

Palus Shikshan Prasarak Mandal's  
ARTS, COMMERCE AND SCIENCE COLLEGE PALUS  
District: Sangli, Maharashtra, India  
Affiliated to Shivaji University Kolhapur



ANNUAL PROGRESS REPORT 2021-2022  
SUPPORTED UNDER  
DBT STAR COLLEGE SCHEME



DEPARTMENT OF BIOTECHNOLOGY  
MINISTRY OF SCIENCE AND TECHNOLOGY  
CGO COMPLEX, LODI ROAD  
NEW DELHI – 110 003



2021-22

*Prabhu*  
Principal  
Arts, Commerce & Science College  
Palus, Dist. Sangli

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**DEPARTMENT OF BIOTECHNOLOGY**  
**PROFORMA FOR SUBMISSION OF ANNUAL PROGRESS REPORT SUPPORTED**  
**UNDER STAR COLLEGE SCHEME**

1. Name of the College: ARTS, COMMERCE AND SCIENCE COLLEGE PALUS

2. Name of Coordinator, designation, Address, Phone No. Dr. Suresh M. Kumbar  
 Professor,  
 Department of Zoology  
 Arts, Commerce and Science College Palus  
 Mobile: 9420675426  
 E-mail: [smkumbar@rediffmail.com](mailto:smkumbar@rediffmail.com)

3. Assessment Duration : 01/04/2021 to 31/03/2022 Duration in Years: 01 Year

4. Details of Departments Supported:

Sr. No.	Name of Department	Courses (B.Sc./M.Sc./PG Diploma, Certificate etc) offered	Regular Faculty Members	
			Total	
			With Ph.D.	Without Ph.D.
1.	Zoology	B.Sc. M.Sc.	1. Dr. S. S. Patil 2. Dr. S. M. Kumbar	1. Mr. A. B. Ghadage
2.	Physics	B.Sc.	1. Dr. S. D. Pawar	1. Mrs. S. S. Patil 2. Mr. M.V. Kamble

5. Number and Date of Advisory committee meeting: 02: 19/10/2020 and 28/01/2021

Designation	Committee	Name	Signature
<b>Chairman</b>	Principal	Dr. R. S. Salunkhe	
<b>Adviser, HRD, DBT</b>	DBT Adviser	Dr. Anamika Gambhir, Sc-F	
	Program Officer	Dr. Garima Gupta, Sc "E"	
<b>External Experts</b>	Physics	Dr. R. T. Sapkal	
	Zoology	Dr. S. R. Yankanchi	
<b>Members</b>	Physics Department	Dr. S. D. Pawar (HOD)	
		Mrs. S. S. Patil	
		Mr. M. V. Kamble	
	Zoology Department	Dr. S. S. Patil (HOD)	
		Mr. A. B. Ghadage	
<b>Coordinator</b>	Member Secretary	Dr. S. M. Kumbar	
<b>Joint-Coordinator</b>		Dr. S. S. Lendave	
<b>Office Staff</b>	Office Superintendent	Mr. N. K. Shinde	
	Accountant	Mr. A. D. Patil	



**DBT Star College Scheme**  
**Advisory Committee Meeting With External Experts**  
**Minutes of the Advisory committee meeting of DBT Star College Scheme conducted on**  
**19<sup>th</sup> March, 2022**

A meeting of the DBT Star College Committee members with the Advisory Committee members (External subject experts) was conducted on 19/03/2022 in the Principal Chamber, of Arts, Commerce and science College Palus. The following committee members were present in the meeting.

Principal, Dr. R. S. Salunkhe welcomed to the Dr. R. S. Sapkal, Department of Physics, T.C. College, Baramati, Physics External Subject Expert in DBT Star College scheme Advisory committee member and Prof. Dr. S. R. Yankanchi, Post Graduate Department of Zoology, Shivaji University, Kolhapur; Zoology External Subject Expert

- Prof. Dr. S. R. Yankanchi advised us to utilize all equipment grant and implement the experiments
- He suggested to carryout hands on trainings
- The expert advised to department not to undertake the projects developing commercial products for human consumption.
- Dr. R. S. Sapkal gave a short PPT presentation on how to go about the program highlighting.
- He emphasized the need to document all the activities.
- He suggested to increasing the inter-disciplinary and inter departmental activities and projects .
- To conduct all the extra practicals, project work as mentioned in the proposal.
- To lay more focus on interdisciplinary activities.
- Advised us to prepare Utilization certificate and annual progress report and submit to DBT in time
- Both experts had suggested us to follow the annual calendar

Both department staff members had queries related to the amount to be utilized for different departmental activities such as study tour, field trips. Prof. Dr. S. R. Yankanchi and Dr. R. S. Sapkal answered all the queries.

The meeting ended with vote of thanks by the DBT Star College Scheme Co-ordinator, Dr. Suresh M. Kumbar, Professor, Postgraduate Department of Zoology





Estd.  
21 August 1992

Palus Shiksha Prasarak Mandal's  
**ARTS, COMMERCE AND SCIENCE COLLEGE PALUS**  
Tal. Palus, Dist. Sangli, Pin- 416 310 ☎ (02346) 226225, 228383  
(Affiliated to Shivaji University, Kolhapur)  
Web: www.accollegepalus.org Email: accollegepalus@gmail.com  
\*NAAC Accredited - B (267 CGPA)\*

B.A.  
B.Com.  
B.Sc.  
B.J.A.  
B.C.A.  
B.S.S.  
P.G.D.C.  
M.A.  
M.Sc.

Vic Principal: Dr. R. S. Salunkhe, [rsalunkhe@accollegepalus.org](mailto:rsalunkhe@accollegepalus.org) | Outward No. Mahas 1 | DBT Appointment File 0011-25  
Mob No. 9860196940 | Date: 18/09/2021

Minutes of the DBT Star College Scheme  
Advisory Committee Meeting

Date: 18<sup>th</sup> September 2021.

Time: 11:30 am

Venue: Principal's Chamber, Arts, Commerce and Science College, Palus - 416310.

An Advisory Committee Meeting for the Star College Scheme of Department of Biotechnology (DBT), Government of India was held on 18<sup>th</sup> September 2021 at Arts, Commerce and Science College, Palus, Sangli to discuss various points i.e. discussion and finalization on purchase of new equipments, preparation of annual calendar, chemicals and stationary items for Physics and Zoology departments under the DBT Star College scheme.

Members Present for the meeting were as follows:

Designation	Committee	Name	Signature
Chairman	Principal	Dr. R. S. Salunkhe	
Adviser, HRD, DBT	DBT Adviser	Dr. Meenakshi Munde	
	Program Officer	Dr. Garima Gupta, Sc. I	
External Experts	Physics	Dr. R. T. Sapkal	
	Zoology	Dr. S. R. Yankarshi	
Members	Physics Department	Dr. S. D. Pawar (HOD)	
		Mrs. S. S. Paul	
		Mr. M. V. Kamble	
	Zoology Department	Dr. S. S. Paul (HOD)	
		Mr. A. J. Ghoshale	
Coordinator	Member Secretary	Dr. S. M. Kambar	
Joint-Coordinator		Dr. S. S. Lentave	
Office Staff	Office Superintendent	Mr. S. K. Shinde	
	Accountant	Mr. A. D. Paul	





Estd.  
21 August 1992

Patsi Shikshan Prasarak Mandal's  
**ARTS, COMMERCE AND SCIENCE COLLEGE PALUS**  
Tal. Palus, Dist. Sangli, Pin- 416 310 ☎ 02340-224226, 228085  
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\*NAAC Accredited - B (2.67 CGPA)\*

B.A.  
B.Com  
B.Sc.  
B.B.A.  
B.C.A.  
B.C.S.  
P.G.D.S.A.  
M.A.  
M.Sc.

Uo: Principal Dr. R. S. Salunkhe, e-mail: r.salunkhe@pscs.edu.in / Shikharaj No. Mahasr / DIT- Appointment File 2021-22  
Mob. No. 9862190990 / Date: 19/03/2022

### DBT Star College Scheme Committee Meeting

Date: 19<sup>th</sup> March, 2022; Time: 11:00 am

Venue: Principal Chamber, Arts, Commerce and Science College, Palus - 416 310

Discussion of various issues regarding purchase and utilization of new equipment, chemicals, books, contingency materials, submission of student and teacher minor projects etc. of Physics and Zoology departments under the Star College Scheme of Department of Biotechnology (DBT), Government of India, is scheduled on Saturday, 19<sup>th</sup> March, 2022 at the Principal Chamber of Arts, Commerce and Science College, Palus. Sangli. Members for the meeting are as follows.

Designation	Committee	Name	Signature
Chairman	Principal	Dr. R. S. Salunkhe	
Sansta Member	Secretary	Mr. Dhondiram Shinde	
External Experts	Physics	Dr. K. T. Sapkal	
	Zoology	Dr. S. R. Yeshwant	
Members	Physics Department	Dr. S. D. Pawar (HOD)	
		Mr. S. S. Patil	
		Mr. M. V. Kamble	
	Zoology Department	Dr. S. S. Patil (HOD)	
Mr. A. B. Ghadage			
Coordinator	Member Secretary	Dr. S. S. Salunkhe	
Joint-Coordinator		Dr. S. S. Umdeve	
Office Staff	Office Superintendent	Mr. N. K. Shinde	
	Accountant	Mr. A. D. Patil	
	Lab. Assistant	Mr. Prashant Desai	



#### 6. Qualitative improvements due to DBT support. Department wise: Zoology

The Star College Scheme of Department of Biotechnology, New Delhi has enabled the departments to procure new equipment and improved the infrastructure facilities in multiple numbers and simultaneously performances, as a result of which the students are able to handle the instruments individually, and subsequently it has increased their confidence level. The DBT star college scheme has enabled the departments to purchase books and enrich the departmental library to which the students have an easy access. It was possible to organize Science day, National voter's day celebration and workshop on Handling of glassware and chemicals in laboratory in an interdisciplinary manner in our college. With the help of DBT funds which has enabled undergraduate students of our college to participate in the various events and present their research work in the form of oral and poster presentations and also provided an opportunity to expose their hidden talents. The Star College Scheme has enabled the departments to upgrade the existing teaching resources which have in turn improved the 'hands on' experimental exposure of the students, in-turn reflecting the enhanced quality of learning and teaching of the students and teachers respectively. Due to star college scheme we were able to create health awareness, computer literacy and information technology and its applications among the students in the college campus. Excursions and field visits conducted to various agriculture related farms and research institutes under this scheme has enabled deserving students from economically backward sections also to attend such field trips and get academic and industrial exposure. Thanks to DBT.

