

## THE COCHIN COLLEGE

Koovapadam, Kochi-2

Affiliated To Mahatma Gandhi University Re-accredited by NAAC With B+ Grade

Fourth Cycle NAAC Accreditation 2024



# Criterion 3 Research, Innovations and Extension

## 3.5 - Collaboration

Metric No. 3.5.1

Number of functional MoUs/linkages with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.

Submitted to



National Assessment and Accreditation Council



## THE COCHIN COLLEGE

## **KOCHI - 682 002**

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1 MoU between Department of Zoology, The Cochin College, Kochi-02 & Plan@Earth, Aluva

• Start Date: 08/01/2024

 $\bullet$  End Date: 08/01/2025

• Period: One Year

1.1 Project on Effect of Water Hyacinth infestation on the Physicochemical parameters of canal water in Karumalloor, Aluva, Kerala

• Date/Period: 08/01/2024

• Number of Beneficiaries from The Cochin College: 96





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#### 1.1.1 MoU







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കേരളo केरल KERALA

CR 055817

#### Preamble

Whereas the FIRST PART is an educational institution committed to promoting academic excellence, research, and community engagement, and;

Whereas the SECOND PART is a charitable organization dedicated to erivironmental conservation, research, and sustainable development;

**B**th Parties recognize the importance of collaborative efforts in research and consultancy, particularly in areas that impact the environment and community well-being.







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കേരുളo केरल KERALA

CR 055819

#### Research Support:

- The FIRST PART will support the research activities by involving faculty members, research scholars, and students in the project.
- o The SECOND PART will provide necessary financial, technical, and administrative support for the successful completion of the research.

## 3. Data Sharing and Intellectual Property:

- Both Parties agree to share data, research findings, and any other relevant information generated during the project.
- The intellectual property rights for the research outputs will be jointly owned by both Parties.



Dr. M. Geetha Principal-in-Charge The Cochin College Kochi- 682 002

Sold to The Trees

K. SREENIVASAN STA, PVENDOR, MATTANCHERRY SUPTREASURY 19 DEC 2023 \*





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o This MoU will remain in effect for a period of one year from the date of signing, and may be extended by mutual agreement.

#### 5. Confidentiality:

o Both Parties agree to maintain the confidentiality of any proprietary or sensitive information shared during the course of this collaboration.

#### 6. Termination:

o Either Party may terminate this MoU with a 30-day written notice. Upon termination, both Parties shall ensure the completion of ongoing tasks or agree on an appropriate course of action.

#### General Provisions

- · Amendments: Any amendments to this MoU must be made in writing and signed by authorized representatives of both Parties.
- . Dispute Resolution: Any disputes arising from this MoU shall be resolved through mutual discussion. If unresolved, the matter may be referred to arbitration as per the applicable laws.
- Governing Law: This MoU shall be governed by and construed in accordance with the laws of India.

### Signatories

For The Cochin College

Name: Dr M Geetha Designation: Principal Date: 8 January 2024

Dr. M. Geetha Principal-In-Charge Kochi- 682 002



For Plan@Earth

Name: Mr. Mujeeb Mohammed Designation: President

Date:8 January 2024

1. In Vinseth Kuran (Signature, Name, Date)

2. DR. Smitha. N. R

(Signature, Name, Date)







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#### 1.1.2 Report

Report on

Effect of Water Hyacinth infestation on the Physicochemical parameters of canal water in Karumalloor, Aluva, Kerala, India

Submitted by Department of Zoology The Cochin College

March 2024





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#### **METHODOLOGY**

Sampling Location: Water hyacinth infested canal in Karumalloor, Aluva was the sampling location. Sampling was done before and after the removal of water hyacinth during January and February 2024. Samples were collected 1-2 week after the removal of water hyacinth, this was done to determine the difference in physico-chemical and microbial parameters of the water sample due to water hyacinth infestation. Sampling was done at 3 points (close to canal wall, 100 meters away from the wall and from the center of the canal) in selected location. All the parameters, except microbial, listed below were analyzed for water samples from the 3 points and the mean/average of the three points were used to compare the effect of water hyacinth removal.



Figure1 – Map showing the sampling location

1. ESTIMATION OF DISSOLVED OXYGEN

Winkler's method is used for the estimation of dissolved oxygen

PRINCIPLE

In Winkler's method oxygen released from water is used to liberate iodine from potassium iodine and this iodine liberated in turn is estimated using standard Sodium thiosulphate (Na2S2O3). When manganese sulphate (MnSO4) is added to a sample of water followed by strong alkaline potassium iodide. Manganese hydroxide [Mn (OH) 2] will be formed. This combines with dissolved oxygen in water. This on acidification with conc. Sulphuric acid in the presence of alkaline potassium iodide, release iodine equivalent to the amount of oxygen dissolved in the sample water. The amount of iodine liberated is estimated by titrating the sample solution against 0.01N Sodium thiosulphate.

#### PROCEDURE

#### a) Fixation of water samples

Water was taken in a BOD bottle of 250 ml immersed into the pond with minimum disturbance, taking care to avoid the formation of air bubble in it. Close the bottle with the

MnSO <sub>4</sub> + 2NaOH	$\rightarrow$	$Mn(OH)_2 + NaSO_4$
$2 \text{ Mn}(OH)_2 + O_2$	$\rightarrow$	2 MnO(OH) <sub>2</sub> (S) Brown ppt
$MnO(OH)_2 + 2H_2SO_4 + 3H_2O$	$\rightarrow$	$Mn (SO_4)_2 + 6H_2O$
$Mn(SO_4)_2 + 2KI$	$\rightarrow$	$MnSO_4 + I_2 + K_2SO_4$
$Na_2S_2O_3 + I_2$	$\rightarrow$	$Na_2S_4O_6 + 2NaI$





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stopper while under water. Now remove the stopper of the water and add 2 ml of manganese sulphate solution followed by 2 ml of alkaline iodide solution into the water sample collected. Add the reagent in such a way that the tip of the pipette touches the bottom and gradually pull them upward. Close the bottle tightly with the stopper and avoid the formation of any air bubble inside. Shake the sample very well, in order to complete the formation of precipitate inside the bottle. Leave the sample undisturbed for some time so that the precipitate settles down completely.

#### b) Titration of water sample

Add 2 ml of conc. Sulphuric acid carefully to the precipitate and close the bottle with the stopper. Mix the content very well to dissolve the precipitate completely to form a brown coloured solution. From this pipette out 20 ml into a clean conical flask and titrate the same against 0.01N sodium thiosulphate solution from the burette and stop titration when the solution in the beaker turns pale yellow. Now add 1 ml of freshly prepared starch solution as indicator. The solutions become blue in colour. Note down the burette reading and repeat the titration for concordant value.

#### 2. LIGHT AND DARK BOTTLE EXPERIMENT

The rate of photosynthesis or primary productivity is estimated using light and dark bottle experiment. For this two measuring cylinder of 250ml is filled with water without minimum disturbance, taking care to avoid the formation of air bubbles in it. Close the bottle with the stopper while under the water. Cover one of the bottles completely with black paper or painted completely to exclude the bottle from sunlight. And the other bottle is left as it. Now tie botth bottles and immerse the bottles into the water to some depth. Keep this arrangement undisturbed for 24 hours. After 24 hours the bottle is taken out of the water and Winkler's method is done for estimating the dissolved oxygen, so that the rate of photosynthesis can be determined.

#### 3. ESTIMATION OF DISSOLVED CARBON DIOXIDE

Dissolved

carbon dioxide in the water sample is estimated using the following method  $\ensuremath{\mathbf{PRINCIPLE}}$ 

Carbon dioxide dissolved in water to form carbonic acid, which subsequently dissociates into H<sup>+</sup> and HCO<sub>3</sub><sup>-</sup>. If water contains a high amount of CO<sub>2</sub>, it becomes acidic. An acid can be titrated against a standard alkali using phenolphthalein as indicator to determine its acidity. If the water is alkaline, due to a higher amount of bicarbonate ions, it should be titrated against a standard acid using methyl orange as indicator.

 $H_2O + CO_2 \Longrightarrow H_2CO_3$ 

NaOH + H<sub>2</sub>CO<sub>3</sub> ⇒ NaHCO<sub>3</sub> + H<sub>2</sub>O

#### PROCEDURE

pH of the water sample is estimated using pH paper. If the sample is acidic, it is titrated NaOH using phenolphthalein as an indicator. If it is alkaline, it should be titrated against HCl, using methyl orange as an indicator. 50 ml of givens sample of water is carefully measured and transferred into a conical flask with minimum disturbance and add few drops of methyl orange indicator to the water and titrate against 0.1N HCl from the burette. The mixture in the flask is gently titrated. During titration, the end point is indicated by the appearance of pale orange colour which persists for 20 seconds. Note down the burette reading and repeat the titration for concordant value.





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#### 4. TEST FOR pH

#### **PROCEDURE**

- 10 ml of water sample is taken in the test tube.
- 3-4 drops of pH reagent -1 is added and mixed well.

The colour that formed is compared with the pH colour chart and pH value is recorded.

#### 5. TEST FOR TOTAL ALKALINITY

#### PROCEDURE

- 25 ml of water sample is taken in the test bottle.
- 4-5 drops of TA-2 are added and mixed until an orange-yellow colour is formed.
- Then TA-1 is added drop by drop and shaken well after each drop until the colour changes from orange yellow to orange red.

  No. of drops of TA-1 required for the colour change is counted.
- Total alkalinity = No. of drops x 5

#### 6. TEST FOR RESIDUAL SULPHITE OR SULPHITE

#### PROCEDURE

- Take 25 ml of water sample in the test bottle.
- Add 1 ml of Sulphite Reagent-1(S1-1) and mix well.
- Add a pinch of Sulphite Reagent-2(S1-2) and mix well until a distinct white colour
- Add Sulphite Reagent-3(S1-3) shake well after each drop until the colour changes from white to dark blue.

No. of drops of SI-3 required for the colour change is counted.
7. PHOSPHATE TESTING METHOD

#### **PROCEDURE**

- Take 5 ml of water sample in the test tube.
- Add 5 drops of Phosphate reagent-1(PR-1) and one drop of Phosphate reagent-2(PR-2).
- Mix the contents and wait for 2-3 minutes for colour to develop.

The colour that formed is compared with the phosphate colour chart provided and record the phosphate value.

#### 8. IRON TESTING METHOD

#### **PROCEDURE**

- Take 5 ml of water sample in the test tube.
- Add 5 drops of Iron Reagent-1(Fe-1).
- Add 1 drop of Iron reagent -2(Fe-2).
- Mix and add 5 drops of Iron reagent-3(Fe-3).
- Mix the contents and wait 2-3 minutes for colour to develop.

The colour that formed is compared with Iron colour chart and record the iron

#### 9. TEST FOR CALCIUM HARDNESS

#### PROCEDURE

- Take 25 ml of water sample in the test bottle.
- Add 10 drops of Calcium Hardness Reagent-2(CH-2) and mix well.
- Add 10 drops of Calcium Hardness Reagent-3(CH-3) and mix.
- Add a few specs of Calcium Hardness Reagent-1(CH-1) and mix until a distinct pink colour develops.



Mendulo Menon Mrudula Menon V. Principal-in-Charge The Cochin College



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> Add Calcium Hardness Reagent-4(CH-4). Shake well after each drop until the colour changes from pink to purple

Count the No. of drops of CH-4 required for the colour change

#### Calcium Hardness = No. of drops x 5

#### 10. TEST FOR FLUORIDE

#### **PROCEDURE**

- Add 5 ml of water sample in test tube.
- Shake well the sample with Fluoride Reagent-1(F-1).
- Then add 5 drops of water sample. Mix the contents

The colour that formed is compared with the Fluoride colour chart and record the fluoride value.

#### 11. TEST FOR CHLORIDE

#### **PROCEDURE**

- Take 25 ml of water sample in the test bottle.
- Add 5 drops of Chloride Reagent-1(CL-1).
- Mix until a distinct yellow colour develops.
- Add Chloride Reagent-2(Cl-2) drop by drop and shake well until the colour changes from yellow to red.
- Count the No. of drops of Chloride Reagent-2(Cl-2) required for the colour change.
   Chloride (mg per liter) = No. of drops x 10
   TEST FOR RESIDUAL CHLORINE

#### **PROCEDURE**

- Take 5 ml of water sample in the test tube.
- Add 5 drops of Residual Chlorine-1(RC-1) and mix well.
- The colour that formed is compared with the Residual Chlorine colour chart and record the value

#### 13. MEASUREMENT OF TRANSPARENCY AND TURBIDITY BY USING SECCHI DISC

The transparency of water is influenced by turbidity which is caused by clay and soil particles and plankton and algae. The measurement of turbidity and transparency is most commonly determined by a simple instrument called Secchi disc.

### PROCEDURE:

Lower the Secchi disc into the water body and note the depth at which it disappear. Now lift up the disc and note the depth at which the disc reappears. The average of these reading is considered to be the limit of visibility. Repeat the procedures for 2-3 times.

### **Total Plate Count (TPC)**

The total plate count (TPC) is a method used to estimate the total number of viable microorganisms present in a sample. It's a common technique employed in microbiology to assess the overall microbial load in various samples, including water. Below is a general protocol for performing a total plate count using a water sample:

#### **Preparation of Nutrient Agar Plates:**

- Prepare the nutrient agar according to the manufacturer's instructions.
- Pour the molten agar into sterile Petri dishes and allow it to solidify.
- Label the plates with appropriate sample information and a unique identifier.

#### Collection of Water Samples:

- Use sterile containers to collect water samples from the source.
- Collect samples in a manner that minimizes contamination.



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#### **Dilution Series**

- Prepare a series of dilutions of the water sample to obtain a suitable range of colony counts.
- Typically, serial dilutions of 10-fold are performed. For example, 1 mL of the sample is added to 9 mL of sterile diluent to make a 1:10 dilution, then 1 mL of this dilution is added to another 9 mL of diluent to make a 1:100 dilution, and so on.

#### Inoculation

- Pipette 1 mL of each dilution onto separate sections of the agar surface of the labeled Petri dishes.
- Spread the liquid evenly over the surface of the agar using a sterile glass spreader.

#### Incubation:

 Invert the agar plates and incubate them at the appropriate temperature (usually around 37°C) for a suitable period (typically 24-48 hours) to allow microbial growth.

#### **Counting Colonies:**

- After incubation, examine the plates for colony growth.
- Count the colonies on plates with colony counts between 30 to 300 colonies.
   Plates with counts outside this range may need to be re-inoculated with a different dilution.
- Record the colony counts for each dilution.

#### Calculation:

- Calculate the total number of colony-forming units (CFUs) per mL of the original water sample using the colony counts and dilution factors.
- The formula is: Total CFU/mL = (Number of colonies counted × Dilution Factor) / Volume of sample plated.





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#### Results

	Parameters**	Before Water Hyacinth Removal	After Water Hyacinth Removal
1	pН	6.7	7.4
2	Total Alkalinity	14 ppm in terms of calcium carbonate	16.6 ppm in terms of calcium carbonate
3	Trasparent	Murky and opaque – hence transparency is zero	Transparent till the bottom
4	Phosphate	Absent	Absent
5	Chloride	Absent	43.3 mg/l
6	Fluoride	Absent	1mg/l
7	Residial chlorine	Absent	Absent
8	Iron	0	4.3 mg/l
9	Calcium hardness	20 ppm in terms of calcium carbonate	12 ppm in terms of calcium carbonate
10	Sulphate	4 ppm	2 ppm

<sup>\*\*</sup> all these parameters were analyzed using standard Nice Water Testing Kits

Parameters	Before Water Hyacinth	After Water Hyacinth
	Removal	Removal
Dissolved Oxygen (DO)	Not detected**	10.5mg/L
Dissolved Carbon dioxide	5.5mg/L	1mg/L
Net Primary productivity	Not detected**	3.6 mg.C/l/24hrs
Gross Primary productivity	Not detected**	4.4 mg.C/l/24hrs

### TPC results

	Before Water Hyacinth	After Water Hyacinth
	Removal	Removal
TPC	5.5 x10 <sup>5</sup> CFU/ml	4.9 x 10 <sup>5</sup> CFU/ml





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#### Conclusions

- The removal of water hyacinth had significant impacts on pH, turbidity, DO, Productivity, Dissolved CO<sub>2</sub>.
- The presence of water hyacinth had an impact on the pH of water in the canal, a low pH of 6.7 was observed before removal. After water hyacinth removal the pH of the water was found to be in the normal pH range of open waters.
- Another significant difference was observed in dissolved oxygen, dissolved oxygen could not be detected in infested waters which could be due to the dense growth of water hyacinth which consumes more oxygen through processes such as decomposition of organic matter within the mats. This consumption can deplete oxygen levels in the water column, especially in areas where water flow is restricted by the dense mats. DO might be undetected also due to the sensitivity of the method (Winkler's method), Winkler method have limitations in detecting very low levels of dissolved oxygen, especially in environments with high levels of oxygen consumption.
- The detection of DO and primary productivity in the samples after removal is clear sign of the impact of the infestation in water quality.
- The same changes in pH and DO was reported by Uka et al (2007) in their studies of water hyacinth infestation of AWBA Reservoir, Ibadan, South-West, Nigeria.
- Significant difference was also observed in the dissolved carbon dioxide level, a decrease in its level was found after removal. This is due to the inverse relationship between DO and dissolved carbon dioxide. This means that when the concentration of dissolved oxygen decreases, the concentration of carbon dioxide increases. This also have an effect on the pH of the water, as more carbon dioxide dissolves in water, the concentration of carbonic acid increases, leading to a decrease in pH.
- Chloride, fluoride and iron was absent in the infested water samples but was observed in water samples after removal, this might be due to the absorption of these by water hyacinth (Xu et al. 2022).
- There was no significant change in the total alkalinity, calcium hardness and sulphate levels.
- Total plate count (TPC) did not show any significant difference before and after removal of water hyacinth.
- As this was a preliminary/pilot study of the effect of removal of water hyacinth on the
  physicochemical and microbial parameters of the canal water at Karumalloor, Aluva.
  Further studies are required to confirm the above results.

#### References

U.N. Uka and K.S. Chukwuka, 2007. Effect of Water Hyacinth Infestation on the Physicochemical Characteristics of AWBA Reservoir, Ibadan, South-West, Nigeria. Journal of Biological Sciences, 7: 282-287.

Xu J, Li X, Gao T, 2022. The Multifaceted Function of Water Hyacinth in Maintaining Environmental Sustainability and the Underlying Mechanisms: A Mini Review. Int J Environ Res Public Health. 13;19(24):16725. doi: 10.3390/ijerph192416725. PMID: 36554606; PMCID: PMC9779344.





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2 MoU between The Cochin College, Kochi-02 and Plan@Earth, a non-profit organisation registered as a charitable society, Aluva

• Start Date: 12/02/2024

• End Date: 11/02/2025

• Period: One Year

### 2.1 Consultancy for Solid Waste Management

• Date/Period: 12/02/2024

• Number of Beneficiaries from The Cochin College: 120





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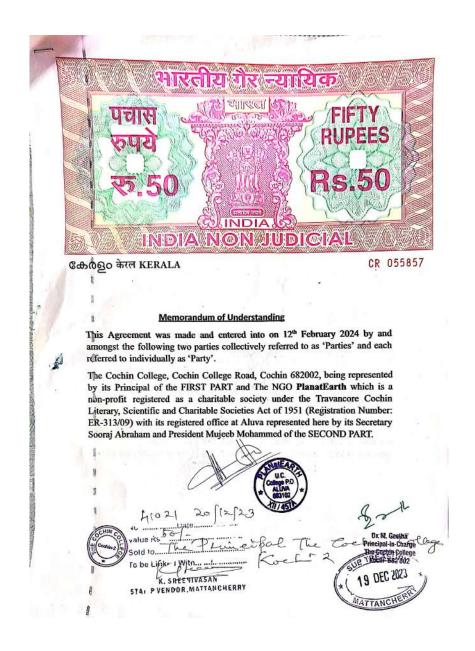
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#### 2.1.1 MoU







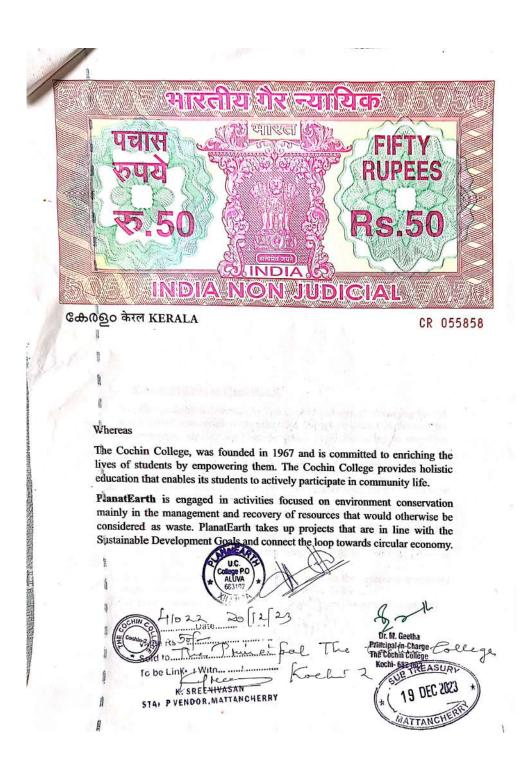
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#### Responsibilities of PlanatEarth

- 1. To offer professional service to The Cochin College, in managing the dry waste (Used examination papers/called Paper) generated in the campus by arranging regular need-based pickups and channeling to recycling companies.
- 2. To guarantee confidentiality in removal of papers pertaining to academics and other sensitive documents. Annexure II
- 3. To compensate the college for the value agreed upon for the removal of recyclables, as indicated in the attached Annexure I, in the form of A4 size paper of a brand and GSM size mentioned by the college.
- To record and document all such paper collected for recycling and Certify the College at the end of the academic year.
- None of the costs needed for any projects needs to be borne in part or wholly by The Cochin College.
- 6. It is the responsibility of **Planatearth** to obtain the necessary regulatory approvals from the concerned government authorities.

7. To give awareness and training for states a solid waste Management.



Dr. M. G. M.





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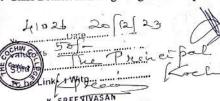
#### Responsibilities of The Cochin College

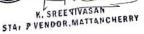
 To ensure that all dry waste that is to handed over to Planatearth is stored free of moisture and food residue.

#### Annexure I

### Rates

- 1. Used Carton Boxes: Rs4 per kilo
- 2. Waste Paper: Rs1 per kilo
- 3. A4 size Quality Paper: Rs10 per kilo
- Waste paper (bus tickets, torn paper, shredded paper): Removed free of cost
- 5. Plastic waste: Removed free of cost
- 6. PET Bottles: Removed Free of Cost
- 7. Glass Bottles: Handling charges of Rs10 per box











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#### Annexure II

#### Certificate of Confidentiality

Plan @ Earth a registered NGO that acts as a service provider to corporate organizations and companies in the matter of collection and recycling of waste paper materials understands that papers of highly confidential nature might be present in the paper thus discarded. We have been offering such services for over 14 years now.

Hence Plan @ Earth undertakes to handle all the paper collected from The Cochin College, with extreme care ensuring 100 percent confidentiality of the content or utility of such matter procured from the institution.

Particular care would be taken in the case where exam sheets, mark sheets etc are handed over.

Every sheet of paper thus collected will be bundled and directly sent for processing where it will all be shredded and reduced to pulp and used for paper manufacturing itself and would reach a recycling plant with minimum handling and that too under strict packaging.

This undertaking is guaranteed under the personal risk of the undersigned, President of Plan @ Earth Mr. Mujeeb Mohammed and Secretary of Plan @ Earth Mr. Sooraj Abraham.

The MoU is valid from 12 February 2024 to 11 February 2025





Dr. M. Geetha Principal-in-Charge The Cochin College Kocki- 582 002





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#### 2.1.2Report

Introduction: In a significant step towards promoting environmental sustainability and waste management, The Cochin College signed a Memorandum of Understanding (MOU) with Plan@Earth, a prominent environmental organization, during 2023-24. This partnership marked the beginning of collaborative efforts to address waste management issues, particularly through vermicomposting. Under this MOU, Plan@Earth conducted a comprehensive vermicomposting training program for students, faculty, and the local community, emphasizing practical, hands-on learning and sustainable practices.

#### Objectives of the Training Program:

- Promote Environmental Awareness: Educate participants on the importance of
- waste management and the role of vermicomposting in reducing organic waste. **Develop Practical Skills:** Provide hands-on training in setting up and maintaining vermicomposting units.
- Foster Sustainable Practices: Encourage the adoption of vermicomposting as a regular practice in households and institutions.
- Community Engagement: Involve the local community in environmental initiatives, thereby strengthening community bonds and collective responsibility towards waste

Overview of the Training Sessions: The vermicomposting training program was conducted over a period of an year, with sessions designed to cater to different groups, including students, faculty members, and local residents. The program included the following key

#### 1. Introduction to Vermicomposting:

- Understanding Vermicomposting: Participants were introduced to the basics of vermicomposting, including the science behind the process, the types of waste suitable for composting, and the environmental benefits.
- $\circ$   $\,$  Types of Earthworms: The sessions covered the different species of earthworms used in vermicomposting, particularly focusing on Eisenia fetida, the most commonly used species

### 2. Hands-On Training:

- o Setting Up a Vermicomposting Unit: Participants were guided through the process of setting up a vermicomposting unit, from selecting the container to preparing the bedding material.
- Maintenance and Monitoring: Practical sessions on maintaining the vermicomposting unit, including feeding the worms, monitoring moisture levels, and managing any issues such as pests or odors.
- Harvesting Vermicompost: Participants learned how vermicompost, separate worms from the compost, and use the compost as a natural fertilizer.

#### 3. Sustainability and Application:

o Applications of Vermicompost: The training highlighted the various uses of vermicompost, particularly in gardening and agriculture, as a nutrient-rich organic fertilizer.



Mendulo Menon Mrudula Menon V. Principal-in-Charge The Cochin College



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 Sustainability Practices: Emphasis was placed on integrating vermicomposting into daily waste management routines and encouraging participants to promote these practices within their communities.

#### 4. Field Visits and Demonstrations:

- On-Site Visits: Participants visited existing vermicomposting units, including those at Plan@Earth's facilities and local model units, to observe large-scale operations and best practices in action.
- Demonstrations: Live demonstrations were conducted to showcase the entire vermicomposting process, from start to finish.

#### **Outcomes of the Training Program:**

- Increased Awareness: The training successfully raised awareness about the importance of waste management and the role of vermicomposting in sustainable living.
- Skill Development: Participants acquired practical skills in setting up and managing vermicomposting units, which they could implement in their homes or institutions.
- Community Involvement: The program fostered greater community involvement in environmental initiatives, with many participants expressing a commitment to continuing vermicomposting practices.
- Collaboration and Networking: The collaboration between The Cochin College and Plan@Earth strengthened, with plans for future initiatives and expanded programs in environmental sustainability.

#### Feedback and Testimonials:

- Student Feedback: Many students expressed their satisfaction with the hands-on approach of the training, noting that it made the learning process engaging and practical.
- Faculty Response: Faculty members appreciated the integration of vermicomposting into the curriculum, recognizing its relevance in promoting environmental consciousness among students.
- Community Impact: Local residents who participated in the training reported a
  positive impact, with several setting up vermicomposting units in their homes
  following the sessions.

Conclusion: The vermicomposting training program conducted by Plan@Earth, following the signing of the MOU with The Cochin College, was a resounding success. It not only equipped participants with valuable skills but also fostered a culture of sustainability within the college and the broader community. This initiative marks a significant step towards achieving the shared goal of environmental conservation and waste management, and it sets the stage for further collaborative efforts between The Cochin College and Plan@Earth.

#### Future Plans:

 Expansion of Training Programs: Plans are underway to expand the vermicomposting training to more students and community members in the coming years.





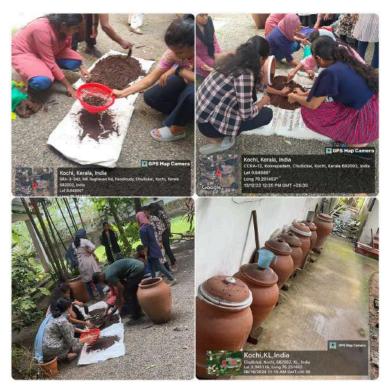
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- Establishment of Vermicomposting Units: The Cochin College aims to establish permanent vermicomposting units on campus as a demonstration project and a source of organic fertilizer for the college garden.
- Continued Collaboration: The college and Plan@Earth will continue to collaborate
  on environmental projects, focusing on sustainability, waste management, and
  community outreach.







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3 MoU between Department of English, The Cochin College, Kochi-02 and Department of English, Aquinas College, Edacochin

• Start Date: 16/12/2021

• End Date: 12/12/2024

• Period: Three Years

#### 3.1 Meet the Author

• Date/Period: 03/03/2023

• Number of Beneficiaries from The Cochin College:63

### 3.2 Exploring Transhumanism through Manga

• Date/Period: 12/02/2024

• Number of Beneficiaries from The Cochin College:50





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#### 3.2.1 MoU







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DA 306886

## NOW THEREFORE THIS MEMORANDUM OF UNDERSTANDING WITNESSES AS FOLLOWS:

Department of English, Aquinas College, Edacochin, and Department of English, The Cochin College, Kochi recognize that the academic collaboration would be of mutual benefit and would provide strengths in research and education and their mutual interest in engaging themselves in academic cooperation.

As per the purpose of the said agreement, the two parties shall:

## FORMS OF ACADEMIC AND NON-ACADEMIC COOPERATION

 Both parties agree to exchange their best services and efforts in order to develop the following forms of Academic and Non-Academic Cooperation.

Tanig John
Head of the Department of English
Aquinas College
Edacochin - 682010

431011 M. R. PROMANABHAN High Court Stamp Vendor)

13.12.202

Department of English
The Cochin College
Kochi-2

Tania John Edakalin





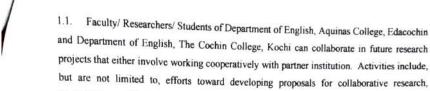


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co-authoring publication, organizing joint conferences/ seminars/ workshops/ webinars and conducting joint research projects.

- 1.2. Cooperate in the exchange of information relating to their activities in teaching and research in fields of mutual interests; sharing best practices adopted by each party; sharing of e-content between the parties; access to library and repository services, if possible.
- 1.3. Participation in seminars, webinars and Department fests.
- 1.4. Exchange of academic materials and other resources.
- 1.5. Any other relevant programme that are mutually agreed upon.

#### LITRARY EVENTS

- Both parties agree to exchange their best services and efforts in order to conduct different literary events as a developmental activity which includes but are not limited to:
- 2.1. Poetry Reading
- 2.2. Exhibition
- 2.3. Book Club

#### COSTS

3. Each Party will be responsible for its own costs in connection with all matters relating to collaborations under this MoU. This agreement may subsequently be withdrawn in case of any financial liabilities. Where possible and appropriate, the Parties may also seek funding for collaborations from any research organization funding.

Head of the Department of English
Aquinas College
Edacochin - 682010

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### CONFIDENTIALITY

4. The Parties agree that there is no intention to share any confidential or proprietary information in any collaboration under this MoU. If either Party wishes to disclose information it considers to be confidential or proprietary to the other Party, the Party needs to take prior written consent of the other party

#### DURATION

5. This MoU is at-will and may be modified by mutual consent of authorized officials from either side. This MoU shall become effective upon signature by the authorized officials and will remain in effect for three years until modified or terminated by any one of the authorized officials of the two institutions.

Signed by

Ms. Tania John Assistant Professor & Head, Department of English, Aquinas College, Edacochin. Associate Professor & Head, Department of English, The Cochin College, Kochi.

Witness:

1. Dr. Sjønd han K Dr. 10 121

2. Alian Rosley Tacob 11 12 12001









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#### 3.2.2 Report

#### Report on Inter-College Collaboration: Invited Talk by Veena Venugopal

Date: March 3, 2023

As part of the ongoing collaboration between Cochin College and Aquinas College, facilitated by a Memorandum of Understanding (MoU), students from the English Department of Aquinas College attended an invited talk by renowned author and journalist Veena Venugopal. This event showcases the successful implementation of the MoU, promoting academic exchange and enrichment between the two institutions.





#### Key points of the collaboration:

- 1. Inter-college event: The talk was organized as part of MoU-related activities, demonstrating active cooperation between Cochin College and Aquinas College.
- 2. Venue and timing: The event was held at Cochin College's seminar hall on March 3, 2023, from 11:30 AM to 12:30 PM.
- 3. Student participation: English Department students from Aquinas College were given the opportunity to attend the event at Cochin College, fostering inter-institutional engagement.





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- Notable speaker: Veena Venugopal, an accomplished author and journalist, provided students with exposure to a professional in the field of literature and media.
- 5. Knowledge sharing: The one-hour session allowed students to benefit from Venugopal's expertise and experiences as an author of three books and her work with prominent publications like The Hindu Business Line and The Hindu.

This collaborative effort highlights the commitment of both colleges to enhance the educational experience of their students through shared resources and networking opportunities. By hosting the event at Cochin College and inviting Aquinas College students, the institutions demonstrated practical implementation of their MoU, creating a platform for cross-college learning and interaction.

Dr. Tania John
Head
Department of English
Aquinas College
Edacochin-682010

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Post Graduate Department Of English The Cochin College Kochi- 682 002









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#### Manga and Transhumanism Seminar Report 2023-24

**Exploring Transhumanism through Manga** 

#### Introduction:

The 2023-2024 academic year at The Cochin College was marked by a captivating seminar as part of the **Theoretical Peregrinations** series, which delved into the fascinating intersection of transhumanist philosophy and manga. This event aimed to deepen the understanding of how manga, a globally popular Japanese art form, portrays the intricate and futuristic ideas central to transhumanism. The seminar not only sparked intellectual curiosity among students and faculty but also encouraged critical discussions on the portrayal of philosophical themes in popular culture.

#### Objectives:

The seminar was designed to explore how manga represents transhumanist themes, providing an interdisciplinary platform that connected literature, philosophy, and cultural studies. It sought to engage students and faculty in meaningful discussions on contemporary issues as reflected in popular culture, particularly focusing on the ethical and philosophical implications of technological advancements as depicted in manga narratives. By examining these themes, the seminar aimed to foster critical thinking and provide a deeper understanding of the ways in which modern media can influence and reflect philosophical discourse.

#### Participants:

The students and faculty of Department of English, Aquinas College, Edacochin and Department of English, The Cochin College, Kochi02.

#### Activities and Implementation:

The seminar was conducted by **Dr. Augustine George**, an Assistant Professor in the Department of English at Sacred Heart College, Thevara. The event took place on **12th February 2024** at 1:30 PM in the Seminar Hall of The Cochin College. Dr. George commenced the seminar by offering a comprehensive overview of transhumanism, discussing its philosophical roots and its increasing relevance in today's rapidly evolving technological landscape. He then explored how manga, as a medium of visual storytelling, is uniquely positioned to portray complex transhumanist ideas. The discussion focused on human enhancement, artificial intelligence, and the ethical dilemmas that arise from such advancements, as seen through the lens of manga. Dr. George illustrated these concepts by analysing specific manga works that are renowned for their exploration of transhumanist





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themes, highlighting the narrative techniques that engage readers with these profound philosophical issues. The seminar concluded with an interactive question-and-answer session, where participants engaged in a lively discussion. The questions ranged from cultural interpretations of transhumanism in Eastern versus Western contexts to the role of manga in shaping public perceptions of technological advancements.

#### Outcomes:

The seminar successfully enhanced the participants' understanding of transhumanism and its portrayal in manga, providing an insightful linkage between literature, philosophy, and modern technological concerns. It stimulated intellectual curiosity among students and faculty, encouraging them to explore philosophical themes through various cultural mediums, particularly manga. The event also fostered an interdisciplinary approach to learning, emphasising the importance of critical thinking when analysing the ethical and cultural implications of technological advancements. By bridging the gap between cultural studies and philosophical inquiry, the seminar offered a unique and enriching educational experience that resonated deeply with the attendees.







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#### Conclusion:

The seminar titled "Envisioning Transcendence: Portraying Transhumanist Philosophy through Manga" was a significant academic event that aligned perfectly with the goals of the Theoretical Peregrinations series. It provided a valuable platform for examining how manga serves as a powerful medium for conveying complex philosophical ideas, particularly those related to transhumanism. The success of this seminar highlighted the importance of interdisciplinary dialogue within academia, demonstrating how cultural studies can be effectively integrated with philosophical inquiry to create a more comprehensive and thought-provoking educational environment at The Cochin College.





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4 MoU between Department of Physics, The Cochin College, Kochi-02 and Department of Physics, Aquinas College, Edacochin

• Start Date: 15/12/2021

• End Date: 15/12/2026

• Period: Five Years

### 4.1 Lecture on Elements of Crystal Structure

• Date/Period: 04/08/2024

• Number of Beneficiaries from The Cochin College: 46





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#### 4.1.1 MoU



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MEMORANDUM OF UNDERSTANDING BETWEEN

DEPARTMENT OF PHYSICS, THE COCHIN COLLEGE, KOCHI, KERALA, INDIA

AND

DEPARTMENT OF PHYSICS, AQUINAS COLLEGE, EDACOCHIN, KERALA, INDIA

This agreement made and entered on the 15th day of December 2021 between the Department of Physics, The Cochin College, Kochi, Kerala, India represented by its Head of the Department (HOD), as the first party and Department of Physics, Aquinas College, Edacochin. Kerala, India represented by its Head of Department (HOD), as the second party.







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#### NOW THEREFORE THIS MEMORANDUM OF UNDERSTANDING WITNESSES AS **FOLLOWS**

Department of Physics, Aquinas College, Edacochin, Kerala, India and Department of Physics, The Cochin College, Kochi, Kerala, India recognize that the academic collaboration would be of mutual benefit and would provide strengths in research and education and their mutual interest in engaging themselves in academic cooperation. As per the purpose of the said agreement, the two parties shall:

## Forms of Academic and Non-academic Cooperation

- 1. Both parties agree to exchange their best services and efforts in order to develop the following forms of Academic and Non-academic Cooperation.
- 1.1.Faculty/Researchers/Students of Department of Physics, Aquinas College, Edacochin, Kerala, India and Department of Physics, The Cochin College, Kochi, Kerala, India can collaborate in future research projects that either involves working cooperatively with partner institution. Activities include, but are not limited to, efforts toward developing proposals for collaborative research, co-authoring publication, organizing joint conferences/seminars/workshops, and conducting joint research projects.

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- 1.1.Cooperate in the exchange of information relating to their activities in teaching and research in fields of mutual interests; sharing best practices adopted by each party; sharing of e-content between the parties; access to library and repository services. if
- 1.2.Participation in seminars and Department fests.
- 1.3. Exchange of academic materials, faculty expertise and other resources.
- 1.4. Any other relevant programme that are mutually agreed upon.

### **Outreach Programmes**

- 2. Both parties agree to exchange their best services and efforts in order to conduct different public outreach programmes as a developmental activity which include but are not limited to:
  - 2.1. Science popularization events
  - 2.2.Sky watch
  - 2.3. Addressing social issues by community interactions

3. Each Party will be responsible for its own costs in connection with all matters relating to collaborations under this MoU. This agreement may subsequently be withdrawn in case of any financial liabilities. Where possible and appropriate, the Parties may also seek funding for collaborations from any research organization funding.

