

**Department of Biotechnology**

**Proforma for submission of Annual Progress Report supported under Star College Scheme**

1. **Name of the College :Vimala College (Autonomous), Thrissur**
2. **Name of Coordinator, designation, Address, Phone No. : Dr Silvy Mathew, Assistant Professor, Department of Botany, Vimala College (Autonomous), Thrissur, Kerala, 9496409300.**
3. **Assessment duration : 01/04/2022 to 31/08/2023** Duration in years: One and half year (including the six month extension)
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.
			<b>Total = 34</b>	
1.	Botany	B.Sc. Botany & M.Sc. Botany (Self)	4	0
2.	Zoology	B.Sc. Zoology & M.Sc. Zoology (Regular & Self)	4	1
3.	Physics	B.Sc. Physics & M.Sc. Physics	7	2
4.	Chemistry	B.Sc.Chemistry & M.Sc.Chemistry (Self)	7	0
5.	Statistics	B Sc, M Sc (Self), Certificate Course -Advanced course in C++ and Python , Basics of Statistical Data Analysis	5	0
6.	Mathematics	B Sc, M Sc, Certificate Course -Documentation through Latex	1	3

**5. Number & Date of Advisory committee meeting : 2**

1. 01/08/2023 at 11.00am
2. 23/03/2024 at 2.00pm

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

(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).

- **Botany- Study on *Clerodendrum paniculatum* linn. flower mediated green synthesis of silver nanoparticles and their biological activities:** *Clerodendrum paniculatum*, a species known for its diverse phytochemical composition and medicinal properties, stands out as a promising candidate for the synthesis of Ag NPs. Four levels of nano silver nitrate solution (10,20,30,40) were sprayed in the

different amaranth plant from their seed growth stage. The result shows that there is the significant difference in their size. Increasing in the concentration of solution from 10  $\mu\text{l}$  to 40  $\mu\text{l}$  caused an increase in the seed growth. *Biosynthesized nanoparticles from Clerodendrum paniculatum* showed significant antioxidant properties.

- **Zoology- Eco Friendly Biosynthesis of Iron Nanoparticles and Screening for Mosquito Larvicidal Activity:** The synthesized nanoparticle dust of 0.01g, 0.025g, and 0.05g were diluted in 5ml of distilled water in 3 different bottles, making up 3 different concentrations of nanoparticles. Into each bottle of nanoparticle solution, 5 mosquito larvae were introduced. These bottles with the live larvae were separately observed for death of the larvae due to nanoparticle toxicity. The solution with high concentration all larvae will die within one day. Death rate of larvae decreases with decrease in concentration.
- **Physics-. An investigation on the performance of single / multimode optic fibres:** One of the basic fibre parameters, the numerical aperture, was calculated for both single and multimode fibers. It was confirmed that as distance between the optic fibre end and the XYZ translation stage increases, the light from the optic fibre disperses more. The bending loss of an optical fiber increased with the number of turns and decreased with the radius of the turns. No considerable change in the maximum output current was observed when the optic fibre was immersed in water or saline solutions. It was also concluded that the optic fibre output had no severe change on varying the temperature of the surrounding medium from 45 to 85 °C.
- **Chemistry- A study of Schiff base and natural compound as corrosion inhibitors:** Organic compounds which act as corrosion inhibitors are not only expensive but also toxic to living beings. So the anticorrosive activity of natural compounds like ginger extract are evaluated. In presence of a Schiff base the inhibition efficiency values in con HCl and con H<sub>2</sub>SO<sub>4</sub> media were found to increase with their concentration. While studies using ginger extract as the inhibitor the efficiency is found to be increasing and then decreasing with increase in concentration. The adsorption isotherm provided a formal description of the adsorptive behaviour of the studied compounds on metal pieces. For the Schiff base in con H<sub>2</sub>SO<sub>4</sub> medium, Langmuir adsorption isotherm and in con HCl medium Freundlich isotherm is plotted.
- **Mathematics-DATA ANALYSIS ON WOMEN'S HEALTH:** Data is collected and analyzed to answer questions, test hypotheses, or disprove theories. Women of all fields of life irrespective of their ages, their profession or family circumstances should be mandatory to undergo periodic health checkups. The study of Women health issues is conducted to understand the impact of COVID on the health issues of women. Responses from women of age group other than 20 to 25 years is studied using different data analysis tools. Some remedial measures are also suggested in the project.
- **Statistics- Forecasting tax revenue of Thrissur district, Kerala using ARMA Model: A time series analysis:** By decomposing revenue data and exploring autocorrelation and seasonality effects, the research aims to discern recurring patterns and causal factors influencing revenue fluctuations. Additionally, it assesses the impact of external factors such as economic indicators and market

dynamics. By providing actionable insights and accurate forecasting models, this study equips decision-makers with valuable tools for strategic planning and performance optimization, contributing to sustainable growth and informed decision-making in organizations.

