



**KISHINCHAND CHELLARAM COLLEGE
CHURCHGATE, MUMBAI 400020**

**DBT STAR STATUS
ANNUAL REPORT**

Period: June 2019 - March 2020

DEPARTMENTS

Biotechnology

Chemistry

Life Sciences

Microbiology

Statistics

Department of Biotechnology

**Proforma for submission of progress reports for Annual Review of Colleges
supported under Star College Status**

(Kindly note that the annual report from S.no. 6 to 10 should not be more than 10 A4 size sheets, with font size 12pt and line spacing 1.5)

- 1. Name of the College:** Kishinchand Chellaram College
- 2. Name of Coordinator, Designation,**
Dr. Sagarika Damle, HOD, Dept of Life Sciences, K. C. College, +91 - 98203 60383
- 3. Assessment duration:** 01/04/2019 to 31/3/2020 Duration in years: 01
- 4. Details of Departments Supported**

Sl No	Name of Department	Courses (B.Sc./M.Sc./PG Diploma, certificate etc.) offered	Regular Faculty members	
			With Ph.D.	Without Ph.D.
			Total = 19 and 15	
1	Biotechnology	B.Sc.	01	04
2	Chemistry	B.Sc., M.Sc., by research and Papers and Ph.D.	08	02
3	Life Sciences	B.Sc., Ph.D.	06	01
4	Microbiology	B.Sc., M.Sc. by papers and research	02	03
5	Statistics	B.Sc., M.Sc.	02	02 + 03 (Ad-hoc)

- 5. Number & Date of Advisory committee meeting:**
Biotechnology – 20th December. 2019
Chemistry – 26th November, 2019
Life Sciences – 20th December, 2019
Microbiology – 21st December, 2019
Statistics – 28th March, 2020

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

(You may enumerate 5 minor projects where students were involved and their impact or similar activities and their outcome; this is for representative purpose and coordinator may include details as per his own choice; kindly refrain from providing philosophical data Avoid any introduction. All the justifications must be very crisp like any aspect non-existent pre-STAR Scheme and you achieved after the grant).

Biotechnology

- The DBT STAR STATUS aided in uplifting the quality of projects undertaken, especially with respect to clinical applications and women health. Key projects are “Development of a modified Zimmermann HPAKT colorimetric assay to detect testosterone using urine and devising a unique test series for contemplating PCOS in females” and “Formulation and evaluation of an Antiseptic Ointment Using Natural Extracts.” Details of other projects are tabulated below.
- Hands on Faculty Development Programme of three-day Workshop on ‘Molecular and Immunological Diagnostic Techniques’, allowing faculties around the state to gain hands on skill in PCR, RFLP, ELISA, Western Blot, Immunohistochemistry & Immunofluorescence.
- Interdepartmental collaboration between Biotechnology & Microbiology, “Lab on Move”, where SYBSc students of the department designed posters and banners to inculcate awareness on environmental issues and GMOs among Kamlabai High Schoolteachers and students.
- A first of its kind Entrepreneurship Development Programme, where students were encouraged to generate devices, gadgets, or inventions from waste, all of which have been combined in an Innovation Manual, Vol. I produced as a resource by the Department.
- Inviting world renowned Dr. Shubha Tole, Ph.D., Head, Neuroscientist, Department of Biological Sciences, Tata Institute of Fundamental Research, for a seminar on “Neuronal Crosstalk in Development” for students and faculty. Industrial visits arranged by the department to ACTREC, NIRRH and the CETP water treatment plant helped students in seeing and understanding what they learn inside the classroom and grow up to industry standards.

Chemistry

- We could purchase new instruments which helped us in providing better facilities for laboratory work. The experiments which were previously conducted in groups due to shortage of instruments, were now conducted individually by the students. We could add new experiments using instruments like pH meter, Conductometer, Spectrophotometer.

- Facilitating interaction of students with resource persons from reputed institutes like BARC, ICT, SAIF thereby generating interest in subject.
- The students obtained a unique opportunity to come across different theoretical as well as wide range of interdisciplinary hands-on training exposure. The facility of Industrial Visits could be extended to all the students with the financial aid from DBT. The number of Industrial Visits has increased.
- The students got an opportunity to handle and work with various instruments, thereby learning Chemistry beyond the boundary of the Prescribed Syllabi. Inviting Padmashree Prof M. M. Sharma on the occasion of IYPT. Students got a chance to listen to stalwarts.
- The teaching learning process was made more interesting for both the faculty and students due to a wide variety of related experiments and activities conducted under the Star Status. The hands-on training involving Application of Dyes synthesized in the lab for Tie and Dye method was an interesting activity which gave the students a glimpse in the practical application of experiments conducted in the laboratory.