#### Confidentiality

4. The parties agree that there is no intention to share any confidential or proprietary information in any collaboration under this MoU. If either Party wishes to disclose information it considers confidential or proprietary to the other Party, the Party needs to take prior written consent of the other party.

#### Duration

5. This MoU is at-will and may be modified by mutual consent of authorized officials from either side. This MoU shall become effective upon signature by the authorized officials and will remain in effect until modified or terminated by any one of the authorized officials of the two institutions. Annut Mules

Signed by

Lt. Dr. Joseph John

Associate Professor & Head

Department of Physics

Aquinas College, Edacochin

1. Dr. Tharangly R. A.S.

Dr. Annieta Philip K

Associate Professor & Head

Department of Physics

The Cochin College, Kochi





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#### 4.1.2 Report

Event Title: Lecture on "Elements of Crystal Structure"

Event Date: 4th August 2023 Event Time: 10:00 AM - 11:00 AM

Venue: Classroom, The Cochin College, Kochi-2 Organised by: Department of Physics, The Cochin College

#### Introduction

On 4th August 2023, the Department of Physics at The Cochin College organised an engaging lecture on the topic "Elements of Crystal Structure." The session was conducted as part of the department's ongoing efforts to provide students with in-depth knowledge in various areas of physics. The lecture aimed to enhance students' understanding of crystal structures, which is a fundamental topic in solid-state physics.

#### Objective

The primary objective of the lecture was to introduce students to the basic concepts of crystal structures, including the arrangement of atoms in solids, unit cells, and the significance of crystal symmetry. The session also aimed to provide students with the necessary foundation to explore more advanced topics in materials science and condensed matter physics.

#### Speaker Profile

The session was led by **Dr. Manjusha V M**, a faculty member from the Department of Physics at The Cochin College, Kochi-2. Dr. Manjusha V M is well-versed in the field of solid-state physics and has extensive experience in teaching and research related to crystal structures and materials science. Her expertise provided students with valuable insights into the complexities of crystal structures.

#### **Event Highlights**

- Introduction to Crystal Structures: Dr. Manjusha began the session by discussing the fundamental concepts of crystal structures, focusing on the different types of unit cells and their geometric configurations.
- Importance of XRD (X-ray Diffraction): The lecture included a detailed explanation of X-ray diffraction (XRD) techniques, which are essential for determining the crystal structure of materials.
- Interactive Session: The students actively participated in the discussion, asking
  questions related to the topic and clarifying their doubts regarding the practical
  applications of crystal structures in various fields.





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### Participation

The lecture was attended by a group of enthusiastic students from the Department of Physics, Aquinas College, Edakochin. The students were highly engaged throughout the session, demonstrating their interest in the subject matter.

#### Feedback

The feedback from the students was positive, with many expressing appreciation for the clarity and depth of the presentation. They found the lecture to be informative and well-structured, which helped them gain a better understanding of the complex concepts related to crystal structures.

#### Conclusion

The lecture on "Elements of Crystal Structure" was a successful event, fulfilling its objective of educating students about the fundamental aspects of crystal structures. The Department of Physics at The Cochin College looks forward to organising more such lectures to continue providing quality education and knowledge to its students.





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# 5 MoU between Department of Physics, The Cochin College, Kochi-02 and Altersoft Innovations, Kochi

• Start Date: 10/05/2024

• End Date: 10/05/2029

• Period: Five Years

### 5.1 State Level Workshop on Python Programming Language

• Date/Period: 08/06/2024

• Number of Beneficiaries from The Cochin College: 25





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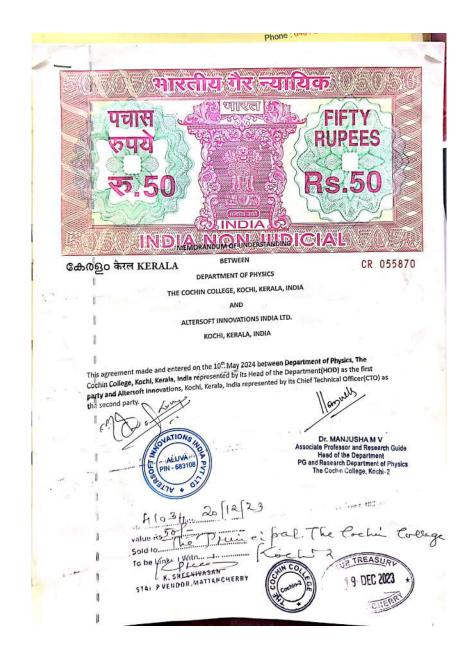
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#### 5.1.1 MoU







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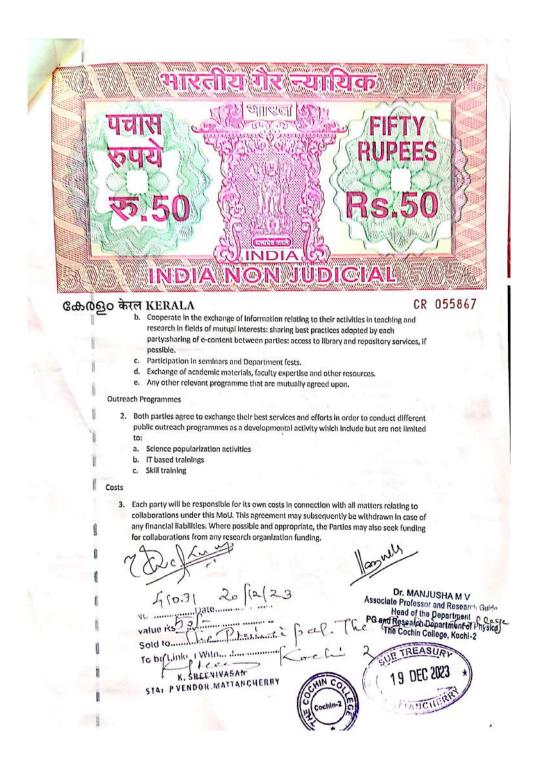


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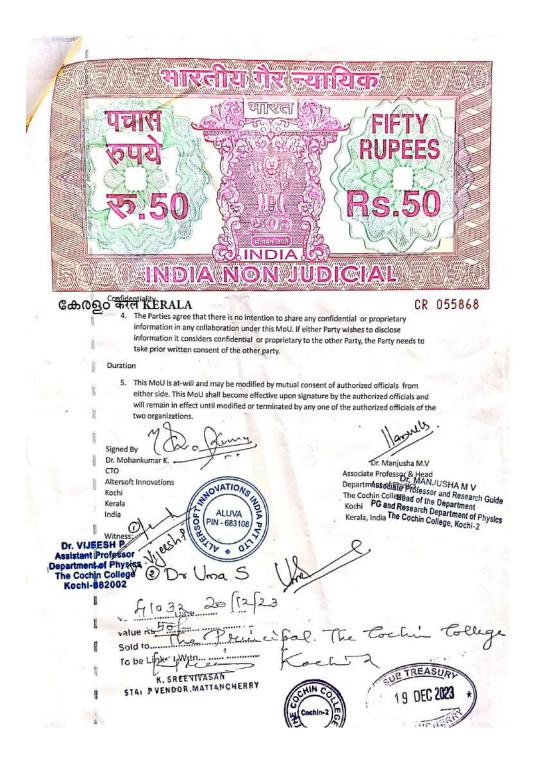
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#### 5.1.2 Report

#### Event Title: "Python Programming Language"

Event Date: 08-06-2024
Event Time: 10:00 AM - 11:00 AM
Venue: Seminar Hall, The Cochin College
Organised by: Department of Physics, The Cochin College

#### Introduction

The Department of Physics at The Cochin College organized an insightful workshop on the topic "Python Programming Language" on 8th July 2024. The event aimed to introduce students and faculty members to the Python programming language, highlighting its applications in various scientific and research fields. The workshop was part of the department's initiative to equip students with essential skills in modern computational tools, which are increasingly becoming integral in scientific research and industry.

#### Objective

The primary objective of the workshop was to provide participants with a foundational understanding of Python programming, its syntax, and its practical applications in solving complex problems in physics and other scientific domains. The session also aimed to encourage participants to explore Python further as a tool for their academic and research endeavors.

#### Speaker Profile

The session was conducted by **Dr. Mohankumar K.**, CTO of Altersoft Innovations, Kochi, Kerala. Dr. Mohankumar K. has extensive experience in software development and has led numerous projects involving Python and other programming languages. His expertise provided participants with valuable insights into the practical applications of Python in industry and research.

#### **Event Highlights**

- Introduction to Python: The workshop began with an introduction to the Python
  programming language, focusing on its simplicity, readability, and wide range
  of applications.
- Basic Syntax and Structure: The speaker discussed the basic syntax and structure of Python code, including variables, data types, and control structures.
- Practical Applications in Physics: Dr. Mohankumar K. demonstrated how Python could be used to solve physics-related problems, including data analysis, simulations, and modeling. Interactive Q&A Session: The event concluded with an interactive Q&A session, where





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participants posed questions about Python's capabilities and its role in their academic pursuits.



#### Participation

The workshop saw active participation from students and faculty members of The Cochin College. A total of 25 participants attended the session, including undergraduates, postgraduates, and faculty from various departments.

#### Feedback

The feedback from participants was overwhelmingly positive. Many appreciated the clarity of the presentation and the practical examples provided. Several participants expressed interest in further workshops and hands-on sessions on Python programming.

#### Conclusion

The workshop on "Python Programming Language" was a resounding success, achieving its objective of introducing participants to a valuable computational tool. The Department of Physics at The Cochin College looks forward to organising more such events in the future to enhance the technical skills of its students and faculty.





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6 Project Collaboration between Department of Commerce, The Cochin College, Kochi-02 & Solar City Project, Kochi Municipal Corporation

• Start Date: 09/03/2020

 $\bullet$  End Date: 09/04/2020

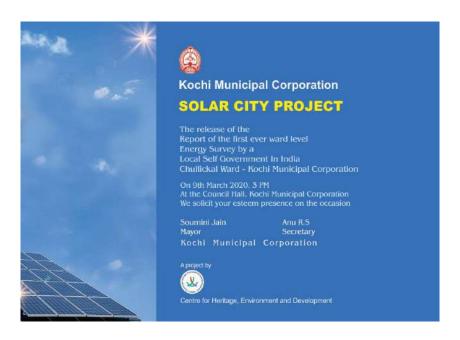
• Period: One Month

### 6.1 Solar City Project

• Date/Period: 09/03/2020

• Number of Beneficiaries from The Cochin College:63

### 6.1.1 Linkage Document







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#### 6.1.2 Report

## Report on the Solar City Project Inauguration by Kochi Municipal Corporation

Date: 9th March 2020

Venue: Council Hall, Kochi Municipal Corporation

Organized by: Centre for Heritage, Environment, and Development

#### Introduction

The Kochi Municipal Corporation, in collaboration with the Centre for Heritage, Environment, and Development, successfully launched the "Solar City Project." The event was marked by the release of the report on the first-ever ward-level energy survey conducted by a local self-government body in India, specifically in the Chullikal Ward of Kochi Municipal Corporation.

#### Key Highlights of the Event

#### Chief Guests:

The program was graced by key officials from the Kochi Municipal Corporation, including Mayor Soumini Jain and Secretary Anu R.S.

#### Report Release

The report on the energy survey, conducted as part of the Solar City Project, was officially released. The survey, which covered approximately 1200 households in the Chullikal Ward, was a pioneering effort in promoting sustainable energy practices at the grassroots level.

#### Student Involvement:

A significant aspect of the project was the active participation of thirty students from the Department of [Name of Department], who carried out the energy survey. Their diligent work provided crucial data that formed the basis of the report, highlighting energy usage patterns and potential areas for the implementation of solar energy solutions.

#### Presentation of the Report:

Prof. Unniraja P.S. was honored by receiving a copy of the report from an official of the Kochi Municipal Corporation. This symbolic gesture underscored the importance of academic and civic collaboration in achieving the goals of the Solar City Project.





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#### Impact and Future Directions

The Solar City Project aims to transform Kochi into a model city for solar energy adoption. The findings from the Chullikal Ward energy survey will guide future initiatives, including the installation of solar panels and the promotion of renewable energy usage among residents.

The success of the program also highlighted the crucial role of educational institutions and students in civic projects, emphasizing the value of community engagement and practical learning experiences.

#### Conclusion

The release of the Solar City Project report marked a significant milestone in Kochi's journey toward sustainable energy. The collaboration between the Kochi Municipal Corporation, the Centre for Heritage, Environment, and Development, and academic institutions exemplifies the potential for local governance and education to work together for a greener future.





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MoU between Department of Commerce, The Cochin College,
 Kochi-02 & Department of Commerce, Siena College, Edakochi

• Start Date: 13/07/2023

• End Date: 12/07/2024

• Period: One Year

### 7.1 A Webinar on Research Methodolody – Sampling Design

• Date/Period: 13/01/2024

• Number of Beneficiaries from The Cochin College:53

### 7.2 Deeksharambh

• Date/Period: 21/08/2023

• Number of Beneficiaries from The Cochin College:190





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#### 7.2.1 MoU



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### MEMORANDUM OF UNDERSTANDING

Postgraduate and Research Department of Commerce, The Cochin College, Kochi, Kerala, India

Postgraduate Department of Commerce, Siena College of Professional Studies, Edakochi, Kerala, India

This Agreement made and entered into on the 13th day of July 2023, between the Postgraduate and Research Department of Commerce, The Cochin College, Kochi, represented by its Head of the Department (HOD), as the first party and the Postgraduate Department of Commerce, Siena College of Professional Studies, Edakochi represented by its

Head of the Department (HOD), as the second party.

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Dr. Rekha P.G. Head of the Department
PG & Research Department of Com
The Cochin College, Kochi-02



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## NOW THEREFORE THIS MEMORANDUM OF UNDERSTANDING WITNESSES AS FOLLOWS

The Cochin College and Siena College of Professional Studies recognize that the academic collaboration would be of mutual benefit and would provide strengths in research and education and their mutual interest in engaging themselves in academic cooperation. As per the purpose of the said agreement, the two parties shall:

#### Forms of Academic Cooperation

- Both parties agree to exchange their best services and efforts in order to develop the following forms of Academic cooperation.
- 1.1. Faculty /Students of The Cochin College and Siena College of Professional Studies can collaborate in future research projects that either involves working cooperatively. Activities include developing proposals for collaborative research, co-authoring publication, organizing joint conferences/Webinars/workshops, and conducting joint research projects.
- 1.2. Cooperate in the exchange of information relating to their activities in teaching and research in fields of mutual interests; sharing best practices adopted by each party; sharing of e-content between the parties; access to library and repository services, if possible.
- 1.3. Any other relevant programmes that are mutually agreed upon.

#### Costs

Each Party will be responsible for its own costs in connection with all matters relating to collaborations under this MoU.

### Confidentiality

3. The parties agree that there is no intention to share any confidential or proprietary information in any collaboration under this MoU. If either Party wishes to disclose information it considers being confidential or proprietary to the other Party, the Party needs to take prior written consent of the other party.

Dr. Rekha P.G. Head of the Department PG & Research Department of Commerce The Cochin College, Kochi-02

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Head Past Graduate Dapartment of Commune Stena College of Professional Studies Edutocki, Kocki 682 010

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### Tenure of MoU

4. This MoU shall be effective for a period of one year from 13<sup>th</sup> July 2023 to 12<sup>th</sup> July 2024, and can terminate or amend this agreement by giving the other Party a written notice one (1) month in advance during this period.

The Parties to this Memorandum of Understanding hereby confirm their agreement to its terms by the following signatures:

Department	Postgraduate and Research Department of Commerce, The Cochin College, Kochi 682002,Ernakulam District, Kerala	Postgraduate Department of Commerce, Siena College of Professional Studies, Edacochi -682010, Ernakulam District, Kerala
Party	First Party	Second Party
Designation	Head of the Department	Head of the Department
Name & Signature of Head of Department	Dr. Rekha P. Gulde Head of the Department PG & Research Department of Corn The Cochin College. Kochi-O:	merce 60200 13 7 202
Witness	Dr. Rejnis. Set Krt. Popusa Party Depty bonn	Dr. Choxoo Rajism Assistent Prodess
Signature of Witness	Rajani. N. Mul	Charle

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### 7.2.2 Report

#### Seminar Report

Title of the Seminar	A Webinar on Research Methodolody – Sampling Design	
Date and Time	13/01/2024	
Platform	Google Meet	
Organized by	Postgraduate Department of Commerce in association with IOAC and Research Cell	
Targeted Audience	Final Year B.com students and BBA	
Resource Person	Dr.ANU.L [M.Com, M.Phil, Ph.D] Assistant Professor and Research Guide PG and Research Department of Commerce The Cochin College	
Name of the staff Co-ordinator	Dr.Chandan Raj S.M & Mrs.Sherlina cyril	
Name and Class of Student	Kennan P.A	
Coordinator	III B.Com Model II Finance and Taxation.	
Total Number of Participants	53	
Seminar Contents/Objectives	<ul> <li>To make students aware of different methods of Sampling.</li> <li>To make students aware of determination of sample size.</li> <li>To make students understand the steps in sampling design.</li> </ul>	





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#### 2. Seminar report

In association with Internal Quality Assurance Cell (IQAC) and Research Cell of Siena College of Professional Studies, Postgraduate Department of Commerce conducted a webinar on Research Methodology-"Sampling Design". The purpose of the webinar was to provide knowledge about different methods of sampling and determination of sample size. The webinar was started with welcome address given by Mrs. Sherlina Cyril, Assistant Professor, Postgraduate Department of Commerce. Dr.Anu.L Assistant Professor and Research Guide Postgraduate and Research Department of Commerce, The Cochin College, was the resource person of the Webinar. Total 53 students joined for the webinar from, Bcom model I Finance and Taxation, Bcom Model II Finance and Taxation, Bcom Model II Marketing, Bcom Model II Travel and Tourism and BBA.

Dr.Anu L covered different methods of sampling such as Probability method of sampling and Non Probability method of sampling with real life examples. The webinar was a full-fledged package for the participants for doing their project work in a successful manner. It ended with vote of thanks being delivered by Chandana Vinil of III Bcom Model I Finance and Taxation.

#### Participants Feedback

The students was actively participated in the webinar and they found it to be very informative and helpful. They felt that they had a better understanding about sampling design and determination of adequate sample size.





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#### 3. Brochure







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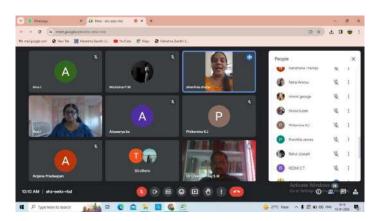
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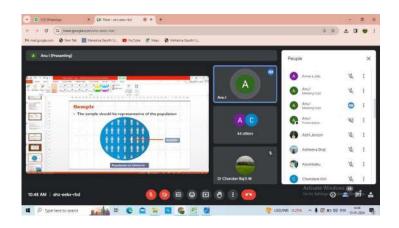
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### 4. Photos









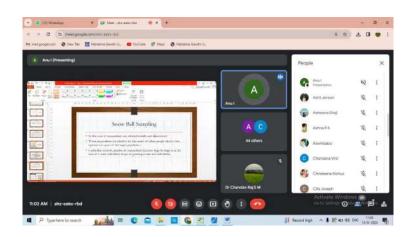
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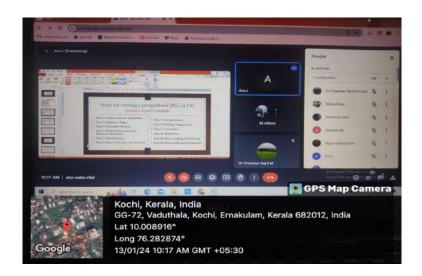
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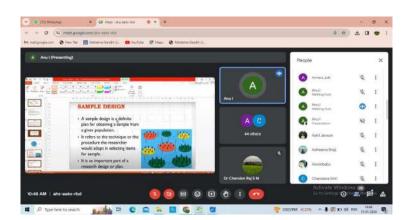
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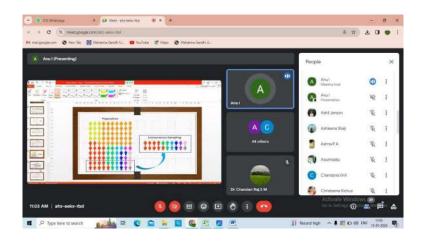
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#### SIENA COLLEGE OF PROFESSIONAL STUDIES EDAKOCHI – 682010

Email: sienacollegemail@gmail.com,Ph.0484-2972720 (Affiliated to Mahatma Gandhi University, Kottayam)

#### ATTENDANCE SHEET

Name of the Webinar : A Webinar on Research Methodology – "Sampling Design"

**Date** : 13/01/2024

Organized by : Postgraduate Department of Commerce and Research Cell

Platform : Google Meet

Sl.No.	Name	Class
1.	AALIYA NIZAR	Bcom Model II Finance and Taxation
2.	AARON JOSEPH	Bcom Model II Finance and Taxation
3.	ABDUL HAKKIM .M. K	Bcom Model II Finance and Taxation
4.	ADITHYA RAMANAN	Bcom Model II Finance and Taxation
5.	AGNES MARIA	Bcom Model II Finance and Taxation
6.	AJMAL M N	Bcom Model II Finance and Taxation
7.	AKHILA . M . R	Bcom Model II Finance and Taxation
8.	AKSHAY S	Bcom Model II Finance and Taxation
9.	AL AMEEN SHAJI	Bcom Model II Finance and Taxation
10.	ALEENA C M	Bcom Model II Finance and Taxation
11.	ARUN DAS M H	Bcom Model I Finance and Taxation
12.	ASHIN SHEEJAN	Bcom Model I Finance and Taxation
13.	ASHLEENA SHAJI	Bcom Model I Finance and Taxation
14.	ATHUL SHAJI	Bcom Model I Finance and Taxation
15.	DAVIS P. J.	Bcom Model I Finance and Taxation
16.	DEVIKA C.V	Bcom Model I Finance and Taxation
17.	ELIZABETH DINIYA.P.J	Bcom Model I Finance and Taxation
18.	FATHIMA V N	Bcom Model I Finance and Taxation
19.	JEESON PAILY K.J	Bcom Model I Finance and Taxation





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21.	JITHIN THOMAS	Bcom Model I Finance and Taxation
22.	JOSMI APLONIYA	Bcom Model I Finance and Taxation
23.	JUDESON GEORGE	Bcom Model I Finance and Taxation
24.	LIYA GRACE LONAN	Bcom Model I Finance and Taxation
25.	MARIA JENIFER ROZARIO	Bcom Model I Finance and Taxation
26.	MUHSINA P M	Bcom Model I Finance and Taxation
27.	ALEENA K HENTRY	Bcom Model II Travel and Tourism
28.	ALFRIN GEORGE M S	Bcom Model II Travel and Tourism
29.	AMAAN FIROZ	Bcom Model II Travel and Tourism
30.	AMAL C.V.	Bcom Model II Travel and Tourism
31.	AMEER. M. R	Bcom Model II Travel and Tourism
32.	ANAAN V S	Bcom Model II Travel and Tourism
33.	ANANDUKRISHNA.M	Bcom Model II Travel and Tourism
34.	ANEES LEYA N J	Bcom Model II Travel and Tourism
35.	ANEETA CATHERIN P.M	Bcom Model II Travel and Tourism
36.	ANN MARYA JUDSON	Bcom Model II Travel and Tourism
37.	APARNA T A	Bcom Model II Travel and Tourism
38.	ARYA.A.S.	Bcom Model II Travel and Tourism
39.	ASHNA K.M	Bcom Model II Travel and Tourism
40.	NAHSIL K A	Bcom Model II Marketing
41.	NANDAGOPAN K S	Bcom Model II Marketing
42.	NANDANA RAJ	Bcom Model II Marketing
43.	NEHA JAMES	Bcom Model II Marketing
44.	NIGIL WILSON	Bcom Model II Marketing
45.	POURNAMI N P	Bcom Model II Marketing
46.	PRESHILLA JAMES	Bcom Model II Marketing
47.	RAICHEL KURIAN	Bcom Model II Marketing







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49.	RONA P J	Bcom Model II Marketing
50.	SHAROOKH SAJEER	Bcom Model II Marketing
51.	SHUHAIB MALIK	Bcom Model II Marketing
52.	SISILIYA PAUL	Bcom Model II Marketing
53.	SNEHA PAIVA	Bcom Model II Marketing







## THE COCHIN COLLEGE

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#### EVENT REPORT

(Affiliated to Mahatma Gandhi University, Kottayam, Kerala)

#### EVENT REPORT

Academic Year : 2023-2024

#### 1) Details of the Event

Title of the Event	Deeksharambh
Date and Time	21st August 2023
Venue	College Auditorium
Organized by	PG Department of Commerce
Targeted Audience	First year Students of Commerce Department
Resource Person	Dr.Rekha P G
	Asst.Professor and HOD,
	PG and Researh Department of Commerce,
	The Cochin Cllege , Kochi
Name of the staff Co-coordinators	1. Mrs.Nimmi E Jose
	2. Mrs.Roselin Geethu
	3. Mrs.Roopa Ruby Mathew
Name and Class of Student	Aswin (I Bcom Model 1 tax)
Coordinators	<ol><li>Archana C S (I B com Marketing)</li></ol>
	<ol><li>Abhinaya (I B com TT)</li></ol>
	4. Catherine Aiswarya C A (I Bcom Model II)
Total Number of Participants	190
Total Expenditure	2000
Source of Funding	Commerce Fund
Event Contents/Objectives	Department Induction Programme for the first years.

#### 2) Report of the Event

Post Graduate Department of Commerce have conducted in association with IQAC Department induction programme for the first year students named "DEEKSHARAMBH" by Dr.Rekha P G, Asst.Professor and HOD, PG

Edakochi, Ernakulam (Dist), Kerala-682010, Ph.0484-2972720

www.siena college.co.in, Email: siena college mail@gmail.com, sienaiqac@gmail.com





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#### EVENT REPORT

(Affiliated to Mahatma Gandhi University, Kottayam, Kerala)

and Research Department of Commerce, students of PG Department of Commerce.

The Cochin College . This programme was attended by first year UG students of PG Department of Commerce.

The programme was commenced with a prayer song and welcome speech by Mrs.Linda Shiffy, HOD of Commerce Department. The event was inaugurated by Principal Prof Dr. M A Solomon. Felicitation given by Vice Principal Mrs. K J Philominal. Dr.Rekha P G addressed the students by explaining about various opportunities available to commerce students. It was concluded by vote of thanks by Mrs. Susmi P S, Assistant Professor, Department of Commerce.

Prepared by

1. Mrs.Nimmi E Jose 2. Mrs.Roselin Geethu

3. Mrs.Roopa Ruby Mathew (Coordinators)

Verified by : Linda Shiffy K A (Head of the Department)

Principal : (Prof.) Dr. M A Solomon

3) Geo Tagged Photos

Edakochi, Ernakulam (Dist), Kerala-682010, Ph.0484-2972720

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#### EVENT REPORT

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8 MoU between Department of English, The Cochin College, Kochi-02 and Department of English, Aquinas College, Edacochin

• Start Date: 08/06/2020

• End Date: 30/06/2021

• Period: One Year

8.1 Webinar on Feminism & Art: Contemporary Perspectives

• Date/Period: 08/03/2021

• Number of Beneficiaries: 46

8.2 Webinar on Creative Writing and the Aesthetics of Translation

• Date/Period: 12/03/2021

• Number of Beneficiaries from The Cochin College:62





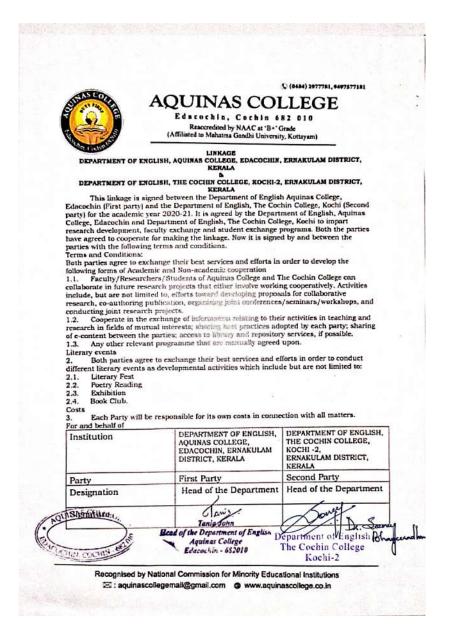
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#### 8.2.1 MoU







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Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in

#### 8.2.2 Report

Event Title: Webinar on "Feminism & Art: Contemporary Perspectives"

Event Date: 8th March 2021 Event Time: 3:00 PM - 4:00 PM Platform: Online Webinar

Organised by: Post Graduate Department of English & The Literary and Debating Club, The

Cochin College, Kochi-2

#### Introduction

The Post Graduate Department of English, in collaboration with The Literary and Debating Club at The Cochin College, organised a webinar on the topic "Feminism & Art: Contemporary Perspectives" on 8th March 2021, coinciding with International Women's Day. The webinar was designed to provide students and faculty with an in-depth understanding of the intersection between feminism and art in the contemporary world.

#### Objective

The primary objective of the webinar was to explore how feminist theory and perspectives influence and shape modern art. The session aimed to provide participants with a critical lens to examine various forms of art through the framework of feminism, highlighting the challenges and contributions of women artists in a historically male-dominated field.

#### Speaker Profile

The session was conducted by **Dr. Sherin B.S.**, from the Department of Comparative Literature & India Studies at English & Foreign Languages University. Dr. Sherin B.S. is an esteemed scholar with extensive research and teaching experience in comparative literature, feminist theory, and cultural studies. Her deep understanding of the subject matter provided participants with valuable insights into contemporary feminist art.

#### **Event Highlights**

- Introduction to Feminism in Art: Dr. Sherin began the session with an overview of feminist theory and its relevance in contemporary art. She discussed the evolution of feminist thought and its impact on various art movements.
   Contemporary Perspectives: The webinar highlighted contemporary female artists and
- Contemporary Perspectives: The webinar highlighted contemporary female artists and their work, examining how they challenge traditional narratives and offer new perspectives on gender, identity, and power.
- Q&A Session: The event concluded with an interactive Q&A session where participants
  engaged with Dr. Sherin on topics related to feminist art, its reception in the mainstream
  art world, and its future directions.



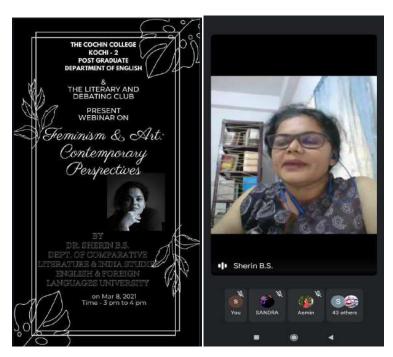


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#### Participation

The webinar attracted a diverse group of 46 participants, including students and faculty members from various departments of The Cochin College and The Aquinas College. The event saw active engagement from participants, with many posing thought-provoking questions and contributing to the discussion.

#### Feedback

Participants expressed positive feedback, praising the speaker's expertise and the relevance of the topic. The event was well-received, with many participants appreciating the opportunity to explore the complex relationship between feminism and art in a structured academic setting.

#### Conclusion





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The webinar on "Feminism & Art: Contemporary Perspectives" successfully achieved its objectives of educating and engaging participants on a crucial topic. The Post Graduate Department of English and The Literary and Debating Club at The Cochin College are committed to organising more such events that provoke critical thinking and foster academic discourse on contemporary issues.





# THE COCHIN COLLEGE

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Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in

Event Title: Webinar on "Creative Writing and the Aesthetics of Translation"

Event Date: 12th March 2021 Event Time: 3:00 PM - 4:00 PM

Platform: Google Meet

Organised by: Post Graduate Department of English & The Literary and Debating Club, The

Cochin College, Kochi-2

#### Introduction

The Post Graduate Department of English, in collaboration with The Literary and Debating Club at The Cochin College, organised a highly engaging webinar on the topic "Creative Writing and the Aesthetics of Translation" on 12th March 2021. The webinar was designed to delve into the intricate relationship between creative writing and translation, exploring how the aesthetics of translation contribute to the richness of literary works.

#### Objective

The primary objective of the webinar was to provide participants with insights into the processes and challenges involved in translating creative literary works. The session aimed to emphasise the role of translation in preserving the nuances of original texts while ensuring that the translated works resonate with the target audience. Additionally, the webinar sought to inspire participants to appreciate the art of creative writing and its transformation through translation.

#### Speaker Profile

The session was conducted by **Dr. Priya K Nair**, a Research Officer at the Kerala State Higher Education Council, Thiruvananthapuram. Dr. Priya K Nair is a distinguished scholar with a deep understanding of literary studies and translation theory. Her extensive experience in the field provided participants with valuable perspectives on the aesthetics of translation and its significance in the broader context of literary appreciation.

#### **Event Highlights**

- Introduction to Creative Writing and Translation: Dr. Priya K Nair began the session
  by discussing the fundamental aspects of creative writing, focusing on how translation
  plays a crucial role in expanding the reach of literary works across cultures and
  languages.
- Aesthetics of Translation: The webinar delved into the aesthetic considerations in translation, highlighting the balance between maintaining the original work's essence and adapting it to the linguistic and cultural contexts of the target language.
- Challenges in Translation: Dr. Priya elaborated on the various challenges faced by translators, including the preservation of tone, style, and cultural references, which are integral to the authenticity of the translated work.





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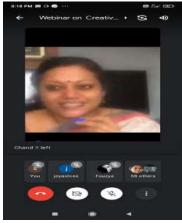
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Interactive Q&A Session: The event concluded with an interactive Q&A session, where
participants engaged with Dr. Priya on topics related to translation practices, the role of
translators as cultural mediators, and the future of translation in the digital age.





Participation





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The webinar attracted a total of 62 participants, including students, faculty members, and literary enthusiasts from various departments of The Cochin College. The session witnessed active engagement from participants, who posed insightful questions and shared their own experiences with translation and creative writing.

#### Feedback

The feedback from participants was overwhelmingly positive. Many appreciated the depth of knowledge shared by Dr. Priya K Nair and the clarity with which she presented complex concepts related to translation. The webinar was praised for its relevance and the practical insights it provided into the field of translation.

#### Conclusion

The webinar on "Creative Writing and the Aesthetics of Translation" was a resounding success, achieving its objective of enlightening participants on the intricate dynamics between creative writing and translation. The Post Graduate Department of English and The Literary and Debating Club at The Cochin College remain committed to organising more such intellectually stimulating events that contribute to the academic and literary growth of the participants.





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9 MoU between Department of Chemistry, The Cochin College,
Kochi-02 and Department of Chemistry, St. Paul's College,
Kalamassery

• Start Date: 25/01/2024

• End Date: 25/01/2029

• Period:Five Years

- 9.1 National Seminar in collaboration with St Paul's College, Kalamassery on the topic Solid State Electrochemistry- Basics to Applications
  - Date/Period: 05/03/2024
  - Number of Beneficiaries from The Cochin College:40
- 9.2 National Seminar in collaboration with The Cochin College, Kochi on the topic Advances in Chemical and Applied Science
  - Date/Period: 16/02/2024
  - Number of Beneficiaries from The Cochin College:46
- 9.3 Workshop on water quality analysis
  - Date/Period: 12/03/2024
  - Number of Beneficiaries from The Cochin College:42





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### 9.3.1 MoU







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The general objective of this collaboration is to facilitate the training programs which serve to enhance the scientific and skill development of student community in the field of chemistry. Thus DEPARTMENT OF CHEMISTRY, THE COCHIN COLLEGE, KOCHI and DEPARTMENT OF CHEMISTRY, ST.PAUL'S COLLEGE, KALAMASSERY have agreed that in support of their mutual interests in the field of training and development.

The two parties will

a) endeavour to encourage students and staff to cooperate each other for mutual academic benefits and for organizing various collaborative events.

b) cooperate in the exchange of information relating to their activities in training and development.

c) thus both parties will evo

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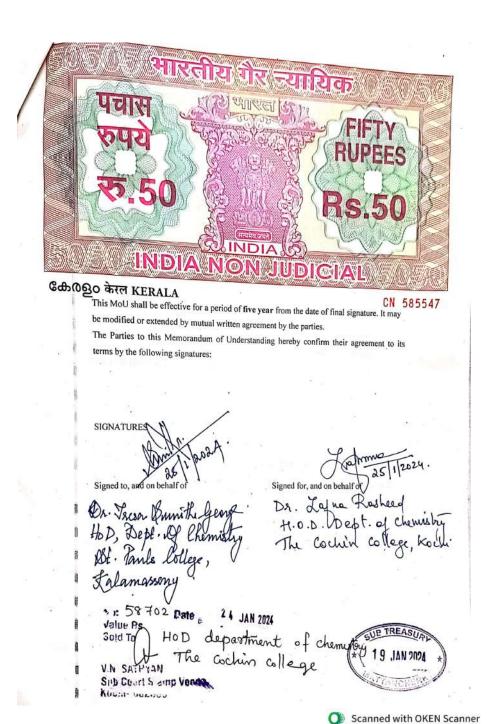
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9.3.2 Report

#### ACTIVITIES ASSOCIATED WITH MOU

As part of the MOU signed between Department of Chemistry, The Cochin College and St. Pauls College, Kalamassery on 25/1/2024, to facilitate training programs which serve to enhance the scientific and skill development of student community in the field of chemistry, the exchange of information relating to the activities in training and development programs were carried out.

#### 1. National Seminar 2024

The department of Chemistry organized a National Seminar (In collaboration with St Paul's College, Kalamassery) on the topic "Solid State Electrochemistry- Basics to Applications" on 05/03/2024. The students of Chemistry department of The Cochin College and St. Pauls college participated for the National Seminar. The First session was handled by Dr Jerry Ferreiro, Assistant professor, IISER, TVM and the Second session was handled by Dr Ananthapadmanabhan, Retired Faculty, Maharaja's College, Ernakulam.





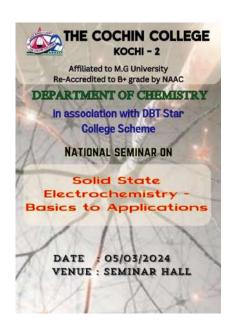
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#### 2. National Seminar

The department of Chemistry, St Paul's College, Kalamassery organized a National Seminar (In collaboration with The Cochin College, Kochi) on the topic "Advances in Chemical and Applied Science" on 16/02/2024. The students of the chemistry departments of both the colleges participated for the seminar. The First session was handled by Meera Balachandran, Professor, Chemical Engineering, School of Engineering, Amritha University, Coimbatore and the Second session was handled by Dr Jorphin Joseph, Assistant Professor, Department of Chemical Oceanography, School of Marine Science, CUSAT, Ernakulam.





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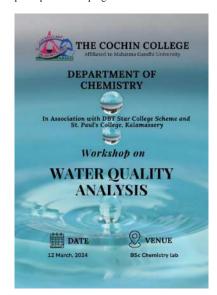
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#### 3. Workshop on Water Quality Analysis

The department of Chemistry, The Cochin College in collaboration with St Paul's College, Kalamassery, organized a workshop on water quality analysis on 12/03/24. Alumni of our department Raphael Simon Shahin and Rehana (Interfield Laboratories, Karuvelipady) handled the session. 12 students from the Cochin College and 8 students from St Paul's College participated in the programme.







