age diseases	Sumita Gavhane, Snehal Ghogare, Ekta Gupta, Komal Ingawale, Neha Jagtap, Priya Jaisal, Yasmeen Khan, Sadaf Khan and Firoza Khan	Dr. Usha Mukundan
05	Bonsai/terrarium	Aparna Shukla, Shubham Tiwari, Elvina Almeida, Amrin Ansari, Harshal Bhalerao, Saloni Bhambid, Siddhesh Bhor, Sushil Chaudhari, , Ranjana Chaudhari, Dhanashree Divate, Dimple Doiphode and Myron Gomes	Dr. A.K. Bhatnagar
06	Drought mitigation (New resistant varieties)	Dhanashree Mhaskar, Aishwarya Misal, Anujkumar Mishra, Afrin Mulla, Akhila Nair, Ravina Nakde,	Dr. Himanshu Dawda

		Rajnishkumar Pandey, Neha Pandey, Snehal Parkhe, Alfia Patel and Mahek Patel	
07	Amazing plants	Anchal Singh, Vedprakash Singh, Pradeep Singh, Rashmi Tanwar, Suraj Thorve, Trupti Tiwari, Deepika Uniyal, Poonam YadavK, Poonam YadavR, Yadav Ramsingh, Kumarimanu Singh and Madhuri Bombre	Dr. D. B. Singh
08	Hydroponics/ Aquaponics	Roshni Jaiswal, Aradhana Kanojia, Zahir Khushnuma, Soniya Naik, Umesh Narvekar, Pawar Mayuri, Suhasini Rai, Toshali Raje, Priyanka Ranagar, Satyapriya Sahu, Prajakta Salunke and Sainath Saluke	Dr. Anil Avhad
09	Mushroom cultivation	Shabnam Khan, Nasinabano Khan, Sadaf Khan, Farhin Khan, Alvira Khan, Mohammad Khan, Namrata Khot, Sachin Kuril, Harshada Mahadik, Iffat Mansuri, and Chandani Mehta	Dr. Mrs. Veena Kelkar

TYBSc. (Botany major, Number of students who participated were = 45)

Students prepared projects on various environment based topics.

Sr. No.	Student's Projects	Participant students
01	Mushroom Composting	Zainab Ansari, Surabhi Sawant, Soeba Chaudhary, Neelam Dubey, Ankit Yadav, Shaista Sayed, Manali Torne, Ankita Turbhekar
02	Various Environmental movements	Richa Sahani, Neha Jaiswal, Ashish Gupta, Shivam Singh, Sachin Maurya and Shiva Vishwakarma
03	Electronic pollution	Jyoti Pathak, Rupam Pandey, Shweta Gupta, Alvina Shaikh and Rukhsar Sayyed
04	Non-Conventional sources of Energy	Rupali Bahiram, Vijay Gupta, Namrata Jaiswal, Santoshi Kadu and Poornima Khutal
05	Resource depletion	Pooja Nagar, Reena Pal, Rashmi Rajbhar, Nikita Shirkar, Soni Singh, Shahista Sayed and Renu Yadav

06	Ozone depletion and Global warming	Tushar Shinde and Rishabh Shukla
07	Mangroves at Risk	Apeksha Gopale, Aishwarya Godble
08	Deforestation	Ansari Zainab, Rai Puja, Shaikh Ariba and Shaikh Hooda
09	Types of Pollution	Surve Afiya, Singh Vinay, Khan Aliya, Bhutkar Sayalee, Kedare Meghna, Shukla Govind and Jagruti Jadhav
10	Conventional sources of Energy	Ketki Sawant, Dipika Singh and Ayushi Singh

STUDENT PROJECT: COSMETOLOGY AND HERBAL PRODUCTS

(Preparation of herbal cosmetics other than Herbal face mask, Bath oil and Hair shampoo powder)

TYBSc Students were divided into five groups and they were asked to survey the Standard Operating Procedures' of herbal cosmetics other than the ones' that they have in their curriculum.

Five herbal products were selected by the students -

- Herbal Face Peel,
- Herbal Body Cleanser,
- Herbal Face bleach,
- Herbal Hair Gel,
- Herbal Hair Spa.

These SOP's were further investigated in terms of their ingredient availability and economic feasibility.

16. Faculty improvement activities such as training courses, seminars etc conducted and their impact

- Hands on training for "**PAGE Technique**" was organised by the Department of Botany for teachers and students from various colleges of Mumbai University on 23rd July 2016. 16 teachers and 9 students attended the same.
- GHG Accounting – Principles and Practices**, a two day training workshop was arranged for inhouse teachers on 12-13th October 2015. The workshop was conducted by **Dr. Dhanya Nambiar** of Center for Environment Education and Development.

The workshop covered topics like Carbon credits, action against global warming and measurement of carbon sequestration rate.

- Lecture and hands on training on the topic of "**Vein Islet number and its utility in segregation of pharmacological material**" By Dr. (Mrs) Meenakshi Vaidya, Department of Botany, Mithibai College, Vile parle. Was arranged on Saturday, July 11, 2015 for teachers of the Botany department

- **Dr (Mrs.) Nisha Muni and Capt. Pravin Nayak** completed Short term Course in “Research Methodology” conducted by UGC Staff College, at Ramniranjan Jhunjhunwala College, Ghatkopar, Mumbai during 13th December to 19th December 2015. Principal in charge, Dr. Himanshu Dawda was the co-ordinator for the same
- **Dr A. K. Bhatnagar and Dr. D. B. Singh** attended “**One day workshop for revised syllabus of SYBSc in Botany**” on 22nd June 2015 at Pendharkar College, Dombivali.
- **Capt. Pravin Nayak and Dr. Anil Avhad** attended one National level workshop on “**HPTLC**” at Institute of Science on 14th August 2015.
- **Capt. Pravin Nayak and Dr. Anil Avhad** attended one day workshop on Biotechnology at Central reference laboratory, Metropolis, Vidyavihar on 19th February 2016.
- **Dr. Anil Avhad** attended a National Seminar “**Conservation of Trees – Perspectives and Strategies**” held in the Bhavan’s College Campus, Munshi Nagar, Andheri (West) Mumbai 400058 on 2nd February 2016.