#### Students Minor Research Projects of Zoology Department

Sr. No.	Title of Project	Impact	Name of students	Remarks
1.	Study of Mosquito and Mosquito Born Diseases	Promoting Rural Health Conditions	Ms. Agale Shreya Anandrao Ms. Dupate Prajakta Ashok	Project work is in under progress
2.	Diversity of Freshwater fishes of Krishna River	Development of Identification skill in students	Ms. Kore Gayatri Manohar Ms. Patil Supriya Uttam Ms. Murudkar Vaishnavi V	
3.	Study of Histological Organs of Freshwater Fish <i>Labeo rohita</i>	Perfection in micro technique and identification skill in students	Mr. Patil Aditya Anil Mr. Pawar Sourabh Tukaram	
4.	Bird Diversity In Palus Tashil	Development of photographic and Identification skill in students	Mr. Jamadade Aniket Anil Mr. Patil Sourabh Suhas	
5.	Study of Hard Epidermal		Ms. Pawar sneha Uttam	



	derivatives of Vertebrates		Ms. Mane Dhanashri Ramesh
6.	Types of Poisonous and Non-poisonous snakes	Able to distinguish Poisonous and non-poisonous snakes in Rural area and bring the awareness in people	Ms. Bankar Ashwini S. Ms. Nalawade Nandita V. Ms. Mohite manorama S.
7.	Preparation of Vermi-composting	Promoting to Rural Agriculture with bio-compositing skill in students	Ms. Chavan payal Anil Ms. Ghule Arti Kishor
8.	Flea and Flea Born Diseases	Promoting Rural Health Conditions	Ms. Ingawale Vaishnavi Vikas Ms. Gaikwad Vishranti Shashikant Ms. Lohar Dipali Vilas

### Students Minor Research Projects of Department of Physics:

Sr. No.	Name of the project	Name of the students	No. of students	Impact	Justification
1.	Preparation of silver nanoparticles by using Allium Sativum leaves	1. Mrs Swati S. Patil. 2. Mr. Koushik Patil 3. Miss Tejswini Kate 4. Miss. Priyanka Awati 5. Miss. Sonali sawant	4	Students can synthesize silver nanoparticles. They can analyse uv visible spectrum	There are different methods for production of silver nanoparticles. Silver nanoparticles have number of extraordinary properties than bulk. Production of silver nanoparticles by chemical method involve use of toxic chemicals. Biosynthesis of nanoparticles is clean nontoxic and eco-friendly method.
2.	To study antimicrobial activity of silver nanoparticles synthesized from allium sativum leaves	1) Mrs. Swati S. Patil 2. Mr. Koushik Patil 3. Miss. Tejswini Kate 4. Miss. Priyanka Awati 5. Miss. Sonali savant	4	Students can grow bacteria and they can study antibacterial activity	Due to chemical method there is adverse and harmful effect on it's application. Allium sativum is medicinal plant. So it shows better result toward antimicrobial activity.
3.	Effect of physicochemical parameters on the quality of drinking water in villages of Burli, Kundal, Amnapur and palus. Dist Sangli (MS)	1) M. V kamble 2) Amruta sanjay chavan. 3) Deepali S. Shivade. 4) Supriya R. Mali. 5) Aaishwarya B. Kakekar	4	Digestive system and health of people in Burli, Kundal, Amnapur and palus.	It is always necessary to test frequently drinking Water Quality. Water quality can be improved by suggesting appropriate measures. If any adverse component is found in water analysis.
4.	Calculation of Enthalpy and specific heat capacity of Rare earth doped metal	1) M. V kamble 2) Amruta sanjay chavan. 3) Deepali shankar shivade. 4) Supriya Ramchandra Mali.	4	Will learn to synthesize calculate Enthalpy and Specific heat capacity of	After learning to calculate Enthalpy and specific heat capacity Students will be familiar and will adopt research in coming future. Similarly Enthalpy and specific heat capacity can be calculated for





	oxide.	5) Aaishwarya Bhujang Kakekar		materials.	other materials.
5.	Effect of negative air ion generator on growth of wheat plant	1) Dr S.D Pawar. 2) Nilesh shinde 3) Mamata singh 4) Satvashila Nalwade	3	This is Innovative way to increase nutrition of plant.	On economy of farmers
6.	Air ion and pollution Index near to road at semi urban station palus	1) Dr S. D Pawar. 2) Nilesh shinde 3) Mamata singh 4) Satvashila Nalwade	3	This is Innovative way to study air pollution	Pollution can be monitored

### 9. Key Performance Indicators

Sr. No.	Indicator	Pre-support 2019-20								During/ After Support 2021-22								Remarks	
1.	Number of students admitted	<b>Department of Zoology</b>																	
		Total = 38								Total = 22									
		Male = 08				Female = 30				Male = 00				Female = 22					
		SC	ST	OBC	G	SC	ST	OBC	G	SC	ST	OBC	G	SC	ST	OBC	G		
		1	0	2	5	6	1	2	21	0	0	1	5	3	1	0	12		
		<b>Department of Physics</b>																	
Total = 18								Total = 10											
Male = 1				Female = 17				Male = 4				Female = 6							
SC	ST	OBC	G	SC	ST	OBC	G	SC	ST	OBC	G	SC	ST	OBC	G				
0	0	0	1	0	1	2	14	0	0	0	4	0	0	1	5				
2.	No. of students passing out (%) students Admitted/ passing out (pass %)	Zoology	Batch 2019-2020 100%								Batch 2020-2021 Result yet to be announce								
		Physics	Batch 2019-2020 90%								Batch 2021-2022 Result yet to be announce								
3.	Drop-out rates	Zoology	00								--								
		Physics	00								--								
4.	No. of students opting for M.Sc.	Zoology	03								07								
		Physics	06								07								
5.	Average marks	Zoology	90%								--								
		Physics	87%								--								
6.	No. of Hands-on-Experiments being conducted	Zoology	1. Measurement of Blood Pressure								1) Mr R. M. Patil: Laboratory Glassware's and Chemicals: Handling and Precautions 2) Prof. Dr. S. S. Patil: Fish Aquarium: Construction and Maintenance 3) Dr. S. S. Patil: Microtomy 4) Dr. S. M. Kumbar: Blotting Techniques 5) Mr. A. B. Ghadage: Estimation of Water Quality								
		Physics	02								1) Water analyzer 2) Use of new equipments 3) Electric wiring 4) Repairing of Electric Domestic appliances								
7.	No. of New Experiments introduced	Zoology	Nil								1) Gel Electrophoresis 2) Thin Layer Chromatography 3) Estimation of BOD								



				4) DNA isolation 5) Identification of Insect Pests 6) Chick Embryo Mounting 7) Estimation of Zooplanktons	
		Physics	00	<b>B. Sc. Part II; Group - I.</b> 1) Newton's law of cooling 2) Temperature coefficient of platinum resistance thermometer <b>Group - II.</b> 3. Specific heat of Graphite. 4) Thermal conductivity of glass in the form of heat <b>Group - III.</b> 5) To study Lissajous figures by using CRO. 6) Melde's Experiment <b>Group - IV.</b> 7) Thickness of thin Film Interference 8) Newton's ring method <b>B. Sc. Part III</b> 9) Y by Koenig's method.  10) Diffraction at cylindrical obstacle.  11) Diameter of Lyco-podium powder.  12) e/m of electron by Thomson's method.  13) I-V characteristics of Solar cell.  14) Band gap energy of semiconductor using p-n junction diode.	
8.	Publications (Scopus indexed)/ Patents, if any	Zoology	02	02	
		Physics	00	00	
9.	Training received by faculty	Zoology	02	1) Three Day International Conference Pune 2) Two Days International Conference Ramanandnagar 3) One Day National Conference Palus 4) Refresher course Mr. A. B. Ghadage	
		Physics	03	03	
10.	Exhibitions/seminars /training courses conducted	Zoology	1) Avishkar Research Project workshop 2) Wall paper presentations 3) Students Seminar Series	1) Book Exhibition 2) B. Sc. - III student Seminar 3) Poster Exhibition for B. Sc. Students 4) Avishkar Research Competition 5) ZOOFEST -2022	
		Physics	01	1) Poster presentation 2) Participated in training prog. Organized by Perfect Electronics 3) Science Exhibition for High school students	
11.	Books/Journals subscribed from grants	Zoology	10	Nil	
		Physics	06	45	
12.	Outreach activities (Popular Lectures)	Zoology	1) Intellectual Property Rights 2) Flood relief Activities NDRF Team maintenance 3) COVID -19 Awareness campaign	1) Dr. A. D. Jadhav: Past, Present and Future in Apiculture 2) Three Days Workshop 3) One day National Conference RARDH-2022	



				4) Popular Lecture on 'Gram-Vavasta' by Shri. Bhaskarrao Pere-Patil 5) Celebration of 'Shivjayanti' 6) Apiculture Visit, Mahabaleshwar	
		Physics	00	1) International Women day program, activities like quiz Online Covid-19 survey 2) Organized three study tours 3) Organized field visit in Perfect electronics	
13	College mentored to apply for DBT Star College grants	Zoology	Self motivation after seeing on DBT website	KNP College, Walwa, Dist. Sangli	
		Physics	-	Matushri Bayabai Shripatrao Kadam Kanya Mavadyala Kadegaon	
14	Invited Lectures	Zoology	Mr. Sandip S. Patil, Dept. of Computer Science, ACS College Palus	1) Prof. Dr. Narendra Kulkarni 2) Mr. A. B. Mane 3) Prin. Dr. V. Y. Kadam 4) Dr. A. D. Jadhav 5) Mr. A. M. Ghadage 6) Sci. Dr. S. M. Ghaskadabi 7) Prof. Dr. N. P. Gramapurohit 8) Prof. Dr. C. B. Ganesh 9) Prof. Dr. S. R. Yankanchi 10) Prof. Dr. M. P. Bhilave 11) Prof. Dr. Nitin A. Kamble	
		Physics	01	1) Dr. R. S. Sapkal, T.C. College, Baramati, Satara	

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

- Students were encouraged to undertake compulsory carrier orientation courses like sericulture, maintenance of electrical equipments and home appliances, yoga and meditation, tally and maintenance of hardware and software in computer and English speaking courses.
- Introduction of new experiments and practical's had aided the students to expand their existing knowledge.
- Conduct of Awareness and Sensitization Programs to the society in the context of health (COVID-19 Pandemic awareness and blood group identification, swatch Bharat scheme).
- Faculty members enriched their knowledge by participation in orientation course, refresher courses, faculty development programmes and participation in workshops /conferences/seminars and also DBT Star College enabled student initiatives such as paper presentations or poster presentation in conferences / Seminars and student exchange programmes.
- Compulsory field visits and study tour for third year students to inculcate competitive spirit among students. These activities are an essential part of the study of life sciences. To study animals in the natural environment where all the animals live in their natural habitat is one of the most interesting and useful experience for a student of zoology.



**Department of Physics:**

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

We are planning to provide water testing facility to residential areas of nearby villages around our college as well as rural areas nearby college.

To recommend measures to be taken before drinking water.

Biosynthesis of nano particles from different plant extract and to study its applications

To do preliminary study of effect of negative air ion generator on different agriculture plants.

To synthesize different nano materials and its applications

**8. Lessons learnt/ difficulties faced / suggestions if any, in implementation of the programme and utilization of DBT grant.**

We have made this year mandatory for individual or group projects to final year students in both physics and zoology departments. Regular encouragement to students for participate and present research papers in Conferences /Seminars / Symposia, etc. and to develop good rapport among eminent subject experts in physics and zoology departments. Promoting to our graduate students for publish their project work data in local news papers, research papers in renowned Journals. Improvement of infra structure facilities in the both participatory departments. Other department faculties and students for optimal use of newly purchased equipment's and knowledge support. Promotion to research thirst and learning skills through ICT tools for both departments. Popularizing and elevating the image of the college through star college scheme activity.

**Department of Physics:**

**Difficulties Faced:** Unable to purchase computers, printers, Xerox machine and smart board from recurring grant. Please allow us to purchase in recurring grant. Due to Covid 19 Pandemic we were unable to organize outreach programs. Program planned were Sky observation program, organizing of guest lecture, training program, hands-on training to students. To complete these activities we need extra time. When the wave of pandemic stops actual work will start.

**Suggestions:** Computers, printers, Xerox machine and smart board cannot be purchased through recurring. Permission must be given to purchase above items through recurring grant.