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# 10 MoU with Plan@Earth,a non-profit organisation registered as a charitable society, Aluva

• Start Date: 01/06/2019

• End Date: 01/06/2020

• Period: One Year

### 10.1 Vermicomposting Initiative 2019-2020

• Date/Period: 10/07/2019

• Number of Beneficiaries from The Cochin College:68





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#### 10.1.1 MoU



XII/457A, U.C.College P.O, Aluva, Kerala, India-683102 0484-2203313 E-Mail: info@planatearth.org ISO (2011) www.planatearth.org Reg No: ER-313/09

#### Memorandum of Understanding

This Agreement was made and entered into on 1st June 2019 by and amongst the following two parties collectively referred to as 'Parties' and each referred to individually as 'Party'.

The Cochin College, Cochin College Road, Cochin 682002, being represented by its Principal of the FIRST PART and The NGO PlanatEarth which is a non-profit registered as a charitable society under the Travancore Cochin Literary, Scientific and Charitable Societies Act of 1951 (Registration Number: ER-313/09) with its registered office at Aluva represented here by its Secretary Sooraj Abraham and President Mujeeb Mohammed of the SECOND PART.

#### Whereas

The Cochin College was founded in 1967 and is committed to enriching the lives of students by empowering them. The Cochin College provides holistic education that enables its students to actively participate in community life.

PlanatEarth is engaged in activities focused on environment conservation mainly in the management and recovery of resources that would otherwise be considered as waste. PlanatEarth takes up projects that are in line with the Sustainable Development Goals and connect the loop towards circular economy.



Dr. M. Geetha Principal-in-Charge The Cochin College Kochi- 682 002







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XII/457A, U.C.College P.O, Aluva, Kerala, India-683102 0484-2203313 E-Mail: info@planatearth.org



www.planatearth.org Reg No: ER-313/09

#### Responsibilities of PlanatEarth

- To offer professional service to The Cochin College, in managing the dry waste (Used examination papers/called Paper) generated in the campus by arranging regular need-based pickups and channeling to recycling companies.
- To guarantee confidentiality in removal of papers pertaining to academics and other sensitive documents. Annexure II
- To compensate the college for the value agreed upon for the removal of recyclables, as indicated in the attached Annexure I, in the form of A4 size paper of a brand and GSM size mentioned by the college.
- To record and document all such paper collected for recycling and Certify the College at the end of the academic year.
- None of the costs needed for any projects needs to be borne in part or wholly by The Cochin College.
- It is the responsibility of Planatearth to obtain the necessary regulatory approvals from the concerned government authorities.
- 7. To give awareness and training for students in solid waste Management.

### Responsibilities of The Cochin College

- To ensure that all dry waste that is to be handed over to Planatearth is stored free of moisture and food residue.
- 2.

#### Annexure I

#### Rates

- 1. Used Carton Boxes: Rs4 per kilo
- 2. Waste Paper: Rs1 per kilo
- 3. A4 size Quality Paper: Rs10 per kilo
- Waste paper (bus tickets, torn paper, shredded paper): Removed free of cost
- 5. Plastic waste: Removed free of cost
- 6. PET Bottles: Removed Free of Cost
- 7. Glass Bottles: Handling charges of Rs10 per box





Dr. M. Geelha Principal-in-Charge The Cochin College Kochi- 682 002





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#### Annexure II

### Certificate of Confidentiality

Plan @ Earth a registered NGO that acts as a service provider to corporate organizations and companies in the matter of collection and recycling of waste paper materials understands that papers of highly confidential nature might be present in the paper thus discarded. We have been offering such services for over 14 years now.

Hence Plan @ Earth undertakes to handle all the paper collected from The Cochin College, with extreme care ensuring 100 percent confidentiality of the content or utility of such matter procured from the institution.

Particular care would be taken in the case where exam sheets, mark sheets etc are handed over.

Every sheet of paper thus collected will be bundled and directly sent for processing where it will all be shredded and reduced to pulp and used for paper manufacturing itself and would reach a recycling plant with minimum handling and that too under strict packaging.

This undertaking is guaranteed under the personal risk of the undersigned, President of Plan @ Earth Mr. Mujeeb Mohammed and Secretary of Plan @ Earth Mr. Sooraj Abraham.

The MoU is valid for 1 year from the date of signing the MoU



College PO ALUVA 683102 \*

Dr. M. Geelha Principal-in-Charge The Gochin College Kochi- 682 002





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#### 10.1.2 Report

#### Vermicomposting Initiative 2019-2020

**Introduction:** In the academic year 2019-2020, The Cochin College launched its inaugural vermicomposting initiative as part of its commitment to environmental sustainability and organic waste management. The initiative was designed to create awareness and practical knowledge about vermicomposting among students and faculty members, fostering a culture of sustainability on campus.

#### **Objectives:**

- To introduce the concept of vermicomposting and its environmental benefits.
- To establish small-scale vermicomposting units across the college campus.
- · To educate students and staff on the practical aspects of vermicomposting.
- To reduce organic waste generated within the college.

Activities and Implementation: The project began with a series of workshops and seminars led by environmental experts who provided an introduction to vermicomposting. These sessions covered the basics, such as the types of waste suitable for composting, the biology of earthworms, and the environmental benefits of vermicomposting.

Following the workshops, small vermicomposting units were set up in various departments, including the Botany, Zoology, and Chemistry departments. Each unit was equipped with the necessary materials, including compost bins, earthworms (Eisenia fetida), and organic waste collected from the college's cafeteria and garden trimmings.

Students from the Environmental Science Club were actively involved in maintaining these units, monitoring the conditions, and recording the progress of the composting process. Regular assessments were conducted to measure the effectiveness of the composting process and to make necessary adjustments.

#### Outcomes:

- Educational Impact: Students and faculty gained a deep understanding of vermicomposting and its role in sustainable waste management. The hands-on experience allowed participants to apply theoretical knowledge in a practical setting.
- Waste Reduction: The initiative successfully diverted a significant portion of organic waste from the college's waste stream, reducing the overall waste sent to landfills.
- Campus Greening: The vermicompost produced was used in the college's garden, enhancing soil fertility and promoting healthy plant growth.

**Conclusion:** The 2019-2020 vermicomposting initiative laid the foundation for a sustainable waste management culture at The Cochin College. The positive response from participants highlighted the potential for expanding the program in the coming years.





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Figure 7: Initiatives taken by students for waste management, collection of vegetable waste



Figure 8: Preparation of Vermipot by students.



Figure 9. Harvesting of Vermicompost





# THE COCHIN COLLEGE

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# 11 MoU with Plan@Earth,a non-profit organisation registered as a charitable society, Aluva

• Start Date: 03/06/2020

• End Date: 03/06/2021

• Period: One Year

### 11.1 Vermicomposting Initiative 2020-2021

• Date/Period: 15/07/2020

• Number of Beneficiaries from The Cochin College:73





# THE COCHIN COLLEGE

### **KOCHI - 682 002**

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in

#### 11.1.1 MoU



### Memorandum of Understanding

This Agreement was made and entered into on 3<sup>rd</sup> June 2020 by and amongst the following two parties collectively referred to as 'Parties' and each referred to individually as 'Party'.

The Cochin College, Cochin College Road, Cochin 682002, being represented by its Principal of the FIRST PART and The NGO PlanatEarth which is a non-profit registered as a charitable society under the Travancore Cochin Literary, Scientific and Charitable Societies Act of 1951 (Registration Number: ER-313/09) with its registered office at Aluva represented here by its Secretary Sooraj Abraham and President Mujeeb Mohammed of the SECOND PART.

#### Whereas

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Dr. M. Geetha Principal-in-Charge The Cochin College Knobl-687 002





# THE COCHIN COLLEGE

### **KOCHI - 682 002**

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in



XII/457A, U.C.College P.O, Aluva, Kerala, India-683102 0484-2203313



#### Responsibilities of PlanatEarth

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- To record and document all such paper collected for recycling and Certify the College at the end of the academic year.
- None of the costs needed for any projects needs to be borne in part or wholly by The Cochin College.
- It is the responsibility of Planatearth to obtain the necessary regulatory approvals from the concerned government authorities.
- 7. To give awareness and training for students in solid waste Management.

### Responsibilities of The Cochin College

- To ensure that all dry waste that is to be handed over to Planatearth is stored free of moisture and food residue.
- 2.

#### Annexure I

#### Rates

- 1. Used Carton Boxes: Rs4 per kilo
- 2. Waste Paper: Rs1 per kilo
- 3. A4 size Quality Paper: Rs10 per kilo
- Waste paper (bus tickets, torn paper, shredded paper): Removed free of cost
- 5. Plastic waste: Removed free of cost
- 6. PET Bottles: Removed Free of Cost
- 7. Glass Bottles: Handling charges of Rs10 per box





Dr. M. Geetha Principal-in-Charge The Cochin College Kochi- 682 002





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Website: www.thecochincollege.edu.in

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XII/457A, U.C.College P.O, Aluva, Kerala, India-683102 0484-2203313 E-Mail: info@planatearth.org

E-Mail: info@planatearth.org

#### Annexure II

#### Certificate of Confidentiality

Plan @ Earth a registered NGO that acts as a service provider to corporate organizations and companies in the matter of collection and recycling of waste paper materials understands that papers of highly confidential nature might be present in the paper thus discarded. We have been offering such services for over 14 years now.

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Particular care would be taken in the case where exam sheets, mark sheets etc are handed over.

Every sheet of paper thus collected will be bundled and directly sent for processing where it will all be shredded and reduced to pulp and used for paper manufacturing itself and would reach a recycling plant with minimum handling and that too under strict packaging.

This undertaking is guaranteed under the personal risk of the undersigned, President of Plan @ Earth Mr. Mujeeb Mohammed and Secretary of Plan @ Earth Mr. Sooraj Abraham.

The MoU is valid for 1 year from the date of signing the MoU

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Dr. M. Geetha Principal-in-Charge The Cochin College Kochi- 682 002





# THE COCHIN COLLEGE

### **KOCHI - 682 002**

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in

#### 11.1.2 Report

#### Expansion of Vermicomposting Efforts 2020-2021

**Introduction:** Building on the success of the initial vermicomposting project, the 2020-2021 academic year saw a significant expansion of these efforts at The Cochin College. This phase aimed to enhance the scale of composting activities, engage more students and faculty, and extend the program's impact beyond the campus.

#### Objectives:

- To increase the number of vermicomposting units across the college.
- To involve more students and faculty in the vermicomposting process.
- To collaborate with local environmental organizations for expertise and resources.
- To extend vermicomposting practices to the surrounding community

Activities and Implementation: The expansion began with the installation of additional vermicomposting units in other parts of the campus, including the administrative block and hostel areas. The college partnered with a local environmental NGO, which provided technical support, additional resources, and expert advice.

Advanced training sessions were organized for both new and existing participants, focusing on troubleshooting common issues, such as managing moisture levels and preventing pest infestations. The training also included sessions on the application of vermicompost in agriculture and gardening, highlighting its benefits as an organic fertilizer.

One of the key highlights of this phase was the community outreach program. The college organized workshops in nearby schools and community centers, where students led demonstrations on setting up and maintaining vermicomposting units. These sessions were well-received and led to the adoption of vermicomposting practices in several local households.

#### Outcomes:

- Increased Participation: The expansion successfully engaged a larger number of students and faculty members, making vermicomposting a central aspect of the college's environmental initiatives.
- Community Impact: The outreach program extended the benefits of vermicomposting to the local community, fostering a broader awareness of sustainable waste management.
- Enhanced Compost Production: The increase in vermicomposting units led to higher production of compost, which was utilized for campus greening projects and distributed to community members for use in their gardens.

Conclusion: The 2020-2021 expansion of the vermicomposting initiative at The Cochin College not only scaled up the college's composting efforts but also strengthened its ties with





# THE COCHIN COLLEGE

**KOCHI - 682 002** 

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the local community. The success of this phase demonstrated the potential for further growth and collaboration in the future.







# THE COCHIN COLLEGE

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Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

# 12 MoU with Plan@Earth,a non-profit organisation registered as a charitable society, Aluva

• Start Date: 04/06/2021

• End Date: 04/06/2022

• Period: One Year

### 12.1 Vermicomposting Initiative 2021-2022

• Date/Period: 18/08/2021

• Number of Beneficiaries from The Cochin College:69





# THE COCHIN COLLEGE

### **KOCHI - 682 002**

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in

#### 12.1.1 MoU



XII/457A, U.C.College P.O, Aluva, Kerala, India-683102 0484-2203313 E-Mail: info@planatearth.org ISO 3001 Www.planatearth.org Reg No: ER-313/09

### Memorandum of Understanding

This Agreement was made and entered into on 4th June 2021 by and amongst the following two parties collectively referred to as 'Parties' and each referred to individually as 'Party'.

The Cochin College, Cochin College Road, Cochin 682002, being represented by its Principal of the FIRST PART and The NGO **PlanatEarth** which is a non-profit registered as a charitable society under the Travancore Cochin Literary, Scientific and Charitable Societies Act of 1951 (Registration Number: ER-313/09) with its registered office at Aluva represented here by its Secretary Sooraj Abraham and President Mujeeb Mohammed of the SECOND PART.

#### Whereas

The Cochin College was founded in 1967 and is committed to enriching the lives of students by empowering them. The Cochin College provides holistic education that enables its students to actively participate in community life.

PlanatEarth is engaged in activities focused on environment conservation mainly in the management and recovery of resources that would otherwise be considered as waste. PlanatEarth takes up projects that are in line with the Sustainable Development Goals and connect the loop towards circular economy.





Dr. M. Geetha Principal-in-Charge The Cochin College Kochi- 682 002





# THE COCHIN COLLEGE

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(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in



XII/457A, U.C.College P.O, Aluva, Kerala, India-683102 0484-2203313 E-Mail: info@planatearth.org www.planatearth.org CERTIFIED Reg No: ER-313/09

#### Responsibilities of PlanatEarth

- To offer professional service to The Cochin College, in managing the dry waste (Used examination papers/called Paper) generated in the campus by arranging regular need-based pickups and channeling to recycling companies.
- To guarantee confidentiality in removal of papers pertaining to academics and other sensitive documents. Annexure II
- To compensate the college for the value agreed upon for the removal of recyclables, as indicated in the attached Annexure I, in the form of A4 size paper of a brand and GSM size mentioned by the college.
- To record and document all such paper collected for recycling and Certify the College at the end of the academic year.
- None of the costs needed for any projects needs to be borne in part or wholly by The Cochin College.
- It is the responsibility of Planatearth to obtain the necessary regulatory approvals from the concerned government authorities.
- 7. To give awareness and training for students in solid waste Management.

#### Responsibilities of The Cochin College

- To ensure that all dry waste that is to be handed over to Planatearth is stored free of moisture and food residue.
- 2.

#### Annexure I

#### Rates

- 1. Used Carton Boxes: Rs4 per kilo
- 2. Waste Paper: Rs1 per kilo
- 3. A4 size Quality Paper: Rs10 per kilo
- Waste paper (bus tickets, torn paper, shredded paper): Removed free of cost
- 5. Plastic waste: Removed free of cost
- 6. PET Bottles: Removed Free of Cost
- 7. Glass Bottles: Handling charges of Rs10 per box





Dr. M. Geetha Principal-in-Charge The Cochin College Kochi- 682 002





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XII/457A, U.C.College P.O, Aluva, Kerala, India-683102 0484-2203313

E-Mail: info@planatearth.org NWW.planatearth.org RTIFIED Reg No: ER-313/09

#### Annexure II

#### Certificate of Confidentiality

Plan @ Earth a registered NGO that acts as a service provider to corporate organizations and companies in the matter of collection and recycling of waste paper materials understands that papers of highly confidential nature might be present in the paper thus discarded. We have been offering such services for over 14 years now.

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Particular care would be taken in the case where exam sheets, mark sheets etc are handed over.

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This undertaking is guaranteed under the personal risk of the undersigned, President of Plan @ Earth Mr. Mujeeb Mohammed and Secretary of Plan @ Earth Mr. Sooraj Abraham.

The MoU is valid for 1 year from the date of signing the MoU



Dr. M. Geetha rincipal-in-Charge The Cochin College Kochi- 682 002





# THE COCHIN COLLEGE

### **KOCHI - 682 002**

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Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in

#### 12.1.2 Report

#### Integrating Vermicomposting into the Curriculum 2021-2022

Introduction: In 2021-2022, The Cochin College took a bold step by integrating vermicomposting into its academic curriculum. Recognizing the importance of sustainability in education, the college introduced a new elective course that provided students with both theoretical knowledge and practical experience in vermicomposting and sustainable waste management.

#### Objectives:

- To integrate environmental sustainability into the college curriculum.
- · To provide students with hands-on experience in vermicomposting.
- To promote research and innovation in sustainable waste management practices.
- To produce skilled graduates who can contribute to environmental conservation efforts.

Activities and Implementation: The new course, titled "Sustainable Waste Management: Vermicomposting and Beyond," was introduced as an elective for students from various disciplines. The course was designed to provide a comprehensive understanding of sustainable waste management, with a particular focus on vermicomposting.

The curriculum included lectures on the science of composting, the ecological role of earthworms, and the environmental benefits of reducing organic waste. Additionally, students were required to participate in hands-on projects where they set up, managed, and monitored vermicomposting units as part of their coursework.

As part of the course, students also conducted research projects on topics such as optimizing composting conditions, comparing different composting methods, and assessing the nutrient content of vermicompost. The findings were presented in seminars and contributed to the growing body of knowledge on sustainable waste management.

Field visits were organized to large-scale vermicomposting facilities and organic farms, providing students with insights into real-world applications of vermicomposting. These visits also offered networking opportunities with industry professionals and environmentalists.

#### Outcomes

- Academic Enrichment: The course successfully enriched the academic curriculum by incorporating practical sustainability practices. Students gained valuable skills and knowledge that are relevant to the growing field of environmental management.
- Research Contributions: The research projects conducted by students contributed to
  the academic discourse on sustainable waste management, with several students
  presenting their findings at conferences and seminars.





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Increased Campus Sustainability: The vermicomposting units managed by students
produced a steady supply of high-quality compost, which was used to support the
college's landscaping and gardening efforts.

**Conclusion:** The integration of vermicomposting into the curriculum in 2021-2022 was a significant achievement for The Cochin College. It not only provided students with a unique educational experience but also reinforced the college's commitment to sustainability and environmental stewardship.







# THE COCHIN COLLEGE

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Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

# 13 MoU with Plan@Earth,a non-profit organisation registered as a charitable society, Aluva

• Start Date: 01/07/2022

• End Date: 01/07/2023

• Period: One Year

### 13.1 Vermicomposting Initiative 2022-2023

• Date/Period: 10/07/2022

• Number of Beneficiaries from The Cochin College:77





# THE COCHIN COLLEGE

### **KOCHI - 682 002**

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

#### 13.1.1 MoU



Aluva, Kerala, India-683102
0484-2203313
E-Mail: info@planatearth.org
ISO 7001
Reg No: ER-313/09

#### Memorandum of Understanding

This Agreement was made and entered into on Jat July 2022 by and amongst the following two parties collectively referred to as 'Parties' and each referred to individually as 'Party'.

The Cochin College, Cochin College Road, Cochin 682002, being represented by its Principal of the FIRST PART and The NGO PlanatEarth which is a non-profit registered as a charitable society under the Travancore Cochin Literary, Scientific and Charitable Societies Act of 1951 (Registration Number: ER-313/09) with its registered office at Aluva represented here by its Secretary Sooraj Abraham and President Mujeeb Mohammed of the SECOND PART.

#### Whereas

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PlanatEarth is engaged in activities focused on environment conservation mainly in the management and recovery of resources that would otherwise be considered as waste. PlanatEarth takes up projects that are in line with the Sustainable Development Goals and connect the loop towards circular economy.



Dr. M. Geetha Principal-in-Charge The Cochin College Kochi- 682 802





# THE COCHIN COLLEGE

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XII/457A, U.C.College P.O, Aluva, Kerala, India-683102 0484-2203313 E-Mail: info@planatearth.org ISO 2001 www.planatearth.org Reg No: ER-313/09

### Responsibilities of PlanatEarth

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- 7. To give awareness and training for students in solid waste Management.

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2.

#### Annexure I

#### Rates

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Dr. M. Geelha Principal-in-Charge The Cochin College Kochi- 682 002





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Annexure II

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The MoU is valid for 1 year from the date of signing the MoU



College PO ALUVA # 883102 #

Dr. M. Geetha Principal-in-Charge The Cochin College Kochi- 682 002





# THE COCHIN COLLEGE

### **KOCHI - 682 002**

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Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in

#### 13.1.2 Report

#### Vermicomposting and Community Engagement 2022-2023

**Introduction:** The 2022-2023 academic year marked a significant milestone in The Cochin College's vermicomposting journey with a strong emphasis on community engagement. This phase aimed to extend the benefits of vermicomposting beyond the campus, involving the local community in sustainability initiatives and promoting environmental awareness.

#### Objectives:

- · To increase community involvement in vermicomposting activities.
- To raise awareness about the environmental benefits of vermicomposting.
- To establish partnerships with local schools and community organizations
- · To promote the adoption of vermicomposting practices in local households.

Activities and Implementation: The college launched a comprehensive community engagement program that included a series of workshops, seminars, and demonstration sessions open to the public. These events were held in collaboration with local schools, community centers, and environmental organizations.

Students and faculty members from The Cochin College led the workshops, which focused on the basics of vermicomposting, setting up home composting units, and managing common challenges. Participants were provided with starter kits, including compost bins, earthworms, and instructional materials, to encourage them to start composting at home.

In addition to the workshops, the college organized field visits to existing vermicomposting units, where community members could observe large-scale composting operations and learn from successful examples. These visits were designed to inspire and motivate participants to implement similar practices in their own communities.

The college also launched a "Composting Champions" program, where students were assigned to mentor local households in setting up and maintaining vermicomposting units. This initiative not only helped spread the practice of composting but also fostered strong relationships between the college and the local community.

#### Outcomes

- Widespread Adoption: The community engagement program successfully led to the
  adoption of vermicomposting practices in numerous local households, contributing to
  a reduction in organic waste and promoting environmental sustainability.
- Strengthened Community Bonds: The program fostered a sense of collective responsibility for environmental conservation, strengthening the bonds between The Cochin College and the local community.
- Increased Awareness: The workshops and field visits significantly raised awareness
  about the environmental benefits of vermicomposting, encouraging more people to
  embrace sustainable waste management practices.





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**Conclusion:** The 2022-2023 vermicomposting initiative at The Cochin College was a resounding success in terms of community engagement and environmental impact. By extending the benefits of vermicomposting to the local community, the college played a crucial role in promoting sustainable practices and fostering a culture of environmental responsibility.







# THE COCHIN COLLEGE

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Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

14 Collaboration between Department of Zoology, The Cochin College, KOCHI-02 and 7th ward, Cheralai division, Cochin Corporation

• Start Date: 07/12/2017

• End Date: 07/12/2020

• Period:Three Years

14.1 Biomag 2017: Community Based Solid and Bio Waste Management Project through Recycling and Upcycling

• Date/Period: 25/06/2018 to 08/03/2020

 $\bullet\,$  Number of Beneficiaries from The Cochin College:78





# THE COCHIN COLLEGE

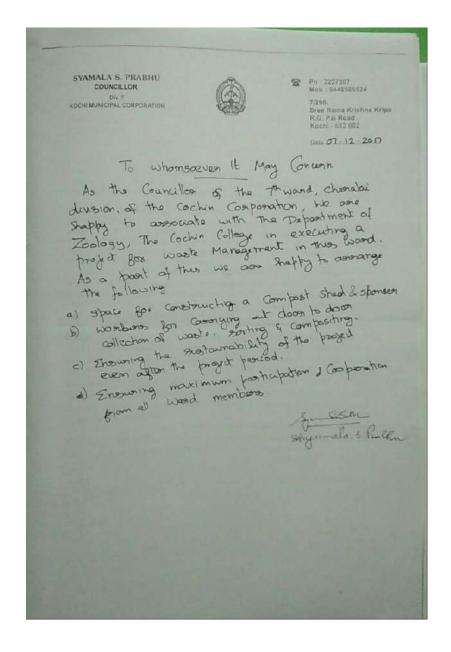
### **KOCHI - 682 002**

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

#### 14.1.1 Linkage Document









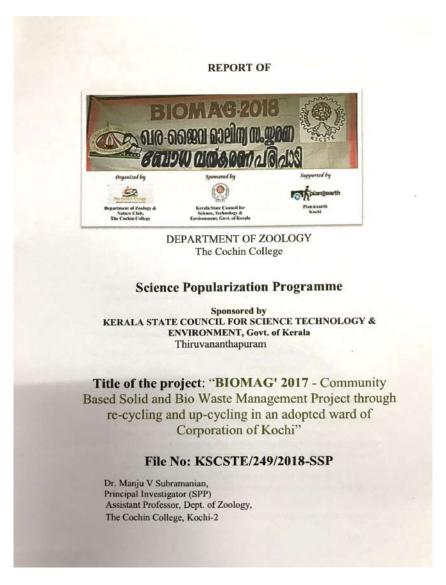
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#### 14.1.2 Report



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### **KOCHI - 682 002**

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## KERALA STATE COUNCIL FOR SCIENCE, TECHNOLOGY AND ENVIRONMENT SCIENCE DODULARIZATION DROGRAMME (SDD)

### PROJECT COMPLETION REPORT

 Title of the Project: "BIOMAG' 2017 - Community Based Solid and Bio Waste Management Project through re-cycling and up-cycling in an adopted ward of Corporation of Kochi"

2. Name and address of Principal Investigator(s)

and Co-Investigator(s) with mobile No

: Dr. Manju V Subramanian Assistant Professor,

Dept. of Zoology,

The Cochin College,

Kochi-2

Mobile. No: 9495336605 Telephone No: 04842222303

E-mail ID: manjubiju906@gmail.com

Implementing Institution(s) and other collaborating Institution(s)

: Planatearth, NGO, Aluva

4. Duration of the project

: 1 year

5. Date of commencement

: 25<sup>th</sup> June 2018

6. Proposed date of completion

: 25<sup>th</sup> June 2019

7. Actual date of completion

: 8 th March 2020

8. Objectives as stated in the project proposal:

- Create awareness among the local community for a decentralized system of waste
   Management
- Start and operate a community based composting unit for domestic food waste
- Start and operate a door to door collection system for dry waste
- Arrange a space for storage and sorting or dry waste with forward linkage for Quantification and Documentation of all wastes thus collected and processed recycling
- · Make the compost ready and available for the local community
- Train kudumbasree workers to make upcycle products from plastic wastes and marketing them
- Deviation made from original objectives if any, while implementing the project and reasons there of: Nil

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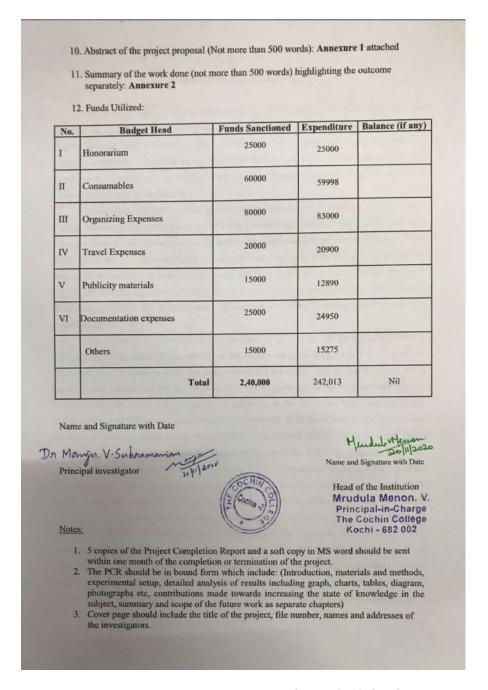




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Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in

#### Annexure 1

#### Abstract of the project proposal

The BIOMAG project was aimed at creating awareness among the public particularly the residents of ward VII of Kochi Corporation about the need to manage plastic waste properly. Plastic waste has become one of the biggest threats to the environment and is also perceived as a hazard to animal and human life through the presence of various micro plastics and additives like Bisphenol A. A consumer state like Kerala has a high per capita generation of plastic waste. This is particularly true in a city like Kochi.

The project was perceived as relevant by the Department of Zoology of The Cochin College because of the coastal proximity of Kochi Corporation. Domestic plastic waste that is not managed properly will invariably find its way to the ocean through the storm-water drains and other public dumps especially during the rainy season. Thus it will become a threat to various species of marine life. On land also the dumps and litter lying around results in other threats to animal life through ingestion by birds, cows and other animals. Leaching from dumpsites like Brahmapuram leads to the contamination of ground water by additives and synthetic dyes used as colouring agents.

The Department of Zoology of The Cochin College took up this project as an Outreach project that can be steered by the students of the department under the guidance of the teachers. The main tasks of awareness creation and sensitization about the need to dispose plastic waste properly was undertaken by the students and teachers through door to door visits to the households of the ward and one on one explanation to the residents. Public activities like streetplays and skits were also planned to spread awareness. Workshops were conducted on other methods to manage plastic waste such as reduce, reuse and refuse. Do It Yourself (DIY) workshops were also conducted for the public on how to make their own shopping bags from used clothing. Workshops were also conducted on how to do home composting of kitchen waste. The Project was not only aimed at giving awareness and sensitizing the target group about reduce, reuse and refuse strategies but went one step further in offering recycling solutions as well. It was fully understood that despite reduce, reuse and refuse strategies there is inevitably generation of plastic waste in every household particularly due to the fact that every item of food and grocery, from food grains to soap, comes in plastic packaging. Hence it was imperative that for the project to have an impact, recycling options too have to be provided to the public. For this purpose, the Department of Zoology engaged a reliable agency that has considerable experience in the field of door to door collection of plastic waste, followed by grading and finally dispatch for recycling. The agency selected for this was PlanatEarth a non-profit agency based in Aluva.

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The recycling solution that was offered to the target community proved to be the main aspect of the project for the public was offered both strategies to reduce the per household generation of waste as well as a way to ensure that whatever plastic waste that is still generated gets collected and recycled.

The project did meet a few setbacks as the ward councilor who had promised storage and sorting facility for the plastic waste collected form her ward, went back on her word and was unable to provide such a space. This necessitated that the plastic waste collected every month form the households of the ward had to be transported to the hub of the agency that is located in Aluva.

Despite this set back the project was executed well and made a significant impact among the community both in terms of the awareness element as well as offering recycling solutions to the target participating households. The BIOMAG project that was started in ward VII of Kochi Corporation to implement a proper system of waste management has met with more than moderate success. Initially there were a few bottle necks as the floods of August 2018 caused some unprecedented delay. However, in terms of the effect and over all reception of the project the response is good. The initial phase to understand the existing method of waste management being followed in the ward. For this meetings were held with the ward councilor Ms. Shyamala Prabhu who extended all support to the project. Students of the Department of Zoology undertook the task of preliminary visits to households as a means of survey in the ward to understand what the existing method was.

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#### Annexure 2

#### Summary of the work done highlighting the outcome:

The present study follows systemic methodologies in which different concern have been exposed during the progression. Basically this means that there was no clear picture of the systems in the beginning of the study, but that the concept has been developed during the innovation process through constant feedback and discussion with residents and local representatives. The study is planned to function as a part of the development process; the typical framework and application is replaced with a more self-motivated approach. Data collection in the study is based on personal inquiry and literature review concerning solid waste management systems. Following methodology was followed:

- Awareness: Through demonstration classes using models, visual aids, street-plays, door to door communication and enrolment. Awareness classes were conducted in many places of the ward. Here demonstrations were given on the various types of waste and how to segregate waste at source. The dangers of plastic pollution as well the process of waste management through the methods of reduce, reuse and recycle were explained. The project officer then moved from door to door handing out leaflets describing the project as well as giving instructions on how to segregate waste at source. As a means of identification, stickers were pasted on the walls of houses that agreed to enrol in the project.
- -Responsible: The public had to be made responsible for its waste, and the project had to aim for long term sustainability. Hence it was proposed to charge a small user fee of Rs 50 per month per household as the user fee for the removal of dry waste. The public was not willing to pay this amount as already Rs 100 was being paid for the removal of food waste. Finally after many debates and meetings it was agreed to fix a monthly user fee of Rs 10 per month. Dry waste consisting of paper, plastic, glass and metal would be collected provided it was clean and dry and free from food residue and moisture.
- Demonstration classes and workshops were also conducted on how to make carry bags from fabric as a means to reduce the use of plastic carry bags.
- Collection: Door to door collection using manually operated push carts. To be collected on a daily basis. Two workers to do so, using push carts. About sixty houses were covered by each worker and a total of houses 120 houses were covered. Food wastes were transferred from household buckets into small covered drums in cart. Food waste NOT to be given in plastic covers. Maximum "dryness" to be recommended. For the project of dry waste collection to be launched, a storage space was the basic requirement. The ward councillor was able to identify a space for the construction of a shed to be used as the material recovery facility where sorting and grading of dry waste that is collected from houses could be done, to facilitate recycling. However when it came to construction of a temporary shed,

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the public intervened and obstructed the construction of the shed out of the fear that the said location would become a permanent spot for dumping of waste.

-Eventually the only means that could adopt was to transport the collected waste form the households to the unit of the implementing agency PlanatEarth where the sorting and storage could be done.

-A team of two ladies was recruited to carry out the door to door collection of dry waste. A collection schedule was set for households that had enrolled in the project. A push cart was needed to collect the waste from households. But since a suitable sponsor could not be found to fund the purchase the pushcart, one was taken on rent for the project period. The uniforms of the push carters (staff to carry out the collection of waste) as well as the push cart were branded. The notices, information handouts, stickers and cards were all printed with the logo of the funding agency.

The new system of door to door collection of dry waste commenced in December 2018, but it took some time for the public and members of the community to unlearn what they were used to and adopt a new system. The parallel system run by the Kudumbasree was not disrupted and that system continued for the removal for food waste.

Using sacks the pushcarters would move from door to door collecting waste that was clean and dry. This would be stacked in a corner and the pickup truck rented by the implementing agency would come and collect the waste and transport it to the hub of this agency for storage.

- -The collection process gradually picked up pace as the project started winning over the trust of the community. The numbers and figures of participating houses and waste collected over the months in the table given below are indicative of this.
- Sorting: Dry recyclables sorted and graded manually. Dry Waste to be collected ONCE a week. Collected in Sacks. Brought to Scrap Dealer Agent. Manually Sorted Recyclables with Sales Value to be given to Scrap Agent. Non-recyclables to be removed once in a month and sent for Upcycling.
- <u>Composting</u>: Thermophilic composting and windrow methods, followed by selective vermicomposting were done. Classes and demonstrations were done on how to compost food waste using discarded flower pots, containers or biopots.

Composting: Kitchen waste to be mixed with suitable bulking agent Eg: Dry leaves, saw dust, wood chips. Ensure combination of greens and browns (Nitrogen and Carbon balance).

Thermophilic Method: to be used initially – Packed in tall drums of 1 meter height, to ensure temperature build up 60-70 degrees, speeds up composting, temperature inhibits undesirable pests. Kept in this state for 4 days, drainage of slurry endured

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Windrow Composting: after 4 days, drums emptied, matter mixed with dry leaves, cured for 14 days, turned and mixed every 2nd day, aerobic exposure ensured Neutralized with lime and cowdung

Cured for 30-40 days, pH ensured and subject to vermicomposting in earthen pots.

Partnership: With plan@earth, a NGO with proven track record. Plan@Earth is a Voluntary Organisation based in Kerala, India. They are non-profitable organisation registered as a Charitable Trust. "Plan @ Earth" has been registered under the Travancore – Cochin Literary Scientific and Charitable Societies Registration Act, XII of 1955 as Register No. ER-313/2009 on 13.05.2009. With the intention of spreading awareness and creating concern about the need to preserve and protect our environment we started operations in the year 2009.

#### Outcome-

- 1. 120 households to be enrolled
- 2. Waste Management services to be provided for 120 houses
- Monthly 1 ton of food waste to be composted (300 grams per household x 30 days x 120 houses)
- 4. Monthly 360 kilos of dry waste to be recovered and recycled (120 x 3)
- At the end of project period nearly 3 tons of food waste and 1 ton of plastic and other dry waste to be recovered and processed
- 6. Generating self-employed women members
- 7. Employment to be provided to 3 people from the local community
- 8. Compost to be available to local community to foster kitchen garden
- 9. Model to be set up that is replicable
  - -Total 5547 kg of plastic waste has been removed. Some non -recyclables have to be dispatched to cement manufacturers for use as RDF. This process incurs charges.
  - The project was well received by the target community.
  - -The members of this community have understood the need to manage plastic waste properly.
  - -Through the methods of reduce, reuse and recycle as well as the techniques for home composting, the community had gained the capacity to manage their waste properly.
  - The students and the teachers of the Department of Zoology got a good exposure to working with a community and got the chance to take workshops, awareness classes and conduct surveys.

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#### Allocation of Funds

The funds were allotted under the head of Organising Expenses Consumables Travelling Charges Publicity Documentation Charges And Others

#### **Organising Expenses**

This head covered the expenses that were met for implementing a system for door to door collection of dry waste consisting mostly of plastic. It covered expenses for the staff deployed for the door to door collection of dry waste on a regular basis. The plastic waste thus collected had to be organised into different grades. There is no single system for recycling plastic that comes in mixed formats as generated by households. Dry waste itself includes plastic, paper, glass and metal. Of this the bulk volume is always plastic. Plastic waste itself needs to be organised into grades like PET, HDPE, PVC, Styrofoam etc. The organising charges covered the process of organising the households into collection schedules and training the residents to store their plastic till the date of collection. Collection schedules were set in such a way that plastic gets collected twice a month from every household. The organising expenses also covered the charges for manual organising of the collected waste into grades ranging from paper, plastic, glass and metal and further the plastic was graded into 30 grades like PET clear, PET coloured, Polypropylene dyed film, Polypropylene clear film, Polythene Clear film, Polythene Coloured Film, HDPE Clear, HDPE Coloured, Styrofoam, PE Packing foam, Low Density Polyethylene, HM, PVC sheets, PVC solid. Waste that is collected from households is usually unsegregated. Through the awareness campaigns undertaken by the students and staff of the Department of Zoology of The Cochin College, the target community was trained how to do a basic segregation of household waste into three eategories-kitchen waste, dry waste and sanitary waste. The BIOMAG project was aimed at offering solutions to Kitchen waste (through composting) and dry waste (through recycling). However for recycling to the initiated and sustained, grade level organising of waste is required. The technique deployed for this was manual grading. Based on the experience of the agency PlanatEarth staffs were trained to organise waste into grades suitable for recycling.

#### Consumables

The project was executed through door to door collection of dry waste from the households of the targeted ward. A push cart was needed for this. As the project did not provide for the purchase of a push cart, a push cart was taken on rent. This push cart had to be secured with lock and key after every day's collection. Initially the ward councillor had promised a storage area where the

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collected plastic could be stored and sorted into desired grades. But the plot of land that she had intended was not suitable as there was water logging and the public objected to the setting up of such a sorting unit there. The option left was to take up an additional property on rent and this was done. After sorting into different categories, there will be items which cannot be used for any purpose so that we put in the category of waste. That must be removed monthly once from the godown.

#### **Publicity Expenses**

This head covered the expenses incurred for leaflets, flier and other stationery as part of the awareness drives and the door to door enrolment of the households under the project. Printed cards were given to the households to inform them about how waste needs to be segregated. This included a list of items that could be taken as well as a list of items that could not be taken as part of the project. ID cards were issued to the staffs who were deployed for the door to door collection of waste.