17. Outreach activities conducted and their impact/ follow-up

- Along with Department of Zoology, Botany Department hosted 10th Annual Conference on ‘Wetlands for our Future: Sustainable Livelihoods’ was organized by Paryavaran Dakshata Mandal Under the Auspices of University of Mumbai In Association with Association of Teachers in Biological Sciences, Mangroves Society of India, B. N. Bandodkar College of Science, SACON on 31st Jan., 1st and 2nd February 2016 at R.J. College.
- **Intercollegiate Competition in Bio-jewellery and Floral rangoli** for Undergraduate students of Mumbai University. Competition was organized on 1st December 2015 in the Department of Botany. 47 teams from 7 different colleges of Mumbai University participated in the event. The competition was judged by Prof. (Mrs) Sanika Gupte, Dr. (Mrs) Janhavi Bhagwat, Dr.(Mrs) Jyotsna Nijsure and Dr. (Mrs) Geeta Joshi. On the basis of Innovative ideas in terms of Material used, Design, Intricacy, Beauty and durability of the product.
- XXI Dr. D.V. Amonkar Memorial Elocution Competition conducted on 24th August 2014. About 37 students from 9 different colleges participated in the same.
- As a DBT Star College Activity, the annual event of Botanica which showcases the diversity of plants and their wide applications was organized on 1st December 2015. The theme was ‘Plant Science’. The program was inaugurated by the Chief Guest Mrs. Vidya Phalke, Principal, Prabodhini high school, Kurla, who is recipient of President Awardee best teacher and alumni of Department of Botany. Project competition was arranged for SYBSc students on this occasion. The exhibition was visited by many students of schools like North Bombay, Hindi high school, Gurukul etc from the vicinity.

A workshop cum sale of Warli, tribal art products and Enviro-Vigil, NGO from Thane were also organized during the same.

18. Any outstanding achievement by student/faculty (merit, award, research paper, presentation in national/international conference/ etc; full citation to be provided)

- Kale, D. K. C. and Mukundan, U. (2015). Cytotoxicity against tumor cell lines of a purified mirabilis antiviral protein isolated from root of *Mirabilis jalapa*. World Journal of Pharmaceutical Research, 4 (2), 1697-1710.
- Kale, D. K. C., Mukundan, U. and Dawada, H. (2015). Mirabilis antiviral protein studies and its potential applications. Annals of Phytomedicine, 4(1), 86-89.
- Kale, D. K. C. and Mukundan, U. (2015). Phytochemicals analysis and antibacterial activities of genetic variants of *Mirabilis jalapa*. International Journal of Recent Scientific Research 6 (12), 7696-7702.
- Karishma Rajbhar, Himanshu Dawda and Usha Mukundan. Tea Polyphenols for Skin Care; Research J. Topical and Cosmetic Sci. 6(1), 2015. (JAN – JUNE ISSUE)
- Karishma Rajbhar, Himanshu Dawda and Usha Mukundan. Quantitative spectrophotometric estimation of specific monosaccharides by DNSA method; International journal of research and development organisation: 2 (1) January 2016, pg 112-126.
- Karishma Rajbhar, Himanshu Dawda and Usha Mukundan. Tea polyphenols a preventive measure to attenuate obesity and diabetes. World journal of pharmaceutical sciences 4(3) 2016, pg 346 – 350.
- Rajkumar Diwakar*, Irfan Shaikh*, Himanshu Dawda, Usha Mukundan. Phytochemical evaluation and quantitative estimation of corosolic and ursolic acid from Psidium guajava. World Journal of Pharmaceutical Research, Volume 5, Issue 3, 1318-1327.
- Karishma Rajbhar, Himanshu Dawda and Usha Mukundan. Polyphenols: methods of extraction. Scientific Reviews Chemical Communication 5(1), 2015, pg 1-6.
- Anil Avhad and Himanshu Dawda (2015) “Studies of Enzyme Glutamine Synthetase (GS) in Sesuvium Portulacastrum (L.), an Associate Halophyte” Indian Journal of Hill Farming June 2015 (ISSN: 0970-6429), Volume 28, Issue 1, Page 43-49 (NAAS IF 2.86).
- Pravin Nayak “Energy Audit for Educational Institution” Two Day National Conference on 7th to 8th Jan 2016, ISBN No: 978-93-843144-4-6, pg 29.
- Pravin Nayak “Physiochemical analysis of Mangrove Soil, UGC Sponsored National Seminar on “ Wetlands-Present Status, Ecology and Conservation, 12th August 2015, ISBN No: 978-81-928005-3-9, pg 189-191.

Book:

- Latha Sivaram, Himanshu Dawda and Usha Mukundan published a book titled *In vitro Studies on Stevia rebaudiana* in December 2015 from a Publishing house: Lambert Academic Publishers, German ISBN: 978-3-659-81373-3
- Micropropagation of Some Medicinal Plants Madhura Shrotri, Himanshu Dawda and Usha Mukundan December 2015 (in press)
- ICAR Centenary Book: 'Biotechnology of Some Crop Plants' Chapter: Tea Tissue Culture (In press). Authors: Mugdha Ambatkar, Jayesh Patil, Mukundan Usha, Guttapadu Sreeram and Sinkar Vilas
- Mr. Akshay Dandge and Mr. Vindhey Dubey of SYBSc Botany received First prize in Poster competition (Topic Soil profile) organized by Mithibai College, Vile Parle on 18th December 2015.
- Ms. Namrata Jaiswal and Mr. Ankit Yadav along with Dr. Anil Avhad, presented a research paper "Strategies to Conserve Wetlands- a Case study of Kala Talao, Kalyan – Maharashtra" in International Conference On "SCIENCE, SUSTAINABILITY & THE SOCIETY-CHALLENGES & OPPORTUNITIES" held at Vikas College, Vikhroli, Mumbai on 20th February 2016.
- Presentation of research paper at Avishkar research festival University of Mumbai
 - Bio indicator of Genotoxicity: The *Allium sativum* Test (B. Deshmukh, A. Pawar, S. Kamble)
 - Antioxidant studies of miracle tree: *Moringa oleifera* (Namrata Jaiswal and Vijay Gupta (TYBSc. Botany)
 - Forensic Palynology-Nature's fingerprints of plants (Ankit A. Yadav, TYBSc Botany)