### 10) Self Evaluation: Department of Zoology

Dept.	*Objective (as stated in proposal)	% achieved	Reasons for underachievement / If achieved, state in quantitative metrics
	To provide high quality education to rural area and economically backward class students in the various aspects of life sciences with diverse interests and carrier aspirations and also to acquire appropriate scientific, intellectual, technical and transferable skills to promote self directed and lifelong learning.	100% 2	Department of Zoology have conducted maximum activities on online mode and offline mode such hand-on-Training, outreach programs, Industrial visit, Study tour, Exhibition, Poster presentation and Avishkar research Competition
	Field Visits and study Tour: visited to apiculture and seashore to learn the natural habitat of animals, it is important to make the student a better understanding of the subject by allowing them to see and observe the natural environment. These activities are an essential part of the study of science and is one of the most interesting and useful experience for a student of Zoology.	100% 2	
	Promoting Research activities: inculcating the research attributes among the faculty and students in design and execution of innovative idea at UG and PG level and which will impart the innovative thinking in the field of biological sciences.	100% 2	
	Compulsory research project for students: Inculcating the research attributes among the students in design and execution of innovative idea at under graduate and post graduate level and which will impart the innovative thinking in the field of biological sciences.	100% 2	
	Computer Literacy Programme: To provide a high quality education in the various aspects of bioinformatics and computer sciences with diverse interests and carrier aspirations and also to acquire appropriate intellectual, scientific, technical and transferable skills to promote self directed and lifelong learning.	100% 2	



## 10. Self Evaluation

Department	Objectives	% Achieved	Reasons for under achievement/If achieved state the qualitative metrics
Physics	1.To enhance the interest of students in basic sciences	50	Due to Covid 19 students cannot attend practicals .
	2.To develop experimental skills in rural college students	50	Students did project but cannot complete all practical's due to pandemic
	3.To make students aware of recent trends in science and technology and Physics	100%	All students participated in computer skill awareness programme. Students participated in Institute visit and Laboratory visit
	4.To increase the ability of students to relate practical and theoretical and applied knowledge	100%	Students completed about 6 projects .Publish research papers, Some are in progress.
	5.To make students capable of need of society through education and practical knowledge	100%	Students are doing project related to water purity in nearby villages. Also the study effect of air ions on growth of plants which will useful for farmers

Total Marks 8



## FIVE MINOR PROJECTS AND THEIR IMPACT OUTCOME

## 5. Minor projects and their impact or similar activities and their outcome: Zoology

## 1. BODY SIZE AND AGE OF LESSER BANDICOOT RAT

*BANDICOOT BENGALENSIS* BY USING SKELETOCHRONOLOGY**Abstract:**

Body size and age of lesser bandicoot rat was estimated by using skeletochronological method. The lesser bandicoot rat or Indian mole-rat (*Bandicoota bengalensis*) is a giant rat of Southern Asia. These are considered a pest in the cereal crops and gardens of India and Sri Lanka. Different body sized lesser bandicoot (n = 27) were collected from the Palus colony, Ambe Ghar colony, road killed, agriculture fields of Palus Taluk in 2020-2021. They brought to the laboratory where snout-vent-length (SVL) of each individual was recorded; the 4<sup>th</sup> toe of both the hind limbs was clipped, fixed in 10% formalin, demineralized in 5% nitric acid and processed for histology. In all 27 lesser bandicoot Rats used for phalangeal skeletochronology, the LAGs were clear and distinct. Among these, three (11.11%) individuals with (SVL: 15.60 ± 0.266 cm), showed no LAGs in their periosteal bone. Two (7.14%) individuals with (SVL: 16.30 ± 0.199) exhibited 1 LAG each, seven (25.92%) bandicoots with (SVL: 17.08 ± 0.212 cm) exhibited 2 LAGs, four (14.81%) with (SVL: 18.57 ± 0.174 cm) recorded 3 LAGs, six (22.22%) individuals with (SVL: 20.71 ± 1.116 cm) showed 4 LAGs and another 5 bandicoots (18.52%) with (SVL: 23.88 ± 0.536) exhibited 5 LAGs in the phalangeal cross sections. The presence of either double lines or partly resorbed LAGs was not noticed. Back calculation indicated that the endosteal resorption rate is very low in this rat. The results suggest that this lesser bandicoot rat may live for a maximum of 5-6 years in the natural population.

2. RECORD OF EXOTIC AQUARIUM SUCKER MOUTH CATFISH *HYPOSTOMUS PLECOSTOMUS* IN THE KRISHNA AND YERLA RIVER, SANGLI DISTRICT

**Abstract:** First time recorded exotic aquarium sucker mouth catfish *Hypostomus plecostomus* in the Krishna and Yerla River near Bramhnal and Nimani respectively in 2021. These catfishes are very active; they live in the bottom-most layers, voracious feeders and



measures about 40.3 to 41.5 cm in length. The morpho-metric data of these catfish was standard body length 31.2 cm, head length 7.5 cm, dorsal fin rays 12, pectoral fin rays 7, pelvic fin rays 6 and anal fin rays 5 and caudal fin rays was 16 with single pair of barbells. They may be introduced accidentally or by aquarium people intensively in the river still don't know. *H. plecostomus*, also known as the sucker mouth catfish or the common pleco. It is a tropical freshwater fish belonging to the armored catfish family (Loricariidae), named for the longitudinal rows of armor-like scutes that cover the upper parts of the head and body. It is used in large aquariums and garden ponds to maintain the ponds and aquarium glass clean. People may leave them to natural water bodies when aquariums cannot accommodate them once they grow bigger. Fishes of this species grow up to 50 cm, and mature when they reach 15-20 cm. Many reviews highlighting the major threats from sucker mouth catfish they compete for food and space of bottom feeders and reduce the production and productivity of the ponds and lakes. They dominate the community and population by overgrowth, and eat the eggs of other fishes thereby reducing the numbers of other species. It is so difficult to eradicate them once these fishes get entry to the natural water bodies. There is a need to educate aquarists and hobbyists not to sell these fish in large numbers, and educate fishermen to eradicate this species by burying or for safe disposal. They may have a life span of 10-15 years. Detailed study is needed to know the feeding behavior, type of food consume, competition, reproductive pattern and preferred ecosystem of this catfish *H. plecostomus* in the Krishna and Yerla River of Sangli District.

### **3. SEASONAL VARIATION IN OVARIAN MORPHOLOGY OF FRESHWATER *HYPSELOBARBUS KOLUS* (SYKES,1839)**

**Abstract:** Annual reproductive cycle of female *Hypselobarbus kolus* was investigated during the age of 18-29 months through gross and histological studies. Annual variation in reproductive organ of female *H. kolus* was observed in the year of 2021. Usually *H. kolus* breeds during the month of June to August but due to the variation in rainfall and weather during the year of 2021 the maximum growth of ovary and the total fecundity in fish *H. Kolus* was measured in September to November. The development of ovary was measured with their body size and weight as well as otolith that show age of fish at which they attain the maturity. However, a comprehensive and more advanced study is needed for understanding of environmental control of reproduction in this fish. The present study shows the annual seasonal variation in mature do vary of *H.kolus*2021.





#### 4. MICROSCOPIC TAXONOMICAL STUDY OF ZOOPLANKTONS OF INGALELAKEPALUS, SANGLI DISTRICT (MS)INDIA

**Abstract:** Zooplanktons act as the main source of food for most of fish and other aquatic animals. They form an important link in food web of freshwater ecosystem. Ecologically, zooplanktons are one of the most important biotic components influencing all the functional aspects of an aquatic ecosystem such as food chain, food web and energy flow. Zooplanktons are good indicators of the changes in water quality because they are strongly affected by environmental conditions and respond quickly to changes in water quality. Hence microscopic taxonomical studies on zooplanktons of Ingale lake Palus of Sangli district was carried out. This investigation revealed that 11 genera belonging to 04 major groups were found as Rotifera 02 genera, Cladocera 02 genera and copepod 06 genera as well as 01 genera of protista.

#### 5. ESTIMATION OF AGE AND LONGEVITY OF FRESHWATER FISH *PUNTIUSSARAN* BY LENGTHWEIGHTRELATIONSHIP AND ENUMERATION OF SCALES AND OTOLITH GROWTH LAYERS

**Abstract:** Age and longevity of freshwater fish *Puntius sarana* inhabiting the Krishna River, Sangli district was estimated by using length weight relationship and enumerating number of growth layers in lateral line scales and otoliths. One to six growth layers were observed in scales and otoliths of 135 individuals measuring their body size from  $11 \pm 0.0$  to  $23.04 \pm 0.75$  cm. Among these 1 fish with body weight 18 gm showed no LAG, 24 fishes with body weight  $33.25 \pm 4.5$  gm possessed 1 LAG, 52 individuals with body weight  $55.5 \pm 8.44$  cm showed 2LAGs, 47 fishes weighing  $91.76 \pm 12.63$  gm possessed 3 LAGs, four fish weighing  $131.7 \pm 9.25$  gm showed 4 LAGs and seven fishes with body weight  $167.7 \pm 51.34$  gm showed 5LAGs in their scales and otoliths respectively. The high degree of positive correlation ( $r = 0.91$ ) between body weight and length was shown in this fish populations. Although there was a positive correlation ( $r = 0.81$ ) between body size and number of Lines of arrested growth (LAGs) layers. This fish population may live more than six years in the nature.



## 6. SEXUAL MATURITY, OVARIAL INDICES AND BREEDING BEHAVIOR IN THE FEMALE FRESHWATER CRAB *BARYTELPHUSA CUNICULARIS* (WESTWOOD)

**Abstract:** Sexual maturity, ovarian indices and breeding behavior were studied in the female fresh water crab *Barytelphusa cunicularis* from March 2020 to February 2021. The female attains sexual maturity at a carapace width of about 7.51 to 8.15 cm. Adult animal with carapace width of 7.0 to 8.5 cm are reproductive more active and the activity declines in older animals. The breeding period is from them on June to August with the pick period during June and July month. The study was carried out by observing weight of ovaries, calculating gonadal index and measuring carapace width. The ovary attains sexual maturity and the spawning begins in the month of June to July. The ovarian index is ranged from 2.87 to 3.28 with colour variation in ovaries in different reproductive phases. The preparatory period of reproduction extends from January to April. The breeding period is from May to August and the post reproductive and quiescent period is from September to December.

### 6. Minor projects and their impact or similar activities and their outcome: Physics

#### 1. Effect of Artificial Negative Ions on the Nutrition and Growth of Wheat (*Triticum aestivum*) using Negative Air Ion Generator

Number of scientists concentrated in research on increase in yield and decrease production-cost of wheat. Negative air ion generator (NAI) plays very important role in the management of soil and crop yield in the agricultural sector. Main focus of the study is to see the effect of artificially generated negative air ions of the order of  $10^9$  per cc generated by negative air ion generator (NAI). Treatment of the generated negative ions was observed on nutrition and growth of wheat crop, which may help to increase the yield. The study was carried in the observatory, to observe the effect of artificial negative ions on the nutrition and growth of wheat crop. after treatment of negative air ions, we found that the values of rate of growth and eight mineral nutrients like N, P, K, Na, Fe, Zn, Mn and Cu of the wheat crop has been increased. Due to this experiment there is no need of using other fertilizers. It has given hopeful results to increase the yield and quality of wheat grains. Such study significantly alters the electrostatic configuration of the agriculture and increases cation holding capacity (CEC) of the soil to maintain fertility, giving healthy vigorous crop.

There are many harmful effects of air pollutions on plants; they can have direct poisonous impacts or by implication by changing soil pH followed by solubilisation of the sulphur dioxide can influence the opening of the stomata, bringing about excessive loss of water as is mixture of different gases. Natural air ions are generally produces many ways as



gamma rays, natural radioactivity, cosmic rays, waterfalls and wind motions. Ionisation, attachment and clustering are three phases for stable form of ions. When atom loses or gains electron then it is said to be positively or negatively charged respectively. Process is called as ionisation. For atom or molecule which is electrically neutral and balanced, it is said to have an equal number protons and electrons. Losing an electron atom molecule becomes negative ions. The constriction of such negative air ions in the atmosphere affects human health and plant physiology. From this study we have to conclude that, negative ions acts as an antibacterial as well as antibiotic which help to kill bacteria or viruses present in plant and soil and increase growth of plant and nutrient level. In this study observed that negative air ion produced around wheat plant by negative air ion generator. Due to high negative potential  $10^{10}$  negative air ions per  $\text{cm}^3$  are generated. Soil in plant pot is more negatively charged. At the same time more cations are held by soil due to more negatively charged soil. As there is attraction between positively charged cation near the surface of soil and negatively charged soil as result cation exchange capacity (CEC) increased. Therefore more nutrients were provided to wheat plant. Automatically, nutrients of plant in increases, due to that yield of wheat will increase without using any fertilizer or pesticides. This naturally produced wheat production is healthy for human health and production cost effective for developing country like India. Negative air ions produced by NAI are combined with pollutants surrounding the wheat crop and settle down on surface. Due to these reasons even though we are not used fertilizers or pesticides there is growth both in height and mineral nutrients in the NAI treated wheat plants. In Further study we will see the effect of treatment of negative ions using NAI on wheat crop in green house which will be helpful to the increase the yield of wheat grains.