#### **Documentation Charges**

This is the remuneration paid to the staffs who was entrusted with the task of monitoring the door to door collection of waste, and the sorting that followed after that. Documentation was done regarding the number of households covered, the quantity of waste collected, the grades the waste was organised into and the recycling done. It also covered the charges incurred as part of the periodical expert visits done by the officers of PlanatEarth to the target area.

Month	Number of Participating Houses	Weight of Dry Waste	
December	12	26 kg	
January	76	190 kg	
February	217	542 kg	
March	423 1184 kg		
April	438	1201 kg	
May	447	1193 kg	
June	445	1211 kg	

Total 5547 kg of plastic waste has been removed. Some non –recyclables have to be despatched to cement manufacturers for use as RDF. This process incurs charges.

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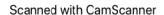
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### Conclusion

The project was well received by the target community. The members of this community have understood the need to manage plastic waste properly. Through the methods of reduce, reuse and recycle as well as the techniques for home composting, the community had gained the capacity to manage their waste properly. However towards the end of the project term when the funds were utilized the project shifted to a system where the households were informed to pay for the recycling services extended. This mandated a user fee of Rs 100 per month as per the directive of the Kerala State Suchitwa Mission as well as the Haritha Kerala Mission. Many of the households have pulled out of the project and the few households that remain in the project get their waste removed once a month upon payment of Rs 100 user fee.

The impact of the project is that the community learnt that waste can be managed properly and the strategies of reduce, reuse, refuse, recycle and composting were taught to the residents of ward VII. The students and the teachers of the Department of Zoology got a good exposure to working with a community and got the chance to take workshops, awareness classes and conduct surveys.







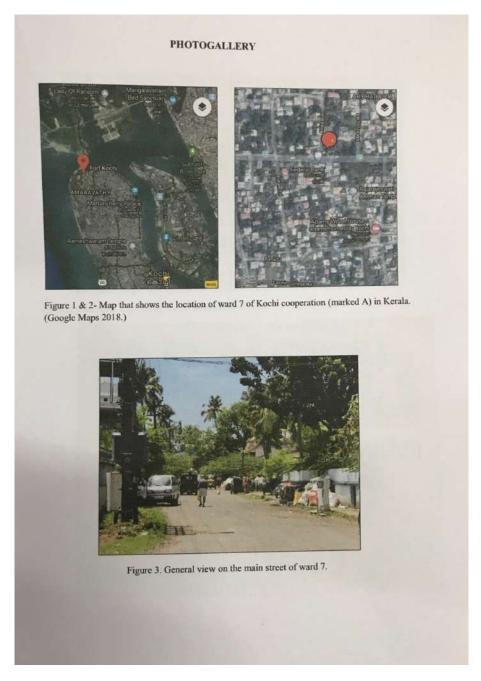


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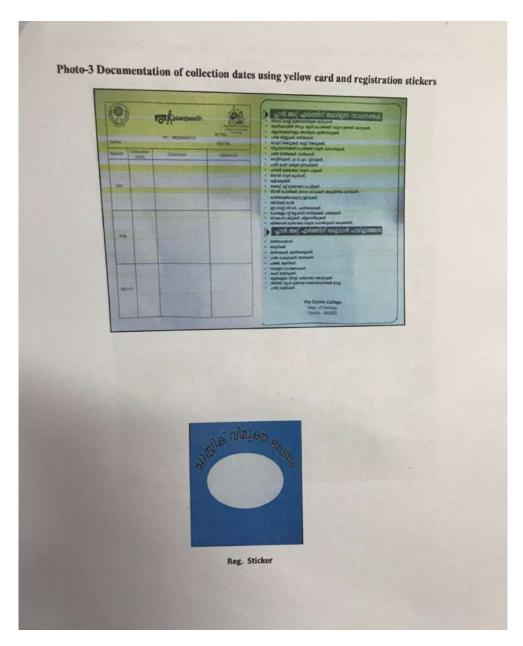


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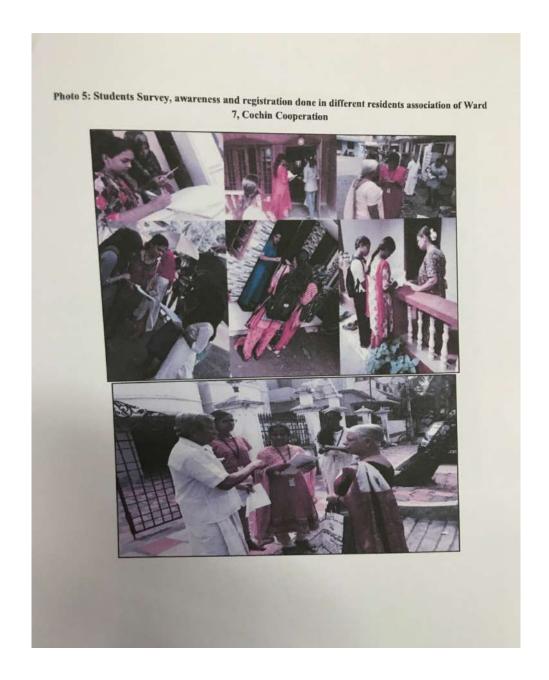


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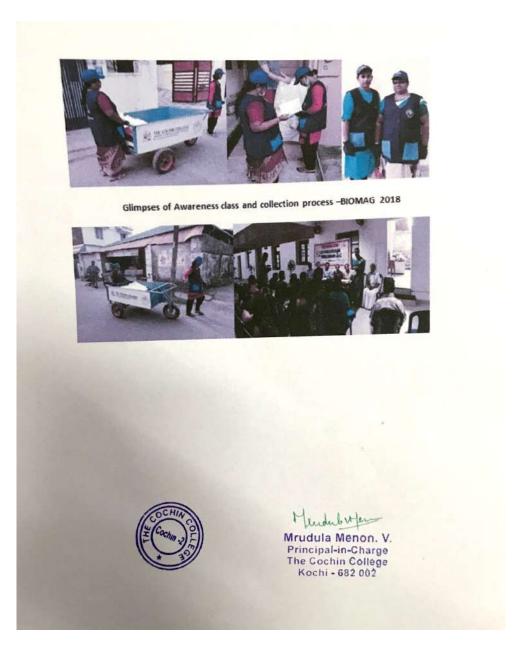


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# 15 Collaboration between The Cochin College, Kochi-02 & UGC HRDC University of Kerala

• Start Date: 23/08/2022

• End Date: 29/08/2022

• Period:One Week

### 15.1 Short term FDP:Towards a Flourishing Educator

• Date/Period: 23/08/2022 to 29/08/2022

• Number of Beneficiaries from The Cochin College:10





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### 15.1.1 Linkage Document

# UGC – HUMAN RESOURCE DEVELOPMENT CENTRE (HRDC) UNIVERSITY OF KERALA



GOLDEN JUBILEE BUILDING, KARIAVATTOM – 695 581 THIRUVANANTHAPURAM, KERALA, S. INDIA www.keralauniversity.ac.in/ugcasc

Office: 91-471-2308989
Fax: 91-471-2412267

Email: hrdcunike@yahoo.com

DR. K. M. SAJAD IBRAHIM PROFESSOR-DIRECTOR (i/c)

UGC-HRDC/184/2022

Date: 07.07.2022

To

The Principal Cochin College Kochi

Dear Madam,

Greetings from UGC-HRDC, University of Kerala!

Sub: Conduct of online Short-Term FDP at Cochin College, Kochi - Collaboration of UGC-HRDC, University of Kerala - Willingness - intimating of -reg.

As informed by you regarding the conduct of online Short-Term FDP (One week) at your institution, we are willing to collaborate with your institution for conducting the above said programme on the topic "Towards a Flourishing Educator".

In this regard, the course should be conducted strictly in accordance with the UGC Guidelines without any financial commitment on the part of UGC-HRDC. The details of course schedule, list of Resource Persons and participants should be forwarded to this office prior to the commencement of the course.

Relieving order is compulsory for joining the course. The participants are not permitted to take any other official duty/assignment during the period of the course.

An amount of Rs.1000/- (non-refundable) should be collected from each selected participant as Registration Fee and remitted to DDF account of UGC-HRDC.

Account Details: Director, UGC-HRDC, University of Kerala, Kariavattom. Bank: SBI Kariavattom, Account No: 57007267818, IFSC: SBIN0070043.

Registration fee receipt should also be produced to this office.

Thanking you,

With Warm\Regards

Professor-Director





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#### 15.1.2 Report

# Report on Collaboration between The Cochin College, Kochi-02 & UGC-HRDC University of Kerala

#### Title of the Event:

An Interactive 7-Day Online Faculty Development Programme on "Towards a Flourishing Educator"

#### Dates:

23 August 2022 - 29 August 2022

#### Collaborating Institutions:

- 1. The Cochin College, Kochi-02
  - Accredited B+ grade by NAAC (2019)
  - Affiliated with Mahatma Gandhi University, Kottayam
  - Organized under the aegis of IQAC (Internal Quality Assurance Cell)
- UGC-Human Resource Development Centre (UGC-HRDC), University of Kerala
   A reputed institution recognized for its role in faculty training and
  - A reputed institution recognized for its role in faculty training and development.
- 3. Mahatma Gandhi University, Kerala
  - Affiliated to the event and provided additional academic support.
- 4. Department of Biotechnology, Ministry of Science & Technology, Government of India
  - o Provided funding support under the DBT Star College Scheme.

#### Objective of the Programme:

The primary objective of the Faculty Development Programme (FDP) was to equip educators with modern pedagogical tools and methodologies to foster a more enriching and engaging educational environment. The focus was on enabling educators to become 'Flourishing Educators' who can significantly contribute to the holistic development of students.

#### Resource Persons:

- 1. Dr. Anu G.S.
  - Associate Professor, Department of Education, Nagaland University, Kohima
     Expert in educational strategies and padagagy
    - Expert in educational strategies and pedagogy

#### 2. Dr. Rosamma Philip

- o Principal, Mount Tabor Training College, Pathanapuram, Kerala
- Renowned for her contributions to teacher education and development.

### Key Features of the Programme:

 Eligibility: Teachers from any stream were encouraged to register, ensuring interdisciplinary participation.





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- Certification: Participants were awarded certificates from UGC-HRDC, University of Kerala, recognized for career advancement and CAS (Career Advancement Scheme) promotions.
- Duty Certificate: Issued to all participants, emphasizing the importance of active participation.
- Releasing Order: Mandatory for participants to ensure full commitment throughout the programme
- Attendance: Video participation was mandatory to maintain the integrity and effectiveness of the programme.

#### Outcome of the Collaboration:

The successful organization of this FDP highlighted the strong collaboration between The Cochin College and UGC-HRDC, University of Kerala, reflecting a commitment to faculty development and continuous learning. The programme received positive feedback from participants for its content, delivery, and the expertise of the resource persons. The event also strengthened the institutional ties and set a precedent for future collaborations focused on enhancing educational practices.

#### Conclusion:

This FDP on "Towards a Flourishing Educator" exemplifies the collaborative efforts of The Cochin College, UGC-HRDC University of Kerala, Mahatma Gandhi University, and other supporting organizations in fostering a vibrant academic community. The success of the programme underscores the importance of continuous faculty development in achieving educational excellence.





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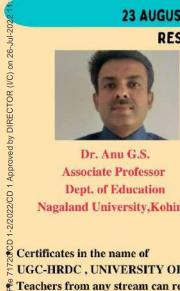




# **An Interactive 7 Day Online Faculty Development Programme on**

# TOWARDS A FLOURISHING EDUCATOR

23 AUGUST2022 - 29 AUGUST 2022 RESOURCE PERSONS



Associate Professor Dept. of Education Nagaland University, Kohima



Dr.Rosamma Philip **Mount Tabor Training College** Pathanapuram, Kerala

UGC-HRDC, UNIVERSITY OF KERALA

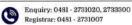
- Teachers from any stream can register
- Considered for CAS Promotion
- € Duty Certificate will be provided
- Releaving Order is MANDATORY
- · Video participation and attendence is mandatory for certification

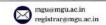
Organised by The Cochin College, Kochi accredited B+ grade by NAAC(2019) affiliated to MG university, Kottayam (under the aegis of IQAC) together with

UGC -HUMAN RESOURCE DEVELOPMENT CENTRE, UNIVERSITY OF KERALA

and

MAHATMA GANDHI UNIVERSITY, KERALA Funded by DBT Star Colleges Scheme











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# The Cochin College, Kochi

The Cochin College is an arts and science college affiliated to Mahatma Gandhi University, Kottayam. The college is situated in the port city Kochi. It was started in 1967 in response to an increasing demand for higher education opportunities in West Kochi. The Cochin College is sponsored by the Cochin Education Society which was founded as a result of the joint efforts of the Indian Chamber of Commerce & Industry and the former Mattancherry Municipal Council. From its humble beginning as a junior college, the institution has grown into a centre of excellence over these years. The college is accredited at B+ Grade by NAAC in 2019. It offers 13 UG programmes, 7 PG programmes and two Ph.D programmes in Commerce and Physics. The college is recognised as CUBE- Hub (Collaborative Under Graduate Biology Education) by TIFR- Mumbai from 2018. The Cochin College has been selected under the DBT- STAR College Scheme "Strengthening of Support" category by Department of Biotechnology, Government of India in 2021.

# Star College Scheme

The Science departments (Botany, Chemistry, Physics, Zoology) of The Cochin College, Cochin, is selected for financial support for Strengthening Life Sciences and Biotechnology Education and Training at Undergraduate level under the Star College Scheme of Department of Biotechnology (DBT), Govt of India. The programme emphasis on strengthening biotechnology component in existing life sciences courses and practical training, industry exposure to students, up-gradation of faculty skills by organising training for faculty. The Institute will receive financial support initially for a period of 3 years. The Scheme aims at

- · Substantial increase in proportion of 'hands on' experimental work by students.
- Increased access of undergraduate students to laboratory and bioinformatics infrastructure.
- Improvement in access to life sciences related journals.
- Improve the percentage of students pursuing life science as a career.

# Mahatma Gandhi University

Mahatma Gandhi University, one of the major, Universities in Kerala, is a premier educational institution that strives to fulfill the higher educational needs of the people from Central Kerala (Reaccredited by NAAC with A grade). The University was established on 2 October 1983 and has jurisdiction over the revenue districts of Kottayam, Ernakulam, Idukki and parts of Pathanamthitta and Alappuzha. The Institution offers a large number of programmes at the Undergraduate, Postgraduate, M Phil and Doctoral levels through its 17 University Departments, 1 International and Inter University Centre, 7 Inter University Centres, 10 Inter School Centres, 77 Govt./Aided Affiliated Colleges, 10 Autonomous Colleges (of which 8 are Colleges with a Potential for Excellence), 200 Unaided Affiliated Colleges and 199 Recognized Research Centres. It imparts education in the interdisciplinary as well as conventional disciplines of Science, Social Science and Humanities besides in the professional disciplines like Engineering, Technology, Legal Studies, Pedagogy, Pharmacy and Nursing.





# THE COCHIN COLLEGE

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# FEATURES OF FACULTY DEVELOPMENT PROGRAM "TOWARDS A

### FLOURISHING EDUCATOR"

### Preamble

An Indian National Policy on Education document stated "No nation can rise above the level of its teachers." The importance and role of good teaching cannot be emphasized better. This faculty development program introduces the participants to the principles underlying effective and efficient teaching in either face-to-face or online modes. The contents are based on outcomes of research on the teaching-learning process, and include anecdotes, activities and discussions.

## Learning Outcomes

At the end of this faculty development program, participants will be able to explain:

- · How and how much difference can a teacher make?
- · Factors that affect student learning.
- What is the first step in preparing for a course?
- · Recipe for effective and efficient teaching.
- Levels of thinking at which questions for assignments, tutorials, and tests can be set. What is a good problem set and how to prepare it?
- Concepts of learning outcome and active-cooperative learning.
- · How to write learning outcomes?
- · How to organize teaching content and deliver it in the class?
- Content preparation, content delivery and student assessment in the online mode? · Merits of oral and written examinations.
- · How often should you test students?
- How to give feedback to students on their learning?
- Concept of teaching portfolio as an evidence of teaching effectiveness. · How
  to improve your teaching with the help of feedback from students and
  colleagues? · What motivates students?





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### SCHEDULE FOR FDP

23-8-2022

9 -9.30am: Inauguration

10- 12.15 : Need of Flourishing Teacher Thinking

Resource Person - Dr.Rosamma Philip

12.15-12.30 : Feedback 12.30-1.30 : Lunch break 1.30-1.45pm: Attendance

1.45-4pm: Towards Integrated Teacher 1.45-4pm : Perspectives

Personality

Resource Person - Dr.Rosamma Philip

4-4.30pm : Feedback

24-8-2022

10- 12.15 : Rationale of Outcome Based 10- 12.15 : Guiding

12.15-12.30 : Feedback 12.30-1.30 : Lunch break 1.30-1.45pm: Attendance 1.45-4pm : Scope of emotional

intelligence on Classroom Management Taxonomy

Resource Person - Dr. Anu G.S.

4-4.30pm: Feedback

25-8-2022

10-12.15: Teacher: The Leader of

Academia

Resource Person - Dr.Rosamma Philip

12.15-12.30 : Feedback 12.30-1.30 : Lunch break 1.30-1.45pm: Attendance

1.45-4pm: Ensuring the Academic Integrity in Higher Education Resource Person - Dr.Anu G.S

4-4.30pm: Feedback

26-8-2022

9.30 -10am: Attendance and Interaction

9.30 - 10am : Attendance and Interaction 10- 12.15 : Teaching for higher Order

Resource Person - Dr.Rosamma Philip

12.15-12.30 : Feedback 12.30-1.30 : Lunch break 1.30-1.45pm: Attendance

Learner of

Diversity

Resource Person - Dr.Rosamma Philip

4-4.30pm : Feedback

27-8-2022

9.30 -10am : Attendance and Interaction 9.30 -10am : Attendance and Interaction for Holistic

Development of the learner

Resource Person - Dr.Rosamma Philip Resource Person - Dr.Rosamma Philip

12.15-12.30 : Feedback 12.30-1.30 : Lunch break 1.30-1.45pm: Attendance

1.45-4pm : Application Blooms

Resource Person - Dr.Rosamma Philip

4-4.30pm: Feedback

29-8-2022

9.30 -10am : Attendance and Interaction 9.30 -10am : Attendance and Interaction

10- 12.15 : Assessment for higher Order

Thinking

Resource Person - Dr.Rosamma Philip

12.15-12.30 : Feedback 12.30-1.30 : Lunch break 1.30-1.45pm: Attendance

1.45-4pm : Teacher: The motivational

Resource Person - Dr. Rosamma Philip

4-4.30pm : Feedback





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#### **ORGANISING COMMITTEE**

#### **Chief Patron**

Sri Thomas J Vayalat Manager, The Cochin College, Kochi

Dr M.Geetha Principal The Cochin College, Kochi Dr Sindhu K IQAC Coordinator The Cochin College, Kochi

# Convenor

Dr Manjusha M V Assistant Professor Department of Physics, The Cochin College, Kochi. Mob.No:9495673678

Email id-fdp@thecochincollege.edu.in

#### Coordinators

Dr. Nayana Jose Assistant Professor Department of Biochemistry The Cochin College,Kochi

Dr Vineeth Kumar T V Program Coordinator Star College Assistant Professor Department of Zoology The Cochin College, Kochi Dr.Jayesh Kuriakose Assistant Professor Department of Biotechnology The Cochin College, Kochi

Dr.Rekha.P.G Assistant Professor Department of Commerce The Cochin College,Kochi

Dr. Paulbert Thomas Assistant Professor Department of Electronics The Cochin College,Kochi Ms.Reethi.P Assistant Professor Department of English The Cochin College,Kochi

Dr.Suprabha.G.Nair Assistant Professor Department of Botany The Cochin College, Kochi

Dr. Zafna Rasheed Assistant Professor Department of Chemistry The Cochin College, Kochi





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# 16 Collaboration between Department of Physics, The Cochin College, Kochi-02 & Maker Village, KINFRA, Kalamassery

• Start Date: 18/07/2022

• End Date: 01/08/2022

• Period:Two Weeks

### 16.1 Internship

 $\bullet$  Date/Period: 18/07/2022 to 01/08/2022

• Number of Beneficiaries from The Cochin College:10





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#### 16.1.1 Linkage Document





23 September 2022

Dr. Uma S

Coordinator, Star College Scheme

Department of Physics,

The Cochin College, Kochi-2

#### INTERNSHIP CERTIFICATE

Sir / Madam,

This is to certify that; Ms. Susan Aleena B has successfully completed her internship on the topic "AUTOMATIC WATER TAP CONTROLLER USING ULTRA SONIC SENSOR" from 18 July 2022 to 01 August 2022 at Maker Village Kochi.

During the above period her character and conduct are found to be good. We wish success in all her future endeavour.

Regards,

ly by gr

Rajeevu Kumar C N

Administrative Officer, Maker Village

Integrated Startup Complex, Kalamassery,

Kochi, Kerala.



 $Kerala\ Technology\ Innovation\ Zone\ |\ Kinfra\ Hi-Tech\ Park\ |\ Kalamassery\ |\ Kochi\ |\ Kerala-683503\ |\ www.makervillage.in$ 





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23 September 2022

Dr. Uma S

Coordinator, Star College Scheme

Department of Physics,

The Cochin College, Kochi-2

#### INTERNSHIP CERTIFICATE

Sir / Madam,

This is to certify that, **Ms. Shamnaz Khan A N**, has successfully completed her internship on the topic "**Arduino Controlled rechargeable battery charger**" from 18 July 2022 to 01 August 2022 at Maker Village Kochi.

During the above period her character and conduct are found to be good. We wish success in all her future endeavour.

Regards,

ly by gr

Rajeevu Kumar C N

Administrative Officer, Maker Village

Integrated Startup Complex, Kalamassery,

Kochi, Kerala.



Kerala Technology Innovation Zone | Kinfra Hi-Tech Park | Kalamassery | Kochi | Kerala-683503 | www.makervillage.in





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#### 16.1.2 Report

## Report on Collaboration between the Department of Physics, The Cochin College, Kochi-02 & Maker Village, KINFRA, Kalamassery

#### Introduction:

The Department of Physics at The Cochin College, Kochi-02, collaborated with Maker Village, KINFRA, Kalamassery, to provide students with practical exposure and hands-on experience in innovative technology projects. This collaboration was established under the Star College Scheme, aiming to enhance the technical skills of students by engaging them in real-world projects at Maker Village, Kerala's leading startup ecosystem and electronics hardware incubator.

#### Objective of the Collaboration:

The primary objective of this collaboration was to offer students an opportunity to apply their academic knowledge in practical scenarios, particularly in the fields of electronics and automation. The collaboration was intended to:

- Provide industry exposure to students.
- Enhance students' technical competencies by working on live projects.
- Foster innovation and creativity among students in the field of physics and technology.

#### **Key Activities:**

Two students from The Cochin College, Department of Physics, successfully completed internships at Maker Village, KINFRA, Kalamassery. The details of their projects are as follows:

#### 1. Ms. Susan Aleena B

- Project Title: Automatic Water Tap Controller using Ultrasonic Sensor
- Duration: 18 July 2022 to 01 August 2022
- Project Description: Susan Aleena developed an automatic water tap controller that uses ultrasonic sensors to detect hand movement and control the water flow, contributing to water conservation efforts. Her project was highly appreciated for its practical application in water-saving technologies.

#### 2. Ms. Shamnaz Khan A N

- Project Title: Arduino Controlled Rechargeable Battery Charger
- Duration: 18 July 2022 to 01 August 2022
- Project Description: Shamnaz Khan designed and implemented an Arduino-controlled rechargeable battery charger, which efficiently charges batteries while monitoring their voltage levels. This project showcased her understanding of microcontroller-based automation and power management.





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#### **Outcomes of the Collaboration:**

- Skill Enhancement: The students acquired valuable skills in electronics, automation, and project management, which significantly contributed to their academic and professional development.
- Industry Exposure: Working at Maker Village provided the students with exposure
  to a professional environment, allowing them to interact with industry experts and
  understand the operational dynamics of a startup ecosystem.
- Innovative Projects: The projects undertaken by the students were not only
  innovative but also had potential applications in the real world, demonstrating the
  success of the collaboration in fostering creativity and technical proficiency.

#### Conclusion:

The collaboration between the Department of Physics, The Cochin College, Kochi-02, and Maker Village, KINFRA, Kalamassery, was highly successful in achieving its objectives. The students gained hands-on experience, which will undoubtedly benefit their future academic and career pursuits. This partnership has set a strong foundation for future collaborations, aiming to provide more students with similar opportunities to explore and innovate in the field of technology.





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# 17 Project Collaboration between Department of Commerce, The Cochin College, Kochi-02 & IGNOU

• Start Date:29/09/2023

• End Date: 29/09/2024

• Period:One Year

### 17.1 MBA Project

• Date/Period: 29/09/2023 to 29/09/2024

• Number of Beneficiaries:01





# THE COCHIN COLLEGE

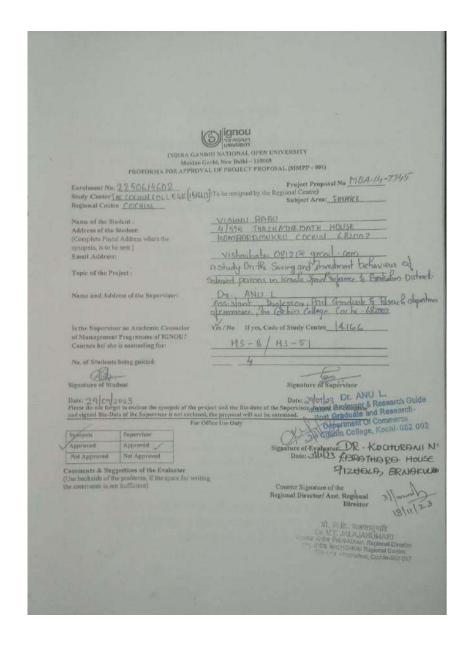
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#### 17.1.1 Linkage Document







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#### 17.1.2 Report

Report on Project Collaboration between the Department of Commerce, The Cochin College, Kochi-02 & IGNOU

In 2023, the Department of Commerce at The Cochin College, Kochi-02, continued to strengthen its partnership with the Indira Gandhi National Open University (IGNOU). This ongoing collaboration aimed to further enhance the academic and research capabilities of both institutions, providing students and faculty with opportunities for expanded learning and professional development.

#### Objectives

- To integrate advanced IGNOU programs into the existing curriculum of the Department of Commerce at The Cochin College.
- To promote collaborative research initiatives between faculty members of both institutions
- To offer students additional certifications and diplomas through IGNOU's distance learning platforms.
- To conduct joint seminars and workshops focusing on contemporary commerce and businesstrends.





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### **Project Report On**

"A study on the savings and investment behaviour of salaried persons in Kerala special reference to Ernakulam district"

Submitted in partial fulfilment of the requirements for the award of the degree of

MASTER OF BUSINESS ADMINISTRATION FINANCIAL MANAGEMENT (MBAFM)

Submitted by VISHNU BABU (Enrolment number: 2250614602)

Under the guidance of

Dr. Anu L
Assistant Professor
Post Graduate and Research Department of Commerce
The Cochin College
Cochin-682002



The Registrar (SED), IGNOU, Maidan Garhi,

New Delhi -110 068





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Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in

#### Project Report on

# A Study Of Supply Chain Management In Fast Food Outlets-Trivandrum District

Dissertation submitted to Indira Gandhi National Open University ,New Delhi in partial

fulfillment of the requirement for the award of degree of

MASTER OF BUSINESS ADMINISTRATION

BY

MANOJKUMAR K

(Reg.no.2108428688)



Under the Supervision of

Dr.ANU L

Assistant Professor

POST GRADUATE AND RESEARCH DEPARTMENT OF

COMMERCE

THE COCHIN COLLEGE

COCHIN-682002





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# 18 Project Collaboration between Department of Commerce, The Cochin College, Kochi-02 & IGNOU

• Start Date:12/05/2019

• End Date: 12/05/2020

• Period:One Year

### 18.1 MBA Project

 $\bullet$  Date/Period: 12/05/2019 to 12/05/2020

• Number of Beneficiaries:01





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### 18.1.1 Linkage Document

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18.1.2 Report

# Report on Project Collaboration between the Department of Commerce, The Cochin College, Kochi-02 & IGNOU

In 2019, the Department of Commerce at The Cochin College, Kochi-02, embarked on a strategic collaboration with the Indira Gandhi National Open University (IGNOU). This partnership was aimed at broadening the educational horizons for commerce students by integrating distance learning programs and resources offered by IGNOU into the curriculum of The Cochin College. The initiative sought to leverage IGNOU's vast experience in open and distance learning to enhance the academic and professional prospects of students.

#### Objectives

- To incorporate IGNOU's certificate and diploma programs into the commerce curriculum of The Cochin College.
- To facilitate resource and knowledge sharing between faculty members of The Cochin College and
  IGNOLL
- To provide students with additional academic qualifications and practical skills through IGNOU's distance education programs.



19 MoU between Department of Commerce, The Cochin College,Kochi-02 & Department of Commerce, Siena College, Edakochi





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• End Date: 03/03/2023

• Period:One Year

#### 19.1 Seminar on Goods and Services

• Date/Period: 10/08/2022

• Number of Beneficiaries from The Cochin College:124

#### 19.1.1 MoU



MEMORANDUM OF UNDERSTANDING

Between

Post Graduate and Research Department of Commerce, The Cochin College, Kochi 2,

Kerala, India

And

Post Graduate Department of Commerce, Siena College of Professional Studies,
Edakochi-10, Kerala, India

This Agreement made and entered into on the 4th day of March 2022 between the Post Graduate and Research Department of Commerce, The Cochin College, Kochi, represented by its Head of the Department (HOD), as the first party and the Post Graduate Department of Commerce, Siena College of Professional Studies, Edacochin represented by its Head of the



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# NOW THEREFORE THIS MEMORANDUM OF UNDERSTANDING WITNESSES AS FOLLOWS

The Cochin College and Siena College recognize that the academic collaboration would be of mutual benefit and would provide strengths in research and education and their mutual interest in engaging themselves in academic cooperation. As per the purpose of the said agreement, the two parties shall:

#### Forms of Academic Cooperation

- 1. Both parties agree to exchange their best services and efforts in order to develop the following forms of Academic cooperation
- 1.1. Faculty /Students of The Cochin College and Siena College of Professional Studies can collaborate in future research projects that either involve working cooperatively. Activities include developing proposals for collaborative research, co-authoring publication, organizing joint conferences/Webinars/workshops, and conducting joint research projects.
- 1.2. Cooperate in the exchange of information relating to their activities in teaching and research in fields of mutual interests; sharing best practices adopted by each party; sharing of e-content between the parties; access to library and repository services, if possible.
- Any other relevant programme that are mutually agreed upon.

  Costs
- 2. Each Party will be responsible for its own costs in connection with all matters relating to collaborations under this MoU.

#### Confidentiality

3. The parties agree that there is no intention to share any confidential or proprietary information in any collaboration under this MoU. If either Party wishes to disclose information it considers to be confidential or proprietary to the other Party, the Party needs to take prior written consent of the other party.

#### Tenure of MoU

4. This MoU shall be effective for a period of one year from 4<sup>th</sup> March 2022 to 3<sup>rd</sup> March 2023, and can terminate or amend this agreement by giving the other Party a written notice one (1) month in advance during this period.

Dr. Rekha P.G.
Head of the Department
PG & Research Department of Commerce
The Cochin College. Kochi-02

Prof. K.J. Philominal Head, Department of Commerce Siena College of Professional Studies Edakochi, Kochi - 682010

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The Parties to this Memorandum of Understanding hereby confirm their agreement to its terms by the following signatures: Department Post Graduate and Research Post Graduate Department of Department of Commerce, Commerce, Siena College of The Cochin College, Kochi 2 Professional Studies, Ernakulam District, Kerala Edacochin -10, Ernakulam Party District, Kerala First Party Designation Second Party Head of the Department Head of the Department Derha Signature Prof. K.J. Philominal Head, Department of Commerce Siena College of Professional Studies Edakochi, Kochi - 682010 Witness Dr. Ryins: s. set AM Popusar P. A+ Research Dept of Comme The colin welly, kodi-2 Mr. Chandan Ray SM Assistant Professor

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Mrudula Menon V.
Principal-in-Charge
The Cochin College

PCn Department of Commerce Siena college of Professional Studies

Edgkochi -10



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19.1.2 Report

#### SEMINAR REPORT

Academic Year : 2022-2023
DETAILS OF THE SEMINAR

Title of the Seminar	the Seminar Goods and Services Tax		
Date and Time	10 <sup>th</sup> August 2022, 10.00 am		
Venue	Seminar Hall		
Organized by	PG Department of Commerce & Internal Quality Assurance Cell		
Targeted Audience	Students of Commerce Department		
Resource Person	Dr. Rajani B Bhat (Assistant Professor &Research Guide, The Cochin College)		
Name of the staff Co- coordinators	1. Mrs. Roopa V.J 2. Mr. Joseph Bony T.L		
fame and Class of Student 1. Gayathri K (II B.com Finance & Taxation			
Coordinators	2. Irfan K Ismail(II B.com Finance &Taxation)		
Total Number of Participants	of Participants 124 students		
Event Contents/Objectives	To enable the students to understand the concepts of GST in India.     To enhance skills in a structured and practical		
	oriented manner.		





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#### 1. REPORT

In association with Internal Quality Assurance Cell (IQAC), Post Graduate Department of Commerce have conducted a seminar on the topic "Goods and Services Tax" by Dr. Rajani B Bhat (Assistant Professor &Research Guide, The Cochin College). The seminar was conducted for both second-year and final-year students of commerce department.

The seminar started with a silent prayer and welcome speech by Mrs. Linda Shiffy K.A, Head of the Department. 124 students from Bcom and Mcom Class were attended the seminar. Dr.Rajani B Bhat explained about the basic concepts of GST and conceptual knowledge on the various aspects which influenced taxation in India prior to the implementation of GST and then compared it to the present scenario of GST. She also presented the tax structure in India levied by both central & state governments. The lecture was very helpful for the participants for framing a concrete idea about GST. The session was informative as well as interactive, as reflected from the feedback received from the participants.

The participants remarked that the seminar was very beneficial and they were equipped with a deep understanding of the topics covered. At the end Irfan K. Ismail, proposed a formal vote of thanks.

Programme Coordinators : Mrs. Roopa V.J

: Mr.Joseph Bony T.L

Head of the Department : Mrs.Linda Shiffy K A

Principal : Prof. Dr. M A Solomon





# THE COCHIN COLLEGE

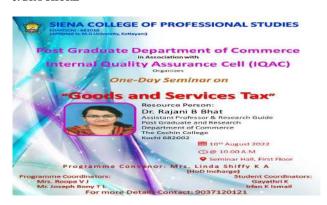
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#### 3. BROCHURE



#### 4. PHOTOS







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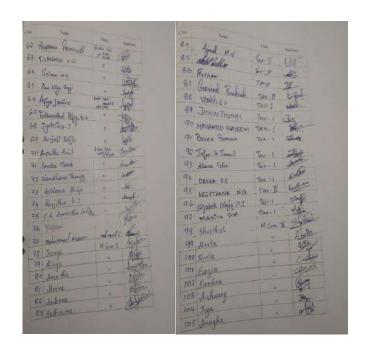
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email: email@thecochincollege.edu.in

20 Project Collaboration between Department of Physics, The Cochin College, Kochi-02 & Department of Physics , Aquinas College, Edacochin

• Start Date: 16/04/2020

• End Date: 15/04/2021

• Period:One Year

### 20.1 M.Sc Physics Project

• Date/Period: 16/04/2020 to 15/04/2021

• Number of Beneficiaries:03





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#### 20.1.1 Linkage Document



**26** (0484) 2977781, 949757718

### AQUINAS COLLEGE

Edacochin, Cochin 682 010 Reaccredited by NAAC at 'B+' Grade (Affiliated to Mahatma Gandhi University, Kottayam)

From

16-04-2020

Dr. Joseph John HoD, Dept. Of Physics Aquinas College, Edakochi

To

Dr. Manjusha M.V.
Assistant Professor
Research Guide, Department of Physics
The Cochin College, Kochi -2

Dear Madam

Sub: M.Sc. Project guidance

The following students from Department of Physics, Aquinas College, Edakochi would like to carry out their M.Sc. Project (academic year 2020-2021) at the Department of Physics, The Cochin College, Cochin under your supervision.

- 1. Pretty Jude
- 2. Sheryl Varghese
- 3. Aleena Celine Carmel

Kindly grant permission for the same and do the needful.

Thanking You

DEPARTMENT OF PHYSICS
AQUINAS COLLEGE
EDACOCHIN
COCHIN 6

Yours Sincerely

M.Sc., B.Ed., M.Phil, Ph.D., NET ASSOCIATE PROPESSIGNE HOD DEPARTMENT OF PHYSICS AQUINAS COLLEGE, EDACOCHIN

Recognized by National Commission for Minority Educational Institutions

a: aquinascollegemail@gmail.com

www.aquinascollege.co.in





# THE COCHIN COLLEGE

### **KOCHI - 682 002**

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in

20.1.2 Report

Report on the Project Collaboration between the Department of Physics, The Cochin College, Kochi-02 & Department of Physics, Aquinas College, Edacochin

The Department of Physics at The Cochin College, Kochi-02, and the Department of Physics at Aquinas College, Edacochin, have initiated a collaborative project aimed at enhancing the academic and research capacities of both institutions. This collaboration focuses on leveraging the expertise and resources of each department to promote high-quality education, research innovation, and student engagement in the field of physics.

#### Objectives of the Collaboration

- To promote joint research projects that address current and emerging topics in physics.
- To organize academic events such as seminars, workshops, and guest lectures to provide students with exposure to advanced concepts and techniques.
- To facilitate faculty and student exchanges to broaden their academic experiences.
- To share laboratory resources and research equipment to optimize the use of available facilities.
- To develop interdisciplinary research projects that integrate knowledge from various scientific fields.





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**(0484) 2977781, 9497577181** 



## AQUINAS COLLEGE

Edacochin, Cochin 682 010

Reaccredited by NAAC at 'B+' Grade (Affiliated to Mahatma Gandhi University, Kottayam)

From

16-04-2020

Dr. Joseph John HoD, Dept. Of Physics

Aquinas College, Edakochi

To

Dr. Manjusha M.V.

Assistant Professor

Research Guide, Department of Physics

The Cochin College, Kochi -2

Dear Madam

Sub: M.Sc. Project guidance

The following students from Department of Physics, Aquinas College, Edakochi would like to carry out their M.Sc. Project (academic year 2020-2021) at the Department of Physics, The Cochin College, Cochin under your supervision.

- 1. Pretty Jude
- 2. Sheryl Varghese
- 3. Aleena Celine Carmel

Kindly grant permission for the same and do the needful.