19. List of Short term training courses/workshops conducted for students and faculty, including title, duration, no. of beneficiaries

- 10 students of the SYBSc students were trained by Texcellence technology for **Aquaponics and Hydroponics** along with working models. Vegetable crops like Spinach, cucumber and coriander were harvested on the terrace garden of the college using same technology.
- **15 students of S Y B Sc were trained in plant tissue culture:** Plant tissue culture is a technique based on the principle of Totipotency which is widely used and applied to tackle many issues in the field of biotechnology and agriculture. In view this, 15 students of SYBSc were selected on the basis of their interest.
- **Others are mentioned in point no 16**

20. Guest Lectures (details like name of scientist, topic, no. of students)

Sr. No.	Resource person	Designation	Topic	Date/Duration	Topic.No. of students
01	Dr. (Mrs) Meeakshi Vaidya	Associate Professor, Mithibai College	Vein Islet number and its utility in segregation of	July 11, 2015	Botany 9 staff and 45 third year B Sc students

			pharmacological material		
04	Mr. Samer Pokle	Director, Techxellence India	Hydroponics and Aquaponics	13 th August 2015	15 staff from various departments and 125 students
05	Dr (Mrs) Behnaz Patel	Head Dept. of Botany Ruia college.	Interesting facts in Botany	13 th August 2015	15 staff and 125 students
02	Dr. Dhanya Nambiar,	Consultant	GHG Accounting – Principles and Practices	13 th October 2015	9 staff and 15 students
03	Mrs. Vidya Phalke,	Principal, Prabodhini high school, Kurla,	Botany	1 st December, 2015	150 students

21. Visits to industries, institutes etc (name of place, duration of visit and no. of students)

FYBSc

FIELD STUDY- EXCURSION TO JIJAMATA UDYAN

F.Y.B.Sc students study Angiosperms in their syllabus but for a better understanding a field trip is ideal. In Mumbai, we are fortunate to have a Botanical Garden and a National Park in the vicinity. Students were taken for a visit to Jijamata Udyan in small batches accompanied by teachers and were educated about the variety of flora and the importance and objectives of a Botanical Garden.

The students then submitted a report on their visit to Jijamata Udyan.

SYBSc

FIELD STUDY- EXCURSION TO MAHABALESHWAR

An excursion to Mahabaleshwar (Dist: Satara, Maharashtra) was arranged for the Botany students of S. Y. B. Sc. on Jan 20 – 22, 2016. The field visit programme included visits to various locations and industries.

Visit to Apiary -Madhusagar . students observed the technique / method for rearing honey bees, types of honey and their medicinal importance

Visited Madhusagar center to study the production of Jam, Jelly, Squash and Syrups of various fruits cultivated around the area. Students also visited the well-known MAPRO industry for understanding the production of various commercial and popular products like Jelly sweets, various types of squashes, syrups, chocolates, , Jam etc.

Students were taken to various locations such as Bombay Point, Wilson Point, Old Mahabaleshwar, to study the vegetation and they were instructed to prepare the list of observed plants with scientific names and characteristics.

The highlight of excursion was a visit to Wheat Rust Research Institute located at Mahabaleshwar. This center is involved in scientific research on wheat rust (*Puccinia* sp.)

It is a testing center for rust resistant varieties brought in by different breeders.. The eminent scientists of this center conduct comprehensive research and successfully produce disease resistant varieties of wheat. Our students could observe various wheat species cultivated at the field station of this institute and also the pattern of fungal infections occurring on the same plant species. Few varieties developed by their scientists showed almost no infection by *Puccinia* and hence seeds were released to farmers for sowing. This institute is the 2nd largest institute in Asia for wheat rust research work.

Students visited strawberry gardens and learnt about the entire process of strawberry cultivation and utilization of its fruit for making various products.

Recreational activities such as boating and visit to market were also a part of this excursion.

TYBSc

FIELD STUDY TRIPS

Field trip to Neral

Students were taken for an excursion to Jummapatti near Neral during the monsoon to study the local flora. The hills around Neral are rich in herbaceous flora and in full bloom during the latter half of monsoon. Some typical plants like the insectivorous *Utricularia*, parasitic *Aeginetia*, medicinal *Helicteres* and *Holorrhena* were observed along with as many as 50 to 60 other flowering plants. Students submitted a detailed field report on the same.

Visit to Sula Wines, Suyojit Biotech and Farms

T.YBSc. Botany students were taken to visit Nashik for one day field trip on 10th July 2015. Students visited following sites-

SUYOJIT BIOTECH. - Mushroom cultivation on commercial level. Students learned and observed all stages of mushroom cultivation i.e sowing, casing, button stage and fruiting as well as harvesting of *Agaricus bisporus*. Students were also shown the technique of storage and packaging of harvested mushrooms.

In the premises of same industry students observed the large scale compost preparation plant for their mushroom cultivation practices. Compost is prepared by using agricultural waste such as straw, bagasse, animal residues with added minerals.

SULA WINES - Students visited SULA WINERY where they saw the process of wine making with detail information on fruit harvest, fermentation, wine clarification, aging and storage of different types of wines.

Nursery and Farms- students visited nearby plant nursery and farms where they observed large number of ornamental, foliage, avenue, and garden plant types. Students also learnt about basic garden and landscaping methods with the help of experts.

Excursion to Pachmadhi

At the T.Y.B.Sc. level students not only study the local flora but also are expected to know the forest types of various parts of the country. After graduation students prepare for various competitive exams for which as Botany graduates they are expected to know about the floristic composition of the country. With this objective an excursion to the Pachmadhi region in Madhya Pradesh was arranged. It is at an altitude of 1067mts in the Satpura range. The landscape is characterized by rugged hills, dense forests, deep ravines and streams and waterfalls rich flora and fauna. It is a biosphere reserve known as the Bori reserve Forest. The students were accompanied by Botany and Zoology teachers as also the forest reserve guide who helped in bringing the students closer to nature and in identifying the plants and animals.