**Title of Project: Effect of Physicochemical Parameters on the Quality of Drinking Water of Krishna River, Sangli Maharashtra, India**

M.V.Kamble, Deepali Shankar shivade, Amruta Sanjay Chavan, Supriya Ramchandra Mali, Aishwarya Bhujang Kakekar

Abstract- Krishna river is considered to be the holy river in Maharashtra. The present study is focused on the determination of physico-chemical parameters such as temperature, pH, EC, colour, odour, hardness, Total alkalinity, phosphate and magnesium, sulphate, Fluoride, Bicarbonate, nitrate. Total hardness of water samples from different sampling points. Increase of pollution concentration indicates an increase in the pollution load due to domestic sewage and industrial effluents into near by villages of Krishna river at Sangli district. In the present study various water samples were collected from different stations.



Name of Teacher: Mrs Swati S.Partil

Project Title : **"Preparation of silver nanoparticles by using Allium Sativum leaf extract"**

Green synthesis emerged as an exciting approach in the field of Nanotechnology. Biogenesis of Nano silver is a simple, Eco-friendly, safe and cost – efficacious and gaining importance now a days. We can synthesize silver (Ag) Nanoparticles using allium sativum leaves extract. Green synthesis of nanoparticles has been achieved by using environmentally acceptable solvent system. Eco-friendly reducing and capping agents were used for the synthesis of Ag Nanoparticles.

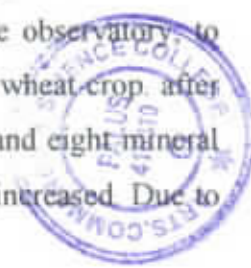
The present study Investigated the synthesis of silver Nanoparticles using le reducing agent as well as capping agents to synthesize silver Nanoparticles. The characteristics surface plasmon absorption was observed at around 429nm in UV-v is spectra confirms the formation of Nanosized particles. Green synthesized silver Nanoparticles were quantified spectrophotometrically at various concentration and also today the Green Nanoparticles synthesis the morphology and crystalline nature, were characterized by scanning electronic microscopy (SEM) energy dispersive x-ray analysis (EDAX) x-ray diffraction

(XRD) and confirm the active functional groups present in synthesized silver molecules by fourier transform Infra-red (FTIR) spectroscopy. More were the approach of plant-mediated synthesis appears the cost efficient, eco-friendly and easy alternative to conventional methods of silver Nanoparticles.

**Project Title: Effect of Artificial Negative Ions on the Nutrition and Growth of Wheat**

S.D. Pawar, P.S. Sankpal , S.B. Nalawade , M.S. Singh , N.S. Shinde , P.H. Mangsule

(Triticumaestivum) using Negative Air Ion Generator Number of scientists concentrated in research on increase in yield and decrease production-cost of wheat. Negative air ion generator (NAI) plays very important role in the management of soil and crop yield in the agricultural sector. Main focus of the study is to see the effect of artificially generated negative air ions of the order of  $10^9$  per cc generated by negative air ion generator (NAI). Treatment of the generated negative ions was observed on nutrition and growth of wheat crop, which may help to increase the yield. The study was carried in the observatory, to observe the effect of artificial negative ions on the nutrition and growth of wheat crop. after treatment of negative air ions, we found that the values of rate of growth and eight mineral nutrients like N, P, K, Na, Fe, Zn, Mn and Cu of the wheat crop has been increased. Due to



this experiment there is no need of using other fertilizers. It has given hopeful results to increase the yield and quality of wheat grains. Such study significantly alters the electrostatic configuration of the agriculture and increases cation holding capacity (CEC) of the soil to maintain fertility, giving healthy vigorous crop. There are many harmful effects of air pollutions on plants; they can have direct poisonous impacts or by implication by changing soil pH followed by solubilisation of the sulphur dioxide can influence the opening of the stomata, bringing about excessive loss of water. Air is mixture of different gases. Natural air ions are generally produces many ways such as gamma rays, natural radioactivity, cosmic rays, waterfalls and wind motions. Ionisation, attachment and clustering are three phases for stable form of ions. When atom looses or gains electron then it is said to be positively or negatively charged respectively. Process is called as ionisation. For atom or molecule which is electrically neutral and balanced, it is said to have an equal number protons and electrons. Losing an electron atom molecule becomes negative ions. The constriction of such negative air ions in the atmosphere affects human health and plant physiology. From this study we have to conclude that, negative ions acts as an antibacterial as well as antibiotic which help to kill bacteria or viruses present in plant and soil and increase growth of plant and nutrient level. In this study observed that negative air ion produced around wheat plant by negative air ion generator. Due to high negative potential 10 10 negative air ions per cm<sup>3</sup> are generated. Soil in plant pot is more negatively charged. At the same time more cations are held by soil due to more negatively charged soil. As there is attraction between positively charged cation near the surface of soil and negatively charged soil as result cation exchange capacity (CEC) increased. Therefore more nutrients were provided to wheat plant. Automatically, nutrients of plant in increases, due to that yield of wheat will increase without using any fertilizer or pesticides. This naturally produced wheat production is healthy for human health and production cost effective for developing country like India. Negative air ions produced by NAI are combined with pollutants surrounding the wheat crop and settle down on surface. Due to these reasons even though we are not used fertilizers or pesticides there is growth both in height and mineral nutrients in the NAI treated wheat plants.

In Further study we will see the effect of treatment of negative ions using NAI on wheat crop in green house which will be helpful to the increase the yield of wheat grains.



## PUBLICATION LIST

M.V.Kamble

M.V. Kamble, Deepali Shankar Shivade, Amruta Sanjay Chavan, Supriya Ramchandra Mali, Aaishwarya Bhujang Kakekar (2022). Effect of Physicochemical Parameters on the Quality of Drinking Water of Krishna River, Sangli Maharashtra, India. Vidyawarta Peer-Reviewed International Journal, PP 149 -153. ISSN:2319 9318.

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S.D. Pawar

1) AIR ION CONCENTRATIONS AND POLLUTION INDEX FOR IRRIGATED AND NON- IRRIGATED VEGETATION AREAS AT RURAL STATION KHATAV(16.570N, 74.310E)

Journal of the Maharaja Sayajirao University of Baroda ISSN: 0025-0422 Volume-55, No.2 2021 505

GajananPatil\* SubhashPawarJalindarBhosalePrachiPatil Pratik Patil.

2) Study of Facile Chemically Synthesized Polythiophene Thin FilmsDeepak B. Shirgaonkar<sup>9</sup>

\*, S. D. Pawar<sup>b</sup> 'RESEARCH JOURNEY' International E- Research Journal E-ISSN :2348-7143

April-2022



## ACTIVITIES CARRIED OUT

## 6. Number of Hands on Experiments being conducted

Sr. No.	Experiments	Date	Resource Person	No. of Beneficiary
1.	"Laboratory Glassware's and Chemicals: Handling and Precautions"	28/04/2021	Mr. Rahul J. Patil	61 students
2.	"Fish Aquarium: Construction and Maintenance"	30/08/2021	Prof. Dr. S. S. Patil	22 students
3.	Microtomy Technique	30/09/2020	Dr. S. S. Patil, Assistant Professor, Department of Zoology, ACS College, Palus	55 students
4.	Blotting Techniques	31/10/2020	Dr. S. M. Kumbar, Department of Zoology, ACS College Palus	55 students
5.	Estimation of Water quality	31/03/2021	Mr. A. B. Ghadage, Department of Zoology, ACS College Palus	55 students 5 faculties

## 7. Number of New Experiments introduced

Sr. No.	New Experiments	Class	No. of Beneficiary
1.	Gel Electrophoresis	B.Sc. III	18 students
2.	Preparation of Polytene Chromosome	B. Sc. I	90 students
3.	Estimation of BOD	B. Sc. III	18 students
4.	Separation of Lipids by Thin Layer Chromatography	B. Sc. II & III	110 students
5.	Identification of Arthropods	B. Sc. II & III	110 students
6.	Chick embryo culture	B. Sc. II	70 students
7.	Human Karyotype	B. Sc. I	90 students
8.	ABO Blood group system	B. Sc. I, II & III	110 students

## 9. Training Received by faculty

Sr. No.	Training Programme	Date	Faculty	Remarks
1.	Refresher Course	Research Methodology 25/04/2022 to 09/5/2022 Ramanujan College New Delhi, HRDC, PMMNMTT, Ministry of Education,	Mr. A. B. Ghadage	Updating in subject knowledge
2.	Lecture Series	'Zoology in 21 <sup>st</sup> Century' Organized by Department of Zoology 17 <sup>th</sup> to 22 <sup>nd</sup> January,	Prof. Dr. S. M. Kumbar	



2022			
3.	One Day Workshop	Opportunities in Skill Up gradation and Technology Donation in Sericulture held on 18 <sup>th</sup> April, 2022	Prof. Dr. S. M. Kumbar
4.	Lecture Series	'Zoology in 21 <sup>st</sup> Century' Organized by Department of Zoology 17 <sup>th</sup> to 22 <sup>nd</sup> January, 2022	Dr. S. S. Patil

10. Exhibitions/seminars /training courses conducted: **Department of Zoology**

Sr. No.	Activity	Day and Date	Resource Person	No. of Beneficiary
1.	Book Exhibition	15/03/2022	Mr. S. D. Mane, Librarian, and Best Book Seller, Kolhapur	56 students
2.	Simple and Basic experiments in Physics	14/03/2022	Department of Physics	68 students
3.	Poster Exhibition for B. Sc. Students	16/12/2021	Prin. Dr. V. Y. Kadam	71 students
4.	B.Sc.- III student online seminar	16/03/2022-27/03/2022	Dr. S. S. Patil	21 students
5.	Poster Presentation Competition	19/01/2022	Mr. M. V. Kamble	36 students
6.	Preparation of Cell Culture Laboratory model	21/04/2022	Mr. A. B. Ghadage	34 students

11. Books purchased under DBT Star College Scheme: **See Annexure – III**

12. Outreach activities (Popular Lectures)

Sr. No.	Topic	Day and Date	Resource Person	No. of Beneficiary
1.	Past, Present and Future in Apiculture	One Day workshop on	Dr. A. D. Jadhav, Department of Zoology, Shivaji University, Kolhapur at A. C.S. College, Palus	
2.	One day National Conference RARDB-2022	10/03/2022	Dr. S. M. Ghaskadabi, Agarkar Research institute, Pune Prof. Dr. N. P. Gramapurohit, Savitribai Phule Pune University Prof. Dr. C. B. Ganesh, Karnatak University, Dharwad Principal, Dr. R. R. Kumbhar, Vivekanand College, Kolhapur	More than 150 faculties and students
3.	Celebration of 'Shivjayanti'	25 <sup>th</sup> Jan. 2021	Mr. H. S. Kale, department of History, ACS College Palus	





4.	'Gram-Vavasta'	23 <sup>rd</sup> Mar. 2022	Shri. Bhaskarrao Pere-Patil	200 participants
5.	'Jagane Sundar Ahe'	27 <sup>th</sup> Mar. 2022	Dr. Suraj Balaso Chaugule	215 Participants
6.	International Women day program, activities like quiz Online Covid-19 survey	28/2/2022	Miss. Swati S. Patil	48 Participants
7.	Science Day Celebration	28/2/2022	Dr. S. D. Pawar Dr. S. S. Patil	102 Participants