Thanking You

DEPARTMENT OF PHYSICS
AQUINAS COLLEGE
EDACOCHIN
COCHIN - 8

Yours Sincerely

Lt Dr. JOSEPH JOHN
M.S.C., B.Ed., M.Phil, Ph.D., NET
ASSOCIATE PROPESSION HOD
DEPARTMENT OF PHYSICS
AQUINAS COLLEGE, EDACOCHIN

Recognized by National Commission for Minority Educational Institutions

■ : aquinascollegemail@gmail.com

• www.aquinascollege.co.in





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# CHARACTERISATION OF BARIUM TITANATE NANO PARTICLES

A PROJECT REPORT SUBMITTED TO

MAHATHMA GANDHI UNIVERSITY

KOTTAYAM

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF SCIENCE IN PHYSICS

BY

PRETTY JUDE

Reg No.190011018931



# DEPARTMENT OF PHYSICS

AQUINAS COLLEGE

(AFFILIATED TO MAHATHMA GANDHI UNIVERSITY)

EDAKOCHIN

COCHIN-682006

2019 - 2021

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Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

### **CERTIFICATE**

This is to certify that this is a bonafide project entitled "CHARACTERISATION OF BARIUM TITANATE NANO PARTICLES" carried out by PRETTY JUDE, Register No. 190011018931, student of Master of Science in physics, Department of physics, Aquinas College, Edakochi, successfully completed, under my supervision and guidance at the Department of Physics, The Cochin College, Cochin. And the contents of this project have not been included in any other project report submitted previously for the award of any degree.

Place:

Date:

Dr MANJUSHA M V Assistant Professor Department of Physics The Cochin Collage

Signature of the Project Guide? 2022

Dr. MANJUSHA M.V

Assistant Professor Department of Physics

The Cochin College, Cochin





# THE COCHIN COLLEGE

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Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

# CHARACTERISATION OF BISMUTH FERRITE DOPED WITH COPPER

A PROJECT REPORT SUBMITTED TO

## MAHATMA GANDHI UNIVERSITY

KOTTAYAM

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF SCIENCE IN PHYSICS

BY

SHERYL VARGHESE

Reg No:190011018934



#### DEPARTMENT OF PHYSICS

AQUINAS COLLEGE

(AFFILIATED TO MAHATMA GANDHI UNIVERSITY)

EDACOCHIN

COCHIN-682006

2019-2021





# THE COCHIN COLLEGE

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Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

### CERTIFICATE

This is to certify that this is a bonafide project entitled "CHARACTERISATION OF BISMUTH FERRITE DOPED WITH COPPER" carried out by SHERYL VARGHESE, Register No.190011018934, student of Master of Science in Physics, Department of physics, Aquinas College, Edacochin, successfully completed under my supervision and guidance at the Department of Physics, The Cochin College, Cochin. And the contents of this project has not been included in any other project report submitted previously for the award of any other degree.

lasing

Dr MANJUSHA M V Assistant Professor Department Of Physics The Cochin College Cochin-682 802

Place:

Date:

Signature of the Project Guide

Dr. MANJUSHA M.V

Assistant Professor

Department of Physics

The Cochin College, Cochin





# THE COCHIN COLLEGE

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Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

### **CHARACTERISATION**

OF

### BISMUTH FERRITE DOPED WITH COBALT

A PROJECT REPORT SUBMITTED TO

MAHATMA GANDHI UNIVERSITY

**KOTTAYAM** 

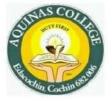
IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF SCIENCE IN PHYSICS

BY

ALEENA CELINE CARMEL

Register No: 190011018926



DEPARTMENT OF PHYSICS

**AQUINAS COLLEGE** 

(AFFILIATED TO MAHATHMA GANDHI UNIVERSITY)

EDAKOCHI

COCHIN-682010

2019 - 2021





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email: email@thecochincollege.edu.in

### **CERTIFICATE**

This is to certify that this is a bonafide project entitled "CHARACTERISATION OF BISMUTH FERRITE COBALT DOPED" carried out by ALEENA CELINE CARMEL, Register No.190011018926, student of MASTER OF SCIENCE IN PHYSICS, Department of physics, AQUINAS COLLEGE, Edakochi, successfully completed, under my supervision and guidance at the Department of Physics, The Cochin College, Cochin. And the contents of this project have not been included in any other project report submitted previously for the award of any degree.

Place:

Date:

Assistant Professo
Department of Physic
The Cochin Cotteg
Cochin-882 002
Signature of the Project Guide

DR. MANJUSHA M.V

**Assistant Professor** 

Department of Physics

The Cochin College, Cochin





# THE COCHIN COLLEGE

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21 Project Collaboration between Department of Physics, The Cochin College, Kochi-02 & Department of Physics , Al Ameen College,

Edathala, Aluva

• Start Date: 20/08/2020

• End Date: 19/08/2021

• Period:One Year

### 21.1 M.Sc Physics Project

• Date/Period: 20/08/2020 to 16/08/2021

• Number of Beneficiaries:02





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#### Linkage Document 21.1.1

Phone: 0484 - 2837561 (Principal)

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EDATHALA, ALUVA-683 561

AIDED INSTITUTION - ACCREDITED by NAAC (Affiliated to Mahatma Gandhi University, Kottayam, Kerala)

Minority Educational Institution covered under Article 30 of the Constitution of India. E-mail: alameencollege@gmail.com Website: www.alameencollege.org

20/07/2020

To

The Head of the Department Department of Physics Cochin College Mattancherry, Kochi

Respected Ma'am,

I request you to kindly grant permission to Celine Brighty Varghese and Suhana Nargis, who are the students of this college, to do their MSc Project under the guidance of Dr.Manjusha M V, Assistant Professor in the Department of Physics, Cochin College, Mattancherry, Kochi.

Yours faithfully

Dr. Rose P Ignatius HOD, Department of Physics

Al - Ameen College Edathala







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email: email@thecochincollege.edu.in



### CERTIFICATE

This is to certify that the project work entitled "CHARACTERISATION OF BARIUM TITANATE NANOPARTICLES" is the bonafide work done by CELINE BRIGHTY VARGHESE (Reg. No. 190011018859) student of Al-Ameen College, Edathala, under my supervision and guidance in department of physics, THE COCHIN COLLEGE, Kochi during 2019-2021 towards the partial fulfillment of the requirements of Master of Science in Physics by Mahatma Gandhi University, Kottayam.

Place: Kochi Date: 16821 Dr MANJUSHA M A Assistant Profestor Department of Physics The Cectury Chilese Cities of Chilese College (1982)

Dr. MANJUSHA M.V
Assistant Professor
Department of Physics
THE COCHIN COLLEGE, COCHIN





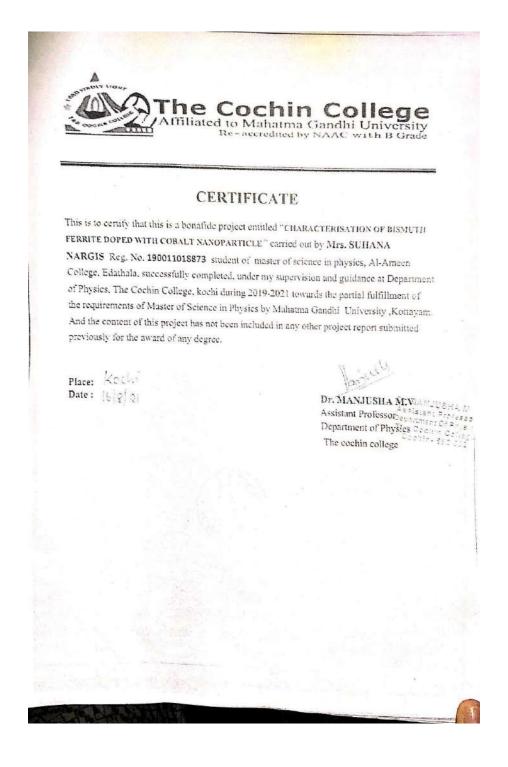
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### 21.1.2 Report

Collaboration Report on the Project "Characterisation of Barium Titanate Nanoparticles"

#### Introduction

The Department of Physics at Al-Ameen College, Edathala, in collaboration with the Department of Physics at The Cochin College, undertook a research project titled "Characterisation of Barium Titanate Nanoparticles." This project was carried out by Celine Brighty Varghese as part of her Master of Science in Physics under Mahatma Gandhi University, Kottayam. The project aimed to explore the structural and functional properties of barium titanate nanoparticles, a material known for its significant potential in electronic and optical applications.

#### **Project Details**

The project was completed as part of the MSc curriculum by Celine Brighty Varghese, with the guidance of Dr. Manjusha M.V., an Assistant Professor in the Department of Physics at The Cochin College. The research was conducted at Al-Ameen College, Edathala, during the academic year 2020-2021. The study focused on synthesizing and characterizing barium titanate nanoparticles to investigate their structural, dielectric, and ferroelectric properties, which are critical for their application in advanced technological destrices.



### Objectives of the Collaboration

The collaboration aimed to leverage the expertise and resources of both institutions to successfully carry out the synthesis and characterization of barium titanate nanoparticles.

### Outcome and Impact

The successful completion of this project has provided valuable insights into the properties of barium titanate nanoparticles, particularly in terms of their structural,





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dielectric, and ferroelectric characteristics. The collaboration between Al-Ameen College, Edathala, and The Cochin College has enriched the academic experience of Celine Brighty Varghese and contributed significant research data to the field of nanomaterials. This project has set a foundation for future research collaborations and has the potential to inspire further studies on the application of barium titanate nanoparticles in various technological domains.

### **Future Prospects**

Following the success of this project, both institutions are considering further research into the application of barium titanate nanoparticles in electronic and energy storage devices. The findings provide a strong foundation for exploring the effects of doping and other modifications on the properties of these nanoparticles. There is also potential for extending the research to investigate the integration of barium titanate nanoparticles into composite materials for advanced applications.

#### Conclusion

The collaboration between Al-Ameen College, Edathala, and The Cochin College on the project "Characterisation of Barium Titanate Nanoparticles" has been a productive and impactful endeavour. The project not only fulfilled the academic requirements of the student involved but also contributed to the advancement of knowledge in the field of nanomaterials. This collaboration exemplifies the benefits of academic partnerships in fostering research and education and lays the groundwork for continued cooperation between the two institutions.





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Collaboration Report on the Project "Characterisation of Bismuth Ferrite Doped with Cobalt Nanoparticles"

### Introduction

The Department of Physics at Al-Ameen College, Edathala, in collaboration with the Department of Physics at The Cochin College, conducted a research project titled "Characterisation of Bismuth Ferrite Doped with Cobalt Nanoparticles." This project was undertaken by Suhana Nargis as part of her Master of Science in Physics under Mahatma Gandhi University, Kottayam. The research aimed to explore the structural, magnetic, and electrical properties of bismuth ferrite when doped with cobalt nanoparticles, focusing on its potential applications in multifunctional devices.

### **Project Details**

The project was conducted by Suhana Nargis, under the guidance of Dr. Manjusha M.V., Assistant Professor in the Department of Physics at The Cochin College. The research was carried out at Al-Ameen College, Edathala, during the academic year 2020-2021. The study focused on synthesizing cobalt-doped bismuth ferrite nanoparticles and characterizing their properties to evaluate their suitability for use in advanced technological applications, such as memory devices and sensors.



### Objectives of the Collaboration

The collaboration between Al-Ameen College and The Cochin College aimed to combine the expertise and resources of both institutions to successfully carry out the synthesis and characterization of bismuth ferrite doped with cobalt nanoparticles

### **Outcome and Impact**

The successful completion of this project has provided valuable insights into the properties of bismuth ferrite nanoparticles doped with cobalt, particularly in terms of their structural and magnetic characteristics. The collaboration between Al-Ameen College, Edathala, and The





## THE COCHIN COLLEGE

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Cochin College has enriched the academic experience of Suhana Nargis and contributed significant research data to the field of nanomaterials. This project has laid a foundation for future research collaborations and has the potential to inspire further studies on the application of doped bismuth ferrite in various technological domains.

### **Future Prospects**

Following the success of this project, both institutions are considering further research into the application of doped bismuth ferrite nanoparticles in electronic and magnetic devices. The findings provide a strong foundation for exploring the effects of other dopants on the properties of bismuth ferrite. There is also potential for extending the research to investigate the integration of these nanoparticles into composite materials for advanced applications.

### Conclusion

The collaboration between Al-Ameen College, Edathala, and The Cochin College on the project "Characterisation of Bismuth Ferrite Doped with Cobalt Nanoparticles" has been a productive and impactful endeavor. The project not only fulfilled the academic requirements of the student involved but also contributed to the advancement of knowledge in the field of nanomaterials. This collaboration exemplifies the benefits of academic partnerships in fostering research and education and lays the groundwork for continued cooperation between the two institutions.





## THE COCHIN COLLEGE

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email: email@thecochincollege.edu.in

22 Project Collaboration between Department of Physics, The Cochin College, Kochi-02 & Department of Physics , Aquinas College,

Edacochin

• Start Date: 04/11/2022

• End Date: 03/11/2023

• Period:One Year

### 22.1 M.Sc Physics Project

• Date/Period: 04/11/2022 to 18/10/2023

• Number of Beneficiaries:01





## THE COCHIN COLLEGE

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### 22.1.1 Linkage Document



### AQUINAS COLLEGE

Edakochi, Kochi 682010 Reaccredited by NAAC at 'B+' Grade (0484) 2977781, 9497577181

(Affiliated to Mahatma Gandhi University, Kottayam)

04.11.2022

From

Dr. Joseph John

HoD, Dept. of Physics

Aquinas College, Edakochi

To,

Dr. Manjusha M V

Assistant Professor

Research Guide, Department of Physics

The Cochin College, Kochi-2

Dear Madam,

Sub: M.Sc. Project Guidance

The following student from Department of Physics, Aquinas College, Edakochi would like to carry out their M.Sc. Project (academic year 2021-2023) at the Department of Physics, The Cochin College, Cochin under your supervision.

1. Shehsadi P. R.

Kindly grant permission for the same and do the needful.

Thanking You,

Yours Sincerely

Lt Dr. JOSEPH JOHN
M.Sc., B.Ed., M.Phil., Ph.D., NET
ASSOCIATE PROFESSOR & HOD
DEPARTMENT OF PHYSICS

Recognized by National Commission for Minority Educational Institutions
Website: www.aquinascollege.co.in Email: aquinascollegemail@gmail.com





## THE COCHIN COLLEGE

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### 22.1.2 Report

#### Collaboration Report: M.Sc. Project Guidance for Aquinas College Student

#### Introduction

The Department of Physics at The Cochin College, Kochi-2, collaborated with the Department of Physics at Aquinas College, Edakochi, to facilitate the successful completion of a Master of Science (M.Sc.) project. This collaboration was initiated to provide advanced research guidance and resources to a student from Aquinas College, enabling them to carry out their M.Sc. project under the expert supervision of Dr. Manjusha M.V., Assistant Professor and Research Guide at The Cochin College.

#### **Project Details**

The request for collaboration was formally made by Lt. Dr. Joseph John, Associate Professor and Head of the Department of Physics at Aquinas College, Edakochi, on 4th November 2022. The letter specifically sought permission for Shehsadi P. R., an M.Sc. student from the Department of Physics at Aquinas College, to undertake their project at The Cochin College during the academic years 2021-2023. The project was to be conducted under the supervision of Dr. Manjusha M.V., leveraging the research facilities and academic environment provided by The Cochin College.



### Outcome and Impact

The collaboration between The Cochin College and Aquinas College provided a valuable opportunity for Shehsadi P. R. to gain hands-on research experience in a supportive academic environment. The guidance provided by Dr. Manjusha M.V. played a crucial role in enhancing the student's research capabilities and contributed to the successful completion of their M.Sc. project. This collaboration also strengthened the academic ties between the two institutions, setting a precedent for future cooperative efforts in research and education.

### **Future Prospects**

Following the success of this collaboration, both The Cochin College and Aquinas College are considering expanding their academic partnerships to include more students and research projects. The positive outcomes of this collaboration suggest that similar initiatives could be





## THE COCHIN COLLEGE

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beneficial for students from both institutions, promoting a culture of shared learning and research excellence.

### Conclusion

The collaboration between The Cochin College and Aquinas College for the M.Sc. project of Shehsadi P. R. was a successful endeavour that highlighted the importance of inter-institutional cooperation in higher education. The project not only provided the student with essential research experience but also fostered a collaborative spirit between the two colleges. This partnership serves as a model for future collaborations, demonstrating the mutual benefits of shared academic resources and expertise.





## THE COCHIN COLLEGE

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Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

23 Project Collaboration between Department of Physics, The Cochin College, Kochi-02 & Department of Physics , Sree Narayana College, Nattika, Thrissur

• Start Date: 01/06/2020

• End Date: 30/06/2021

• Period:One Year

### 23.1 M.Sc Physics Project

• Date/Period: 01/06/2020 to 30/06/2021

• Number of Beneficiaries:02





## THE COCHIN COLLEGE

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Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

### 23.1.1 Linkage Document

### DEPARTMENT OF PHYSICS

SREE NARAYANA COLLEGE, NATTIKA, THRISSUR - 680566

To

Dr. Manjusha M V, Assistant Professor, Department of Physics, The Cochin College, Kochi 2.

Respected madam,

Kindly permit the following M.Sc. Physics students (Academic year 2020-21) of our college to do their projects under your guidance and supervision.

- 1. Catherine Joseph
- 2. Sruthi M S

01.06.2020.

Thanking you,

Yours faithfully,

Czinija K.K

Dr. Girija. K.K

HOD

Dr. Girija, K.K., M.Sc., M.Phil, Ph.D., Associate Professor Department of Physics S.N. College, Hattiin







## THE COCHIN COLLEGE

### **KOCHI - 682 002**

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### 23.1.2 Report

### Collaboration Report on the Project "Characterisation of Bismuth Ferrite Doped with Copper"

### Introduction

The Department of Physics at The Cochin College, Koovapadam, and the Department of Physics at Sree Narayana College, Nattika, successfully collaborated on a research project titled "Characterisation of Bismuth Ferrite Doped with Copper." This project was conducted as part of the Master of Science in Physics program under the University of Calicut. The primary goal was to explore the structural, magnetic, and electrical properties of bismuth ferrite doped with copper, with an emphasis on its potential applications in multifunctional devices.

### **Project Details**

The research was carried out by Sruthi M.S., a student of Sree Narayana College, Nattika, under the guidance of Dr. Manjusha M.V., Assistant Professor, Department of Physics, The Cochin College, Koovapadam, during the academic years 2019-2021. This study fulfilled the requirements for the Master of Science in Physics degree from the University of Calicut. The focus was on synthesising and characterising copper-doped bismuth ferrite, a material known for its multiferroic properties, which hold significant promise for various technological applications

### CHARACTERISATION OF BISMUTH FERRITE DOPED

WITH COPPER

LINIVERSITY OF CALICUT

ment of the requirement for the award of the degree of MASTER OF SCIENCE IN PHYSICS

> SRUTHI.M.S g No: SNATMPH009

Department of Physics Size Narayana College Nattika



Dr. Manjusha M V
Assistant Professor

Cochin CoSege, Koovapadam





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### Objectives of the Collaboration

The collaboration aimed to synthesise and investigate the physical properties of bismuth ferrite doped with copper. The research sought to understand how the introduction of copper ions influences the material's ferroelectric, magnetic, and dielectric properties. Additionally, the study aimed to evaluate the doped material's potential for use in applications such as memory devices, sensors, and spintronic devices. The project provided the student with an opportunity to engage in advanced research under the mentorship of an experienced faculty member.

#### Methodology

The research involved the preparation of copper-doped bismuth ferrite samples using a solid-state reaction method. These samples underwent various characterization techniques, including X-ray diffraction (XRD) to analyse the crystal structure, scanning electron microscopy (SEM) for morphological studies, and vibrating sample magnetometry (VSM) to assess the magnetic properties. Dielectric measurements were also performed to investigate the material's electrical properties. The results from these analyses were used to draw conclusions about the effect of copper doping on the overall properties of bismuth ferrite.

### **Key Findings**

The study revealed that doping bismuth ferrite with copper significantly altered its structural and functional properties. The XRD analysis showed a shift in the peaks, indicating changes in the lattice parameters due to the incorporation of copper ions. SEM images highlighted the impact of doping on grain size and morphology. The VSM results demonstrated enhanced magnetic properties, which are crucial for potential applications in spintronic devices. Additionally, dielectric measurements indicated improved dielectric properties, making the doped material suitable for applications in capacitors and other electronic devices. These findings contribute to the growing understanding of multiferroic materials and their potential applications.

### **Challenges Faced**

Several challenges were encountered during the research, including the synthesis of high-purity samples and the optimization of doping levels to achieve the desired properties. Precise control of experimental conditions was necessary to ensure reproducibility. Coordinating research activities between the two institutions required effective communication and scheduling to align the experimental work with academic timelines.

### Outcome and Impact

The successful completion of this project has significantly advanced the understanding of copper-doped bismuth ferrite, particularly in terms of its structural, magnetic, and dielectric properties. The collaboration between The Cochin College, Koovapadam, and Sree Narayana College, Nattika, has enriched the academic experience of Sruthi M.S. and contributed valuable research to the field of multiferroics. This project has laid a strong foundation for future research





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collaborations and has the potential to inspire further studies on the modification and application of multiferroic materials.

### **Future Prospects**

Building on the success of this project, both institutions are considering further collaborative research, particularly in the area of material science and device applications. The findings provide a strong basis for exploring other dopants and their effects on multiferroic materials. Additionally, there is potential for extending this research to include experimental studies on the practical applications of copper-doped bismuth ferrite in devices such as memory storage systems and sensors.

#### Conclusion

The collaboration between The Cochin College, Koovapadam, and Sree Narayana College, Nattika, has been a productive and impactful endeavour, resulting in significant academic and research achievements. The project has not only fulfilled the academic requirements of the student involved but has also contributed to the advancement of knowledge in the field of multiferroic materials. This collaboration exemplifies the benefits of academic partnerships in fostering research and education, and it sets the stage for continued cooperation between the two institutions.





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### CHARACTERISATION OF BISMUTH FERRITE DOPED

### WITH COPPER

Project report submitted to the

UNIVERSITY OF CALICUT

In partial fulfilment of the requirement for the award of the degree of

MASTER OF SCIENCE IN PHYSICS

BY

SRUTHI.M.S

Reg No: SNATMPH009

Department of Physics

Sree Narayana College Nattika



Under the guidance of

Dr. Manjusha M V

Assistant Professor

Department of Physics

Cochin College, Koovapadam

2019-2021





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(Affiliated to the University of Calicut)



### CERTIFICATE

This is to certify that the entitled "CHARACTERISATION OF BISMUTH FERITE DOPED WITH COPPER" is a bonafide record of the project work done by SRUTHI.M.S (SNATMPH009) under the guidance of Dr.Manjusha M V, Assistant Professor, Department of Physics, The Cochin College Koovapadam, in partial fulfilment of the requirements for the MSc. in Physics of Department of Physics Sree Narayana College Nattika, Calicut University during the period of 2019 -2021.

Dr. Namitha Ashokan T

Head of the Department

Sree Narayana College Nattika

Date:

Place





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### CERTIFICATE

This is to certify that the project work entitled "CHARACTERISATION OF BISMUTH FERRITE DOPED WITH COPPER" submitted by SRUTHI.M.S, M.Sc. in Physics, 4th Semester Register No. SNATMPH009, Department of physics, Sree Narayana College Nattika, Calicut University is an authentic work carried out by her under my guidance and supervision. The contents of this project work have not been presented earlier for the award of any other degree in any other university.

Place: Kochi
Date 16 | 8 | 21

Dr. MANJUSHA M Walton Broken

Assistant Professor Dept. of Physics

The Cochin College, Koovapadam





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### Collaboration Report on the Project "Characterisation of Barium Titanate Nanoparticles"

### Introduction

The Department of Physics at The Cochin College, Koovapadam, and the Department of Physics at Sree Narayana College, Nattika, have jointly undertaken a research project titled "Characterisation of Barium Titanate Nanoparticles." This project was completed as part of the Master of Science in Physics program under Calicut University, Malappuram. The research focused on synthesising and analysing the properties of barium titanate nanoparticles, with the aim of exploring their potential applications in various technological fields.

### **Project Details**

The project was carried out by Catherine Joseph, a student of Sree Narayana College, Nattika, under the academic supervision of Dr. Manjusha M.V., Assistant Professor, Department of Physics, The Cochin College, Koovapadam. The research spanned the academic years 2019-2021 and was designed to meet the requirements for the Master of Science in Physics degree from Calicut University. The study specifically targeted the synthesis and characterisation of barium titanate nanoparticles, which are known for their exceptional dielectric properties and potential use in capacitors, sensors, and other electronic devices.

### CHARACTERISATION OF BARIUM TITANATE

NANO PARTICLES

A PROJECT REPORT SUBMITTED TO
CALLCUT UNIVERSITY
MALAPPURAM
IN PARTIAL PULFILMENT OF THE REQUIREMENT FOR THE
AWARD OF THE DEGREE OF
MASTER OF SCIENCE IN PHYSICS
BY
CATHERINE JOSEPH
Rep. No. SATMPH0005



DEPARTMENT OF PHYSICS SREENARAYANA COLLEGE (AFFILIATED TO CALICUT UNIVERSITY) NATTIKA THRISSUR-680566 2019 - 2021

### Objectives of the Collaboration

The primary objective of this collaboration was to synthesise barium titanate nanoparticles and investigate their physical properties. The research aimed to understand the structural, dielectric,





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and ferroelectric properties of these nanoparticles, which are crucial for their application in advanced technological devices. Another objective was to provide the student with hands-on experience in nanomaterial synthesis and characterization, guided by an expert in the field.

#### Methodology

The research involved the synthesis of barium titanate nanoparticles using a sol-gel method, which is widely recognized for producing high-purity nanomaterials. The synthesised nanoparticles were characterised using various techniques, including X-ray diffraction (XRD) to determine the crystal structure, transmission electron microscopy (TEM) for particle size analysis, and dielectric measurements to evaluate their electrical properties. These characterizations were essential to understanding how the nanoparticles' properties vary with size and structure.

### **Key Findings**

The study successfully synthesised barium titanate nanoparticles with controlled size and shape. XRD analysis confirmed the formation of a pure tetragonal phase, which is typical of barium titanate at the nanoscale. TEM images showed that the nanoparticles were uniform in size, with an average diameter in the nanometer range. Dielectric measurements revealed that the nanoparticles exhibited high dielectric constants, making them suitable for use in high-performance capacitors and other electronic components. These findings contribute to the growing body of research on the potential applications of barium titanate in nanotechnology.

### **Challenges Faced**

The research faced several challenges, including the precise control of particle size during synthesis and the need for sophisticated equipment for accurate characterization. Achieving the desired phase purity required careful optimization of synthesis parameters. Additionally, coordinating the research activities between the two institutions necessitated effective communication and planning.

### **Outcome and Impact**

The successful completion of this project has provided significant insights into the properties of barium titanate nanoparticles, particularly in terms of their structural and dielectric characteristics. The collaboration between The Cochin College, Koovapadam, and Sree Narayana College, Nattika, has enriched the academic experience of Catherine Joseph and contributed valuable data to the field of nanomaterials. This project has set the stage for future research collaborations and has the potential to inspire further studies on the application of barium titanate nanoparticles in various technological domains.

### **Future Prospects**

Following the success of this project, both institutions are considering further research into the application of barium titanate nanoparticles in electronic and energy storage devices. The





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findings provide a strong foundation for exploring the effects of doping and other modifications on the properties of these nanoparticles. There is also potential for extending the research to investigate the integration of barium titanate nanoparticles into composite materials for advanced applications.

### Conclusion

The collaboration between The Cochin College, Koovapadam, and Sree Narayana College, Nattika, on the project "Characterisation of Barium Titanate Nanoparticles" has been a productive and impactful endeavour. The project not only fulfilled the academic requirements of the student involved but also contributed to the advancement of knowledge in the field of nanomaterials. This collaboration exemplifies the benefits of academic partnerships in fostering research and education, and it lays the groundwork for continued cooperation between the two institutions.





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### CHARACTERISATION OF BARIUM TITANATE

### **NANO PARTICLES**

A PROJECT REPORT SUBMITTED TO

### **CALICUT UNIVERSITY**

### **MALAPPURAM**

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF SCIENCE IN PHYSICS

BY

CATHERINE JOSEPH

Reg. No. SNATMPH005



DEPARTMENT OF PHYSICS

SREENARAYANA COLLEGE

(AFFILIATED TO CALICUT UNIVERSITY)

**NATTIKA** 

THRISSUR-680566

2019 - 2021

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### SREE NARAYANA COLLEGE NATTIKA



### **CERTIFICATE**

Certify that this is a bonafide record of the project work done by **CATHERINE JOSEPH** under the guidance of **Dr. MANJUSHA M.V,** Assistant Professor, Department of Physics, The Cochin College, Cochin, in the year 2019 - 2021 for the completion of the M.sc Degree.

Date: 21/08/2021

Place: Nattika

1 tha

Dr. NAMITHA ASOKAN T

Head of the Department Sree Narayana College

Nattika

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### **CERTIFICATE**

This is to certify that the project report entitled "CHARACTERISATION OF BARIUM TITANATE **NANO** PARTICLES" submitted to the Calicut University Malappuram, in partial fulfilment of the requirement for the Award of the degree of MASTER OF SCIENCE IN PHYSICS is a record of the original work done by CATHERINE JOSEPH (Reg. No. SNATMPH005) under the guidance of Dr. MANJUSHA M.V, Assistant Professor, Department of Physics ,The Cochin College, Cochin , during the year 2019 -2021.

Place: Examiners:

Date: 1.

2.

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### **CERTIFICATE**

This is to certify that the project work entitled "CHARACTERISATION OF BARIUM TITANATE NANO PARTICLES" submitted by CATHERINE JOSEPH, M.sc. Physics, 4<sup>th</sup> Semester Register No. SNATMPH005, Department of Physics, Sree Narayana College Nattika, Calicut University is an authentic work carried out by her under my guidance and supervision. The contents of this project work have not been presented earlier for the award of any other degree in any other university.

Place: Edappally

Date: 26/08/2021

Signature of the Project Guide

MANJUSHA McKehin Goller Gothin 621 20

Assistant Professor

Dept. of Physics

The Cochin College, Koovapadam



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24 Collaboration between Department of Zoology, The Cochin College, Kochi-02 & Community Environment Resource Center, Mullackal, Allapuzha

• Start Date: 12/08/2019

• End Date: 08/08/2021

• Period:Two Years

24.1 Intensive Data Collection for Kerala Bioblitz, A Citizen Science Program initiated by ATREE-CERC in association with India Biodiversity Portal

• Date/Period: 12/08/2019 to 08/08/2021

 $\bullet\,$  Number of Beneficiaries from The Cochin College: 68





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### 24.1.1 Linkage Document

Institution Name	Uploads	Observers
Christ College, Irinjalakuda, Thrissur	4093	20 📶
SN College, Kollam	1480	14 📶
The Cochin College, Kochi	952	41 📶
Government college, Chittur, Palakkad	705	2 📶
St. Joseph College for Women, Alappuzha	510	29 📶
St. Mary's College for Women, Thiruvalla, Pathanamthitta	490	5 ती
Baselius College, Kottayam	353	12 📶
Govt. College for Women, TVM	289	25 📶
NSS College, Changanassery	279	з Щ
University of Kerala, Thiruvananthapuram	172	2 ф
SNM College Maliankara, Ernakulam	170	ा सी
S H College, Thevara, Ernakulam	117	5 📶
Morning Star, Home Science College, Angamaly, Ernakulam	93	4 ती
SN College, Pambanar, Idukki	70	5 त्ती
Central University of Kerala, Kasaragod	64	1 📶
St. Xavier's College for Women, Aluva, Ernakulam	51	2 📶
Sree Sankara College, Kalady, Ernakulam	45	1 41
KKTM Govt. College, Pullut, Kodungalllur	34	1 📶
Payyannoor College, Kannur	23	2 📶
Mary Matha College, Wayanad.	15	2 📶
Bishop Moore College, Mavelikkara, Alappuzha.	8	1 41
Sir Syed College, Taliparamba, Kannur	8	2 📶
NSS College, Ottapalam, Palakkad	7	2 स्त्री
Mar Athanasius College, Kothamangalam	6	1 📶
St. Albert's College, Ernakulam	6	1 41
Christian College, Chengannur Alappuzha	4	2 📶
SB College, Changanacherry, Kottayam	3	2 📶
Chetana College of media and performing arts, Thrissur	2	1 📶
Govt. Victoria College, Plakkad	2	1 ता
Mar Ivanios College, TVM	2	1 📶
SN College, Cherthala, Alappuzha	2	1 வி
Total	10059	191





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### Community Environmental Resource Center (CERC) A field academy of Ashoka Trust for Research in Ecology and the Environment (ATREE)



### CERTIFICATE OF APPRECIATION

This is to certify that Dr. Manju V Subramanian, Assistant Professor, Dept of Zoology, The Cochin College, faculty in charge has been contributing to the intensive data collection for Kerala Bioblitz, a citizen science program initiated by ATREE-CERC, in association with India Biodiversity Portal (IBP), to document the biodiversity.

MANEEJA MURALI SENIOR PROGRAM OFFICER ATREE CERC

ATREE is recognised as a Scientific and Industrial Research Organisation by the Department of Scientific Industrial Research, Ministry of Science and Technology, Govt of India.





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### Community Environmental Resource Center (CERC) A field academy of Ashoka Trust for Research in Ecology and the Environment (ATREE)

Ammankovil Street, Mullackal, Alappuzha. Kerala, India. Pin 688 001. Tel: 0477 - 2251818 E-mail: cerc@atree.org url : www.vembanad.org



### CERTIFICATE OF APPRECIATION

This is to certify that below mentioned BSc Zoology degree students of The Cochin College under the faculty in charge Dr. Manju V Subramanian, Assistant Professor, Dept of Zoology, The Cochin College, has been contributing to the intensive data collection for Kerala Bioblitz, a citizen science program initiated by ATREE-CERC, in association with India Biodiversity Portal (IBP), to document the biodiversity.

- 1.Aarcha P Soman
- 2. Pooja Baiju
- 3.Devika Devanath
- 4. Aishwarya Elizabeth T.B
- 5.Ashika Farzana K.M
- 6.Deepthy Maria K.A
- 7.Bhavya Suresh
- 8.Sainaba Anees
- 9.Mohammed Nisar K.

10.Mohamed Faraz

MANEEJA MURALI SENIOR PROGRAM OFFICER ATREE CERC

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### 24.1.2 Report

Collaboration Report: Participation in Kerala Bioblitz by The Cochin College, Kochi

### Introduction

The Cochin College, Kochi, through its Department of Zoology, actively participated in the Kerala Bioblitz, a citizen science program initiated by the Ashoka Trust for Research in Ecology and the Environment (ATREE) Community Environmental Resource Center (CERC) in association with the India Biodiversity Portal (IBP). This collaborative effort was aimed at documenting biodiversity through intensive data collection, thereby contributing to environmental conservation and scientific research. The involvement of The Cochin College in this initiative highlights the institution's commitment to environmental stewardship and education.

### **Details of Participation**

Under the guidance of Dr. Manju V Subramanian, Assistant Professor in the Department of Zoology, a dedicated group of BSc Zoology students from The Cochin College participated in the Kerala Bioblitz. The students involved were Aarcha P Soman, Pooja Baiju, Devika Devanath, Aishwarya Elizabeth T.B, Ashika Farzana K.M, Deepthy Maria K.A, Bhavya Suresh, Sainaba Anees, Mohammed Nisar K., and Mohamed Faraz. Their efforts in collecting and uploading biodiversity data were pivotal in the success of this large-scale citizen science project.







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#### **Achievements and Contributions**

The students and faculty of The Cochin College made significant contributions to the Kerala Bioblitz. According to the data provided by ATREE-CERC, The Cochin College ranked third among participating institutions with a total of 952 uploads and 41 observers. This impressive achievement reflects the dedication and hard work of the participants in documenting local biodiversity.

### Recognition

The contributions of The Cochin College were recognized with certificates of appreciation issued by ATREE- CERC. Dr. Manju V Subramanian was acknowledged for her leadership and dedication as the faculty in charge, ensuring the successful participation of the students. The students involved were also recognized individually for their efforts in data collection, which played a crucial role in the overall success of the project.

### **Impact and Future Prospects**

The participation of The Cochin College in the Kerala Bioblitz has not only enhanced the college's reputation in environmental science but has also provided valuable hands-on experience for the students involved. The data collected during this project will contribute to ongoing research and conservation efforts in Kerala. Looking forward, The Cochin College plans to continue its collaboration with ATREE- CERC and other environmental organisations, encouraging more students to participate in citizen science projects that contribute to biodiversity conservation.

### Conclusion

The collaboration between The Cochin College and ATREE -CERC for the Kerala Bioblitz is a testament to the institution's commitment to environmental education and research. The active participation of students and faculty in this project has yielded significant results, contributing to the documentation of Kerala's rich biodiversity. This successful collaboration sets the stage for future initiatives that will further the cause of environmental conservation and sustainability.





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# 25 Collaboration between The Cochin College, Kochi-02 & IITM TEACHING LEARNING CENTRE.

• Start Date: 26/07/2021

• End Date: 30/07/2021

• Period:Five Days

### 25.1 Five Days FDP on "How Teachers can make a Difference"

• Date/Period: 26/07/2021 to 30/07/2021

• Number of Beneficiaries: 36





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#### Linkage Document 25.1.1



### Conduct of FDP for college teachers

Dr. Karmalkar S <karmal@ee.iitm.ac.in>
To: IQAC TCC <tcciqac54@gmail.com>

Mon, 17 May, 2021 at 7:28 pm

Dear Dr. Sindhu

Dear Dr. Sindhu
Thank you for your email.
The title of our FDP is "How teachers can make a difference."

I attach the brochure for a 5 day, 10 session version. Depending on the dates and availability of resource persons, the contents may undergo minor changes. The total charges for the FDP would be Rs. 60 k, payable to Registrar, IIT Madras. These charges include honorarium for the resource persons, IIT charges and 18% GST.

I look forward to hear from you.

Regards. Karmalkar

Dr. Shreepad Karmalkar Professor, Electrical Engineering Department Head, Teaching Learning Center Indian Institute of Technology, Madras Chennai 600 036 India



Mendulo Menon Mrudula Menon V. Principal-in-Charge The Cochin College



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### 25.1.2 Report

REPORT OF THE FACULTY DEVLOPMENT PROGRAMME ORGANIZED BY THE COCHIN COLLEGE AND CONDUCTED BY IITM TEACHING LEARNING CENTRE.

The Cochin College hosted an interactive and activity oriented 5-day Online Faculty Development Programme on How can Teachers make a Difference conducted by Teaching Learning Centre IIT Madras in association with M.G. University Kottayam. The programme begun on 26<sup>th</sup> July and ended on 30<sup>th</sup> July 2021. 36 participants were admitted for the course.

The preamble  $\operatorname{pf}$  the programme – the importance and role of good teaching cannot be emphasized better. The FDP introduces the participants to the principles underlying effective and efficient teaching in either face-to-face or online modes. The contents are based on outcomes of research on the teaching learning process and include anecdotes, activities and discussions.

The inauguration session held on 26th at 9.30 am. The official inauguration was done by the Honorable Vice Chancellor of M.G. University, Dr. Sabu Thomas. Welcome address was delivered by Dr. Manjusha M V. Dr. M Geetha, Principal in Charge, delivered the Presidential address. Prof Shreepad Karmalkar, Head TLC, IIT Madras addressed the participants and The Manager of The Cochin College Mr. Thomas J Vayalat and Dr. Sindhu K IQAC coordinator gave away felicitation to the participants. Dr. Rekha P.G. HOD of Research and P. G. Department of commerce proposed the vote of thanks.