Inter Departmental Activities

- A survey “The Short Term Survey of the present status of apparent biodiversity of Bhavale afforestation site of Hariyali” was made by Dr. P.G.Kale of Zoology Department and Dr. Anil Avhad of Botany Department for Hariyali, NGO from Thane between 3rd October- 20th November 2015.
- A survey “TREE CENSUS AND INVENTORY REPORT (MO. Ghatkopar, NSD. Sewri, NSD. Mankhurd)” Third year students during December 2015.
- Dr. Usha Mukundan conducted a session on “Careers after graduation” for the students of all faculties on 20th April 2016.

22. List of Lab manuals/SOPs generated for all participating departments

A lab manual for third year B Sc in Botany has been prepared. SOP's have been prepared in the first year of the DBT scheme.

23. Feedback mechanism adopted (to be indicated in term of how the quality of teaching and hands on training improved)

Manual and students have responded positively

24. Any special innovative approach adopted by the college in improving the UG education

The department of Botany implemented new teaching learning techniques like project based learning, Process Oriented Guided Inquiry Learning which was possible due to DBT funding. Students were given tasks and were made to draw conclusions. Botanical names could be remembered using games.

25. A summary on “how the Scheme helped in strengthening of the UG education and what would not have been possible without this” (not more than 1000 characters)

The scheme helped in providing enough resources in terms of equipment's and consumables so that students could perform experiments individually. It also encouraged students take up minor projects. The demonstration experiments were performed by the students. Our students come from marginalised section of the society. All students were able to come for Industrial visits, excursions, field trips since the expenses were partially take care from the funds received from DBT under the star college scheme.

26. Suggestions/feedback for improving the scheme

Our college has maximum students for science programs. The funds could be proportional to the number of student beneficiaries.

Department of ZOOLOGY

14. List of additional practicals introduced

A. For F. Y. B. Sc. Students (about 200)

1.

Aim: Study on fermentation process and product yield from fruit juices.

Objective: To understand the role of microbes in fermentation process.

Outcome: Comparative study of the yield of fermentation products was understood.

The knowledge can find application in beverage industries. Students learned to operate the instruments like incubator and colorimeter.

2.

Aim: Determination of total hardness and CO₂ in water samples.

Objective: To create awareness about the quality of drinking water in Mumbai.

Outcome: Students estimated levels of CO₂ & total hardness in various water samples. Students learnt simple techniques of testing the quality of water.

B. For S. Y. B. Sc. Students (about 75)

1.

Aim: Detection of adulterants in commercial honey samples.

Objective: To make students aware about the various adulterants in honey samples.

Outcome: Students learnt to analyze the quality of honey by different tests. Students could understand the significance of honey in Indian traditional medicine.

C. For T. Y. B. Sc. Students (48 students)

1.

Aim: Study of variations in B.P and Pulse rate in persons of different age groups.

Objectives: To evaluate status of cardio vascular health of individuals of different age groups.

Outcome: Students learnt to operate sphygmomanometer and pulse meter. They learnt the influence of age on B.P and Pulse rate in different age groups.

2.

Aim: To Review the Diet pattern and its influence on health.

Objectives: To understand the significance of balanced diet.

Outcome: Students adopted healthy eating habits and its benefits were observed.

3.

Aim: To determine the quality of water samples collected from Thane Creek.

Objectives:

To ascertain the present status of quality of water.

To ascertain the fertility of the creek ecosystem.

Outcome:

The students learnt the hands on techniques of water analysis.

The students acquired computational skills.

The students could relate the parameters analysed to the fertility/ ability to support life and the effect of anthropogenic activities on environment.

4.

Aim: To determine the quality of sediments collected from Thane Creek.

Objectives:

To ascertain the present status of quality of sediments.

To ascertain the fertility of the creek ecosystem.

Outcome:

The students learnt the hands on techniques of sediment analysis.

The students acquired the computational skills.

The students could relate the parameters analysed to the fertility/ ability to support life and the effect of anthropogenic activities on environment.

15. List of minor projects implemented, name of students and supervisor

A. Study of ecological status of Thane Creek

1. Avadhesh Ram- M. Sc. Part II
2. Vedant Khakhrodia- M. Sc. Part II
3. Mr. Prathamesh Kulkarni-M. Sc. Part I
4. Ms. Candida Vaz- T.Y.B. Sc.
5. Mr. Royston Rogers- T.Y.B. Sc.

Supervisor: Dr. P. G. Kale

B. Study on Endophytic fungi associated with mangroves

1. Sandhya Santhosh- T.Y.B.Sc.
2. Ganesh Singh B. Rajpurohit- T.Y.B.Sc.

Supervisor: Dr. Janhavi A. Bhagwat

16. Faculty improvement activities such as training courses, seminars etc conducted and their impact

- **Culturing Hydra:** Mrs. Sanika Gupte took the training from Agarkar Research Institute in culturing Hydra in lab conditions on 2nd June 2015.
- **Bee workshop:** Mrs. Sanika Gupte attended Bee Workshop at Central University Kerala, from 10.8.2015 to 14.8.2015.
- **Soft skill development:** Mrs Sanika Gupte attended a short term course on soft skill development from 7-12th March 2016 at Academic Staff College University of Mumbai.
- **Research methodology:** Dr. Bindu Achary participated in the Faculty Improvement Program on 'Research Methodology', at R. J. College, in the month of December 2015.
- **Yoga:** Dr.P.G.Kale, Dr.S.T.Ingale, Dr Bindu Achary, Dr Geeta Joshi received training in basic yoga in the month of July. Dr Bindu Achary also completed trimester course in yoga in the month of August from Ambika Yog Kutir, Dombivli .
- **Aquatic animal study:** Dr. Geeta Joshi and Mrs. Sushma Singh attended a skill development program in "Techniques in Aquatic Animal Health" from 7-12th Sept. 2015 at ICAR-Central Institute of Fisheries Education, Mumbai.
- **Biotechnology techniques:** Dr. Janhavi Bhagwat and Mrs. Sushma Singh attended a training program on Biotechnology techniques held at Central Reference Lab., Metropolis healthcare Ltd. on 19th Feb. 2016.

- **Instrumentation:** Training for the use of **Digital Multimeter** for water analysis was organized for the teachers in Botany and Zoology to enable them to use it in various projects by Technical person, Mr. Arif Khan, from the Scientific Sales Syndicate, Goregaon on 25th June 2015.