Life Sciences

- Importance of segregation and management of Solid Waste was taught to the students with the help of a Hands-on training carried out by Dr. Nilima Kulkarni from 'Haryali' NGO under the program entitled 'Zero Garbage'. F. Y. B. Sc students further extended this activity as a project for kitchen waste management.
- Sensitization about Bird Conservation in urban areas by supplementing eco-friendly material for Bird Nest Making Workshop was carried out by Mr. Rakesh Khatri in association with EcoRoots Foundation. The activity was extended for Colaba Municipal School Students and the nests prepared were put to actual use. Students of all classes participated in the activity.
- Online educational tools were generated for understanding Bioinformatics by students under Star Project. This tool was made available for creating awareness about bioinformatics as a discipline amongst Schools, Junior College and undergraduate degree college students.
- Skill development of Non-teaching staff as mentors in training F. Y. B. Sc students for setting up of a *Paramoecium* Culture.
- Fields trips and institutional visits to places such as Tadoba Tiger Reserve, Marine ecosystem at Colaba Fort, Alibaug, Visit to Metropolis Diagnostics, Anandvan, Varora etc. were academically enriching for the students and were instrumental in inculcating a temperament of learning outside the classroom.

Microbiology

- ‘Analysis of Physiochemical and microbial Parameters to evaluate the drinking water quality in five different villages in the vicinity of Saphale of Palghar district in Maharashtra’ was an interdepartmental Community- based project carried in collaboration with Department of Chemistry.
- The funding under the DBT Status grant helped in converting many demonstration experiments like Restriction digestion, Agarose Gel Electrophoresis, MIC determination by agar dilution method to Hands-on experiments, which made the topic interesting for the undergraduate students.
- T. Y. B. Sc students were trained in Molecular Biology techniques like DNA Extraction and Real Time PCR, ELISA. Various projects, lectures and workshop helped the students to understand practical applications of certain topics and motivated them towards research activities.
- Students became facilitators for inculcating scientific temper among school students in activities like Lab on Move and Microfiesta 4.0.
- The field visits to ACTREC, BARC, NIRRH, Maharashtra State Khadi and Village Industries Board, Directorate of Bee keeping, Katraj dairy helped the students to widen their horizon beyond the syllabus. It ignited the curiosity and helped the students to develop scientific temper and technical skills.

Statistics

- The funds received under the Star College Status, enabled the Department to setup computational laboratory as well as purchase books to enrich the college library to which the students and teachers have an easy access.
- Due to DBT STAR status students were given more hands-on with different statistical packages like MS-Excel, SPSS, R-Programming, SAS and Jamovi etc. Hence, Students got exposure to statistics data analysis related projects which enabled UG students to take-up small in-house projects. This helped them to gain an insight into research in statistics.
- New practicals were designed from the perspective of understanding theoretical concepts taught in class rooms.
- Students are motivated to take part in different levels of competitions like Intercollegiate, University, State and National level data analysis and Research paper presentations.
- With enhanced ability, students developed an interest in analytics and hence opportunities for internship to placement in small numbers were generated.

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

Biotechnology

- The 3 days FDP organized was an enormous effort taken and received appreciation from all participants. The Entrepreneurship Development Programme for students with the Innovation Manual, Vol. I as an important resource was a novel attempt. The Department plans to construct and streamline its own journal to encourage research, publication and scientific writing.

Chemistry

- All the students of T.Y.B.Sc. class were involved in group research projects. These projects covered a wide variety of topics from herbal products, Cosmetics, Food to Volatile Organic Compounds.
- T.Y.B.Sc. students of the Chemistry Department Visited the Nuclear and radiochemistry laboratory and were demonstrated the method of procuring and storing radioisotopes. They were explained the methods of safe discard of radioisotopes and use of sophisticated instruments like gamma ray spectrometer, GM counter.
- We have generated SOP for handling of instruments and their calibration which is a ready reckoner available to all working with the instruments. Also, a collection of Project reports was prepared as a resource that could be referred by students in future.
- Planning to have Lab on wheels so that we can reach the less privileged students from remote areas
- Planning to conduct training programs for faculty in the field of Advanced instrumental analysis
- We are planning to introduce a new set of experiments that can be conducted by UG students using the newly procured IR Spectrophotometer under Star Status.

Life Sciences

- Organization of lecture cum workshop entitled '100 Not Out' on Geriatric Management helped in spreading awareness among the students regarding the opportunities available in field of elderly care. Many aspects of event management were learned by the students in organizing a National Level Workshop.
- Planned for a training program in 2020 - 2021 after the procurement of New Instruments purchased under STAR STATUS GRANT.
- Skill upgradation of faculty and students for generating Online resources/ E-content.