The Learning outcomes of FDP

The participants will be able to explain

- How and how much difference can a teacher make
- \* Factors that affect student learning
- What is the first step in preparing for a course?
- Recipe for effective and efficient teaching levels of thinking at which questions for assignments, tutorials and tests can be set.
- What is a good problem set and how to prepare it
- Concept of learning outcome and active-cooperative learning
- How to write learning outcomes
- How to write teaching contents and deliver it in a class
   Content preparation, content delivery and student assignment in online mode
- Merits of oral and written examination
- How often should you test students
- How to give feedback to students on their learning
- Concept of teaching portfolio as an evidence of teaching effectiveness
- $\ensuremath{ \diamondsuit}$  How to improve your teaching with the help of feedback from students
- What motivates students

Certificates were restricted to 30 participants and was issued to participants who attened all sessions with active participation. The participants should turn on their video whenever asked for by the resource person. The entire class will be split into groups and each group will be assigned a number. At any time, the resource person will call out one group at random and members of that group has to



Mendulo Menon Mrudula Menon V. Principal-in-Charge The Cochin College



## THE COCHIN COLLEGE

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turn on the videos. Handwritten notes on A4 size papers had to be uploaded at the end of all the session.

### The schedule for 5 days was

Date	10-11.30am	2-3.30pm
26-7-2021	How and how much difference can a teacher make	Learning outcomes
27-7-2021	Active cooperative learning	Recipe for effective and efficient teaching
28-7-2021	Recipe for effective and efficient teaching-	Assessment
29-7-2021	MOOC learning management system	E-learning
30-7-2021	Motivation	Reflection

The resource persons for the FDP were

Prof. Shreepad Karmalkar

Prof. Edamana Prasad

Prof. C. Vijayan

Prof. G. PhanviKumar

Dr. Nandini A.P.

Dr. Sanjai Rani

Dr. Janaki G.

Dr. Riche Verma





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#### Attendance Of the Participants

	Name of the Participant with salutation	Designation	Department	Name of the College, Place
1	Dr. Paulbert Thomas	Assistant Professor	Department of Electronics	The Cochin College, Cochin
2	Dr. Uma S.	Assistant Professor	Department of Physics	The Cochin College
3	Dr. Sathya Narayanan K	Assistant Professor	Department of Physics	The Cochin College
4	Dr. Smitha Thankachan	Assistant Professor	Department of Physics	Mar Athanasius College (Autonomous)Kothamangalam
5	Ms.Manju Rajan	Assistant Professor	Department of Economics	S N COLLEGE KOLLAM
6	Viji C	Assistant Professor	Department of Physics	Maharaja's College, Ernakulam
7	DR. BOSCO LAWARENCE	Associate Professor	Department of Botany	Govt. Arts College, Thycaud, Thiruvananthapuram
8	MANJUSHA S M	Assistant Professor	Department of History	GOVERNMENT COLLEGE TRIPUNITHURA
9	Dr.Uma.P	Assistant Professor	Department of Economics	Govt College Tripunithura
10	Dr. Haripriya B B	Assistant professor	Department of Commerce	The Cochin College, Kochi-2
11	Dr.Preethy.K	Associate Professor	Department of Music	Sree Sankaracharya University of Sanskrit, Kalady
12	Ms. Mary Linsa K. S.	Assistant Professor	Department of Physics	Maharaja's College Ernakulam
13	Ms. Chaithanya Elsa Achankunju	Assistant Professor	Department of English	Mar Thoma College for Women, Perumbavoor
14	Shema Elizabeth Kovoor	Assistant Professor	Department of	Union Christian College, Aluva
15	Ms. Remya James	Assistant professor	Department of Zoology	St Joseph's College for Women, Alappuzha





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16	Renjith S.	Assistant professor	Department of History	The Cochin College, Kochi-2
17	Dr.Smitha N R	Assistant Professor	Department of Zoology	The Cochin College, Kochi
18	Dr.Jayesh Kuriakose	Assistant Professor	Department of Biotechnology	The Cochin College, Kochi -2
19	Dr. Manju V. Subramanian	Assistant Professor	Department of Zoology	The Cochin College, Kochi-2
20	LIMA SUNNY	Assistant Professor	Department of English	St. Paul's College Kalamasserry
21	Thimmaiah Bayavanda Chinnappa	Professor	Department of Management	ICASR STAREX UNIVERSITY and PIMS
22	Dr. Soney Bhageeradhan	Assistant professor	Department of English	The Cochin College, Kochi -2
23	Dr Sajeev U S	Assistant Professor	Department of Physics	Government College Kottayam
24	Dr.Menon Meera Raman	Assistant Professor	Department of Zoology	The Cochin College, Kochi -2
25	Dr. Nalinam M.	Assistant professor on contract	Department of Economics	The Cochin College, Kochi -2
26	Ms. MEENU RAJU	Assistant Professor	PG Department of Zoology	The Cochin College, Kochi-2
27	Mr.Tom Pious	Assistant Professor on Contract	Department of Economics	The Cochin College, Kochi-2
28	Ms.LINTA JOSEPH	Assistant Professor	PG Department of Zoology	The Cochin College, Kochi-2
29	Philip Sam Tharakan	Research Scholar	Department of Commerce	The Cochin College





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30	Mr. SAJITH KUMAR B	Assistant	Department	People Institute of
		Professor	of	Management Studies, Munnad
			Management	

#### Photos of the Pogramme









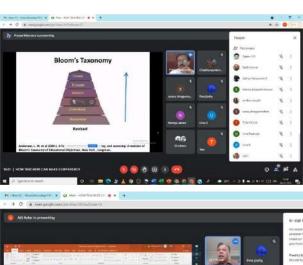
# THE COCHIN COLLEGE

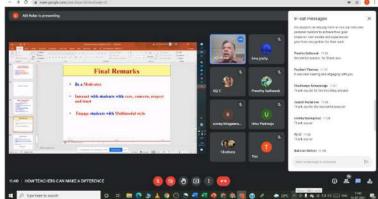
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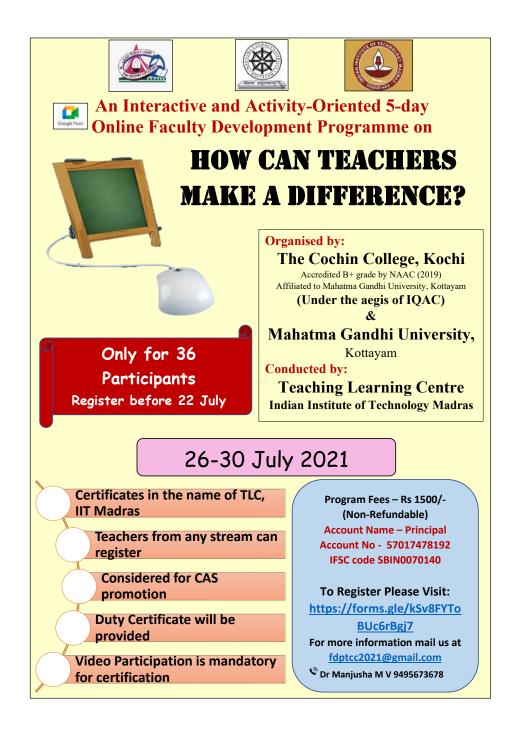
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#### The Cochin College, Kochi

The Cochin College is an arts and science college affiliated to Mahatma Gandhi University, Kottayam. The college is situated in the port city Kochi. It was started in 1967 in response to an increasing demand for higher education opportunities in West Kochi. The Cochin College is sponsored by the Cochin Education Society which was founded as a result of the joint efforts of the Indian Chamber of Commerce & Industry and the former Mattancherry Municipal Council. From its humble beginning as a junior college, the institution has grown into a centre of excellence over these years. The college is accredited at B+ Grade by NAAC in 2019. It offers 13 UG programmes, 7 PG programmes and two Ph.D programmes in Commerce and Physics. The college is recognised as CUBE- Hub (Collaborative Under Graduate Biology Education) by TIFR-Mumbai from 2018. The Cochin College has been selected under the DBT- STAR College Scheme "Strengthening of Support" category by Department of Biotechnology, Government of India in 2021.

#### Teaching Learning Centre, Indian Institute of Technology Madras

Teaching Learning Centre of Indian Institute of Technology Madras (IITM) started in 2011 and is the first of its kind in the IIT system. It is an approved TLC under the scheme of Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT), Dept. of Higher Education, Ministry of Human Resource Development (MHRD). Over these years TLCIITM has been constantly alerting the faculty about the need for a quality teaching-learning process. Through various programme. The centre assists faculty to become conversant with research-based, practically proven, widely adopted/adapted teaching learning methodologies which they can adopt in their classrooms. So far TLCIITM has conducted 123 faculty development programmes benefitting 6926 participants as on 28 February 2021.

#### Mahatma Gandhi University, Kottayam

Mahatma Gandhi University, one of the major, Universities in Kerala, is a premier educational institution that strives to fulfill the higher educational needs of the people from Central Kerala (Reaccredited by NAAC with A grade). The University was established on 2 October 1983 and has jurisdiction over the revenue districts of Kottayam, Ernakulam, Idukki and parts of Pathanamthitta and Alappuzha. The Institution offers a large number of programmes at the Undergraduate, Postgraduate, M Phil and Doctoral levels through its 17 University Departments, 1 International and Inter University Centre, 7 Inter University Centres, 10 Inter School Centres, 77 Govt./Aided Affiliated Colleges, 10 Autonomous Colleges (of which 8 are Colleges with a Potential for Excellence), 200 Unaided Affiliated Colleges and 199 Recognized Research Centres. It imparts education in the interdisciplinary as well as conventional disciplines of Science, Social Science and Humanities besides in the professional disciplines like Engineering, Technology, Legal Studies, Pedagogy, Pharmacy and Nursing.





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Features of the Faculty Development Program
"How Can Teachers Make a Difference?"
Conducted by Teaching Learning Centre, IIT Madras



#### **Preamble**

An Indian National Policy on Education document stated "No nation can rise above the level of its teachers." The importance and role of good teaching cannot be emphasized better. This faculty development program introduces the participants to the principles underlying effective and efficient teaching in either face-to-face or online modes. The contents are based on outcomes of research on the teaching-learning process, and include anecdotes, activities and discussions.

#### Learning outcomes

At the end of this faculty development program, participants will be able to explain:

- ➤ How and how much difference can a teacher make?
- > Factors that affect student learning.
- What is the first step in preparing for a course?
- Recipe for effective and efficient teaching.
- Levels of thinking at which questions for assignments, tutorials, and tests can be set. What is a good problem set and how to prepare it?
- Concepts of learning outcome and active-cooperative learning.
- ➤ How to write learning outcomes?
- ➤ How to organize teaching content and deliver it in the class?
- ➤ Content preparation, content delivery and student assessment in the online mode? · Merits of oral and written examinations.
- ➤ How often should you test students?
- ➤ How to give feedback to students on their learning?
- Concept of teaching portfolio as an evidence of teaching effectiveness. How to improve your teaching with the help of feedback from students and colleagues? What motivates students?

#### Criteria for Participation Certificate in the name of TLC, IIT Madras

Participation certificates in the name of TLC, IIT Madras will be issued to those participants who attend ALL sessions. Following will be regarded as evidence of attendance in *online* programs:

- (a) Video: The participant should turn on their video whenever asked for by the resource person and during interactions. The entire class will be split into groups of three, and each group will be assigned a number. At any time, the resource person will call out one group at random, and the members of that group should turn on their videos; all others should turn their videos off.
- (b) Notes: Each participant should take handwritten notes on A4 size papers, writing their name, session number and session name at the top of the first page. At the end of each session, they should scan these notes, name the notes file in the format First name\_session number, e.g. Lata\_1, Lata\_2, etc., and upload it at https://forms.gle/YUzpiFHfCvvtUnyo2.





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(c) **Feedback:** Each participant should provide feedback at the end of each session at <a href="https://forms.gle/HGssxJp1zaVrkJEBA">https://forms.gle/HGssxJp1zaVrkJEBA</a> (takes < 4 min).

**Number of participants:** Those *desirous of certificates* is restricted to 36 to ensure effective implementation of the above policy.

**Policy on recording of our lectures**: Our lectures are meant for the participants of our program only. These cannot be recorded and distributed to others.

#### Schedule of the Programme

Day	10-00 am to 11-30 am	2-00 pm to 3-30 pm
26 July 2021	How and how much difference can a teacher make	Learning Outcomes
27 July 2021	Active Cooperative Learning	Recipe for Effective and Efficient Teaching - 1
28 July 2021	Recipe for Effective and Efficient Teaching - 2	Assessment
29 July 2021	MOOC, Learning Management Systems, etc.	E-learning
30 July 2021	Motivation	Reflection

#### **Resource Persons**

Prof. Shreepad Karmalkar (Head TLC) Electrical Engineering Department, IITM

Prof. Edamana Prasad, Chemistry Department, IITM

Prof. C. Vijayan, Physics Department, IITM

Prof. G. Phanikumar, Metallurgical and Materials Engineering Department, IITM

Prof. Ajit Kolar (Rtd., Founder TLC), Mechanical Engineering Department, IITM

Dr. Nandini A. P, Ex-Senior Project Officer, TLC, IITM

Dr. Sanju Rani (Ex-Senior Project Officer, TLC, IITM), Asst Professor SRM Institute of Science & Technology

Dr. Richa Verma, Principal Project Scientist, CCBR, IITM





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**Organising Committee** 

Chief Patron

Sri Thomas J Vayalat Manager, The Cochin College, Kochi

Dr Geetha M

Principal, The Cochin College, Kochi Dr Sindhu K

IQAC Coordinator, The Cochin College, Kochi

Convenor

Dr Manjusha M V

Assistant Professor

Department of Physics, The Cochin College, Kochi

Coordinators

Dr Rekha P G

Assistant Professor Department of Commerce The Cochin College, Kochi Ms Reethi P

Assistant Professor Department of English The Cochin College, Kochi Dr Vineeth Kumar T V

Assistant Professor Department of Zoology The Cochin College, Kochi

**Contact Us** 



fdptcc2021@gmail.com



**Dr Manjusha M V 9495673678** 





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**Teaching Learning Center (TLC)**Indian Institute of Technology Madras Chennai 600036 India



Assistant professor, Dept. of History

The Cochin College, Kochi-2

has participated in the 5-Day Online Workshop on

How Teachers Can Make a Difference

held during July 26-30, 2021.

Prof. Shreepad Karmalkar Head, Teaching Learning Center





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email: email@thecochincollege.edu.in

**Teaching Learning Center (TLC)**Indian Institute of Technology Madras Chennai 600036 India



This is to certify that

#### **MANJU V. SUBRAMANIAN**

Department of Zoology The Cochin College

has participated in the 5-Day Online Workshop on

How Teachers Can Make a Difference

held during July 26 - 30, 2021.

Prof. Shreepad Karmalkar Head, Teaching Learning Center





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email: email@thecochincollege.edu.in

**Teaching Learning Center (TLC)**Indian Institute of Technology Madras Chennai 600036 India



This is to certify that **MANJUSHA M.V.** 

**Department of Physics** 

The Cochin College

was the Convener of the 5-Day Online Workshop on

How Teachers Can Make a Difference

held during July 26-30, 2021.

Prof. Shreepad Karmalkar Head, Teaching Learning Center





# THE COCHIN COLLEGE

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# 26 Collaboration between The Cochin College, Kochi-02 & Mahatma Gandhi University, Kottayam

• Start Date: 22/07/2022

• End Date: 29/08/2022

• Period:Seven Days

### 26.1 Seven Days FDP on "Towards a Flourishing Educator"

 $\bullet$  Date/Period: 22/08/2022 to 29/08/2022

• Number of Beneficiaries:24







# THE COCHIN COLLEGE

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#### 26.1.1 Linkage Document



No. 71720/CD 1-2/2022/CD 1

Dated: 26.07.2022

From

The DIRECTOR, COLLEGE DEVELOPMENT COUNCIL

Τo

The Principal Cochin College , Cochin

Sub:- Conduct of Faculty Development Programme - Request for Permission- Reg:-

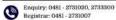
Ref:- Your Email dated 18/07/2022

I am happy to inform you that the University is pleased to grant permission to organise a Faculty Development Programme to be conducted in your institution from 23.08.2022 to 29.08.2022. Please note that the Co- Sponsorship is without any financial commitment from the part of the University. It may be noted that the 'emblem' of the University should not be used, while preparing the certificates of the programme by the Colleges.

Yours faithfully

Dr. P.T. BABURAJ
DIRECTOR (I/C)
(For The DIRECTOR, COLLEGE
DEVELOPMENT COUNCIL)

Draft #8 of File 71720/CD 1-2/2022/CD 1 Approved by DIRECTOR (I/C) on 26-Jul-2022 11:11 AM - Page











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**26.1.2** Report

Program Report (1 June 2022- 31 May 2023) Faculty Development Programme 22/8/2022-29/8/2022

Sl N o		
1	Name of the Program	TOWARDS A FLOURISHING EDUCATOR
2	Online/Offline	Online
3	Date	22/8/2022-29/8/2022
4	Time	9.30 am- 4pm (7days)
5	Organised by	The Cochin College
6	Resource person/persons	-Dr. Anu G S Associate Professor Department of Education Nagaland, Kohima.  Dr. Rossamma Philip Principal Mount Tabor Training College Pathanapuram, Kerala
7	Coordinator/con venor	Dr. Manjusha M V
8	Organising Committee	FDP Club, The Cochin College
9	Financial Assistance	DBT Star College Scheme
10	No of students participated	NIL
11	No of Faculty Participated	24
12	Public Participation (if any)	-

13	Detailed Report	An online one week FDP was organised in association with	
		MG University Kottayam and UGC-HRDC, University of	
		Kerala funded by DBT star College Scheme. The seven days	



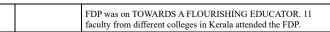


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# FEATURES OF FACULTY DEVELOPMENT PROGRAM "TOWARDS A

#### FLOURISHING EDUCATOR"

#### Preamble

An Indian National Policy on Education document stated "No nation can rise above the level of its teachers." The importance and role of good teaching cannot be emphasized better. This faculty development program introduces the participants to the principles underlying effective and efficient teaching in either face-to-face or online modes. The contents are based on outcomes of research on the teaching-learning process, and include anecdotes, activities and discussions.

### Learning Outcomes

t the end of this faculty development program, participants will be able to plain:

- · How and how much difference can a teacher make?
- · Factors that affect student learning.
- · What is the first step in preparing for a course?
- · Recipe for effective and efficient teaching.
- Levels of thinking at which questions for assignments, tutorials, and tests can be set. What is a good problem set and how to prepare it?
- Concepts of learning outcome and active-cooperative learning.
- How to write learning outcomes?
- How to organize teaching content and deliver it in the class?
- Content preparation, content delivery and student assessment in the online mode? · Merits of oral and written examinations.
- How often should you test students?
- How to give feedback to students on their learning?
- Concept of teaching portfolio as an evidence of teaching effectiveness. How to improve your teaching with the help of feedback from students and colleagues? What motivates students?





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List of Participants for the FDP "Towards a Flouring Educator" organised by 1 association with UGC-HRDC Kerala university and DBT Star Colleges, 2

	Name of the Teachers	Name of the College
1	Dr. Paulbert Thomas	The Cochin College, Kochi 2
2	Dr. Uma S.	The Cochin College, Kochi 2
3	C S PRABHA	The Cochin College, Kochi 2
	Dr. Sajeesh T. H	St. Alberts College, Ernakulam
	Thamanna K T	The Cochin College, Kochi 2
	Dr.Nayana Jose C	The Cochin College, Kochi 2
	Dr Rajani B Bhat	The Cochin College, Kochi 2
	Shinda Vargheese	The Cochin College, Kochi 2
	Amala Mary C.A	The Cochin College, Kochi 2
10	Aneesha Mary Almeida	The Cochin College, Kochi 2
	NAS. SPECIAL DESIGNATURE.	Sree Narayana Arts and Science
11	Dr. Surabhi Muthe, S	College, Kumarakom, Kottayam.
	Arathy A S	The Cochin College, Kochi 2
1000000	ANISHA ANTONY V A	The Cochin College, Kochi 2
	Stephy Simon A	The Cochin College, Kochi 2
	Dr.Kavitha V.Rajan	The Cochin College, Kochi 2
	Aswathy Reghunath	The Cochin College, Kochi 2
	Dr. Poornima C. C.	The Cochin College, Kochi 2
1000000	Dr. Anu Philip	Bharathamatha College, Thrikkakara
The second secon	Dr. Zafna Rasheed	The Cochin College, Kochi 2
	Georgina Grace	The Cochin College, Kochi 2
EDITOR	Arshad P R	The Cochin College, Kochi 2
22	Noufiya T N	The Cochin College, Kochi 2
23	Vidya joseph	The Cochin College, Kochi 2
		Sree Narayana Arts and Science
24	Reena Mol S	College, Kumarakom, Kottayam.





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27 Collaboration between Department of Electronics, The Cochin College & Maker Village, KINFRA High Tech Park, Kalamassery

• Start Date: 17/03/2023

• End Date: 31/03/2023

• Period: Two Weeks

27.1 Field Visit to Maker Village and G 20-DIA Regional Meet

• Date/Period: 31/03/2023

• Number of Beneficiaries:10







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#### 27.1.1Linkage Document



Paulbert Thomas <paulbert@thecochincollege.edu.in>

#### G20 -DIA Regional Meet @ MAKER VILLAGE

Assistant Manager Incubation . <ami@iiitmk.ac.in>
To: Paulbert Thomas <paulbert@thecochincollege.edu.in>

29 March 2023 at 09:26

Greetings From Maker Village!!!

As you are aware, India holds the G20 Presidency and will convene the G20 Leaders' Summit for the first time in the country in 2023.

Technological Transformation and Digital Public Infrastructure being one of India's G20 Priorities, the G20 Digital Innovation Alliance (G20-DIA) has been launched by the Ministry of Electronics and Information Technology (MeitY) to recognise and support innovators who have digital solutions for global impact.

In this regard, a G20-DIA Regional Meet is being organised by Maker Village on 31st March 2023 at Integrated Startup Complex, Kochi to bring together stakeholders such as government officials from MeitY including Joint Secretary and CEO MeitY Startup Hub, other delegates from Govt, investors, successful innovators, seasoned entrepreneurs, corporate leaders and others to explore opportunities for global impact.

We extend our wholehearted invitation to you for gracing this momentous occasion with your esteemed presence.

The minute-to-minute agenda would be shared with you very soon.

#### G20 -DIA Regional Meet

Date: 31.03.2023 Time: 10 AM

Venue: Maker Village, Integrated Start-up Complex, Kalamaserry, Kochi

#### **Key Highlights of G20- DIA:**

- $\cdot \quad \text{MeitY Start-up Hub is launching an application for Innovators/ Startups with digital solutions to solve global challenges and scale the solutions in \quad \text{Ed-tech, Health-tech, Agri-tech, Fin-tech, Secured Digital Properties of the properti$
- Infrastructure, and Circular Economy.

  Selected 174 start-ups will be provided mentoring support, capacity-building workshops, and investor and customer connect programs and sessions for three months before the Mega Summit in August.

  G20 DIA aims to establish multi-stakeholder partnerships among startup founders, government agencies,
- corporates, investors, mentors etc. by providing business opportunities and platforms to network and collaborate
- G20 DIA intends to Showcase the start-ups and their solutions on a global platform and provide an opportunity to meet and pitch with various investors and get recognised in the G20 -DIA eBook.

We look forward to your and your institution's participation in the event and request that you kindly revert to this email as a confirmation of your participation.

#### Regards,

Anshad K Assistant Manager (Incubation) Maker Village™ http://www.makervillage.in/ kINFRA High Tech Park, Kalamassery, Cochin 683503 location: http://bit.ly/MakerVillageLocation Mob: +917012786949



Mendulo Menon Mrudula Menon V. Principal-in-Charge The Cochin College



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27.1.2 Report

Collaboration Report: Field Visit to Maker Village and G20-DIA Regional Meet Participation

#### Introduction

The Cochin College, in collaboration with Maker Village, participated in the G20-DIA Regional Meet held at the Integrated Start-up Complex, Kalamassery, Kochi, on March 31, 2023. This collaboration aimed to expose students from The Cochin College to cutting-edge technological innovations and foster their understanding of the global digital economy. The visit included participation in the G20-DIA Regional Meet, where various stakeholders, including government officials, investors, and innovators, gathered to discuss technological transformation and digital public infrastructure.

#### **Project Details**

The collaboration was initiated through an invitation from Maker Village to The Cochin College to attend the G20-DIA Regional Meet. The event was part of India's G20 Presidency, focusing on recognizing and supporting innovators with digital solutions that can have a global impact. The Cochin College accepted this invitation its students, particularly those from the Department of Electronics, Innovation and Entrepreneurship Cell (IIC), and Young Innovators Program (YIP) attended the meet.

The list of participants included students primarily from the B.C.A., B.Sc. Chemistry, and B.Sc. Physics programs. These students had the opportunity to attend the G20-DIA Regional Meet, where they were exposed to discussions on Ed-tech, Health-tech, Agri-tech, Fin-tech, Secured Digital Infrastructure, and Circular Economy. Additionally, they learned about the various opportunities available for startups, including mentoring support, capacity-building workshops, and investor connections.





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#### **Outcome and Impact**

The collaboration was a resounding success, with students gaining valuable insights into the technological landscape and the global digital economy. The G20-DIA Regional Meet provided them with a platform to understand the challenges and opportunities in various tech sectors, inspiring them to think innovatively about their future careers.

The collaboration between The Cochin College and Maker Village also strengthened the institution's ties with the startup community, opening up potential avenues for future partnerships and student internships.

#### **Future Prospects**

Building on the success of this collaboration, The Cochin College plans to continue engaging with Maker Village and other similar platforms. Future collaborations may include more frequent field visits, workshops, and participation in tech summits, providing students with continuous exposure to the evolving digital and technological landscape.

#### Conclusion





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The collaboration between The Cochin College and Maker Village for the G20-DIA Regional Meet was a significant step in enhancing the educational experience of the students. It provided them with an understanding of global technological trends and inspired them to consider innovative solutions to global challenges. This partnership exemplifies the benefits of connecting academia with the industry, and it sets a precedent for future collaborations aimed at empowering students with the skills and knowledge necessary for success in the digital age.





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# 28 Collaboration between Department of Zoology, The Cochin College, Kochi-02 & Scopeful Bioresearch Pvt Ltd., Kalamassery

• Start Date: 13/06/2022

• End Date: 12/06/2023

• Period:One Year

### 28.1 Internship

• Date/Period: One Month

• Number of Beneficiaries:45





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#### 28.1.1 Linkage Document







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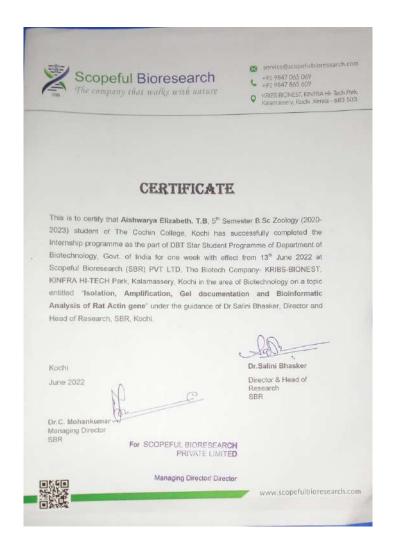


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28.1.2 Report

#### Internship Report- 2022

In October 2022, seven meritorious students from the Department of Zoology at The Cochin College participated in an internship program funded by the DBT Star College Scheme. The internship was hosted by Scopeful Bioresearch Pvt. Ltd., located at KRIBS-BIONEST, Kinfra Hi-Tech Park, Kalamassery, Cochin. The primary focus of the internship was to provide hands-on training in molecular biology techniques, specifically the isolation, amplification, and gel documentation of the rat beta-actin gene.

Scopeful Bioresearch, a biotech company under the Rajiv Gandhi Centre for Biotechnology and the Kerala Start-up Mission, specializes in developing natural products such as herbal drugs, dietary supplements, nutraceuticals, and eco-friendly biotechnology solutions. The internship provided the students with the opportunity to work in a state-of-the-art laboratory, gaining practical experience in nucleic acid isolation, PCR amplification, electrophoresis, and gel documentation.

During the internship, students were trained in subculturing rat myoblast L6 cells, isolating RNA, and conducting PCR to amplify the rat beta-actin gene. The program emphasized the importance of understanding molecular biology's role in modern research and its applications in various fields such as biotechnology, medicine, and pharmaceutical industries. The hands-on experience not only enhanced the students' technical skills but also prepared them for future careers in biotechnology and related fields.

Overall, the internship provided valuable insights into molecular research, fostering a deeper understanding of biotechnology applications and the importance of integrating academic knowledge with practical skills. The program was a significant step in bridging the gap between academia and industry, equipping the students with the expertise needed to excel in their future endeavors.





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#### Photos taken during internship







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# 29 MoU between Department of BCA, The Cochin College, Kochi: 02 and Techbyheart, Kadavanthra

• Start Date: 15/03/2024

• End Date: 14/03/2026

• Period: Two Years

### 29.1 Value Added Course on Cyber Forensic and Data Security

• Date/Period: 30 Hours

• Number of Beneficiaries: 47





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MoU29.1.1



TBH/MOU/03/24/02

15/03/2024

#### MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (the "MoU"), entered into on this on 15th March 2024 between Cochin College BCA Department With an address of Indian Bank, Cochin College Road Near South, Koovapadam, Chullickal, Kochi, Kerala 682002 Contact Persons. M. Keerthana S Contact Number: 9633981674 (here in after referred to as "THE FIRST PART"),

Techbyheart with an address of 54/2967, 3rd Floor, Kohinoor Building Temple Road, Kadavanthra, Kochi, Ernakulam, Pin- 682020 India, (hereinafter referred to as "THE SECOND PART"), also hereinafter referred to individually as "PARTY" and collectively as "THE PARTIES".

WHERE AS, the Parties desire to enter into an agreement for the delivery of specific training programmes to students admitted into the school across all disciplines, levels and years of study; WHERE AS, the SECOND PART is a company engaged in Software developing and cybersecurity testing and training sought to be engaged by the FIRST PART for the afore mentioned delivery of training; and WHERE AS, the Parties have corresponded extensively so as to arrive at mutually acceptable terms to effectuate the aforementioned objective and desire to memorialize certain terms and conditions of their anticipated endeavor;

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CP 983350

NOW THEREFORE, in consideration of the mutual promises and covenants contained herein, the Parties have read, understood and agree to be legally bound by the following

### PURPOSE AND SCOPE

The Parties intend for this MoU to provide the foundation, structure and guidelines for interpretation of any and all binding agreements including this Agreement executed between them for the purpose of conducting the business contemplated there with. No agreement or contract executed between the Parties with respect to fulfilment of the object of the collaboration as afore mentioned shall be construed contrary to the terms established here in unless expressly provided for as being overriding of specific clauses contained in this MoU.

### 2. BACKGROUND

The First Part is an Educational Institution offering courses across various disciplines and engaging students of various levels of study including both undergraduate and postgraduate. The First Part in consideration of benefit of students seeks to engage the Second Part, which is a training institute operating within the territory of India

### RESPONSIBILITIES OF THE FIRST PART

The First Part shall make available all necessary arrangements to facilitate the operations of the Second Part with respect to the furtherance of the objective of this MoU. These necessary arrangements include the following and any others not herein after included which shall be intimated to the First Part by the Second Part if theneed so arises: -

a. The First Part shall furnish the Second Part with the academic calendars, schedules and syllabus applicable to every student enrolled in the institution of the First Part who have enrolled in the course offered by the Second Part in a timely and organized fashions

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- b. The First Part shall designate such number of personnel who will function as a point of contact for all communications, correspondence collaborations and other delegated responsibilities with the Second Part.
- c. The First Part shall provide infrastructure necessary for organizing student workshops, campus ambassador selection programs, campus ambassador activities, induction drives and such other activities and programs organized by the Second Part.
- d. The First Part shall formulate such plans and organize such programs necessary to encourage the participation and subsequent enrolment of students with the courses and training programs organized by the Second Part.
- e. Upon the communication by the Second Part of a list of students who are yet to enroll in the courses and training programs offered by the Second Part, the First Part shall through the designated personnel as afore mentioned or any other person-in-charge, arrange for effective induction of such students into the concerned programs offered by the Second Part.
- f. The First Part shall also arrange for the collection of payments due to the Second Part as communicated by the Second Part both from the students as well as the management of the First Part as applicable upon the delivery of invoice by the Second Part as per the provisions of this agreement. The First Part hereby undertakes to not default or delay payments due to the Second Part for the services offered, the benefit of which has been enjoyed by the First Part and the students of the First Part.
- g. The First Part shall undertake steps necessary for the signing of subsequent agreements in furtherance of the objects of this agreement including Service Level Agreements on behalf of the management as well as the students. All agreements signed there in shall be honored by the First Part and not disputed subsequent to execution.

### 4. RESPONSIBILITIES OF THE SECOND PART

- a. The Second Part shall designate an executive who will be in charge of all communication with the First Part with respect to the programs, courses, fee structure, terms and conditions, student data and other particulars arising in the course of the services offered.
- b. The Second Part shall select campus ambassadors from among students who will be delegated tasks and responsibilities that the Second Part understands as necessary for the promotion, management, organization, improvement and continuance of the services offered.
- C. The Second Part shall furnish bills payable by the Pirst Part or the students of the Pirst Part in a timely and prompt manner as well as furnish notice at least 30 days in advance in case of changes in terms of payment and other such changes allowed herein. In the event the Eccond Part effects a bad second the Second Part shall wrive their various fees partly or fully thely invoice of fees previously agreed to be charged shall be served by the Second Part upon the Pirst Bott.
- d. The Second Part shall maintain confidentiality with respect to all student data and other data collected in the course of activities and services offered and such data shall not be share with any Third Para without prior convens of any and all persons concerned and directly affected by the sharing of data

### 5. MIITHALHADERSTANDINGS

- a. Both Parties understand the terms and conditions set forth in this Moll and agree that the terms set forth herein are legally binding and may be enforced in a competent court of law.
- E. Doth Parties shall ensure due difigence in their conduct and respect the interests of each other so as to preserve the relationship hereby created.



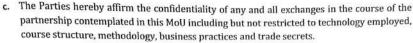


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- d. The Terms and Conditions of all agreements arising out of the collaborative venture herein set forth and including the terms of this MoU shall be kept confidential and not divulged to any third party unless in accordance with the provisions set forth herein or such divulsion is in the course of compliance with applicable laws of the principal location of business operations.
- e. The Parties shall ensure the ethical and professional conduct and strive towards establishing and maintaining fiduciary relations arising out of the relationship created bounds.
- f. The Parties understand and agree that the direct participation of the First Part is essential for the continued growth of the collaboration contemplated in this MoU including brand value, brand recognition and sales which shall be considered the primary objects of the partnership contained in this MoU. To this extent, the Second Party shall henceforth be allowed to use symbols and styling of the First Party as an endorsement of the services of the Second party as needed.
  - g. The Parties understand and agree that the safety and security of the students are of critical importance. All interactions arising out of the various provisions of this agreement as well as the activities contemplated herewith shall be monitored by the First Party when such interactions are conducted within the premises of the First Party. The Second Party shall not be held responsible for any injury to any student due to mental duress, improper conduct of students or staff and other possible liabilities that may arise during the course of the activities and programs contemplated herein. The Second Party shall ensure that all personnel directly employed by the Second Party and engaged by the First Party are made aware of the proper code of conduct so as to ensure the safety of students.
  - h. No financial commitment from any party will be assumed unless a formal approval / acceptance to that effect has been accorded through signed documents by both the parties.
  - Throughout the duration of the agreement, the first party is permitted to engage in associations and sign another contract or Memorandum of Understanding (MoU).

### 5. SESSION SCHEDULE

Session	Module	Hours	Date	Time	Faculty
Session 1		G		9.30 to 04.30	
Session 2		6		9.30 to 04.30	
Session 3		6		9.30 to 04.30	
Session 4		6		9.30 to 04.30	
Session 5	Revision and Exam	6		9.30 to 04.30	
	Total	30 Hours		1	

It is mandatory for each participant to have an attendance of 75%. The schedule for each session will be pre-structured and fixed before the start of the training program to ensure smooth and efficient learning.

### 7. WARRANTIES

- 7.1 The Parties warrant the truth of all information contained herein and the correspondence between them.
- 7.2 The Parties warrant the authority to enter into an agreement in the manner envisaged by the





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terms and conditions delineated in this MoU.

- 7.3 The Parties warrant the legality of the contractual relationship created herewith and the intention to comply with the same.
- 7.4 Nothing in this agreement shall be disputed or disregarded at any time on the grounds that it is in contravention to any by-laws or company policy or internal rules of the respective company.

### 8. FORCE MAJEURE

Neither Party shall be liable for any breach or non-observance of any term or condition of this agreement on account of force majeure which shall mean fire, explosion, acts of government and other similar circumstances beyond a Party's control.

### 9 TERMINATION

Either Party shall have the right to terminate this Agreement, before the Agreement period, by providing the other with written notice of termination at least Sixty (60) days prior to the end of such Agreement period. Neither Party shall have the right to terminatethis Agreement at any other time, unless such termination is mutually agreed to by the Parties hereto. On termination of this Agreement, both PARTIES agree to return any confidential or proprietary materials to each other, to immediately cease using each other's business names and logos and to settle any monies due within Thirty (30) days,unless otherwise agreed in writing.

### 10. DURATION AND AMENDMENT

This MOU is at-will and may be amended by mutual consent by the Parties. This MOU shall become effective upon signature by all Parties and will remain in effect until the expiration of two years from the date of execution unless this MoU is so amended to extend such period of effect or thereafter renewed.

### 11. ASSIGNMENT

Neither Party shall assign or transfer any of its rights or obligations hereunder without uneprocessor in ownership of all or substantially all of the assets of the assigning Party if the successor in ownership expressly assumes in writing the terms and conditions of this Agreement. Any such attempted assignment without written consent will be void. This Agreement shall inure to the benefit of and shall be binding upon the valid successors and assigns of the Parties.

### 12. ARBITRATION

Any and all disputes arising out of or in relation to or in connection with all other agreements henceforth executed in the course of business between the Parties or relating to the performance or non-performance of the rights and obligations set forth herein or the breach, termination, invalidity or interpretation thereof shall be settled through mutual consultations and agreements by the Parties. In the event of an impasse, the matter shall be referred to and settled through arbitration. The arbitrator shall be appointed through mutual consultation and with mutual consent. The seat of arbitral process shall be within the Territory of Ernakulam and in accordance with the Indian Arbitration and Conciliation Act, 1996. The arbitral award shall be made out in writing and be bindingon both Parties and enforceable in a court of law of competent jurisdiction.

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### 13. ENTIRE AGREEMENT

This Agreement contains the entire agreement and understanding between the Parties, superseding all prior contemporaneous communications, representations, agreements, and understandings, oral or written, between the Parties with respect to the subject matter hereof that may be construed as repugnant to the terms and conditions established in this MoU. This Agreement may not be modified in any manner except by written amendment executed by each Party hereto. All future agreements executed by the Parties with each other in the course of business shall be read with and construed in accordance with the terms contained herein and together shall constitute entire agreement. This MoU is therefore bound to be annexed into any and all subsequent agreements executed by the Parties hereto.