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

Different statistical tools were familiarized by students, biosynthesis of nanoparticles from plants extracts, Math coding & AI, FABLAB visits, Astrotalk series etc.

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

- Changing of the bank was a problem for the smooth running of the project.
- Hands-on training was completed and students studied a lot from the same.
- Students got detailed information via field visits and institute visits.

**9. Key performance indicators**

Sl. No.	Indicator	Pre-support	During /After Support	Remarks								
1	No. of students admitted	Total = 802					Total =828					
		M	F=802				M	F=828				
		Nil	SC	ST	OBC	G	Nil	SC	ST	OBC	G	
		0	90	3	200	509		65	0	357	406	
2	No. of Students Admitted/ passing out (pass %)	85.83%					93%					
3	Drop-out rates	3					0					
4	No. of students opting for MSc	Total Female = 88 SC-5,ST-1,OBC-15,G-67					Total Female = 401 SC-40,ST-0,OBC-137, G-224					
5	Average marks	85					90					
6	No. of hands-on experiments being conducted	3					8					
7	No. of new experiments introduced	10					24					
8	Publications (scopus indexed) /patents, if any.	Nil					2					
9	Training received by faculty	Yes					6					
10	Exhibitions/seminars /training courses conducted	1 exhibition and 3 regional seminars					45					
11	Books/journals subscribed from grants	Nil					154 printed books					
12	Outreach activities	(Popular lectures)					21					
13	Colleges mentored to apply for DBT Star College grants	Nil					4					
14	Invited lectures	Nil					15					

Proofs (S.No. 6-14 not more than 5 pages, 1.5 line spacing 11 times roman font size) to be provided duly attested by Principal and Coordinator.

### 5. Self evaluation

<b>Department</b>	<b>*Objective (as stated in proposal)</b>	<b>% achieved</b>	<b>Reasons for underachievement / If achieved, state in quantitative metrics</b>
<b>Botany</b>	Enhancement of infrastructure	80%	Need more equipments for carrying out practicals
	Advancement of quality in teaching, learning process	80%	Need more facilities
	Awareness Talks	90%	Conduct more sessions by outside state resource persons
	Skill acquisition programmes	80%	Need to conduct more skill development courses
	Outreach and Extension	80%	Need to inculcate science to communities and do more for school students
<b>Zoology</b>	Enhancement of infrastructure	80%	Need more advanced equipments
	Advancement of quality in teaching learning process	90%	Include more training for teachers and students
	Outreach and extension-Visit to premier institutions and labs	90%	Need to visit more institutions and labs
	Inculcation of research culture and skill development of faculty	90%	More programmes for skill development of students
	Laboratory exposure to students and biosafety issues	80%	Do more activities for Non teaching staff
	Advancement of quality in teaching learning process	90%	Inculcate research attitude in students by new techniques
	<b>Physics</b>	Enhancement of infrastructure	80%
Advancement of quality in teaching, learning process		70%	Include more training for teachers and students
Inculcation of research culture		80%	Need more quality equipments and chemicals
Skill acquisition programmes		80%	Need to conduct internships for intercollegiate level
Outreach and Extension		60%	Lack of interest in science after covid-19, inculcate more school and

			college students
<b>Chemistry</b>	Enhancement of infrastructure	80%	Need more equipments for characterization processes
	Advancement of quality in teaching, learning process	80%	Need of more softwares
	Inculcation of research culture	70%	Students need more number of equipments to fulfill research activities
	Skill acquisition programmes	80%	Need more systems and softwares to conduct lab skills and competitive skills
	Outreach and Extension	20%	Outreach activities should strengthen
<b>Statistics</b>	Enhancement of infrastructure	80%	More systems for accommodating all students
	Advancement of quality in teaching, learning process	60%	Need more workshops for faculty and students
	Inculcation of research culture	60%	Need more advanced softwares for research activities
	Skill acquisition programmes	60%	Ned to conduct more programmes for improving programming skills
	Outreach and Extension	60%	Outreach activities should strengthen
<b>Mathematics</b>	Enhancement of infrastructure	80%	More systems for accommodating all students
	Summer training (Chennai Mathematical Institute, Chennai, Ramanujan Mathematical Society, Chennai, Institute of Mathematical Science, Chennai)	70 %	Training were applied, but did not get, so sent students have attended in other reputed institutions.
	Workshop on Robotics and Artificial Intelligence	100%	1
	Collaborate with the Amala Cancer Research Institute in Thrissur to conduct Bio Mathematical Analysis	60 %	Due to technical issues, we couldnot do at Amala institution , we have completed projects in other reputed
	Internship in Applied Geometry and Vasthu at Tekton Builders	75%	Internships were done by all students but not in the mentioned title.

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

**Course Coordinator**

**Head of the Institution**