Microbiology

- A three-day faculty training workshop was conducted on ‘Molecular and Immunological Techniques’ to train the teachers from Mumbai and interiors of Maharashtra state. The workshop also includes lectures for UG and PG students for colleges from Mumbai and Thane.
- A SOP of Molecular and immunological techniques along with troubleshooting was developed and made available to all teacher participants and is available on the college website.
- The students were trained in documentary making at the event SciShots and an intercollegiate competition Microfiesta 4.0 having two competitions on working model making and video making was conducted to promote scientific temper in students.

Statistics

- The Department of Statistics has published a book titled “Analyzing and Visualizing Data using free open-source software Python Programming with case studies” with ISBN number ISBN No. 978-93-80788-93-7. The book is freely available with previous R-Programming book on K. C. College Website.
- Students contributed their papers in Research Journal title “Jigyasa”. Published Environment Space Magazine and Prepared e-report on Python based Projects.
- Organized interdepartmental two days free open Source Jamovi Software Workshop for SYBSc and TYBSc Students of Statistics and Life Sciences by in-house faculty of Statistics Department on Occasion of National Statistics Day.

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

- The DBT Star Status funding encouraged faculty in planning FDP, allowed ordering of additional instruments and laboratory utilities, motivated students to undertake research projects of more value and clinical applications. Extensions and new practicals could be conducted and importance of maintaining records that could lead to generation of SOPs was learnt by the stakeholders.
- Organizing various sessions for students in addition to their regular schedule was a greatest challenge, which was overcome by efficient planning and time management. With the guidelines provided by DBT, reaching out to the underprivileged educational institutions especially in rural areas could be accomplished by the five departments.

- A need for separate technical or support staff for the administrative work related to Star Status program. As there is no provision for separate fund allocation for Annual Maintenance Contract for instruments, there is a need for the same, however the college supports the maintenance requirements as the need arises.

9. Key performance indicators

S.no	Indicator	2018 – 2019		2019 - 2020		Rem
1	No. of students admitted	Total = 517		Total = 440		
		M = 148	F = 369	M = 104	F = 336	
		Biotechnology – M-11; F-37 G- 34, SC-1, OBC-3 Chemistry – M – 48; F – 158 G – 163; SC – 20; OBC - 23 Life Sciences – M - 25; F - 94 G – 100; SC – 8; OBC - 11 Microbiology – M-13; F-49 G-45; SC – 9; OBC – 8 Statistics – M-51; F-31 G-75; SC – 3; OBC – 6		Biotechnology – M-06; F-32 G-25, SC-2, OBC-3 Chemistry – M-36; F-144 G – 145; SC – 16; OBC - 19 Life Sciences – M – 19; F – 83 G – 87; SC – 6; OBC - 9 Microbiology – M - 7; F - 46 G - 42; SC – 5; OBC - 6 Statistics – M-36; F-31 G-58; SC – 2; OBC – 7		
2	No. of students passing out (%) Students Admitted/ passing out (pass %)	Biotechnology – 100% Chemistry – 82.98% Life Sciences – 100% Microbiology – 100% Statistics – 75.00%		Biotechnology – 100% Chemistry – 100% Life Sciences – 100% Microbiology – 100% Statistics – 97.87%		
3	Drop-out rates	Biotechnology – 21.00% Chemistry – 40.38% Life Sciences – 27.86% Microbiology – 6.45% Statistics – Nil		Biotechnology – 20.00% Chemistry – 45.00% Life Sciences – 8.51% Microbiology – 15.09% Statistics – Nil		
4	No. of students opting for MSc	Biotechnology – 67.64% Chemistry – 20.93% Life Sciences – 75.00% Microbiology – 72.41% Statistics – 34.38%		Biotechnology – 85.29% Chemistry – 39.58% Life Sciences – 56.00% Microbiology – 63.33% Statistics – 36.17%		
5	Average marks (Modal value has been represented)	Biotechnology – A Chemistry – A Life Sciences – A+ Microbiology – A+ Statistics – A		Biotechnology – A+ Chemistry – O Life Sciences – A+ Microbiology – A+ Statistics – O		