14. EFFECTIVE DATE AND SIGNATURE

This mou shall be effective upon the signature of the parties. In witness where of the parties here unto indicate their agreement through the signatures of their corresponding authorities.

**COCHIN COLLEGE** 

TECHBYHEART,

DEPARTMENT OF COMPUTER APPLICATION

Director

Witness:

1. Shinda Vaegheese Shinda 2. Hridya K.S Bough





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29.1.2 Report

### VALUE ADDED COURSE

### TECHBYHEART

### CYBER FORENSIC AND DATA SECURITY

**Duration: 30 Hours** 

### **Course Description:**

This syllabus is designed to provide a robust understanding of both cyber forensic techniques and data security practices, preparing students for advanced roles in the industry.

### Course Objectives:

- To provide an understanding of the principles and methodologies used in cyber forensics
- To introduce the legal and ethical aspects of cyber forensics and digital evidence handling.
- To provide students with a comprehensive understanding of data security principles, including encryption, access control, and data integrity.
- To explore various types of data breaches and the methods used to secure data in transit
  and at rest

### Course Outline:

### Module 1: Introduction to Cyber Forensics (6 Hours)

- Overview of Cyber Forensics
- Types of Cyber Crimes and Legal Framework
- Digital Evidence: Collection, Preservation, and Analysis
- Introduction to Forensic Tools and Software

### Module 2: Digital Evidence and Forensic Tools (6 Hours)

- Digital Evidence Acquisition and Imaging Techniques
- File Systems and Data Recovery Methods
- Network Forensics: Analyzing Network Traffic and Logs
- Forensic Analysis of Mobile Devices





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### Module 3: Fundamentals of Data Security (6 Hours)

- Introduction to Data Security: Concepts and Importance
- Cryptography and Encryption Techniques
- Access Control and Authentication Methods
- Data Integrity and Non-Repudiation

### Module 4: Advanced Data Security Techniques (6 Hours)

- Securing Data at Rest and in Transit
- Database Security: Securing Structured and Unstructured Data
- Data Breach Detection and Prevention Techniques
- Incident Response and Handling Data Breaches

### Module 5: Integration of Cyber Forensics and Data Security (6 Hours)

- Investigating Data Breaches Using Forensic Techniques
- Legal and Ethical Considerations in Cyber Forensics and Data Security
- Reporting and Presenting Forensic Findings

### Assessment of Outcome

- Quizzes and assignments (40%)
- Group project and presentation (30%)
- Final exam (30%)

### Reference

- "Computer Forensics: Cybercriminals, Laws, and Evidence" by Marie-Helen Maras.
- "Incident Response & Computer Forensics" by Jason T. Luttgens, Matthew Pepe, and Kevin Mandia.





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	List of Students enrolled 2023-24 for Cyber Forensic and Data Security					
SI No	Name of student	Program enrolled in the college	Certificate course code	Certificate/Value addedcourse enrolled		
1	ABHISHEK MOHAN	BCA	TECHBYHEART	Cyber Forensic and Data Security		
2	ABRAHAM BENNY	BCA	TECHBYHEART	Cyber Forensic and Data Security		
3	AIEMEN ANWAR	BCA	TECHBYHEART	Cyber Forensic and Data Security		
4	AISWARYA D	BCA	TECHBYHEART	Cyber Forensic and Data Security		
5	AISWARYA PRATHAPAN	BCA	TECHBYHEART	Cyber Forensic and Data Security		
6	AISWARYA RAJU	BCA	TECHBYHEART	Cyber Forensic and Data Security		
7	AJAL MATHEW	BCA	TECHBYHEART	Cyber Forensic and Data Security		
8	AKHIL P A	BCA	TECHBYHEART	Cyber Forensic and Data Security		
9	AKHILENDU C D	BCA	TECHBYHEART	Cyber Forensic and Data Security		
10	ALEENA ANTONY	BCA	TECHBYHEART	Cyber Forensic and Data Security		
11	AMAL CHANDRA BABU	BCA	TECHBYHEART	Cyber Forensic and Data Security		
12	AMAYA M	BCA	TECHBYHEART	Cyber Forensic and Data Security		
13	AMSHEN YESUDAS	BCA	TECHBYHEART	Cyber Forensic and Data Security		
14	ANEETTA A.P	BCA	TECHBYHEART	Cyber Forensic and Data Security		
15	ANTONY JUDE	BCA	TECHBYHEART	Cyber Forensic and Data Security		
16	ARUN JAYAPRAKASH	BCA	TECHBYHEART	Cyber Forensic and Data Security		
17	ASLAM T.T	BCA	TECHBYHEART	Cyber Forensic and Data Security		
18	ASLAM N.A	BCA	TECHBYHEART	Cyber Forensic and Data Security		
19	ATHIRA M.S	BCA	TECHBYHEART	Cyber Forensic and Data Security		
20	AZADULLAH HASEEM	BCA	TECHBYHEART	Cyber Forensic and Data Security		
21	BASMA FARZANA P.B	BCA	TECHBYHEART	Cyber Forensic and Data Security		
22	DERIN V.J	BCA	TECHBYHEART	Cyber Forensic and Data Security		
23	FARDHEEN V.M	BCA	TECHBYHEART	Cyber Forensic and Data Security		





# THE COCHIN COLLEGE

### **KOCHI - 682 002**

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31 JOEL	FONSACO	BCA	TECHBYHEART	Cyber Forensic and Data Security
32 JOSE	PH CLYWIN	BCA	TECHBYHEART	Cyber Forensic and Data Security
33 JOSE	PH THOMAS	BCA	TECHBYHEART	Cyber Forensic and Data Security
34 K.Z N	MOHAMMED FAJAR	BCA	TECHBYHEART	Cyber Forensic and Data Security
35 LENE	EN GLEN	BCA	TECHBYHEART	Cyber Forensic and Data Security
36 LIZV	INA K AUSTIN	BCA	TECHBYHEART	Cyber Forensic and Data Security
37 MAX	WIN FRANCIS	BCA	TECHBYHEART	Cyber Forensic and Data Security
38 MEE	NAKSHI M.R	BCA	TECHBYHEART	Cyber Forensic and Data Security
39 NAK	UL KRISHNA M.R	BCA	TECHBYHEART	Cyber Forensic and Data Security
40 NAN	DANA K.M	BCA	TECHBYHEART	Cyber Forensic and Data Security
41 NAN	DHANA JEERAJ	BCA	TECHBYHEART	Cyber Forensic and Data Security
42 NAV	EEN BABU M.R	BCA	TECHBYHEART	Cyber Forensic and Data Security
43 NIVE	DITHA J.C	BCA	TECHBYHEART	Cyber Forensic and Data Security
44 RIZD	HAN M.Z	BCA	TECHBYHEART	Cyber Forensic and Data Security
45 ROH	AN JOSEPH	BCA	TECHBYHEART	Cyber Forensic and Data Security
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# 30 MoU between Department of Zoology, The Cochin College, Kochi:02 and Department of Zoology, St.Joseph's College for Women, Alappuzha

• Start Date: 15/07/2021

• End Date: 31/05/2022

• Period: One Year

### 30.1 Faculty Exchange Programme

• Date/Period: One Year

• Number of Beneficiaries: 60





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### 30.1.1 MoU







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email: email@thecochincollege.edu.in



This Memorandum of Understanding shall not be construed as creating any legal or financial relationship between the Colleges, but as a statement of intent to foster the possibility of genuine and mutually beneficial collaboration.

### ARTICLE 1: OBJECT

Both Institutes agree to develop the following collaborative activities in the academic areas of mutual interest, on a basis of equality and reciprocity.

The two institutions shall seek to promote:

### a. Faculty/Staff Exchanges

- The exchange of faculty to the mutual benefit of both institutions,
- (ii) Collaboration in online teaching, research and development, and consultancy studies in the field of mutual interest,
- (iii) The exchange of academic materials and publications,
- (iv) Conducting lectures,
- (v) Undertaking joint research,
- (vi) Attachment of staff for purposes of curriculum development and review, upgrading of teaching and research skills,
- (vii)Participating in seminars, symposiums, and other types of academic discussions,

### b. Other Areas:

- (i) to exchange information on research and educational programs,
- (ii) to exchange information on teaching, learning material and other literature relevant to their educational and research programs,
- (iii) to organize jointly seminars, conferences, or workshops on topics of mutual interest and to invite each other's faculty to participate therein,
- (iv) to propose and engage jointly in research or training programs sponsored by funding agencies, and to invite each other's faculty to participate therein,
- (v) to exchange, on a reciprocal basis, students at Undergraduate level of time for purpose of education and /or research guidance

Dr. M. Geetha
Principal
The Cochin Colleprincipal-in-Char
Cochin 682002
The Cochin Collet
Kochl- 682 007



Dr Rita Latha D'couto Principal

St Joseph's College for Women Alappuzha 688001

Principal

St Joseph's College for Wo





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### ARTICLE 3: VALIDITY

The Memorandum shall remain in force from 15 July 2021 to 31 May 2022. Institutions may extend the term by written agreement signed by both after review.

### ARTICLE 4: AMENDMENTS/MODIFICATIONS

This MoU may be amended or modified by a written agreement signed by the representatives of both institutes

### ARTICLE 5: FINANCIAL SUPPORT

No financial support will be provided to faculty or students for any program listed in the exchange program.

### ARTICLE 6: TERMINATION

Either institution may terminate the MoU by giving written notice of six months in advance to the other institution. Once terminated, neither Department of Zoology, The Cochin College, Cochin or Department of Zoology, St Joseph's College for Women, Alappuzha, will be responsible for any losses, financial or otherwise, which the other institutions may suffer. However, The Cochin College, Cochin or St Joseph's College for Women, Alappuzha, will ensure that the provisions of this Memorandum shall continue to apply to all activities in progress until their completion.

Dr M Geetha Dr. M. Ges Principal The Cochin Collegencipal-in-Charge Cochin 682002

The Cochin College Knchi- 592 669



Dr Rita Latha D'couto Principal

St Joseph's College for Women Alappuzha 688001

Dr. RITA LATHA D'COUTG

Principal St Joseph's College for Women Alappuzha





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**30.1.2** Report

Report on Faculty Exchange Program between The Cochin College, Kochi, and St. Joseph's College, Alappuzha (2021-22)

#### Introduction

In the academic year 2021-22, continuing the collaboration established during the previous year, The Cochin College, Kochi, and St. Joseph's College, Alappuzha, once again participated in a faculty exchange program. Despite the ongoing challenges posed by the COVID-19 pandemic, both institutions remained committed to enhancing the educational experience of their students through online platforms. This initiative was part of the broader efforts encouraged by the government to maintain academic continuity and foster inter-collegiate cooperation.

### **Details of the Faculty Exchange Program**

- 1. Participating Institutions:
  - o The Cochin College, Kochi
  - o St. Joseph's College, Alappuzha

### 2. Mode of Instruction:

 With the continuation of remote learning practices, the faculty exchange program was conducted online. Faculty members utilized Google Classroom and Google Meet to conduct their classes, ensuring seamless delivery of content and interaction with students.

### 3. Subjects Covered:

- o The Cochin College, Kochi:
  - Faculty from The Cochin College conducted classes on Genetics and Evolution, sharing their expertise with students from St. Joseph's College through Google Classroom. The platform was used to distribute course materials, facilitate discussions, and provide feedback.

### o St. Joseph's College, Alappuzha:

Faculty from St. Joseph's College delivered lectures on the open course
 Occupational Zoology to students at The Cochin College. These sessions
 were conducted live through Google Meet, allowing for real-time
 engagement and interaction between students and instructors.

### Outcomes of the Program

- Continued Academic Enrichment:
  - The program provided students with access to specialized knowledge and diverse teaching styles, contributing to a richer learning experience.
- Sustained Digital Proficiency:
  - Both students and faculty continued to refine their digital literacy, adapting to the evolving demands of online education.
- Ongoing Collaboration:





# THE COCHIN COLLEGE

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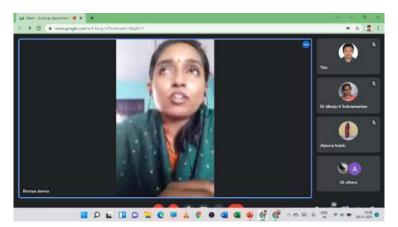
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 The success of the faculty exchange program in its second year underscored the strong academic partnership between The Cochin College and St. Joseph's College. This ongoing collaboration set the stage for future academic initiatives and exchanges.

### Conclusion

The faculty exchange program between The Cochin College, Kochi, and St. Joseph's College, Alappuzha, for the academic year 2021-22, successfully built on the foundation laid during the previous year. Through the use of online platforms, both institutions were able to continue providing quality education and strengthen their academic ties, demonstrating resilience and adaptability in the face of ongoing challenges.



Google Meet classes for Occupational Zoology – Ms Remya James, Str Josephs s college for Women Alappuzha





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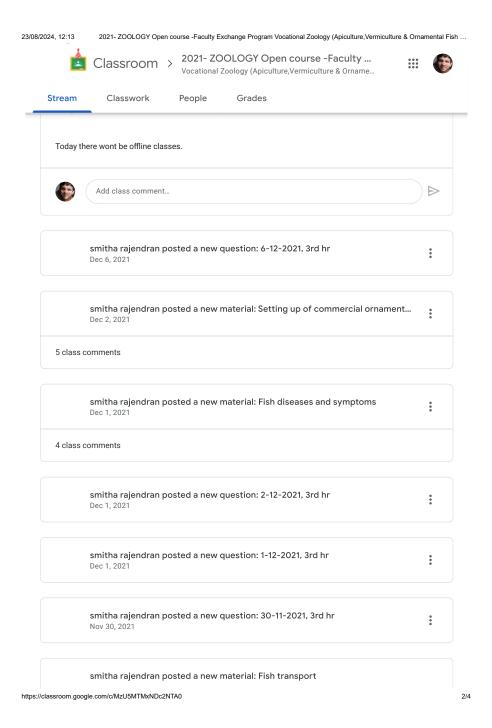


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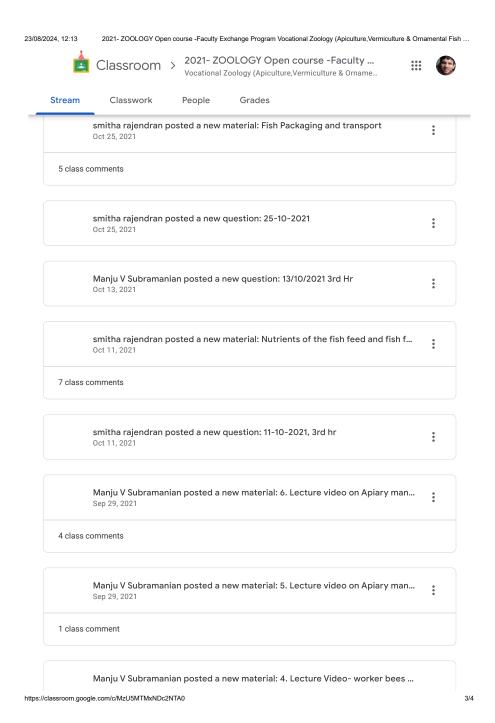


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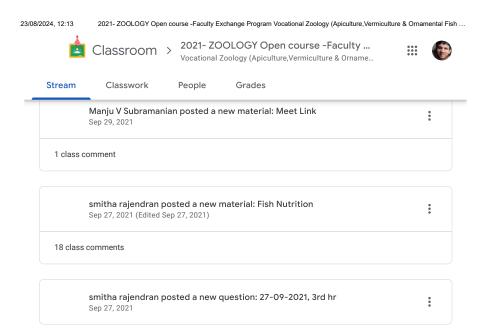


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# 31 MoU between Department of Zoology, The Cochin College, Kochi-02 and Department of Zoology, St.Joseph's College for Women, Alappuzha

• Start Date: 15/07/2020

• End Date: 31/05/2021

• Period: One Year

### 31.1 Faculty Exchange Programme

• Date/Period: One Year

• Number of Beneficiaries: 60





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### 31.1.1 MoU







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### ARTICLE 1: OBJECT

Both Institutes agree to develop the following collaborative activities in the academic areas of mutual interest, on a basis of equality and reciprocity.

The two institutions shall seek to promote:

a. Faculty /Staff Exchanges

The exchange of faculty to the mutual benefit of both institutions,

(ii) Collaboration in online teaching (iii) The exchange of academic materials and publications,

(iv) Conducting lectures,

(v) Attachment of staff for purposes of curriculum development and review

(vi) Participating in seminars, symposiums, and other types of academic discussions,

Ms. Mrudula V Menon Principal he Cochin College 20 felis 682002/5/12/2020 Value Rs Sold tog.

Dr Rita Latha L Principal

St Joseph's College for Women

K. SREENIVASAN TAMPEVENDOR, MATTANCHERRY



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### b. Other Areas:

- (i) to exchange information on research and educational programs,
- (ii) to exchange information on teaching, learning material and other literature relevant to their educational,
- (iii) to organize jointly seminars, conferences, or workshops on topics of mutual interest and to invite each other's faculty to participate therein,

### ARTICLE 3: VALIDITY

The Memorandum shall remain in force from 15 July 2020 to 31 May 2021. Institutions may extend the term by written agreement signed by both after review.

### ARTICLE 4: AMENDMENTS/MODIFICATIONS

This MoU may be amended or modified by a written agreement signed by the representatives of both institutes

### ARTICLE 5: FINANCIAL SUPPORT

No financial support will be provided to faculty or students for any program listed in the

### ARTICLE 6: TERMINATION

Either institution may terminate the MoU by giving written notice of six months in advance to the other institution. Once terminated, neither Department of Zoology, The Cochin College, Cochin or Department of Zoology, St Joseph's College for Women, Alappuzha, will be responsible for any losses, financial or otherwise, which the other institutions may suffer. However, The Cochin College, Cochin or St Joseph's College for Women, Alappuzha, will ensure that the provisions of this Memorandum shall continue to apply to all activities in progress until their completion.

Mudul Herson Ms. Mrudula V Menon Principal

The Cochin College Cochin 682002

Dr Rita L'atha D'couto Principal St Joseph's College for Women





Mendulo Menon Mrudula Menon V. Principal-in-Charge The Cochin College



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### 31.1.2 Report

Report on Faculty Exchange Program between The Cochin College, Kochi, and St. Joseph's College, Alappuzha (2020-21)

#### Introduction

During the academic year 2020-21, the educational institutions across India faced unprecedented challenges due to the COVID-19 pandemic. In response to the nationwide lockdown and the subsequent transition to online learning, the government encouraged faculty exchange programs to enhance the quality of education and share resources effectively. The Cochin College, Kochi, and St. Joseph's College, Alappuzha, actively participated in this initiative, conducting a faculty exchange program that benefited students from both institutions.

### **Details of the Faculty Exchange Program**

- 1. Participating Institutions:
  - o The Cochin College, Kochi
  - o St. Joseph's College, Alappuzha

### 2. Mode of Instruction:

 Due to the lockdown restrictions, the faculty exchange program was conducted entirely online. The faculty members utilized digital platforms like Google Classroom and Google Meet to deliver their lectures and interact with students.

### 3. Subjects Covered:

- o The Cochin College, Kochi:
  - Faculty members from The Cochin College conducted classes on Genetics and Evolution. These sessions were shared with the students of St. Joseph's College through Google Classroom, where the materials were uploaded, and discussions were facilitated.

### St. Joseph's College, Alappuzha:

Faculty from St. Joseph's College took classes on the open course
 Occupational Zoology for students of The Cochin College. These sessions
 were conducted through Google Meet, allowing real-time interaction and
 engagement.

### Outcomes of the Program

- Enhanced Learning Experience:
  - The faculty exchange allowed students from both colleges to access a wider range of expertise and perspectives in their respective subjects. The online mode ensured that the exchange continued uninterrupted despite the pandemic.

### Improved Digital Competency:

 Both students and faculty members became more adept at using digital platforms for learning and teaching. This experience was invaluable, given the ongoing reliance on online education during the pandemic.





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### Strengthened Academic Collaboration:

 The program fostered a collaborative spirit between the two institutions, paving the way for future academic partnerships and exchanges.

### Conclusion

The faculty exchange program between The Cochin College, Kochi, and St. Joseph's College, Alappuzha, during the 2020-21 academic year exemplifies how educational institutions can adapt to challenges and continue providing quality education through innovative means. This initiative not only enriched the students' learning experience but also strengthened the academic ties between the two colleges.





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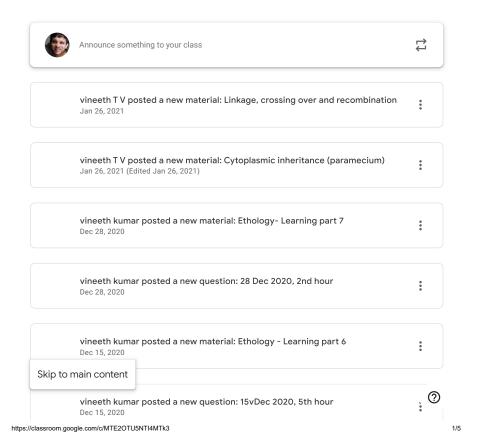
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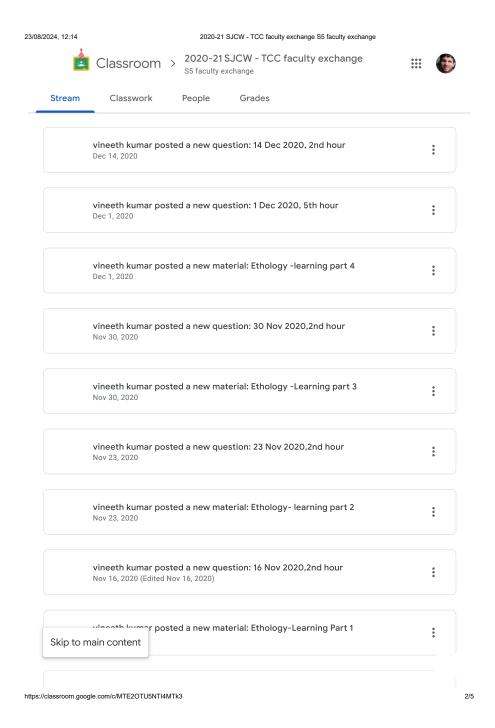


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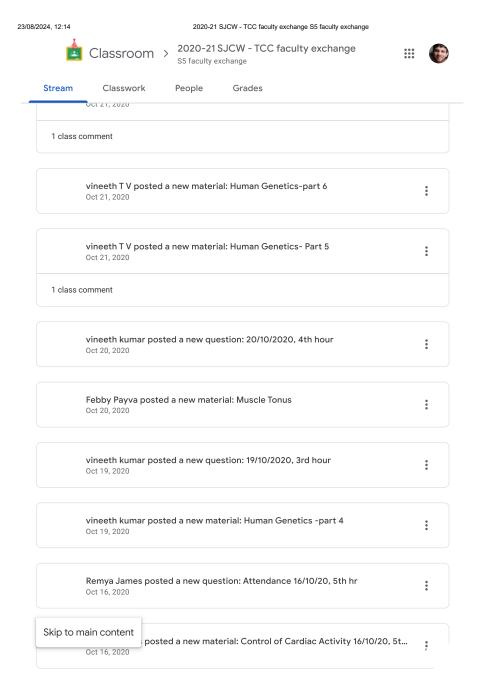


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https://classroom.google.com/c/MTE2OTU5NTI4MTk3





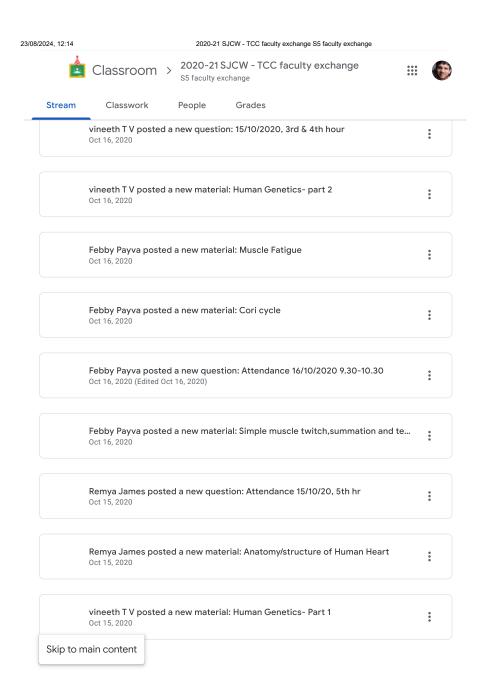


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	Febby Payva posted a new question: Attendance 15/10/2020 8.30-9.30 Oct 15, 2020	•
	Febby Payva posted a new material: Energetic of Muscle contraction and ox Oct 15, 2020 (Edited Oct 15, 2020)	•

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# 32 Linkage between The Cochin College, Kochi-02 and Echo-WWF-India

• Start Date: 12/10/2023

• End Date: 28/07/2024

• Period: 10 months

32.1 Ecowash: A Comprehensive Study on Developing Bio Enzyme Detergent, its Performance Testing and Social Influence.

• Date/Period: One Year

• Number of Beneficiaries from The Cochin College:34 students





# THE COCHIN COLLEGE

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### 32.1.1 Linkage Document



Letter of Understanding between WWF-India and The Cochin Collage

### ABOUT WWF-INDIA

WWF-India is one of India's leading conservation organizations with programmes and projects spread across the country. The organisation works towards the conservation of biodiversity, natural habitats and the reduction of humanity's ecological footprint. The mission of WWF-India is to stop the degradation of the earth's natural environment and to build a future in which humans live in harmony with nature.

### ABOUT ENVIRONMENT EDUCATION

Environment Education has been a core part of WWF India's conservation efforts since 1969. The division's vision is to inform, inspire and empower children, youth and citizens to take action for a sustainable planet. Its three-prongled strategy focusses on building environmental awareness and knowledge; developing requisite capacity and skills; and enabling action for conservation and sustainability.

### ABOUT ECHO

WWF-India engages youth in universities/ colleges to ideate, design, develop and implement their conservation projects around a yearly theme to address the most pressing environmental issues.

Environment Conservation Heroes (ECHO) is an annual innovation platform that runs through the academic year and leads to the National Summit and a rolling Panda Trophy.

At the beginning of the ECHO journey, the core team of students – representing their college is oriented in teamwork, project management, and business canvas development and familiarized with the year's theme. Each team conducts a need assessment, defines one or more problem statement(s), devise innovative solutions aligned with the yearly theme, and take action to test it.

A panel of experts on the parameters of innovation, scalability, impact, feasibility, and business model reviews the impact created by the teams.

### Theme of ECHO 2023

The theme of ECHO 2023 will engage college students to innovate and take action to advance Sustainable Development Goal 11- Sustainable cities and communities. SDG 11 aims to make cities and human settlements inclusive, safe, resilient and sustainable.

### THE ACTIVITY

WWF-India will invite colleges/universities to participate in the ECHO programme. Each college will assign one teacher convenor and four student representatives. These student representatives will act as core team and has to be selected as per the criteria provided by WWF-India.

The key roles & responsibilities of the core team are stated below:

Responsible for ECHO Project Ideation, Engagement and Implementation as per the theme





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- Mobilize and engage students from other departments to contribute to the implementation of the ECHO Project
- Attend periodic Review Meetings
- Submit Project Reports as per the timeline
- Represent College at the State Level Elimination and National Level Summit

### Steps involved

COLLEGE REGISTRATION - Upon submission of signed copy of this letter, participation of the college will be confirmed.

CORE TEAM FORMATION - The college will nominate four core student representatives and one teacher coordinator as per the criteria shared by WWF-India.

ECHO BOOTCAMP- The core team will attend a two-day workshop to get familiar and carve the ECHO Journey.

INCUBATION- The core team to invite more students from the college to ideate and develop the project proposal and action plan (aligned to the theme of the year).

IMPLEMENTATION – The core team, with other students, will pilot-test the project idea for a period of six months and submit a report.

STATE LEVEL ELIMINATION – Students will submit their detailed impact reports to present their project impact and earn a chance to enter the National Finale.

NATIONAL ECHO SUMMIT - Selected teams for National Level Summit will be invited to present their project impact to the panel of Jury.

### ECHO'S TENTATIVE TIMELINE

LoU Signing with WWF-India	August 2023	Mari			
ECHO Bootcamp	September 2023	W	1	1	1
Proposal Submission	October 2023	(6)	11		
Project Review and Implementation	November 2023-April 2024	M	Щ	11	1
State Level Elimination	May/ June 2024	1	- 1	-	10
National Level Summit	July 2024	1 - 1		7.	ŸĪ

### ROLES AND RESPONSIBILITIES

- PARTICIPATING COLLEGE/INSTITUTION:
  - The college will be responsible for nominating four youth representatives.
  - The college shall nominate a teacher convener as a point of contact to coordinate ECHO activities within the college and with WWF-India.





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- The college shall be responsible for ensuring active participation of nominated youth and teacher convenor in the workshop, review meetings and any other sessions organized under ECHO 2023.
- The college shall be responsible for ensuring administrative permissions and provide available support to students for smooth implementation of their projects.
- 5. The college shall ensure participation of nominated youth and teacher convenor in the National Level
- 6. The winner of ECHO 2023 shall return/handover the rolling panda trophy to the winning college in the subsequent year.

### WWF-INDIA:

- Conduct ECHO Orientation Workshop for nominated youth at the beginning.
- Review and approve project proposals submitted by the college core team.
- Provide mentoring support during the course of project implementation.
- 4. Review the progress and provide feedback on a bi-monthly basis to the core team.
- Organize a National Level Summit for shortlisted colleges.
- Provide Appreciation Certificate to teacher convenor and core team members upon successful and active participation in ECHO 2023.

### RECOGNITION

Recognition for students and teachers involved upon active participation and successful implementation of ECHO 2023 until the National Level Summit in July/August 2024

- Appreciation Certificate will be provided to the college and the teacher convenor.
- 2. Appreciation Certificate will be provided to the four core team members.
- Up to ten projects/colleges with the best impact from Pan-India will be shortlisted and selected to
  enter the National Level Summit. A core team of these selected colleges will receive a trophy and
  goodies.
- The college selected as the Best Achiever at the National Level Summit will be rewarded with a rolling Panda Trophy for earning the Environment Conservation Heroes 2023 Title.

On Behalf of WWF-India

A.K. Styrku MAR.

Name of the authorized signatory:

Designation:

Sr. Education Office

Signature with seal:

Date:

17 10 2023.

A.K. SIVAKUMAR

A.K. SIVAKUMAR
Sr. Education Officer
WWF-India, Kerala State Office
Thirmananthapuram

On behalf of (Name of College)
The Cochin College.

Name of the authorized signatory. M. heetha
Designation: Phine pal in charge.

Signature with seal: Date: 12-10-2023



Dr. M. Geetha Principal-in-Charge The Cochin College Kochi- 682 002







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32.1.2 Report

Report on

ECOWASH: A Comprehensive Study on Developing Bio Enzyme Detergent, Its Performance Testing, and Social Influence

Submitted to

ECHO 2023, WWF India

Submitted by Department of Zoology The Cochin College

March 2024





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#### Certificate

This is to certify that the project entitled 'ECOWASH: A Comprehensive Study on Developing Bio EnzymeDetergent, Its Performance Testing, and Social Influence 'a collaborative project with Plan@earth, NGO, Aluva, is an authentic record of work carried out by students of Second Year BSc Zoology (list attached).

Dr Smitha NR Head, Department of Zoology The Cochin College





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#### **List of Students**

l No	Name of Student	Program
1	DEVIKA SANTHOSH	B.Sc. Zoology Model I
2	KRISHNA DILEEP	B.Sc. Zoology Model I
3	RESMI RAVEENDRAN	B.Sc. Zoology Model I
4	VRINDA	B.Sc. Zoology Model I
5	ANJALI SANTHOSH	B.Sc. Zoology Model I
6	C J ANJANA	B.Sc. Zoology Model I
7	GRACE A.R	B.Sc. Zoology Model I
8	KRISHNENDU RAMESH	B.Sc. Zoology Model I
9	THANSIYA SHAMEER	B.Sc. Zoology Model I
10	UMADEVI J.S	B.Sc. Zoology Model I
11	VIVEK P V	B.Sc. Zoology Model I
12	MANU MOHAN	B.Sc. Zoology Model I
13	ANAGHA P K	B.Sc. Zoology Model I
14	SREE LAKSHMY T L	B.Sc. Zoology Model I
15	AISWARYA T B	B.Sc. Zoology Model I
16	ALIYA RAFEEK	B.Sc. Zoology Model I
17	AMRUTHA PRASAD	B.Sc. Zoology Model I
18	ANUSH KRISHNA V A	B.Sc. Zoology Model I
19	ASHLEY STEPHEN	B.Sc. Zoology Model I
20	AYANA M S	B.Sc. Zoology Model I
21	CINDERLLA ROSE A J	B.Sc. Zoology Model I
22	JUFANA FIRDOUS	B.Sc. Zoology Model I
23	MARY ANGEL A J	B.Sc. Zoology Model I
24	V A HAFIZ MOHAMMED	B.Sc. Zoology Model I
25	SANDRA SAJEEV	B.Sc. Zoology Model I
26	LEO C B	B.Sc. Zoology Model I
27	NIDHUNA RAJESH	B.Sc. Zoology Model I
28	SALWA HAREES	B.Sc. Zoology Model I
29	FATHIMA BEEVI	B.Sc. Zoology Model I
30	REEMA MARAKKAR	B.Sc. Zoology Model I
31	SAHIYATHUL NIZA . E . S	B.Sc. Zoology Model I
32	ANANDHA KRISHNAN M P	B.Sc. Zoology Model I
33	YEDUKRISHNAN K R	B.Sc. Zoology Model I
34	JOMON DUROM	B.Sc. Zoology Model I





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ECOWASH: A Comprehensive Study on Developing Bio Enzyme Detergent, Its Performance Testing, and Social Influence

The Cochin College

#### 1 Project Overview

Title: ECOWASH - A Comprehensive Study on Developing Bio Enzyme Detergent, Its Performance Testing, and Social Influence

Institution: The Cochin College, Cochin

Event: ECHO 2023

**Project Aim:** The ECOWASH project aims to introduce and promote the use of eco-friendly bio enzyme cleaners to address the problem of grey water pollution in urban areas, particularly in West Kochi.

#### 2 Project Background

The Cochin College is located in an area with a population density of 10,470 people per square kilometer, significantly higher than the state average of 859 people per square kilometer. The lack of open spaces for sewage disposal has led to grey water, containing detergents and cleaners, being discharged into drainage canals, which then flow into the Arabian Sea. These canals, once used for transportation and fishing, are now heavily polluted and support invasive species like water hyacinth.

#### 2.1 Problem Identification

- $\bullet \ \ \textbf{Pollution of Canals:} \ \ \text{The canals of West Kochi are heavily polluted with grey water from households}$
- Health Impact: Many residents experience skin problems due to the use of chemical-based detergents.
- Environmental Impact: The toxic chemicals from detergents contribute to the decline of aquatic life in the canals.

### 3 Project Objectives

- $1. \ \, {\rm Assess} \,\, {\rm the} \,\, {\rm impact} \,\, {\rm of} \,\, {\rm chemical} \,\, {\rm detergents} \,\, {\rm on} \,\, {\rm the} \,\, {\rm environment} \,\, {\rm and} \,\, {\rm dermatological} \,\, {\rm health}.$
- 2. Compare the effects of commercial detergents and bio enzymes on fish.
- 3. Encourage a behavioral shift towards the use of bio enzyme cleaners in the community.

#### 4 Methodology

### ${\bf 4.1}\quad {\bf Strategies\ and\ Implementation}$

#### 4.1.1 Capacity Building

- Conducted skill development workshops for students and community members on the theory and practice of bio enzyme preparation.
- Training sessions included hands-on demonstrations of bio enzyme preparation and discussions on the environmental and health benefits of bio cleaners.







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#### 4.1.2 Community Engagement

- $\bullet$  Conducted door-to-door surveys and distributed online question naires among 137 families in the neighboring community.
- Collected data on current cleaning practices, health issues related to detergent use, and willingness to try bio-cleaners.
- Organized community meetings and awareness programs to educate the public on the importance of using eco-friendly cleaning agents.

#### 4.1.3 Preparation of Bio Enzymes

 $\bullet$   $\mathbf{Ingredients:}$  Citrus peels (orange and lemon), jaggery, and water.

#### Procedure:

- $1.\ \mathrm{Mix}\ 1\ \mathrm{cup}$  of citrus peels,  $3\ \mathrm{cups}$  of jaggery, and  $10\ \mathrm{cups}$  of water in a large container
- 2. Allow the mixture to ferment for 60 days, stirring occasionally to release gases.
- 3. Weekly, remove the supernatant (clear liquid) and set it aside.
- 4. After 60 days, filter the liquid to obtain the bio enzyme. The citrus peels can be crushed and added to enhance the fragrance.
- The final product is an organic solution containing beneficial microorganisms and enzymes capable of breaking down organic matter into simpler, less harmful substances.

### 4.1.4 Experimental Testing

 Set up three tanks with guppy fishes to compare the effects of bio enzymes and commercial detergents (Lysol).

#### • Tank Setup:

- Tank 1: Control (clean water)
- Tank 2: Bio enzyme solution  $(5\mathrm{ml}/5\mathrm{L})$
- Tank 3: Lysol solution  $(5\mathrm{ml}/5\mathrm{L})$

#### Observations:

- Recorded the behavior and survival rates of the fishes over a period of time.
- Noted any immediate behavioral changes and long-term effects on fish survival.

#### • Result:

- Fishes in the bio enzyme tank showed no adverse behavioral changes and survived throughout the experiment.
- Fishes in the Lysol tank showed signs of distress, such as restlessness and frequent surfacing, and all died within 20 minutes.

#### 4.1.5 Community Trials

- Distributed bio enzyme samples to 25 interested families for surface cleaning and washing (used along with soap seed solution).
- Collected feedback on product effectiveness, user satisfaction, and any issues encountered (e.g., shelf life, fragrance).
- $\bullet$  Conducted follow-up surveys to assess changes in cleaning practices and health impacts.





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#### 5 Results

#### 5.1 Survey Findings

- $\bullet$  71% of the 137 surveyed families use detergents/cleaning agents more than five times a day.
- $\bullet~100\%$  of households discard grey water into common sewage.
- 55% of individuals experience skin problems such as dryness, redness, and burning sensation due to detergent use.
- 92% of the surveyed families agreed to test the bio enzyme detergent.

#### 5.2 Experimental Results

- Bio Enzyme Tank: Fishes exhibited normal behavior similar to those in the control tank and survived throughout the experiment.
- Lysol Tank: Fishes showed significant distress within 3 minutes of Lysol addition, with half dying at around 10 minutes and all dead by 20 minutes.

#### 5.3 Community Trials

- $\bullet$  Satisfaction: 95% of the families were satisfied with the bio enzyme cleaner.
- Issues: Some users noted the short shelf life and mild fragrance as areas for improvement.

#### 6 Impact

#### 6.1 Environmental Impact

Reduced chemical discharge into sewage systems, leading to a healthier urban water ecosystem.

#### 6.2 Health Impact

Decrease in skin-related issues caused by conventional detergents.

#### 6.3 Social Impact

Increased community engagement and movement towards sustainable living practices.

#### 7 Conclusion

The ECOWASH project successfully demonstrated the environmental, health, and social benefits of using bio enzyme cleaners as an alternative to chemical-based detergents. By fostering community engagement and promoting sustainable practices, the project has laid the foundation for a healthier and more sustainable unknowned.

urban environment.