17. Outreach activities conducted and their impact/ follow-up

Awareness generation programs / exhibitions/ seminars, training programmes etc. for teachers/students of other colleges/ students.

ZOO-FEST

Objective: To promote and develop scientific temperament, research aptitude as well as soft skills in the students.

Inauguration/Exhibits: The activities of “Zoo –Fest” 2015-16 was inaugurated on 11th August 2016 by Dr. Shilpa Desai, Health Psychologist. Dr. Hemant Kharkanis, Associate Manager, Godrej Mangroves was the Chief Guest for the annual exhibition, “Zoo-Fest” on 23rd Dec. 2016.

Felicitation: The winners of Zoo-Fest events from F.Y, S.Y and T.Y.B.Sc. classes were felicitated on this occasion.

F.Y.B.Sc –Zoo-Quest (Quiz Event)

- Lion team (first Prize): Khan Farheen, Namrata Singh, Khan Zaiba.
- Leopard team (second Prize): Khan Ruquiya, Susan Sheeba, Punam dwivedi.
- Panther team (third Prize): Nisha Yadav, Ram dablu, Pooja Chaudhari
- Tiger team (Consolation): Khan Razia umar, Khan Nafisa, Parab Sayli.

S.Y.B.Sc

I. Zoo-Tech (Exhibit Event)

First Prize: Topic - Amazing world of animals

Winners-Ashwini Shinde, Priya Pal, Sangeeta Gupta, Pooja Sharma, Iram Sayeed.

Second Prize: Topic - Molecular Evolution

Winners-Toshal Raje, Siddesh Bhor, Dimple Doiphode, Suhasini Rai, Shristy Singh, Prajakta Salunke, Sandeep Choudhary.

Third Prize: Topic - Rare disease

Winners- Harendra Prajapati, Krishna Prajapati, Maurya Chitra, Madiha Hasan, Antima Rajbhar, Mishra Ruchi

Consolation Prize: Topic - Marine Ecosystem

Winners- Arbaz Dharekar, Pankaj Patel, Babita Mishra, Priyanka Mishra, Remola Arya

II. Zoo-Project

- | | | |
|--------------------------------------|-------------------|-----------------------|
| ○ First Prize | : Ashwini Shinde | - Scope of Zoology |
| ○ Second Prize | : Iram Sayed | - Malaria |
| ○ Third Prize | : Dimple Doiphode | - Dairy Sciences |
| ○ I st Consolation Prize | : Ruchi Mishra | - Life Style Diseases |
| ○ II nd Consolation Prize | : Ruksar shaikh | - Scope of Zoology |

T.Y.B.Sc- Zoo-Chart (Poster Presentation)

First Prize: Topic - Natural Resources

Winners-Khotra Sharandeep, Lokhande Anagha, Gupta Aarti, Gupta Sangeeta, Santosh Sandhya.

Second Prize: Topic - Infertility- A growing concern

Winners-Dwivedi Divyaratnam, Priya singh, Vaz Candida, Anna Lincy, Kamble Prachi.

Third Prize: Topic - Gut Bacteria

Winners- Khan Saba, Ansari Asma, Attar asma, Farheen Khan.

Outcome:

- ✓ The projects and designing of working models gave scope for development of research aptitude.
- ✓ Enhancement of creative talent amongst the students with events like bio-rangoli, bio-article making, symbol making, slogan writing etc.
- ✓ Awareness to use the eco-friendly materials.
- ✓ Imparting knowledge to school students with the help of various exhibits.

18. Any outstanding achievement by student/faculty (merit, award, research paper, presentation in national/international conference/ etc; full citation to be provided)

Research Paper Presentation:

- a. **Purushottam G. Kale (2016)** "Who is responsible for the death of wetlands? A case study", at the Conference on 'Wetlands for our future: Sustainable Livelihoods', organized under the auspices of University of Mumbai by Paryavaran Dakshata Mandal, in collaboration with the Association of Teachers in Biological Sciences (ATBS), Mangroves Society of India (MSI), Salim Ali Centre for Ornithology and Natural Resources (SACON), Bhandarkar College and Ramniranjan Jhunjhunwala College, on 31st January 2016.
- b. **Purushottam G. Kale (2016)** "Responsible afforestation: A participatory effort to sustain livelihoods", in an International Conference on 'Science, Sustainability and Society in the Current Scenario: Challenges and Opportunities', organized by Vikas College in collaboration with the Indian Association of Aquatic Biologists and Naushad Ali Sarovar Samvardhini, on 20th February 2016.
- c. **Kamlakar Indulkar and Purushottam Kale (2016)**, "Learning at Home: An initiative for Self Learning", a paper read at the International Multidisciplinary Conference on 'Innovative Trends in Science, Commerce, Literature, Social Science, Economics, Management and Information Technology', held on 26th March 2016, at Adivasi Pragati Mandal Sanchalit, Comrade Godavari Shamrao Parulekar College of Arts, Commerce and Science, Talasari, Dist. Palghar, organized in association with the International Association of Academicians and Researchers (INAAR).
- d. **Deepak Poojary (2016)**, "Effect of construction waste dumping and reclamation activity on the macrobenthos of ulhas river estuary" at one day National Seminar on 'Wetlands: Present Status, Ecology and Conservation, organized by Maharshi Dayanand College, Parel, in collaboration with the Salim Ali Centre for Ornithology & Natural History (SACON) and the Association of Teachers in Biological Sciences (ATBS) at M. D. College, on 12th August 2015.

The Minor Research Projects was awarded to the following faculty members:

- a. **Dr. (Mrs). Janhavi Bhagwat** received a UGC Minor research project Grant of 2,40,000/- for project titled "Investigation and evaluation of haemocytic properties of some ethanobotanicals" for a period from 2014-2016.
- b. **Dr. (Mrs) Geeta Joshi** received a UGC Minor research project Grant of 2.35 Lakhs on "Improving management and trade of ornamental fish keeping by early diagnosis and treatment of diseases in 2015.
- c. **Mrs Sanika Gupte** got sanction of Minor research project titled "Evaluation of physicochemical characters of soil in and around Mulshi, Pune, The grant amount was 25,000/-.
- d. **Mrs Sushma Singh** received 25,000/- as sanction of Minor research project titled "Influence of envit. and anthropological factors on infestation of fresh water fish by parasites from some lakes of thane district"

Book Published:

- a. Dr. P. N. Sardesai- One of the authors in F. Y. B. Sc. Text Book of Zoology (ISBN -978-81-931459-06) University of Mumbai.