#### 14. Invited Lectures

Sr. No.	Topic	Date	Resource Person	No. of Beneficiary
1.	'Environmental Conservation in 21 <sup>st</sup> Century	26 <sup>th</sup> Oct, 2021	Prof. Dr. Narendra Kulkarni PDVP College, Tasgaon	67
2.	'Biological Techniques'	17 <sup>th</sup> Jan, 2022	Mr. A. B. Mane ASC College, Ramanandnagar	52
3.	'Fishery Technology'	23 <sup>rd</sup> Mar 2022	Prof. Dr. M. P. Bhilave, Department of Zoology Shivaji University, Kolhapur	53 Students
4.	'Pathophysiology'	12/05/2022	Prof. Dr. Nitin B. Kamble, Department of Zoology Shivaji University, Kolhapur	40 students 5 faculties
5.	'Future Career Opportunities in Zoology'	22/12/2020	Prof. Dr. S. R. Yankanchi, Department of Zoology Shivaji University, Kolhapur	40 students 5 faculties
6.	'Biostatistics hands on training'	24-25/03/2021	Mr. A. M. Ghadage Assistant Professor, Department of Statistics, KRP College Islampur	40 students 5 faculties
7.	'Career Guidance'	19/3/2022	Dr. R.T. Sapkal	48



**Reference books purchased under DBT Grant in Academic Year  
2021-2022**

Sr. No.	Name of Book	Author	Publication
1	Concepts of Physics -1	H.C. Verma	Bharti Bhawan
2	Concepts of Physics -2	H.C. Verma	Bharti Bhawan
3	Radiation detection and measurement fourth edition	Glenn F. Knoll	Wiley
4	Solutions to concepts of Physics Vol-2	H.C. Verma	New Rajneesh New Delhi
5	Analysis and Design of information systems second edition	James A. Senn	Tata Mcgraw-hill
6	Statical Mechanics second edition	Kerson Haung	Wiley
7	Elementary solid state Physics	M.Ali Omar	Pearson
8	Modern Physics Second edition	S.L. Kakani	Viva
9	Relativity	Albert Einstein	General Press
10	Properties of matter	S. Biswal	Vrinda
11	Material Science and Eng. Second edition	R Balasubramaniam	Wiley
12	Question and answer Guide to Astronomy	Bely, Chrristan,	Cambridge uni. Press
13	An Introduction to relativity	Narlikar	Cambridge uni. Press
14	Quantum Mechanics second edition	Gurbachan S. Chaddha	New Edge
15	Lasers theory and application	K. Thyagarajan A.k Ghatak	Macimillan
16	Introduction to Mathematical Physics	Charly Harper	Prentice Hall
17	Mag. Electricity	D.N. Vasudeva	S.Chand
18	Elements of quantum Mechanics	Kamal Singh	S.Chand
19	Cosmology	JayantNarlikar	Cambridge Uni. Press
20	Modern Physics	Therja	S.Chand
21	Essential of Quantum Mechinacs	Hakke	Asian Books
22	Nuclear Physics	John Lilje	Wiley
23	Solid State Physics	Ashcroft	Thomson
24	Mechanics	D.S. Mathur	S. Chand
25	Int. to special relativity	Robert	Wiley
26	Electromagnetic for Eng.	Fawwaz T Ulaby	Pearson
27	Elements of Cosmology	Jayant Narlikar	University Press
28	Classical Electromagnetism	Jerrold Frankiln	Perason
29	Elements of Plasma Physics	S.N. Goswami	Central



30	Modern Physics concepts and applications	Sanjiv Puri	Narosa Pub. House
31	Oscillation and waves	M Ghosh	S.Chand
32	Applied Physics	J. Kumar	Vijay Nicole
33	Quantum Mechanics third ed.	Eugen Merzbacher	Wiley
34	Classical Mechanics	Rana and Jog	Mcgraw-hill
35	Theory and Problem of Electrodynamics	Joseph	Tata Mcgraw-hill
36	An Int. Modern Physics	Pandey and Tripathi	Vikas Pub. New Delhi
37	Optics and Atomic Physics	Khadelwal	Himalaiya



### Field/Industrial Visits and Study Tour

#### Department of Zoology: Field visit and study tour information

1. Visit to sea shores – Radhanagari Dam, Malvan, Sindhudurg fort, Vengurla, Redi Ganapathi and Shiroda beach in Konkan, Maharashtra on 7 and 8 March, 2022.
2. Visit to Maharashtra Government Apiculture Center Mahabaleshwar, Gondilwadi, Palus to study maintenance and management of exotic breeds African Bore and Switzerland Saanen breed 5<sup>th</sup> March, 2021.

Goats are among the main meat-producing animals in India, whose meat (chevon) is one of the choicest meats and has huge domestic demand. Due to its good economic prospects, goat rearing under intensive and semi-intensive system for commercial production has been gaining momentum for the past couple of years. High demand for goat and its products with potential of good economic returns have been deriving many progressive farmers, businessmen, professionals, ex-servicemen and educated youths to take up the goat enterprise on a commercial scale. The emerging favorable market conditions and easy accessibility to improved goat technologies are also catching the attention of entrepreneurs.

#### Poster presentation competition for B.Sc. III students on 19/1/2022

Department of Physics organized Poster Presentation competition on 19/1/2022 for B.Sc. III students. The main purpose of this programme was to get knowledge about the project and to encourage the students to study the articles related to project. Students were divided into four groups. The students prepared four projects. The subjects were Basic concepts of nanotechnology, Synthesis methods for nano particles, UV visible spectroscopy, biosynthesis of nanoparticles. The function was inaugurated by Hon. Principal Dr. R. S. Salunkhe. Dr S. S. Patil Head of Department of zoology, Dr. S. M. Kumbar coordinator of DBT project was present during the competition. One number was given by examiner. Miss Pratima Sankpal M.Sc. Nanotechnology worked as examiner. The programme was very fruitful for students. That increased the confidence of students. The programme also enhanced the knowledge related to project.

Total 36 students participated in the project.



### Report Field visit and MOU with Perfect Electronics Wai

Department of Physics Organised field visit to Electronics Industry Perfect Electronics at Wai. Students of Department of Physics and one teacher participated in the visit organised on 9/2/22. Dr R.V.Dhelkle sir guided the students about building of different circuits on double sided PCB. He gave information about monostable multivibrator, astable multivibrator, inverting ac amplifier ,coding ,decoding of digital circuits. He also gave information how circuit work. The MOU between Department of Physics and Perfect electronics was signed at the time of visit. Mrs Swati Sahebrao Patil Assistant Professor Department of Physics organised the field visit. The students participated in field visit were Miss Amruta kadam, Miss Vaishnavi patil , Miss Poonam Jadhav, Miss Sakshi Pawar, Miss Prajakta lad and Miss Sanjana Gaikwad. Dr.S.D.Pawar and Mr M.V.Kamble gave valuable guidance about visit and signing MOU. Department of Physics also thankful to Principal Dr R.S.Salunkhe for supporting us and encouraged

us.



**Palus Shikshan Prasarak Mandals**  
**Arts, Commerce and Science College Palus**  
**Department Of Physics**  
**Activity Study Tour Report**

**Study tour Palus to Science museum Pimpri-Chinchwad**

**Date 5/3/2022**

Department of Physics has organised study tour of B.Sc.II students to Pimpri Chinchwad Science museum on 5/3/22. Total 15 students and teachers of department of Physics participated in study tour. We departed at 5.00am from palus. We reached at 11 am to museum. Students were really very excited for seeing the experiments in the museum, In the museum students can do different experiments like coupled oscillations. mixing of two immiscible liquids. magnetic line of force, Images formed by different mirrors. parabolic motion of straight object, most probable distribution of Maxwells law, use of power of steam, different engines working, how they are modified for maximum efficiency, Structure of RNA, DNA, Conservation of linear momentum .

Our students had enjoyed 3D show and Taramandal Show in the museum. After performing all the activities we departed at 4.45 pm for Palus. For this study tour We Department of physics are very much thankful to Department of Biotechnology to support us financially to conduct study tour. The tour is very much important to increase the knowledge and the practical experience. Their interest in applications was increased. We came back with much more confidence. This happened only because of financial support of DBT to our students from rural area.

**Hands on training programme for water testing machine**

**Date 26/3/2021**

The hands on training programme was conducted by Mr. Naidu, Owner of Venkatesh suppliers, Pune. The programme was conducted on 26<sup>th</sup> March 2021 in Department of Physics, A.C.S.College, Palus. Students of B. Sc.III and Dr.S.D.Pawar, Mrs Swati Patil, M.V.Kamble, Miss Pratima Sankpal were present in the training Programme. Mr Naidu shared knowledge about Water testing Machine. The parameters that can be checked by using the machine. Mr. Naidu gave information about Measurement of PH, TDS, softening, turbidity, dissolved oxygen in water .



We Department of Physics is very much grateful to Department of Biotechnology ,New Delhi for funding us for this instrument of water testing.

### **Science Day Quiz Programme Organised by Department of Physics For Undergraduate students in association with DBT on 28/2/22**

Department of Physics, Arts Commerce ,Science College Palus is organizing Sir C. V. Raman Memorial Science Quiz Competition 2022 on the occasion of National Science Day 28 February 2022 in association with Department of Biotechnology New Delhi.

The quiz consists of 50 questions based on general science and students from any undergraduate course can participate in it. Exciting cash prizes will be given to the first three winners who have registered for competition.

First Prize: Rs. 500

Second Prize: Rs. 300

Third Prize: Rs. 200

Certificates will be given to all participated candidates.

All teachers are requested to promote maximum students to participate in the event and make it a grand success. DR.S.D.Pawar

Mrs.S.S.Patil

Mr.M.V.Kamble

Department of Physics

A.C.S.CollegePaluse to students for registration

Total 48 students undergraduate students registered for online quiz competition.

The competition was conducted on 28/2/22 ,Monday. All registered students participated in Quiz.

[https://docs.google.com/forms/d/e/1FAIpQLScRAP4Z8AVc9fUImvtpQbguMW8VkoEPJXLSuWsh6SYj\\_wjSIA/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScRAP4Z8AVc9fUImvtpQbguMW8VkoEPJXLSuWsh6SYj_wjSIA/viewform?usp=sf_link) for quiz

#### **Notice for Quiz**

Greetings everyone.

Department of Physics,Arts Commerce ,Science College Palus is organizing Sir C. V. Raman Memorial Science Quiz Competition 2022 on the occasion of National Science Day 28 February 2022 in association with Department of Biotechnology New Delhi.



The quiz consists of 50 questions based on general science and students from any undergraduate course can participate in it. Exciting cash prizes will be given to the first three winners who have registered for competition.

First Prize: Rs. 500

Second Prize: Rs. 300

Third Prize: Rs. 200

Certificates will be given to all participated candidates.

All teachers are requested to promote maximum students to participate in the event and make it a grand success.