6	No. of hands-on experiments being conducted	Biotechnology – 12 Chemistry – 13 Life Sciences – 27 Microbiology – 19 Statistics – 08	Biotechnology – 17 Chemistry – 16 Life Sciences – 30 Microbiology – 15 Statistics – 08
7	No. of new experiments introduced	Biotechnology – 30 Chemistry – 05 Life Sciences – 12 Microbiology – 16 Statistics – 25	Biotechnology – 21 Chemistry – 03 Life Sciences – 12 Microbiology – 23 Statistics – 21
8	Publications (Scopus indexed) /patents, if any.	Biotechnology – 00 Chemistry – 00 Life Sciences – 00 Microbiology – 00 Statistics – 00	Biotechnology – 01 Chemistry – 00 Life Sciences – 00 Microbiology – 00 Statistics – 00
9	Training received by faculty	Biotechnology – 02 Chemistry – 00 Life Sciences – 03 Microbiology – 01 Statistics – 03	Biotechnology – 07 Chemistry – 00 Life Sciences – 02 Microbiology – 06 Statistics – 03
10	Exhibitions/seminars/training courses conducted	Biotechnology – 01 exhibition; 01 Seminar Chemistry – 4 Training courses; 4 Seminars Life Sciences – 05 exhibitions; 04 training courses; 01 seminar Microbiology – 02 exhibitions; 04 training courses; 01 seminar Statistics – 01 Exhibition; 03 Training courses	Biotechnology – 01 exhibition; 4 training courses; 06 seminars Chemistry – 5 Training courses; 5 Seminars Life Sciences – 02 exhibitions; 04 training courses; 02 seminars Microbiology – 01 exhibition; 03 training courses Statistics – 01 Exhibition; 05 Training courses; 2 Seminars
11	Books/journals subscribed from grants	Biotechnology – 01 Chemistry – 00 Life Sciences – 00 Microbiology – 00 Statistics – 00	Biotechnology – 00 Chemistry – 00 Life Sciences – 00 Microbiology – 01 Statistics – 26
12	Outreach activities (Popular lectures)	Biotechnology – 00 Chemistry – 04 Life Sciences – 05 Microbiology – 00 Statistics – 07	Biotechnology – 02 Chemistry – 07 Life Sciences – 04 Microbiology – 05 Statistics – 01

13	Colleges mentored to apply for DBT Star College grants	Biotechnology – 00 Chemistry – 00 Life Sciences – 00 Microbiology – 00 Statistics – 01	Biotechnology – 00 Chemistry – 00 Life Sciences – 01 Microbiology – 00 Statistics – 01	
14	Invited lectures	Biotechnology – 01 Chemistry – 07 Life Sciences – 11 Microbiology – 02 Statistics – 04	Biotechnology – 02 Chemistry – 11 Life Sciences – 10 Microbiology – 01 Statistics – 02	

•Proofs (for Point 6-14 under S. No. 9 not more than 5 pages, 1.5 line spacing 12 times roman font size) to be provided duly attested by Principal and Coordinator.

10. Self-evaluation

*Objective (as stated in proposal)	% Achieved	Reasons for underachievement / If achieved, state in quantitative metrics
DEPARTMENT OF BIOTECHNOLOGY		
Scientific training, Hands on training for skill upgradation	80% = 1.5	With a total of 38 (17+21) hands on experiments, 15 new research projects and 12 completed research projects, a seminar on scientific writing, and 6 student activities focused on thesis writing, research paper writing, reference formats; we've been able to achieve the best of this objective. We aim to garner publication soon. In the present year, department faculty participated in 10 workshops, and organized 9 trainings for other staff and faculty.
Field trips/ industrial visits- Learning outside four walls	75% = 1.5	3 Industrial visits were organized this year, each to places of different Biological Significance – Cancer Biology, Developmental Biology, and Environmental Biology.
Collaboration/ interdepartmental activities	80% = 1.6	Various workshops and interdepartmental activities were conducted based on the training on different Molecular and Diagnostic techniques, ELISA technique, western blotting and also a creative training on Documentary and Short film making.
To materialize and commercialize research by development of cost-effective alternative products, and generate e-resources.	80% = 1.6	With a total of 5 research projects focused on alternative product development such as biodegradation of plastic, fertilizers, and formulation of new products, An <i>Innovation Manual</i> listing 24 different products generated from waste items. We also have 4 in-house publications in Jigyasa.
Outreach activity/ Extension activity	80% = 1.6	With 5 research projects focused on a Lab on Move activity with BMC school students and teachers, and few hands-on training practicals on evaluating environmental health and agriculture produce, this has been a challenging objective. 10