Resource Person:

Dr. P. G. Kale was a resource person for ;

- a. The Orientation Cum Selection Camp, for selecting the members of Indian Team to Participate in the 26th International Biology Olympiad to be held at Denmark, at HBCSE, on 6th June 2015.
- b. The Pre-departure Training Camp, at HBCSE on 5th July 2015, for training the members of Indian Team to Participate in the 26th International Biology Olympiad to be held at Denmark, at HBCSE
- c. The convention on 'Home Schooling' at Ganesh Mandir Hall, Dombivli, organized by 'Shikshanay', Bhandup, on 1st August 2015.
- d. The 'Exposure Camp in Biology' for Biology Teachers, at HBCSE, Mankhurd, on 15th October 2015.
- e. The NSS camp of R. J. College, on 25th November 2015 at Shiravli, Murbad.
- f. The Faculty Improvement Program on 'Research Methodology', at R. J. College, on 17th December 2015 and on 18th December 2015 .
- g. The 'Workshop for Review of F. Y. B. Sc. Zoology Books', organized on behalf of University of Mumbai by Maharashtra College, Mumbai, on 30th March 2016

Membership of Organizing Committees:

Dr. P. G. Kale

- a. Convened a workshop on 'Communication, Safety and Health Management' for non-teaching staff of R. J. College, between 15th and 27th June 2015.
- b. The organizing secretary for the one day 'Convention on Thane Creek', organized jointly by Mangroves Socioety of India, Paryavaran Dakshata Manch, Association of Teachers in Biological Sciences, K. J. Somaiya College and B. N. Bandodkar College, at Patanjali Hall, Bandodkar College, Thane, on 26th July 2015.

- c. Convened a 'Resource Generation Camp' at HBCSE, on 7th and 8th August 2015, for drawing high quality MCQs for NSEB, the first screening test to select members of Indian Team to participate in the International Biology Olympiad.
- d. Co-convenor of a UGC Sponsored one day National Seminar on 'Wetlands: Present Status, Ecology and Conservation, organized by Maharshi Dayanand College, Parel, in collaboration with the Salim Ali Centre for Ornithology & Natural History (SACON) and the Association of Teachers in Biological Sciences (ATBS) at M. D. College, on 12th August 2015. Presented one paper and co-authored another read at the conference.
- e. Member of organizing committee of 'Nisarga Mela' organized by Paryavaran Dakshata Mandal and Rotary Club of Young, Dombivli, at Prakash Vidyalyay, Gogiraswadi, Dombivli (E) on Sunday, 17th January 2016.
- f. Convener of the Conference on "Wetlands for our future: Sustainable Livelihoods", organized by Paryavaran Dakshata Mandal, under the auspices of University of Mumbai, in collaboration with Association of Teachers in Biological Sciences, Mangroves Society of India, SACON, Bandodkar College and R. J. College. The first Day of the conference was hosted at R. J. College, the second day, 1st February 2016 was hosted by University of Mumbai, at Marathi Bhasha Bhavan, Kalina Campus of University, during which Prizes were declared by me. On Day 3, Tuesday, 2nd February 2016, a meeting of invited experts in and stakeholders of wetlands assembled in the Convocationhall of University of Mumbai and a 'White Paper' was prepared, to be submitted to the authorities.
- g. Convened a Resource Generation Camp for setting high quality MCQs for NSEB, the first screening examination for selecting members of Indian Team to participate in the International Biology Olympiad, at Homi Bhabha Centre for Science Education, Mankhurd, on 28th, 29th and 30th April 2016.
- h. Mrs Sanika Gupte and Dr Bindu Achary are members of Syllabus Committee for S.Y.B.Sc at University of Mumbai.

Subject Expert:

Dr. P. G. Kale-

- a. Young Tarang Program on 'Jungle Vachwa, Zade Jagwa' of Sahyadri Vahini, Doordarshan, on 3rd September 2015.
- b. 'Jagar Paryavaranacha' program of DD Sahyadri Channel of Prasar Bharati, Mumbai, on 29th November 2015. The episode was on 'Noise pollution' and was telecast on Sunday, 8th November 7.30 pm and Monday, 9th November 2015, at 7.30 am.
- c. In the selection panel for the post of Assistant Professor in Zoology at Maharashtra College, Nagpada, on 26th November 2015.
- d. For evaluating the Science Projects at Intercollegiate Science Exhibition at Ruia College, Matunga, on 3rd December 2015.
- e. For evaluating the entries for the 'Young Innovetor Award' programme, organized by Zee 24 Taas and dna news paper, on 12th January 2016, when the it was recorded and the Award Function was telecast on Saturday, 6th February 2016, 9.00 pm to 10.30 pm and repeat telecast was on Sunday, 7th February 2016 at the same time on Zee 24 Taas channel.

- f. 'Jagar Paryavaranacha' on 'Colours', on DD Sahyadri Channel of Prasar Bharati, Mumbai, with Mr. Yatindra Pradhan, Producer of Short Film, 'Bura Na Mano Holi Hai' and Mr. Raviraj Gandhe as the anchor, on 17th February 2016. telecast on Sunday, 20th March 2016 at 7.30 pm with repeat telecast on Monday 21st March 2016 at the same time.

Participation in Conferences/ Seminars/ Workshops:

Dr. P. G. Kale

- 'Workshop on University Regulations' conducted by Prin. Dr. Usha Mukundan and Asst. Registrar, CONCOL section, University of Mumbai, at R. J. College, on 8th June 2015.
- Anniversary Celebration on Sunday 4th July 2015, 'Jalayatra' a boat rally of PDM for creating awareness towards Thane Creek, its biodiversity and ecological status, of Paryavaran Dakshata Mandal
- National Workshop on 'Research Based Pedagogical Tools for Teachers of Undergraduate Colleges', at the Indian Institute of Science Education and Research (IISER), Pune, jointly sponsored by the Newton Program of the British Council; Ministry of Human Resource Development, Govt. of India; Department of Biotechnology (DBT), Govt. of India; and IISER, Pune, conducted by a team of 5 experts from the Centre for Science Education, Sheffield Hallam University, UK, from 10th to 12th March 2016.