DR.S.D.Pawar

Mrs.S.S.Patil

Mr.M.V.Kamble

Department of Physics

A.C.S.CollegePalus





organized under DBT Star College Scheme in the year 2021-22

DEPARTMENT OF ZOOLOGY ACTIVITIES

Sr. No.	Activities	Resource Person	Day and Date	No. of Beneficiary
1.	Workshop "Laboratory Glassware's and Chemicals Handling and Precautions"	Mr. Rahul Patil, Assistant Professor, Balwant College Vita	Wednesday, 28/04/2021	
2.	Lecture on "What it is to be a Neuroscientist at NBRC?, Gurgaon, Haryana	Dr. Khushboo Punjabi, Scientist in NBRC, Haryana	Saturday, 06/05/2021	
3.	Workshop on "Fish Aquarium: Construction and Maintenance"	Prof. Dr. S. S. Patil, Krishna College Retre	Monday, 30/08/2021	
4.	Lecture on 'Environmental Conservation in 21 <sup>st</sup> Century'	Prof. Dr. Narendra Kulkarni, Department of Botany, PDVP College Tasgaon	Tuesday, 26/10/2021	
5.	DBT Mentorship Program	Dr. Garima Gupta, Scientist-E, Department of Biotechnology, New Delhi	Monday, 08/11/2021	
6.	Three days Workshop on "Fundamental in Biostatistics"	Mr. A. M. Ghadage, Assistant Professor, KNP College, Islampur	Saturday, 02-05/10/2021	
7.	Inauguration of M.Sc. ICT Laboratory and <b>Poster Presentation</b>	Principal Dr. V. Y. Kadam, MBSK Girls College, Kadegaon	Thursday, 16/12/2021	
8.	Lecture "Past, Present and Future in Sericulture"	Prof. Dr. A. D. Jadhav, Department of Zoology, Shivaji University, Kolhapur	Wednesday, 12/01/2022	
9.	Lecture on 'Biological Techniques'	Mr. Abhijit B. Mane Assistant Professor, Arts, Science and Commerce College Ramanandnagar	Monday, 17/01/2022	
10.	One Day <b>Hand on Training</b> Workshop on "Biological Techniques: Microtomy, Blotting Techniques and Estimation of water Quality"	Dr. S. S. Patil Dr. S. M. Kumbar Mr. A. B. Ghadage Department of Zoology, Arts, Commerce and Science College Palus, Dist. Sangli - 416310	Thursday, 09/02/2022	
11.	<b>One Day National Conference</b> on "Recent Advances in Developmental and Reproductive Biology"	Dr. S. M. Ghaskadabi, Agarkar Research institute, Pune Prof. Dr. N. P. Gramapurohit, Savitribai Phule Pune University Prof. Dr. C. B. Ganesh, Karnatak University, Dharwad Principal, Dr. R. R. Kumbhar, Vivekanand College, Kolhapur	Thursday, 10/03/2022	
12.	Guest Lecture 'Fishery Technology'	Prof. Dr. M. P. Bhilave, Department of Zoology, Shivaji University, Kolhapur	Wednesday, 23/03/2022	
13.	B. Sc. III year Zoology student study tour	Mahabaleshwar, Harihareshwar, Murud, Alibhag, Karnal Fort, Pune Rajiv Gandhi National Park	19-21/03/2022	
14.	B. Sc. II year Zoology	Radanagari, Malvan and	08-09/04/2022	

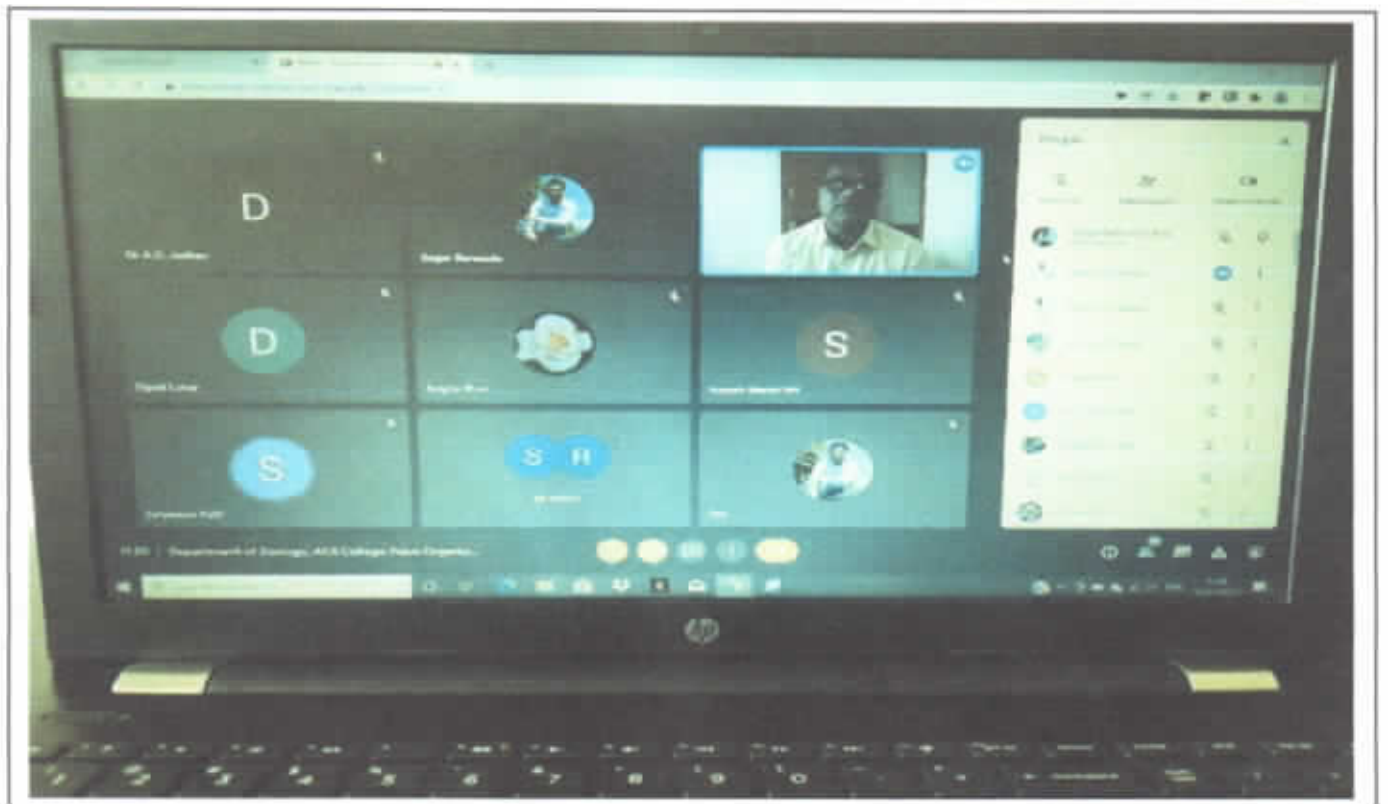


	student study tour	Shinddurg fort and devghad, Vijaydurg		
15.	B. Sc. I year Zoology student study tour	Mahabaleshwar, Harihareshwar, Murud, Alibhag, Karnal Fort, Pune Rajiv Gandhi National Park	13-14/04/2022	
16.	Guest lecture on 'Patho- Physiology with reference to Cancer Biology'	Prof. Dr. Nitin Kamble, Department of Zoology, Shivaji University, Kolhapur	Thursday, 12/05/2022	



**Department of Zoology, ACS College Palus Organized Lecture Series Under DBT Star College Scheme on "Past, Present and Future in Apiculture"**

**Resource Person: Dr. A.D. Jadhav, Shivaji University Kolhapur**



DBT Star College Scheme organized One Day Online Workshop on "Fish Aquarium: Construction and Maintenance"

Resource Person- Dr. S. S. Patil

# GLASS FISH AQUARIUM CONSTRUCTION, MANAGEMENT AND MAINTAINENCE



**DR. S. S. PATIL**

RTD. PROFESSOR AND HEAD, RTD.

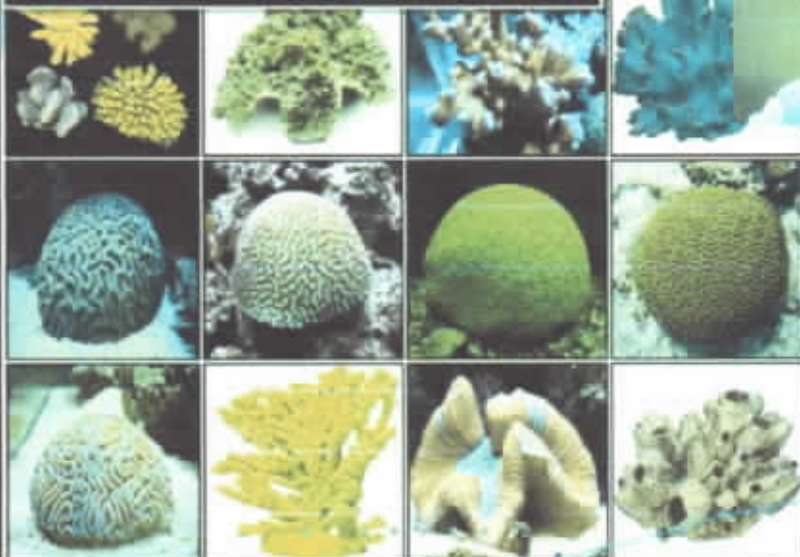
DEPARTMENT OF ZOOLOGY

KRISNA MAHAVIDYALAYA RETHARE (Bk.), KARAD.

[spatil1977@gmail.com](mailto:spatil1977@gmail.com), Mob, No. 9822026797

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## 8. COLOURED CORALS AND BARNACLE



**One Day Online Workshop on 'Laboratory Glassware and Chemicals: Handling and Precautions' under DBT Star College Scheme, New Delhi.**

**Resource Person- Mr. R. J. Patil, Balwant College Vita**

Arts, Commerce and Science College, Palus

**Department of Zoology**  
Organize

One Day Online Workshop on  
**'Laboratory Glasswares and Chemicals: Handling and Precautions'**  
under DBT Star College Scheme, New Delhi.

**Mr. Rahul J. Patil** M.Sc., NET, JRF, SET, GATE

Head and Assistant Professor  
Department of Zoology  
Balwant College, Vita.  
E-mail- [rahulpatilzoo@rediffmail.com](mailto:rahulpatilzoo@rediffmail.com)  
9121309701