		posters on biotechnological invention through Inspirus'19 has turned out to be satisfactory objective accomplished.
DEPARTMENT OF CHEMISTRY		
Hands on Training	80% = 1.6	Some of the planned activities could not be conducted due to limitations of time. (Workshop and Hands on training on Mass Spectrometry)
Collaboration and Interdepartmental Activities	50% = 1.0	Summer Training for students could not be arranged due to clashes with academic calendar and also due to the confidentiality and hygiene issues of the industries.
Field Trips	80% = 1.6	FYBSc students could not be taken for Industrial Visit due to time constraint
Outreach Activities	75% = 1.5	Lab on wheel is one Outreach activity that is still in the planning stage. We are currently working on it.
Resource generated	70 % = 1.4	We are still in the planning stage as far as resources to be generated.
DEPARTMENT OF LIFE SCIECNES		
Training Programs: 4 of 6 (03 per Term: Targeted) Research Projects and New/extended Practical 35 Research projects and 11 new and 30 extended practical	80% = 1.6	Due to shortage of time and syllabus completion priorities the target number of training programs were not achieved. The Department focusses on inculcating Research temperament in students from first year itself. Research projects focusing on various fields of science were carried out by students wherein all students of the department (FY, SY and TY) were involved in the same. Students of TYBSC were also asked to present their research findings on an open platform. The department aims to publish these findings in peer reviewed Journals.
Field trips and Industrial Visits 8 of 8 (04 per Term: Targeted)	100% = 2.0	Many places in an around Mumbai are covered wherein students from all four subjects of the department participate in the field trips. Being a biology-oriented Department, more field trips are always targeted.
Collaboration and Interdepartmental Activities 8 of 10 (05 per Term: Targeted)	80% = 1.6	Many other collaborative plans are in progress and shall be carried on in the upcoming years
Outreach and Extension activities 4 of 6 (03 per Term: targeted)	67% = 1.34	School children and adopted villages have been targeted for outreach activities. More activities were planned but could not be completed due to various factors including lack of time.

Resource Generation:	75% = 1.5	More quantitative outcomes have been targeted. A broader reach needs to be targeted and department has been working on the same. Generated resources include Jigyasa Research Journal, Herbaria, DNA Models, Cell organelle and Ecosystem charts and models, Bioinformatics teaching and learning tool, Herbal plant products, Scientist of the Year Calendar, Departmental Newsletter, SOPs for handling of Lab Instruments
DEPARTMENT OF MICROBIOLOGY		
Training for skill upgradation	100% = 2.0	Skill enhancement workshops and trainings were conducted (Workshop for Teachers (01) + Training for students (01)) and attended by the staff (06) and students (02). Students were also trained in handling of instruments during practicals (07) and research projects (03).
Tie-ups/ Collaboration/ Interdepartmental activities	80% = 1.6	Collaboration with Lady Tata Memorial Trust and HiMedia for training teachers and students respectively. Various Interdepartmental projects (02), Outreach activities (04) and workshop and training were conducted (02)
Industrial/ Institutional/ Field visits	80% = 1.6	7 Field/ Institutional and Industrial visits were conducted for faculty and students. The department aims to organize industrial visit Bioprocess and Pharmaceutical industries in the next academic year.
Outreach activities	80% = 1.6	5 outreach activities were conducted. The activities aimed at inculcating scientific temper in school students (Microfiesta 4.0, Lab on Move, Sharing is caring). Also, students from various subjects were trained in video making and Artificial intelligence for broadening their skill set. Water analysis of 5 villages was carried by the students using various physical, chemical and Microbiological indicators. Lectures under workshop were attended by students and teachers from across Maharashtra.
Resource generated	75% = 1.5	Jigyasa and SOP of Molecular and immunological techniques was developed and is available online
DEPARTMENT OF STATISTICS		
Development of educational resources	80% = 1.6	Contribution by Research Scholars in Jigyasa every year. e-Book and print book were developed and access is given by college website and social media like Research Gate, Facebook. This has encouraged readers to learn and motivated to contribute their ideas.
Collaborative and Interdepartmental Activities	80% = 1.6	Statistics Department believes in open door social policy. Always readily available to render all kinds of help from

		training program to research pursuits of students, researchers and teachers.
To train students on statistical /Data analysis skills at institution level and also to strengthen Hands on training programs of the students	66% = 1.3	Lack of resources like one-to-one basis Computing facility (computers with variety of softwares, Payment of Professional Fees of around twenty thousand per day to teach open-source software etc)
Industrial / Field Visit	50% = 1.0	Limited fund is assigned to visit Agricultural Universities/Institute Visit along with and time management.
To inculcate Research Culture	50% = 1.0	Lack of resources like Menu driven high end Software. Computers, No. of confirmed faculty etc

*** For quantitative analysis you may fix five objective (max) each having 2 marks and accordingly can calculate the matrix.**