Seminars, Conferences and Workshops organised:

Regional Conference on "Wetlands for our Future: Sustainable Livelihoods", Paryavaran Dakshata Mandal under the auspices of Mumbai University in Association with ATBS Bandodkar College & R.J.College was organised on 31st January 2016 . Dr. P. G. Kale was the Convenor of the conference and all teachers in Botany and Zoology were on various committees.

19. List of Short term training courses/workshops conducted for students and faculty, including title, duration, no. of beneficiaries

I. A six day workshop was organized for non-teaching staff from various departments

Sr . no	Name of the guest faculty	Designation	Host Institute	Title of the lecture	Dates	Duration of visit
1	Mr. Anil Hardikar	Media and Event Manager	Free Lance	Communication Management	15.06.15	2hrs
2	Mr. Santosh Thombre	Head, safety health and environment.	Cipla	Safety Management	16.06.15	2hrs

3	Mr. Amol Joshi	Professional Pranic healer	Own Clinic	Psyche Management	17.06.15	2hrs
4	Dr. R. P. Athalye	Vice Principal and Associate Professor	Bandodkar College.	Health & Stress Management	18.06.15	2hrs
5.	Dr. Prasad Karnik	Director	Sleep Institute	Sleep Management	26.06.15	2hrs
6.	Dr. P. G. Kale	Head, Dept of Zoology	R. J. College	Diet Management	27.06.15	2hrs

Objective:

To train the members of non-teaching staff in management of communication, safety, psyche, health, stress, sleep and diet.

Outcome:

- The participants learnt various techniques of effective written and spoken communication.
- Hands on training of safe handling of electrical appliances, fire extinguishers, handling hazardous chemicals.
- Maintaining the Psychological fitness and avoidance of emotional outbursts.
- Participants learnt simple yogic daily exercises for management of health and stress.
- Importance of sleep in physical and mental health was understood.
- Selection of diet to suit the seasons and to avoid medicine were learnt.

II. GLP: A lecture and training on ‘Good Laboratory Practices and Laboratory Safety’ was conducted by Dr. P.G.Kale for T.Y.B.Sc students on 10th June 2015.

III. Laboratory Skills: Two day training in ‘Basic laboratory skills and hands on training on instrumentation’ was conducted for T.Y.B.Sc students by Dr. (Mrs). J.A. Bhagwat on 12th and 13th of June 2015.

IV. First Aid: The students of F.Y.B.Sc were given First Aid training by Civil Defence personalities on 12th Feb. 2016.

V. Safety Signs: As a Good Laboratory Practice the students of F.Y.B.Sc were trained to identify various chemicals as toxic hazardous etc. and relabeling of the chemical bottles in the laboratory was done under the supervision of Dr. Bindu Achary on 21st Feb.2016.

Outcome:

- The above activities helped the students in inculcating laboratory discipline and skills required to handle various laboratory instruments and chemicals.
- They also learnt various first aid techniques.

20. Guest Lectures (details like name of scientist, topic, no. of students)

Sr. no	Name of the guest faculty	Designation	Host Institute	Title of the lecture	Date/ Duration	No. of students
1.	Dr. Rajendran Gopalan	Assistant Professor,	Bradford University	Opportunities abroad	28.07.14 2hr	108
2.	Dr. AmitaValmiki	Head, Dept. Of Philosophy	R.J college	<i>Environmental Ethics and Religion</i>	13.08.14 1hr	45
3.	Mrs. Ashwini Jadhav	Assistant manager	Geochem Lab. Kanjurmargin	G.L.P. for T.Y.B.Sc students of Zoology and Botany	11.06.15 2hrs	85
4.	Mr. Manas Manjrekar	Research Scholar	WII, Dehradun,	Opportunities in Wildlife Research	30.06.15 2hrs	100
5.	Dr. Sanjay kumar Bharadwaj	Associate Prof.	Meerut University	Research Avenues in Ornithology	10.09.15 2hrs	80
6.	Prof. B.B.Nath	Professor in Zoology	Department of Zoology, Pune University	Avenues in Biodiversity research and NET/SET preparation	04.03.16 2hrs	60
7.	Mr. Jaywant Dukhande	PSI and Friend of Snakes	Mumbai Police	Snakes and their habits	20.01.16 2hrs	60

Objective:

To lend valuable information from the experience and expertise of learned scholars

Outcome:

Enrich the students with latest update of industries and technicalities. Students were bestowed with knowledge of avenues for higher studies.

21. Visits to industries, institutes etc (name of place, duration of visit and no. of students)

- **Veermata Jijabai Udyaan:** About 200 F.Y.B.Sc students visited the Zoo at Veermata Jijabai Udyaan, Byculla for about 3hrs in the month of December 2015–January 2016 in batches.
Objective: To study the habitats, morphology and distribution of animals.
Outcome: Students submitted a report based on their observations and findings. Enhancement of taxonomic knowledge and observatory skills.
- **SNGP:** About 75 S.Y.B.Sc students had been for one day excursion to Sanjay Gandhi National Park-Borivli on 15th sept. 2015. They also visited rocky and sandy beaches of Alibag on 15th Feb. 2016.
Objective: To enlighten the learners about the current status of wildlife conservation in Mumbai.
Outcome: Students submitted a report based on their observations and findings. The photography skills were enhanced. Acquired understanding of malacological species. Seeding of career in wildlife in young minds.
- **Study tours to Biogas Plant, SGNP and Orissa :** T.Y.B.Sc. students visited the Biogas Plant and Sewage Water Treatment Plant, at Hiranandani Estate - Thane on Thursday 13th August 2015. They had been for one day excursion to Sanjay Gandhi National Park-Borivli on 12th sept. 2015. T.Y.B.Sc. students had been for long excursion to Orissa Bhubaneshwar from 2nd to 11th Jan. 2016. A project report was submitted by the students on these study tours.
Objective: To familiarize students with the aspects of wildlife and environment.
Outcome: Understood the change in biodiversity with regional topography. Insight into the socio-cultural aspect of India. Development of field skills as well as the skill of reporting the findings. Inculcation of spirit of team work

22. List of Lab manuals/SOPs generated for all participating departments

- Hand book for F.Y.B.Sc. Zoology practical.
- Hand book for S.Y.B.Sc. Zoology practical.
- Hand book for T.Y.B.Sc. Zoology practical.
- Protocols for T.Y.B.Sc. and M.Sc.
- Handouts for various workshops/extension practical
- SOP for all Laboratory instruments.