Date: 28/04/2021 Time: 11:00 am. Onwards

REC

Mr. R. J. Patil

Mr. R. J. Patil

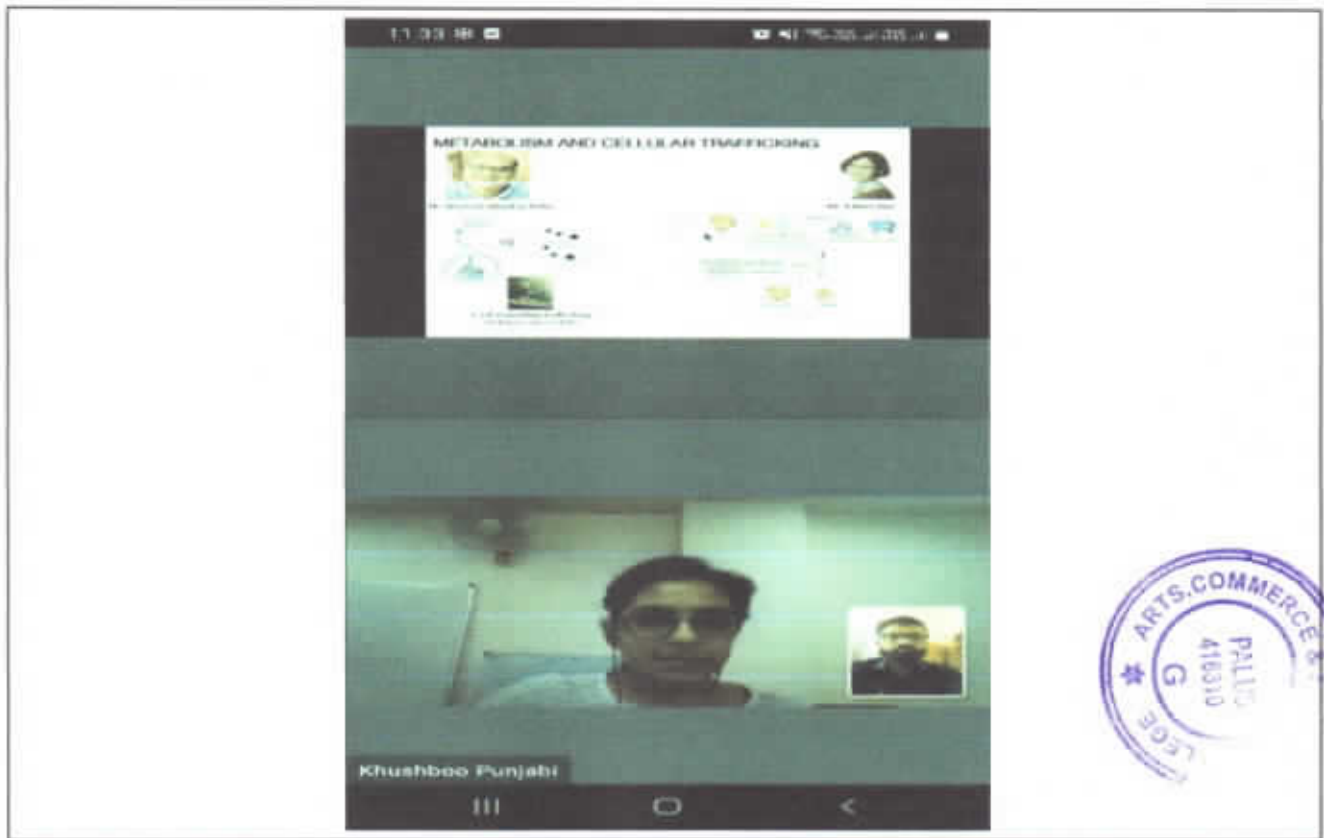
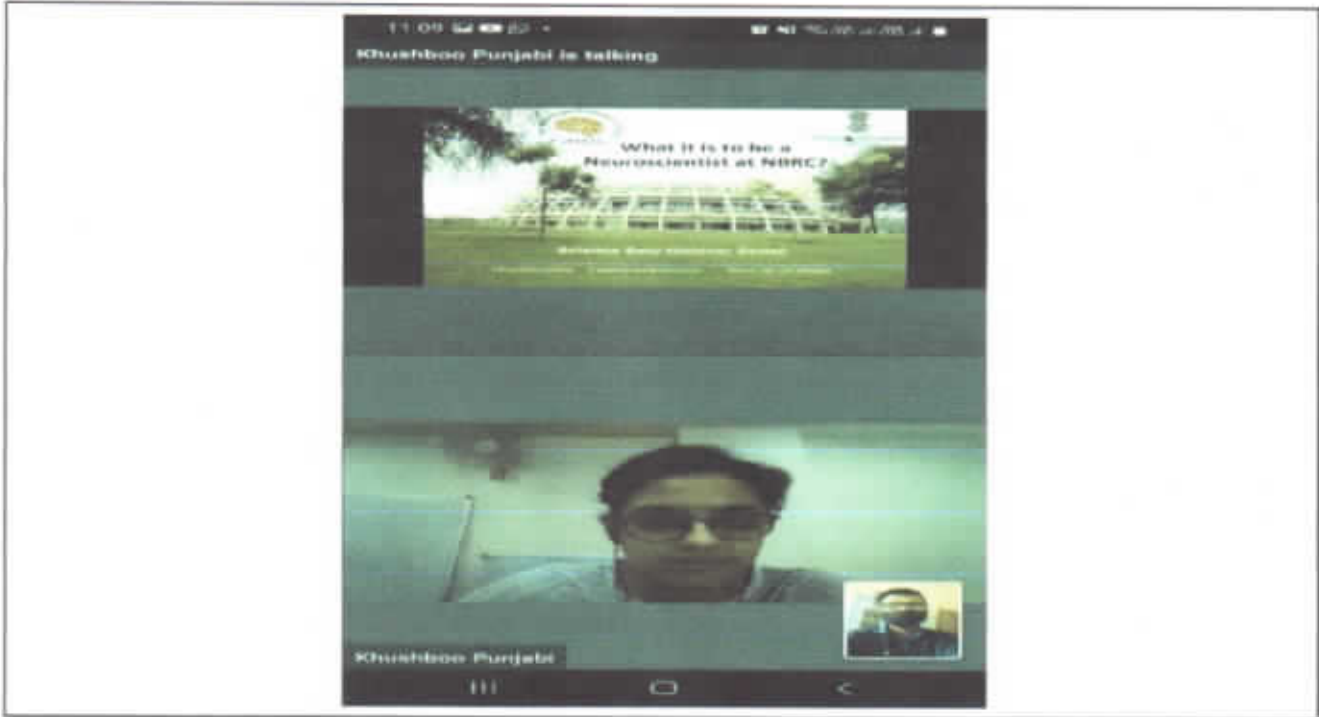
Mr. R. J. Patil

Arts, Commerce & Sci.  
PALUS  
416310  
COLLEGE

POSTER PRESENTATION COMPETITION UNDER DBT STAR COLLEGE SCHEME



Lecture on 'What it is to be a Neuroscientist at NBRC by Dr. Khushboo Punjabi, Scientist in NBRC, Haryana on 6<sup>th</sup> May, 2021



**Field Visit to Sagareshwar Wildlife Sanctuary under DBT Star College Scheme on 12<sup>th</sup> March, 2022**





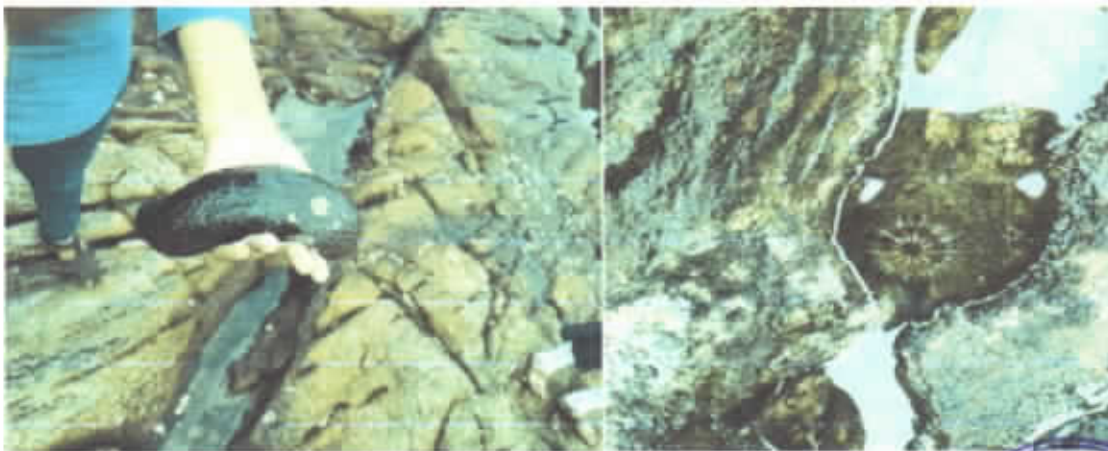
**Inauguration of ICT Laboratory and Poster Presentation Competition  
Organized by Department of Zoology under DBT Star College Scheme on  
16<sup>th</sup> Dec. 2021**



**Book Exhibition organized by Department of Library under DBT Star College Scheme**



**B. Sc. II Year Study Tour conducted by department of Zoology  
Arts, Commerce and Science College Palus on 7-8/04/2022**



**DEPARTMENT PHYSICS DBT ACTIVITY 2020-2022**

Sr. No	Name of Activity	Resource Persons	No. of Beneficiary	Date
1	Training program Perfect Electronics	Dr. R.V. Dhakele	3	9/2/22-14/2/22
2	Field Visit	Dr. R.V. Dhakele	3	9/2/22
3	Study Tour	Pune science park	19	5/3/22
4	Guest Lecture	Dr. S.T Mane	56	11/3/22
5	Study tour	Space center panalha SGI IIG Shivaji Uni	39	23/3/22
6	Hands on training	Nadu water testing	4	26/3/21
7	Hands on training	New instruments	4	17/4/22
8	Poster presentation		17	19/1/22
9	Online Quiz		48	28/2/22
10	Online Science day celebration			28/2/22
11	Wall Paper and poster presentation		41	15/12/22
12	Zero Shadow day		21	7/5/22
13	One day workshop and exhibition	Simple Experiments for English Medium School	45	14/3/22
14	Dr. Dada Nade Guest lecture		57	21/3/22
15	Shree G. B. Patil		68	14/3/22
16	Dr. R.T. Sapkal	Carrier Guidance	48	19/3/22
17	Project1 Dr. Pawar S.D.		5	
18	Project 2 Sou. S.S. Patil		5	
19	Project 3 Mr. M.V. Kamble		5	
20	Quiz Prize Distribution		5	4/6/22



## DBT activity

One day workshop on Simple and Basic experiments in Physics

Organised by Department Of Physics ,A.C.S.CollegePalus

Date :14/3/22 Time :10.30 am to 3.3.pm

Venue: ICT room and Department Of Physics

Department of Physics organised one day workshop on "Simple and Basic experiments in Physics" on 14/3/22.

The workshop was mainly for Highschool students and B.Sc.I year students. The aim of the workshop was to increase the curiosity and knowledge of highschool students. The whole programme was divided into two sessions. The first session was a lecture by Shri.G.B.Patil, Junior College teacher at Secondary school Bhilavadi. Total 38 high school students participated in the programme. The students were from English medium School Palus.

In the first session Shri G.B. patil sir gave a nice speech on simple science. He gave experimental demonstration of simple experiments like light travels in straight line, Total internal reflection, Boyle's Law. All students actively participated in the lecture. That was a golden opportunity for rural area high school students. He also explained how conservation theorem works.

Then the students were taken for the session lab visit. The students visited our Physics laboratory. They saw different experiments arranged in the laboratory such as resonance of sound, Dispersion of Light, Plane diffraction Grating, Propagation of sound wave, Propagation of light wave, resonance of sound. The demonstration of the experiments was given by our college students.



Time: 14-03-2022 11:43  
Note: Workshop for High School  
Department of physics,  
A.C.S.colg.palus

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Department of Physics organized Wall paper and poster presentation competition on 15 th December 2021. The theme of competition was Nobel prize winner from 2008-2018.



**Science Day Quiz Programme Organised by Department of Physics For Undergraduate students in association with DBT on 28/2/22**

**Science day celebration 28 /2/2022**

Department of Physics, A.C.S.Collegepalus celebrated Science Day 28/2/22.Honourable Registrar of Shivaji University Kolhapur Dr.V.N.Shinde was chief guest for the programme.

Department of Physics organised one day workshop on "Simple and Basic experiments in Physics" on 14/3/22.

The workshop was mainly for Highschool students and B.Sc.I year students.The aim of the workshop was to increase the curiosity and knowledge of highschool students. The whole programme was divided in to two sessions. First session was lecture of Shri.G. B. Patil ,Junior College teacher at Secondary school Bhilavadi. Toatal 38 high school stdents participated in the programme. The students were from English medium School Palus.

Our Palus-Ratnagiri-Ganpatipule-Palus route was finalized for the educational trip of the academic year 2021-21. March 17, 2021 is the date for the educational trip. For this we decided to travel to Sangli.



## Poster Presentation Competition

Department of Physics, A.C.S. College palus Organized poster presentation competition for B.Sc.- III students on- 19/01/2021



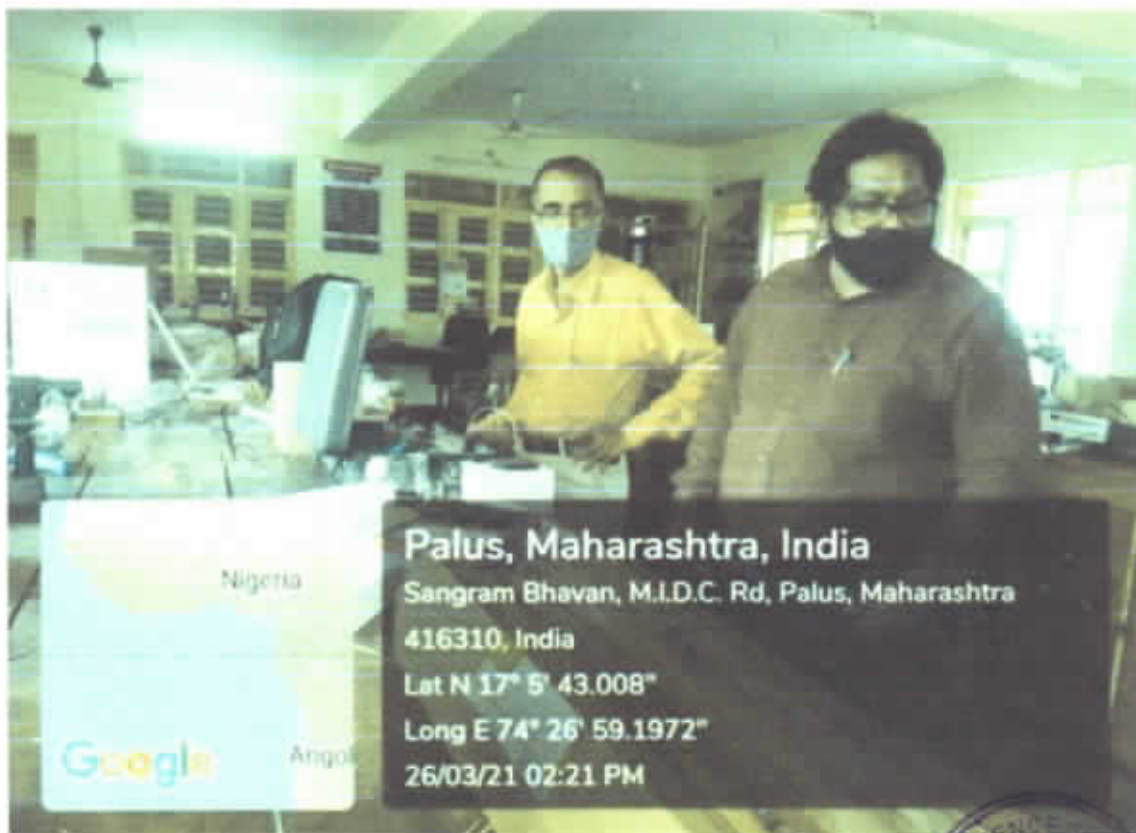
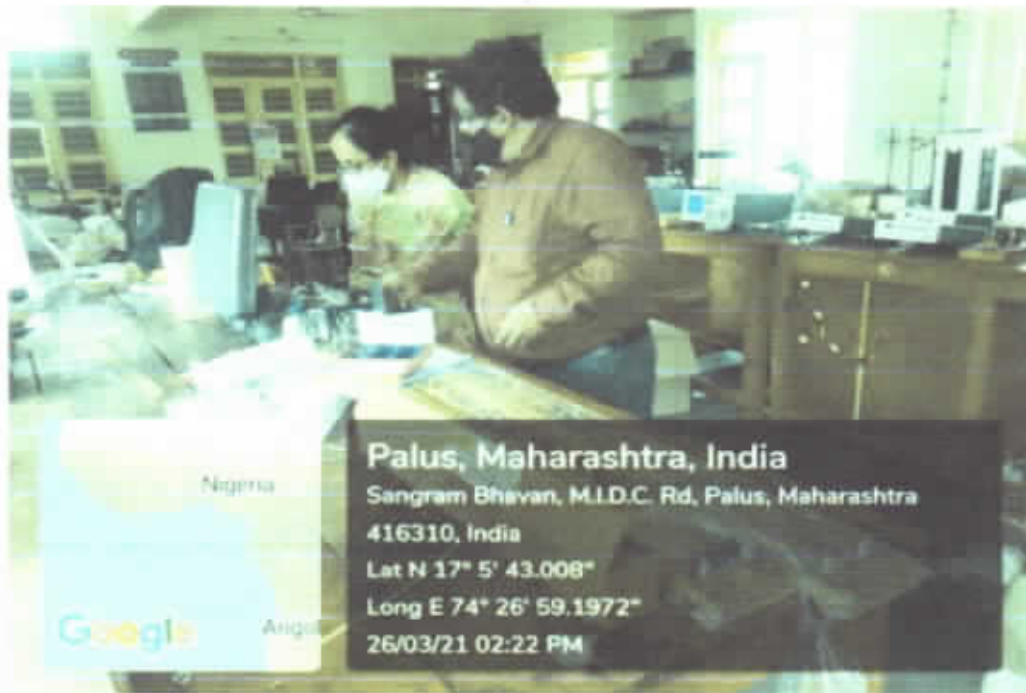
Department of Physics has organised study tour of B.Sc.II students to Pimpri Chinchwad Science museum on 5/3/22. Total 15 students and teachers of department of Physics participated in study tour.





### Hands on training programme for water testing machine

Date 26/3/2021: The hands on training programme was conducted by Mr. Naidu, Owner of Venkatesh suppliers, Pune. The programme was conducted on 26<sup>th</sup> March 2021 in Department of Physics



## Report Field visit and MOU with Perfect Electronics Wai

Department of Physics Organised field visit to Electronics Industry Perfect Electronics at Wai.



DBT activity Two Days Training Programme

"Maintenance of domestic appliances"

Venue: Department of Physics

Date: 31<sup>st</sup> March 2022 time 10.30 am to 1.45 pm

1<sup>st</sup> April 2022 time 10.30 am to 1.45 pm



## Annexure V

## List of Equipments purchased under DBT Star College Scheme 2021-22

Sr.No	Particulars	Date	Accession No.	Quantity	Rate /Pc
1	Y by Koenig's method	14-2-22	62	1	9204
2	Cardinal points by turn table method	14-2-22	63	1	28910
3	Spectrometer	14-2-22	64-65	2	12744
4	Searle's viscometer	14-2-22	66-67	2	5310
5	Optical bench	14-2-22	68	1	9558
6	Double refracting prism	14-2-22	69	1	3186
7	Sodium source (55W) with transformer with wooden box	14-2-22	70	1	9322
8	Spherical aberration lenses	14-2-22	71	1	425
9	Tuning fork of good quality(Japan) model	14-2-22	72	1	10726
10	Resistance box-(Besto) 0-1000	14-2-22	73-76	4	2891
11	Ballistic galvanometer with lamp and scale arrangement	14-2-22	77-78	2	5310
12	Rheostat 0-100	14-2-22	79-82A	5	2242
13	A.C. source (2amp)	14-2-22	83-86	4	1711
14	e/m by Thomson method	14-2-22	87	1	17700
15	Mortar and pestle 3", 4", 5", 6"	14-2-22	88-91	4	1050
16	IV characterization of solar cell	14-2-22	92	1	10502
17	Band gap of semiconductor using PN junction diode	14-2-22	93	1	5664
18	Biprism	14-2-22	94	1	920
19	Grating	14-2-22	95-98	4	1380.5
20	Prism	14-2-22	99-102	4	1156.5
21	Polar graph using photocell	14-2-22	103	1	10502
22	Mercury (250gm)	14-2-22	104	1	2655
23	Table lamp	14-2-22	105-114	10	743.4
24	Magnifying lens	14-2-22	115-120	6	212.35
25	Electric gun (good quality)	14-2-22	121-125	5	460.2
26	Thermal conductivity of copper by sear's apparatus	14-2-22	126	1	10502
27	K by lee's method with copper container	14-2-22	127	1	6372
28	Post office box	14-2-22	128-129	2	2891
29	D.C. source (TPSU)	14-2-22	130-132	3	15635
30	Rheostat 0-250	14-2-22	133-134	2	3186
31	Rheostat 0-100	14-2-22	135-136	2	2336.5
32	Miliameter A.C. 0-500 MA	14-2-22	137-138	2	1274.5
33	Miliameter D.C. 0-500 MA	14-2-22	139-140	2	1274.5
34	Voltmeter 0-10V	14-2-22	141-144	4	637.25
35	Voltmeter 0-5V	14-2-22	145-148	4	637.25
36	Micrometer 0-250 $\mu$ A	14-2-22	149	1	637
37	Micrometer 0-500 $\mu$ A	14-2-22	150	1	637
38	To determine specific heat of graphite	14-2-22	151	1	11564
39	Meld's experiment	14-2-22	152	1	10620
40	Viscosity by poisseuilles method	14-2-22	153	1	5310
41	Newton's ring method	14-2-22	154	1	9558
42	Digital Conduct meter	14-2-22	155	1	17849
43	Laser He-Ne	14-2-22	156	1	26550
			<b>Total</b>		<b>394505</b>



## Annexure - V

List of Equipments Purchased by Zoology under DBT Star College Scheme

Sr. No.	Particulars	Date	Accession No.	Quantity	Rate/Unit
1.	Refrigerator	17/02/2022	2659	01	25,500.00
2.	Canon SLR Camera DL-1500	21/02/2022	CR/C/S/0514	01	37,300.00
<b>Grand Total Rs.</b>					<b>62,800.00</b>

## Annexure - V

List of Equipments Purchased by Zoology under DBT Star College Scheme

Sr. No.	Particulars	Date	Accession No.	Quantity	Rate/Unit
1.	Instant Electric Heater		2659	01	1,831.00
<b>Grand Total Rs.</b>					<b>1,831.00</b>



  
**Principal**  
 Arts, Commerce & Science College  
 Palus, Dist. Sangli

## Best practice 2 : Organization of Book exhibition



Time: 02-27-2022 11:11  
Note: ACS College Palus, Marathi Bhasha And Book Exhibition

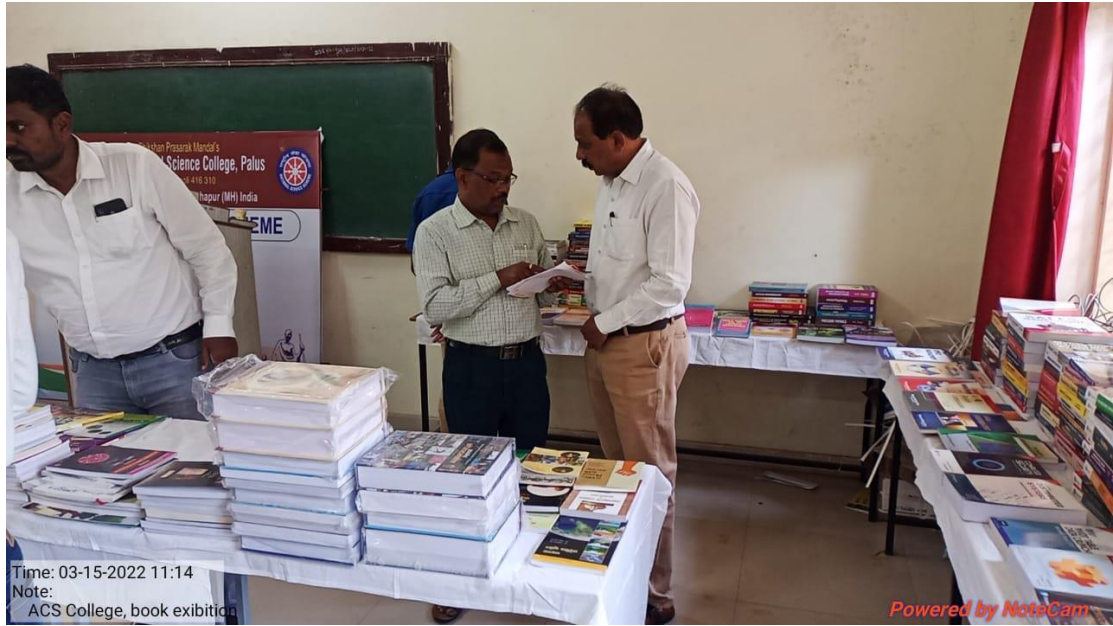
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Time: 02-27-2022 09:33  
Note: ACS College Palus, Marathi Bhasha Din and Bok Exhibition

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Time: 12-30-2021 14:09  
Note: mathematical Day book exhibition

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Time: 12-30-2021 14:09  
Note: mathematical Day book exhibition

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