23. Feedback mechanism adopted (to be indicated in term of how the quality of teaching and hands on training improved)

Feedback forms were prepared for the training programs conducted by the Department and the affectivity of each session conducted during the course was ascertained. The feedback was made available to the faculty on their request.

24. Any special innovative approach adopted by the college in improving the UG education

Book Review: T. Y. B. Sc Zoology students were orientated towards the book review session by Dr. S. T. Ingale & Mrs. S. S. Gupte on 3rd July 2015 to inculcate the habit of reading. Of the 45 students enrolled, 24 students participated in the activity. Out of all the reviews 7 reviews were shortlisted

and best three were selected on merit. Mr. Royston Rogers, Ms Vaz Candida and Ms. Khot Azra were felicitated as the winners of this event

Objective: To develop reading habits with critical analysis of the content.

Outcome: Students learnt the utilization and importance of books as a greater source of information.

Debate: A debate titled “Voices of Gender” was organized for T. Y. B. Sc class which was judged by Prof. Arundhati Chitre, Associate professor of Sociology and Prof. Deepak Poojary, Asst. Professor of Zoology on 11th July 2015. A team of 8 boys and girls each participated and Ms. Candida Vaz was judged the best speaker.

Objective: To stimulate vocabulary skills in students.

Outcome: Dissolution of stage fear and boosting of self confidence.

Paper presentation: T.Y.B.Sc students Sandhya Santhosh and Ganesh singh B. Rajpurohit gave oral presentation on “*Endophytic fungi Associated with Mangroves as a Resource for Pharmacological bioactives : A Review*” under the guidance of Dr. Janhavi A. Bhagwat in the seminar “Wetlands for our future: Sustainable livelihood” on 31st Jan. 2016.

Objective: To develop research skills.

Outcome: Application of knowledge leading to achievement second prize in the event.

Literature Survey: S.Y.B.Sc students carried out a literature survey on various topics such as Aquarium fishes and their maintenance, Lifestyle diseases, Personal and Social Hygiene, etc., and submitted a report based on their findings in Zoo-Fest event on 23rd Dec. 2016.

Objective: To inculcate a research temperament by reviewing scientific literature.

Outcome: Students gained the skill of writing dissertation based on various data and observations.

Review writing: A Review writing Competition for S.Y.B.Sc was conducted on A documentary on snakes, ‘Serpents’, a BBC production on 16th October 2016 by Dr. Janhavi Bhagwat. Entries of Ms. Iram Sayed and Mr. Sandeep Chaudhary were judged the best.

Objective: To enhance the observatory and graphic skills in students.

Outcome: Students gained knowledge by Audio-visual learning and also the art of writing review writing.

Intercollegiate event: Intercollegiate Poster Making Competition was organized on 23rd December 2015. About 20 students from various colleges; Kirti, Somaiya, Elphinstone, V.K.Krishna Menon, NES Ratnam, Kelkar, Sathaye, R.J participated in this event. Mr. David Nadar of Ratnam College and Mr.Rajan Rane of Sathaye College won the prizes in the Degree and Junior category.

Objective: To promote creativity amongst students.

Outcome: Promotion of healthy competitive spirit and enhancement of focused thinking

Food court: A zoo feast was organized by T.Y.B.Sc and M.Sc students.

Objective: Use of culinary skills in formulation of balanced diet.
To develop marketing & managerial skills.
Outcome: Inculcated entrepreneurship skills in students.
Generated awareness about healthy and nutritious food.

25. A summary on “how the Scheme helped in strengthening of the UG education and what would not have been possible without this” (not more than 1000 characters)

The DBT STAR COLLEGE scheme gave new insights to the teachers in effective teaching and development of novel methods in practicals. They not only devised innovative tasks and methods of communication but realized the needs to expand their sphere of knowledge, skills and experiences. The students got an opportunity to participate in extension practicals and hands on experience on instruments. Their laboratory and computational skills improved and they also learnt effective communication. More students participated in the study tours due to travel sponsorship by DBT. With the DBT funding, the department could organize guest lectures by eminent personalities to widen the horizon of knowledge and skills.

26. Suggestions/feedback for improving the scheme

- Funding for faculty improvement program involving greater expenses can be taken into consideration.
- Creating Online feedback by DBT for students and teachers to avoid generation of paper waste.

Logo of the College



A passport size photo of the coordinator, front pose, no side posture, sharp and best quality, no grains and 200-300dpi; with name, designation and complete address



Name:

Dr. Himanshu G. Dawda

Designation:

Vice Principal & Associate Profesor

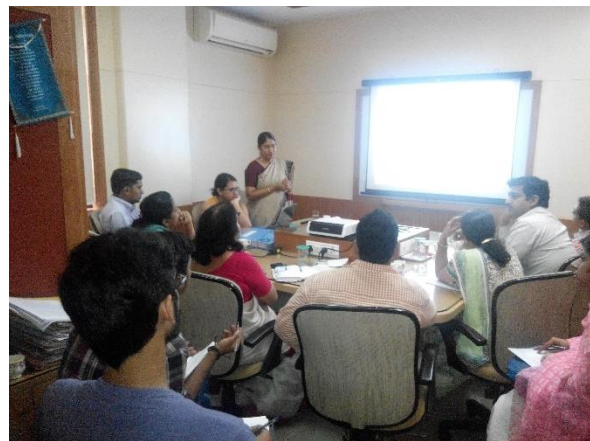
Address:

Department of Botany,
Ramniranjan Jhunjhunwala College,
Gahtkopar West, Mumbai 400086.

Photographs of events/activities/celebrations held in the college under the support of Star College Scheme.



Avishkar Competition



GHG Accounting workshop



Dr. D.V.Amonkar Elocution competition



Teacher's training for PAGE technique



Parents meet



Floral Rangoli competition