Vision: The project aims to significantly reduce the ecological footprint of households and improve community health by promoting the widespread adoption of bio enzyme cleaners.

Value Proposition: By leveraging community involvement and student participation, the project edu-

Value Proposition: By leveraging community involvement and student participation, the project educates and empowers individuals to adopt more sustainable practices, positioning the community as a leader in environmental stewardship and health consciousness.



Mrudula Menon V.
Principal-in-Charge

The Cochin College



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### **OUR PROJECT FOCUS**

Our college, The Cochin College, is situated in an area having a population density of 10,470 people per square kilometre as of 2020 (859 people per square kilometre – Kerala State).

Lack of open spaces in household have caused to fill the drainage canals with sewage water containing detergents, cleaners etc

The survey conducted as a part of the project revealed that 100% of the houses surveyed empty the grey water to the canals, which finally finds its way too the Arabian Sea

Once these canals were used for transportation and fishing but now these are just grey water reservoirs



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### OUR PROJECT FOCUS



• Grey water contains all toxic chemicals from detergents, soaps, cleaners etc, this might have lead to the decline of aquatic life in the canals









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### OUR PROJECT FOCUS

 Grey water contains all toxic chemicals from detergents, soaps, cleaners etc, this might have lead to the decline of aquatic life in the canals



Unilever Issues Voluntary U.S. Recall of Select Dry Shampoos Due to Potential Presence of Benzene

> https://www.fda.gov/safety/recalls-marketwithdrawals-safety-alerts/unilever-issuesvoluntary-us-recall-select-dry-shampoos-duepotential-presence-benzene



https://enviroklenz.com/best-laundry-detergent-for-sensitive-skin/





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### OUR PROJECT FOCUS

- One solution to this problem is usage of toxic chemical free cleaners- an excellent alternative is bio enzymes.
- The main focus of this project is to introduce and encourage use of bio enzyme cleaners by the public
- The integration of bio enzymes into urban management practices can significantly contribute to achieving SDG 11 by enhancing waste management, supporting sustainable agriculture etc.
- By leveraging the natural capabilities of bio enzymes, cities can become more liveable, healthy, and sustainable







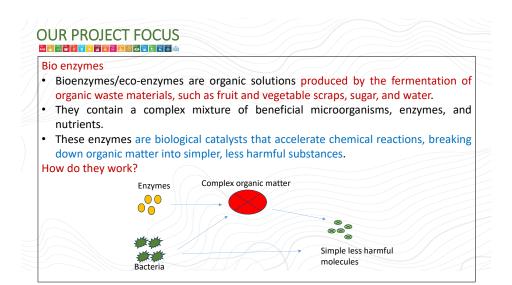
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Black and White of Bio enzymes

### **Advantages**

- Eco-Friendly
- Cost-Effective
- Versatile
- Healthier Option

### Disadvantages

- Slower Action
- Short Shelf Life
- Temperature and pH sensitive





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### VISION OF OUR PROJECT

### Objectives

- To access the impact of chemical detergents on the environment and dermatological health
- To compare the effect of commercial detergents and bio enzymes on fish
- To nurture a behavioural change in society to shift to bio-cleaners

Our vision is to promote the widespread adoption of environmentally friendly bio-cleaners, reducing the ecological footprint of households and improving community health.





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### STRATEGIES WE FOLLOWED

**Key Strategies** 

Capacity Building – skill development Community Engagement and Education

Mode of Implementation

- 1. Initial Survey and Data Collection
- Conducted door-to-door surveys and online questionnaires among 137 families in the neighbouring community.
- Collected data on current cleaning practices, health issues related to detergent use, and willingness to try biocleaners.
- 2. Training and Preparation
- Organized training workshops, covering the theory and practice of bio-detergent preparation.
- Prepared bio-detergents in bulk, ensuring consistency and quality.









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### STRATEGIES WE FOLLOWED

Comparing the effect of commercial detergent and bio enzymes on fish

- Tested the survival rate of guppy fishes (6 fishes in one tank)
- Three tanks (control, bio enzyme, Lizol) with 5 litres of water were set up for the experiment
- 5ml/5L of bioenzyme and lizol was added to the tanks
- The behavioral changes and the survival rates of the fishes were noted

Conducted small-scale trials within the community to gather feedback on product effectiveness and user satisfaction







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#### PROJECT IMPACT

#### **Analysis of Survey Results**

- Of the 137 families, >71% use detergents/cleaning agents more than 5 times a day
- Being an Urban society with space limitations all the houses (100%) discard the grey water into the common sewage.
- About 55% individuals experience skin dryness, redness, burning sensation while using detergents
- About 92% has agreed to test the bio-detergent.





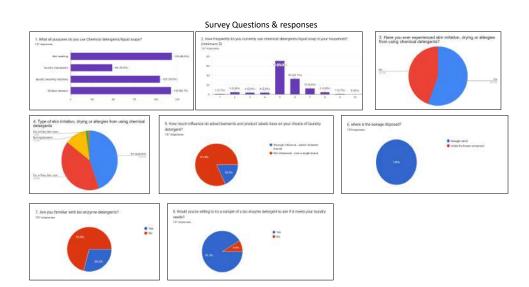
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### PROJECT IMPACT

### Comparing the effect of commercial detergent and bio enzymes on fish

- Bio enzymes did not effect the survival of the fishes even at 10ml/5L
- Their behaviour was similar to the fishes in the control tank
- Behavioural changes were observed in fishes after 3mins of addition of Lysol (5ml/5L)
- They were restless and surfaced regularly showing discomfort
- Half of the fishes died at around 10 mins
- All 6 fishes in the tank died at 20 mins of adding lysol



Behavioural changes



End of the experiment





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### PROJECT IMPACT

Conducted small-scale trials within the community to gather feedback on product effectiveness and user satisfaction.

- Bio enzyme samples were given to 25 interested families
- They used it for cleaning surfaces and washing (along with soap seed solution)
- · About 95% of the users were satisfied.
- Some complained about the shelf life and less fragrance.





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### PROJECT IMPACT

**Environmental Impact**: Reduced chemical discharge into the sewage system, leading to a healthier urban water ecosystem.

**Health Impact**: Decrease in skin-related issues caused by conventional detergents.

**Social Impact**: Heightened community engagement and collective movement towards sustainable living practices.





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### VALUE PROPOSITION

- The project aims to significantly reduce the environmental and health impacts associated with traditional cleaning agents by promoting biocleaners.
- By leveraging community engagement and student involvement, the initiative not only fosters behavioural change but also educates and empowers individuals to adopt more sustainable practices.
- This project will position our community as a leader in environmental stewardship and health consciousness, setting an example for other communities to follow.





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# Thank you





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### 33 Linkage with Shendurney Wildlife Division, Thenmala

• Start Date: 05/12/2022

• End Date: 05/01/2023

• Period: 1 month

### 33.1 Nature Education Camp

 $\bullet$  Date/Period: 15/12/2022 and 16/12/2022

• Number of Beneficiaries from The Cochin College:34 students and 3 Faculty members





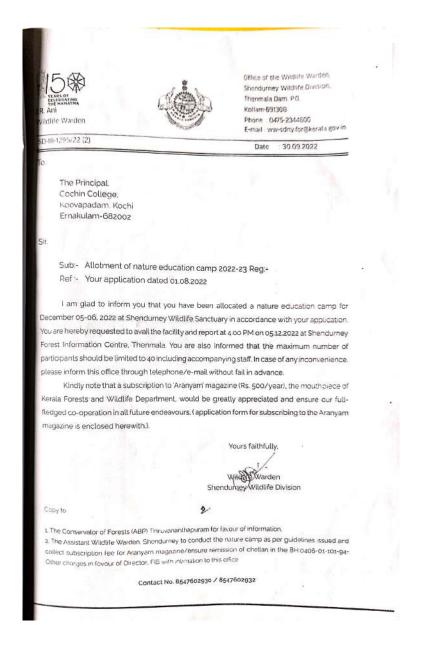
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#### 33.1.1 Linkage Document







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#### **33.1.2** Report

#### Nature Camp Report: Shendurney National Park

Organized by: Department of Zoology, The Cochin College Dates: 15th & 16th December 2022 Sponsored by: Kerala Forest Department Participants: 34 Students and 3 Faculty Members

#### Day 1: 15th December 2022

#### Morning Departure:

The nature camp commenced with an early morning departure from The Cochin College. Excitement and anticipation filled the air as 34 students and 3 faculty members boarded the bus, ready for an adventurous journey to Shenturney National Park, Kerala.

#### Arrival and Welcome:

The group arrived at Shenturney National Park by 4 PM. Upon arrival, they were warmly welcomed by representatives from the Kerala Forest Department, who provided an introduction to the park and the planned activities.

#### Awareness Sessions:

The evening was dedicated to raising awareness about the importance of conservation and the unique biodiversity of Shenturney National Park. Experts from the Kerala Forest Department conducted engaging sessions, highlighting the park's flora and fauna, conservation efforts, and the significance of preserving natural habitats.

#### **Cultural Programs:**

Following the informative sessions, students and faculty participated in cultural programs. These programs not only showcased the talents of the participants but also fostered a sense of camaraderie and connection with nature through music, dance, and storytelling.

### Day 2: 16th December 2022

#### Forest Trekking:

The second day of the camp began with an exhilarating forest trekking expedition. Led by experienced guides, the participants explored the lush green trails of Shendurney National Park. The trek provided an opportunity to witness the park's diverse wildlife, including various species of birds, butterflies, and other fauna. The serene beauty of the forest and the informative commentary from the guides made the trek an unforgettable experience.

#### Conclusion and Return:

After a day filled with adventure and learning, the group prepared for their return journey. They departed from Shenturney National Park at around 4 PM and arrived back at The Cochin College by 7 PM. The camp concluded with the participants expressing their gratitude to the





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Kerala Forest Department for sponsoring the camp and to the Department of Zoology for organizing such an enriching experience.

#### Acknowledgements

The Department of Zoology, The Cochin College, extends heartfelt thanks to the Kerala Forest Department for sponsoring the nature camp and providing valuable insights into conservation efforts. A special thanks to the faculty members and students for their enthusiastic participation, making the camp a memorable and educational experience for all. This nature camp has not only enhanced the participants' understanding of biodiversity and conservation but also instilled a deep appreciation for the natural world, which will inspire future efforts in environmental protection and sustainable living





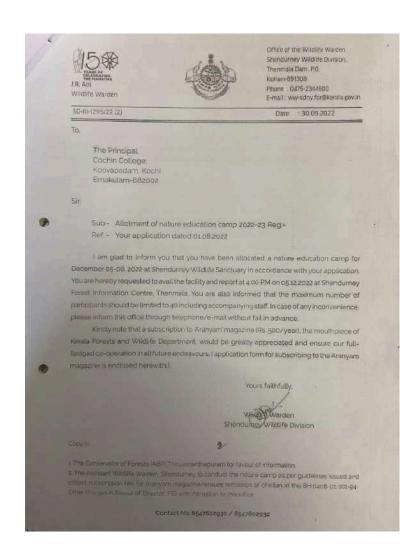
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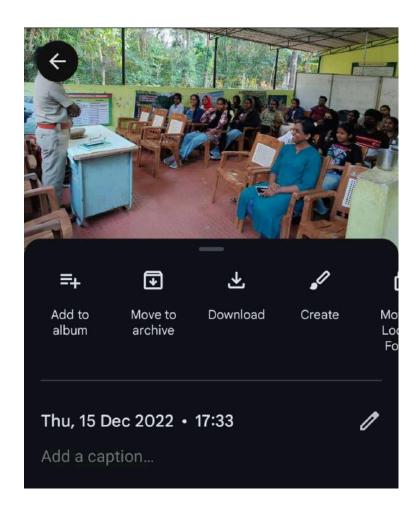
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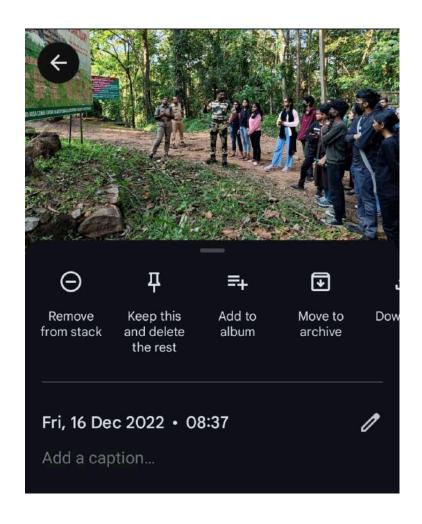
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#### Nature Camp

List of Students :34 - 8 Boys + 26 Girls

Sl No	Name	Gender	Age
1	ANUSH KRISHNA V A	Male	19
2	CINDERLLA ROSE A J	Female	18
3	SREE LAKSHMY T L	Female	19
4	ANJALI SANTHOSH	Female	19
5	AYANA M S	Female	19
6	GRACE A R	Female	18
7	JUFANA FIRDOUS	Female	19
8	KRISHNA DILEEP	Female	19
9	NIDHUNA RAJESH	Female	19
10	UMADEVI J S	Female	19
11	VIVEK P V	Male	19
12	YEDUKRISHNAN K R	Male	19
13	AISWARYA T B	Female	19
14	ALIYA RAFEEK	Female	19
15	AMRUTHA PRASAD	Female	19
16	ANAGHA P K	Female	19
17	ANANDHA KRISHNAN M P	Male	19
18	ASHLEY STEPHEN	Female	19
19	FATHIMA BEEVI	Female	19
20	JOMON DUROM	Male	19
21	LEO C B	Male	18
22	MANU MOHAN	Male	19
23	MARY ANGEL A J	Female	19
24	REEMA MARAKKAR	Female	19
25	SAHIYATHUL NIZA E S	Female	19
26	SALWA HAREES	Female	19
27	SANDRA SAJEEV	Female	19
28	V A HAFIZ MOHAMMED	Male	18
29	DEVIKA SANTHOSH	Female	19
30	RESMI RAVEENDRAN	Female	19
31	C J ANJANA	Female	19
32	KRISHNENDU RAMESH	Female	18
33	THANSIYA SHAMEER	Female	19
34	VRINDA	Female	19





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Teaching & Non-Teaching Staff

reaching & Hon-reaching Stan								
Sl No	Name	Designation	Gender	Age				
2	Dr Vineeth Kumar T V	Assistant Professor	Male	35				
3	Dr Manju V Subramanian	Assistant Professor	Female	42				
4	Mr Ebin T B	Lab Attender	Male	31				

Dr. Smitha N R Head of Department





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### 34 Collaboration with Central Marine Fisheries Research Institute

• Start Date: 20/12/19

• End Date: 19/12/2020

• Period:1 year

### 34.1 Citizen Science Programme

• Date/Period: 05/08/2019

• Number of Beneficiaries from The Cochin College: 68





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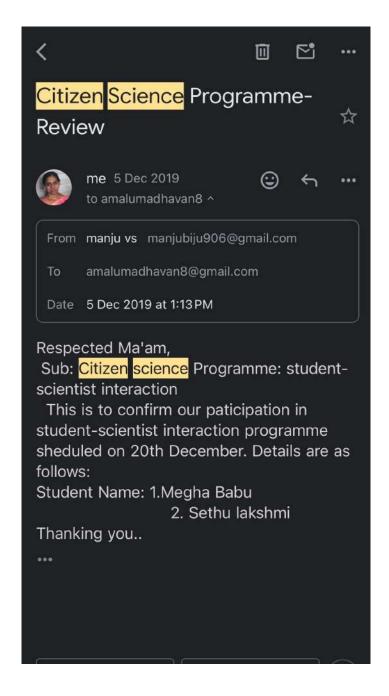
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#### 34.1.1 Linkage Document







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#### **34.1.2** Report

Report on Collaboration between The Cochin College and Central Marine Fisheries Research Institute (CMFRI)

Date of Event: 5th August 2019 Certificate Date: 10th August 2021

Participant: Ms. Surayya P.M, Department of Zoology, The Cochin College

Faculty in Charge: Dr. Manju V Subramanian

Event Overview: Ms. Surayya P.M from the Department of Zoology at The Cochin College, under the supervision of Dr. Manju V Subramanian, participated in an intensive data collection exercise as part of the "Citizen Science Programme" organized by the Central Marine Fisheries Research Institute (CMFRI), Kochi. This programme is a significant national effort aimed at improving coastal water algorithms and providing risk map advisories to coastal communities.

Project Details: The data collection was conducted in conjunction with the DST-Rehabilitation of Vibio Infested Vembanad Lake: Pollution and Solution (REVIVAL) project. This project focuses on the rehabilitation of the pollution-affected Vembanad Lake, which is plagued by Vibrio infestation. The data collected during this initiative is critical in formulating strategies and advisories for the coastal communities dependent on the lake.

Significance: This collaboration highlights the active involvement of The Cochin College's Department of Zoology in national-level scientific initiatives aimed at environmental conservation and sustainable development. The hands-on experience gained by the participant, Ms. Surayya P.M. under the guidance of Dr. Manju V Subramanian, contributes to the department's commitment to research and community service.

**Acknowledgment:** The participation and contribution of Ms. Surayya P.M in this one-day training program were officially recognized by Dr. Grinson George, Principal Scientist at CMFRI, through a Certificate of Participation.

**Institutional Impact:** The engagement in such national projects enhances the academic profile of The Cochin College and reinforces its role in addressing environmental challenges through scientific research and community involvement.

Conclusion: The collaboration between The Cochin College and CMFRI in the Citizen Science Programme serves as a model for future partnerships, providing students and faculty with opportunities to contribute to significant environmental projects that have a direct impact on the well-being of local communities.





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भारतीय कृषि अनुसंघान परिषद Indian Council of Agricultural Research केन्द्रीय समुद्री मात्स्यिकी अनुसंधान संस्थान Central Marine Fisheries Research Institute



CMFRI (कृषि अनुसंधान एवं शिक्षा विभाग, केन्त्र कृषि एवं किसान कल्याण मंत्रालय, भारत सरकार)
(Department of Agricultural Research and Education, Ministry of Agriculture and Farmers' Welfare, Govt. of India)
पोस्ट बोक्स सं. 1603, एरणाकुलम नोचं पी.औ., कोच्ची - 682 018, केरल, भारत
Post Box No. 1603, Emakulam North P.O., Kochi - 682 018, Farala, India
Phone: 91 484 2394867/2391407, Fax: 91 484 2394909/2396685, Email: director.cmfri@icar.gov.in, Web: www.cmfri.org.in

Dr. Grinson George Principal Scientist

10th August 2021

### Certificate of Participation

This is to certify that Ms. Surayya P.M, Department of Zoology, Cochin college under the faculty in charge Dr. Manju V Subramanian has participated in the one day training and contributed to the intensive data collection in "Citizen Science Programme", which is major national effort for improving the coastal water algorithm and provide risk map advisories for the coastal communities under DST-REhabilitation of Vibrio Infested VembanAd Lake: Pollution and Solution (REVIVAL) project organized by ICAR- Central Marine Fisheries Research Institute, Govt. of India, Kochi-682018, Kerala on 5th August 2019.

(Grinson George)







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35 Dr.Nayana Baiju, Assistant Professor, Department of
Biochemistry: Collaboration with Columbia University Irving
Medical Center 2020

• Start Date: 01/12/2019

• End Date: 30/06/2020

• Period: 7 months

35.1 Academic appointment as Associate Research Scientist in the Division of Surgical Sciences in the Department of Surgery, Columbia University Irving Medical Center

• Date/Period: 7 Months

• Number of Beneficiaries from The Cochin College: 01





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#### Linkage Document 35.1.1

Craig R. Smith, MD

Johnson & Johnson Distinguished Professor Valentine Mott Professor of Surgery Chair, Department of Surgery Vagelos College of Physicians and Surgeons



© COLUMBIA Surgeon-in Chief
Columbia University Irving Medical Center
New York-Presbyterian

October 25, 2019

Nayana Baiju, PhD Galaxy Luxor, Flat No T3 Ponnurunni Desom Vyttila (p.o), Kochi 682019 Kerala, India

Dear Dr. Baiju,

I am pleased to offer you an academic appointment as an Associate Research Scientist in the Division of Surgical Sciences in the Department of Surgery. As is the case with all academic appointments at Columbia University Irving Medical Center, your appointment is made in accordance with the provisions of the University's Statutes and the other rules of governance of the University, and it is contingent upon satisfactory evaluation of the attached pre-hire attestation.

Here we have put together a summary of some of the key administrative aspects of your appointment which you can use as a guide as a member of the Columbia University research community.

#### Term and Termination

- a. Your initial appointment will be from  $\underline{\text{December 1, 2019 to June 30, 2020}}$  with renewal contingent on the availability of funding. If you will not be reappointed, you will be given 90-days' notice of non-
- b. If you decide to resign from your position, you are expected to provide 90-days written notice to your Principal Investigator, Dr. Shanta Modak,
- c. When your appointment ends, we expect that you will have completed all of your responsibilities, including the timely completion of research-related materials

#### Compensation and Benefits

Your salary beginning December 1, 2019 will be set at \$57,708 to be paid in semi-monthly installments for the term of your appointment. In addition to your salary, you will be entitled to the benefits associated with Officers of Research as outlined in <a href="http://hr.columbia.edu/benefits/">http://hr.columbia.edu/benefits/</a>. Please be aware that you must sign up for health benefits within 31 days of the effective date of your appointment.

Milstein Hospital Building 177 Fort Washington Avenue MHB-7GN-435 New York, NY 10032 Telephone: 212.305.9600 Fax: 212.305.0905 crs2@cumc.columbia.edu columbiasurgery.org



Mendulo Menon Mrudula Menon V. Principal-in-Charge The Cochin College



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#### **Duties**

- Perform laboratory research that focuses on the development and investigation of infection control technologies, including research related to the development of antimicrobial films, slow release medical device coatings and wound care formulations.
- Screening of various synthetic and natural antimicrobial agents for use in the film forming polymer systems.
- High performing antimicrobials selection and their mechanism of action will be studied, evaluated and reported.
- Participate in academic activities such as attending/presenting at seminars and conferences.
- Assist the PI organize the laboratory and guide junior lab members and students.
- Perform literature searches, manage data, analyze experimental results and published data.
- Participate to the development of an extramurally funded research program by assisting PI with NIH
  grants by developing and generating data and figures.
- Other activities as assigned related to the research program of Dr. Modak or the Department
  of Surgery.

Your employment is contingent upon verification of your identity and eligibility to work in the United States. The verification process requires that you complete a Form I-9 in compliance with the Immigration Reform and Control Act of 1986.

In addition to the I-9, you will also need to complete the Invention Agreement form and the New York State mandated Notice and Acknowledgement of Wage Rate and Designated Pay Day form before your status as employee can be activated.

In order to facilitate your transition to Columbia, we also ask that you attend an orientation session as early in your employment as possible. The orientation will provide valuable information on Columbia, the resources available to you as a Columbia employee and guidance on the many benefits now available to you, including the deadlines for submitting your benefits paperwork.

Please contact Jennifer Sherman, Assistant Director of Surgery Academic Affairs, for information about pre-employment requirements and orientation. She may be reached at 212-305-0423 or by email at jq19@cumc.columbia.edu.

You will be expected to follow the protocols and procedures of the laboratory which are established by individual laboratory heads. All requests for time away from the laboratory should be discussed with your Principal Investigator and should be scheduled taking the needs of the laboratory into capsiders the

As an Officer of Research, you are subject to the policies and procedures outlined in the Faculty Handbook and other University documents. A copy of the Handbook is located at <a href="http://www.columbia.edu/cu/vpaa/handbook/">http://www.columbia.edu/cu/vpaa/handbook/</a>. You may also wish to review and avail yourself of the resources made available by the University's Office of Postdoctoral Affairs at <a href="http://www.columbia.edu/cu/postdocs">http://www.columbia.edu/cu/postdocs</a>.

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We are excited at the prospect of your joining Columbia and would be delighted if you choose to accept our offer. If you are in agreement with the terms outlined above, please sign in the space provided below and return a copy of this letter and the pre-hire attestation by email to Jennifer Sherman.

If you have any questions or need additional information, do not hesitate to contact me.

Sincerely,	
Shankordelec	
Shanta Modak, PhD	
Principal Investigator	
anfant	
Craig R. Smith, MD	
Chair, Department of Surgery	
I accept the appointment under the terms set for	orth above.
Nayana Baiju, PhD	Date

Milstein Hospital Building 177 Fort Washington Avenue MHB-7GN-435 New York, NY 10032 Telephone: 212.305.9600 Fax: 212.305.0905 crs2@cumc.columbia.edu columbiasurgery.org





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#### 35.1.2 Report

- 1 Dr. Nayana Baiju, Assistant Professor, Department of Biochemistry) -Collaboration with Columbia University Irving Medical Center (2019-2020)
- 1.1 Area of Research: Antimicrobial Research and Infection Control Technologies
  - Details: Dr. Nayana Baiju, a faculty member at The Cochin College, has been actively involved in collaborative
    research with Columbia University Irving Medical Center, New York, during December 2019-June 2020. As an
    Associate Research Scientist in the Division of Surgical Sciences in the Department of Surgery, she worked under
    the guidance of Dr. Shanta Modak. Her research focused on the development of infection control technologies,
    including antimicrobial films, slow-release medical device coatings, and wound care formulations
  - Outcome: This collaboration has led to several patents awarded between 2016 and 2020, including compositions for skin and surface disinfectants containing botanicals, broad-spectrum natural preservative compositions, and biofilmresistant surfaces. The partnership has also resulted in high-impact publications and presentations at international conferences, significantly contributing to the field of infection control and antimicrobial research.
- 1.2 Collaborative Patents and Research Projects (2016-2020)
  - Patent Awards: Dr. Nayana Baiju has co-authored multiple patents with collaborators at Columbia University, demonstrating the successful outcomes of her research efforts. Notable patents include:
    - Skin and Surface Disinfectant Compositions Containing Botanicals Patent No. US 9511040 B2
       (Dec 6, 2016)
    - Broad Spectrum Natural Preservative Composition Patent No. 9497975 B2 (Nov 22, 2016)
    - Biofilm Resistant Surfaces Patent No. 9981069 B2 (May 29, 2018)
  - Research Impact: These patents, awarded between 2016 and 2020, represent significant advancements in antimicrobial technologies and have applications in various industries, including healthcare and consumer products. The collaborative research has positioned The Cochin College as a contributor to cutting-edge scientific developments.







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#### **Patents Awarded**

- 1. Skin and Surface Disinfectant Compositions Containing Botanicals Shanta M. Modak, Nayana Baiju, Lausepina Caraos. Patent No US 9,511,040 B2 Dec 6, 2016
- 2. Broad spectrum natural preservative Composition Shanta M. Modak, Santhosh Kumar Dongre, Nayana Baiju, Lausepina Caraos. Patent No 9,497, 975 B2, Nov 22, 2016
- Antimicrobial compositions containing low concentrations of Botanicals Shanta M. Modak, Nayana Baiju, Lausepina Caraos. Patent No. 9687429 June 27, 2017
- 3. Botanical Antimicrobial Compositions Shanta M. Modak, Santhosh Kumar Dongre, Nayana Baiju, Lausepina Caraos. Harikrishnan Ramachandran Patent No 9,968101 B2 , May 15, 2018
- 4. Biofilm Resistant Surfaces Shanta M. Modak, Arnab kumar Ghosh Santhosh Kumar Dongre, Ronald Citron , Nayana Baiju, Patent No 9,981,069 B2, May 29, 2018
- 5. Skin and Surface Disinfectant Compositions Containing Botanicals Shanta M. Modak, Nayana Baiju, Lausepina Caraos. Patent No. 10,542,760 Jan 28, 2020





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     (Dec 6, 2016)
  - Broad Spectrum Natural Preservative Composition Patent No. 9497975 B2 (Nov 22, 2016)
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- 2. Broad spectrum natural preservative Composition Shanta M. Modak, Santhosh Kumar Dongre, Nayana Baiju, Lausepina Caraos. Patent No 9,497, 975 B2 . Nov 22, 2016
- 6. Antimicrobial compositions containing low concentrations of Botanicals Shanta M. Modak, Nayana Baiju, Lausepina Caraos. Patent No. 9687429 June 27, 2017
- ${\bf 3.\ Botanical\ Antimicrobial\ Compositions\ Shanta\ M.\ Modak,\ Santhosh\ Kumar}$ Dongre, Nayana Baiju, Lausepina Caraos. Harikrishnan Ramachandran Patent No 9,968101 B2, May 15, 2018
- 4. Biofilm Resistant Surfaces Shanta M. Modak, Arnab kumar Ghosh Santhosh Kumar Dongre, Ronald Citron , Nayana Baiju, Patent No 9,981,069 B2, May 29,
- 5. Skin and Surface Disinfectant Compositions Containing Botanicals Shanta M. Modak, Nayana Baiju, Lausepina Caraos. Patent No. 10,542,760 Jan 28, 2020





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# 36 MoU between Department of Economics, The Cochin College, Kochi: 02 and Kerala Economic Association

• Start Date: 19/06/2021

• End Date: 18/06/2021

• Period: Three Years

36.1 A webinar titled "Reproductive Health and Rights - Impact of Pandemic" was organized in observance of World Population Day

• Date/Period: 11/07/2021

• Number of Beneficiaries from The Cochin College: 108

36.2 Public lecture by Professor Prabhat Patnaik on "Kerala Economy in Transition:Reflection on Kerala's Development Strategy."

• Date/Period: 09/07/2021

• Number of Beneficiaries from The Cochin College: 110





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#### 36.2.1MoU



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MEMORANDUM OF UNDERSTANDING BETWEEN The Department of Economics, The Cochin College, Kochi-2 AND Kerala Economic Association, Reg. No. KNR/CA/600/2013

This Memorandum of Understanding (MoU) is entered into on this 19th day of June, 2021. by and between the Department of Economics, The Cochin College, Kochi-2 (hereinafter referred to as "The Cochin College"), and the Kerala Economic Association (hereinafter referred to as "KEA"), collectively referred to as "Parties".

#### Preamble

The purpose of this MoU is to establish a collaborative partnership between The Cochin College and KEA to promote academic excellence, research, and professional development in the field of Economics.

#### 1. Objectives of the Collaboration

1. Joint Seminars and Workshops: The Parties agree to organize and conduct seminars. workshops, and conferences on contemporary economic issues, involving experts, academicians, and industry professionals.

Research Collaboration: The Parties will collaborate on research projects that address key economic challenges, with an aim to publish findings in reputed journals and contribute of policy-making. Precise pal the foch tollege

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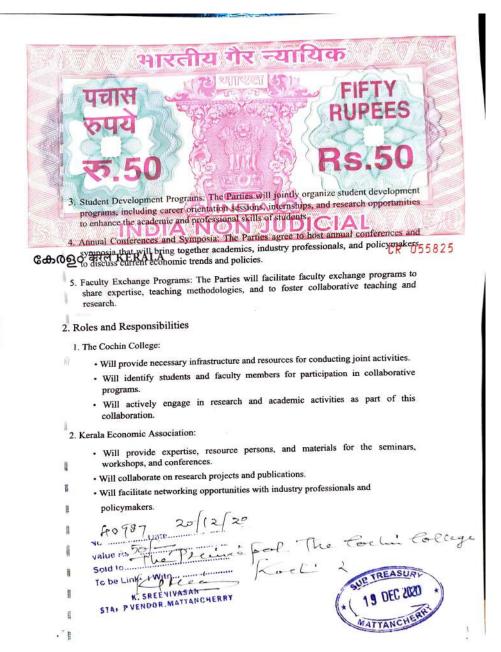
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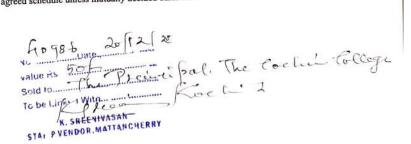


കേരളം Ratice The ICC will be responsible for planning, executing, and monitoring the 55824

- The JCC will meet at least twice a year to review progress, plan future activities, and resolve any issues that may arise.
- 4. Financial Arrangements
  - The financial responsibilities for each activity will be mutually agreed upon by the Parties prior to the commencement of the activity.
  - Any costs incurred during the collaborative activities, including travel, accommodation, and other related expenses, will be shared as per the agreement between the Parties for each specific event.

### 5. Duration and Termination

- This MoU will come into effect from the date of signing and will remain in force for a period of three (3) years.
- Either Party may terminate this MoU by giving three (3) months' written notice to the other Party. In the event of termination, ongoing activities will be completed as per the agreed schedule unless mutually decided otherwise.







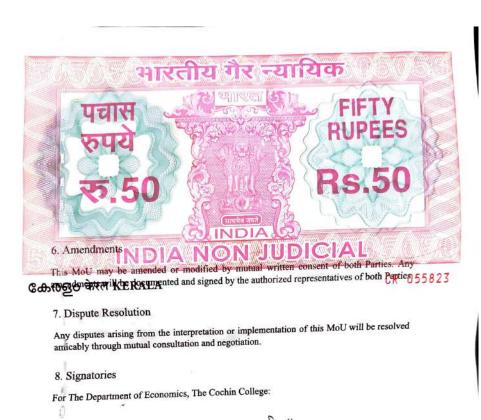
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Dr. Sindhu K
Head, Department of Economics
The Cochin College
Date: 19/06/2021

Associate Professor & Head
Department of Economics
The Cochin College, Kechi- 2

For Kerala Economic Association:

Dr. Priyesh CA
Geheral Secretary, Kerala Economic Association
Date: 19/06/2021

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**36.2.2** Report

### Report on Collaboration between The Department of Economics, The Cochin College, and Kerala Economic Association

The Department of Economics at The Cochin College, Kochi-2, has established a collaborative partnership with the Kerala Economic Association (KEA) through a Memorandum of Understanding (MoU) signed on June 19, 2021. This partnership aims to promote academic excellence, research, and professional development in the field of Economics. The collaboration encompasses organizing seminars, workshops, and conferences, alongside joint research projects, student development programs, and faculty exchange initiatives.

Since the initiation of this partnership, the following key programs have been successfully conducted:

Webinar on World Population Day (July 2021):

A webinar titled "Reproductive Health and Rights - Impact of Pandemic" was organized in observance of World Population Day on July 11, 2021. The event featured distinguished speakers, including Prof. Dr. P. S. Nair, and was chaired by Prof. K. J. Joseph, President of KEA. Students and faculty members of The Cochin College actively participated in the webinar, contributing to the discussions and gaining valuable insights. Lecture on Kerala's Development Strategy (July 2021):

Another significant event was a public lecture by Professor Prabhat Patnaik on "Kerala Economy in Transition:
Reflections on Kerala's Development Strategy." The lecture was well-attended by both students and faculty members
from The Cochin College, with Dr. Sindhu Krishnan serving as the moderator, facilitating a rich exchange of ideas. These
programs highlight the active engagement of both students and faculty from The Cochin College in the collaborative
activities with KEA, fostering an environment of academic enrichment and professional development. The department
looks forward to furthering this partnership to achieve its goals of academic excellence and innovation.





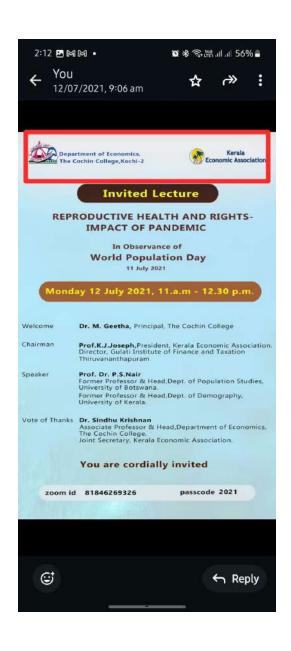
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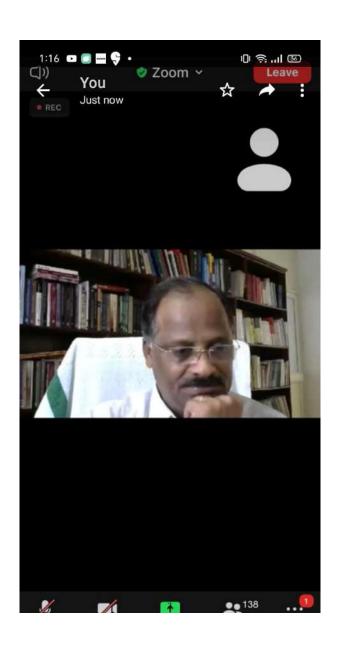
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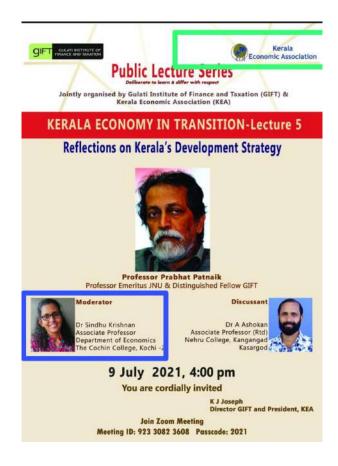
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# 37 MoU between Pvt Merits Biolabs, Pulikeel Building, Bypass, Kochi and Department of Zoology, The Cochin College, Kochi-02

• Start Date: 21/12/2023

• End Date: 31/05/2024

• Period: Six Months

### 37.1 B.Sc Project

 $\bullet$  Date/Period: 05/06/2023 to 29/12/2023

• Number of Beneficiaries from The Cochin College: 37 Students





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#### 37.1.1 MoU



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CR 055828

#### Memorandum of Understanding

Between

PVT Merit Biolabs, Pulikeel Building, Bypass, Kochi And

Department of Zoology, The College College, Cochin 682006

This memorandum of understanding made for 6 months (from December21st 2023 to 31-May 2024) between PVT Merit Biolabs, Kochi (here in after referred to as PVT MERIT BIOLABS) and Department of Zoology, The Cochin College, herein after referred to as Dept.) Witnessed as follows: RECOGNISING the mutual interest in the fields of research, development, education, training, transfer of technology and dissemination of knowledge to the students of Dept. on a long term basis HEREBY agree to establish collaboration according to terms and conditions set out in the articles following hereunder. The two institutions in the Memorandum of Understanding will be PVT MERIT BIOLABS, Kochi & and Department of Zoology, The Cochin College.

CONTINUE OF THE COUNTY OF THE

To be Links + With

K. SREENIVASAN STAI PVENDOR.MATTANCHERRY 19 DEC 2023 \*





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### ARTICLE 1-FIELD OF CO-OPERATION

Co-operation between the two institution may be established within any field related to science and technology of mutual interest and in particular in the fields of research, development, education, training and dissemination of knowledge to the students of Department on a long term basis .

#### ARTILE 2-ACADEMIC RESEARCH PROJECTS & TRAINING PROGRAMMES

- 1, Department will encourage students to join PVT Merit Biolabs for carrying out their Academic
- 2. The participating students will continue as students for degree of their parent Institution (Dept.) and will be enrolled as affiliate (or non-degree) students in the host institution (PVT MERIT BIOLABS).
- 3. For every student under Course program, the host institution will send Academic project work reports of the students in the courses to the parent in hitution at the end of the tenure/term.

STAL PVENDOR MATTANCHERRY





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CR 055829

 Each student will be sent by the Dept. for the course program for a mutually approved duration of time.

5. The Dept. will nominate students for the course program, and forward relevant data concerning the students to the host institution. The host institution will decide on the acceptability of the student's nominated, and identify an appropriate supervisor. It is expected that the host institution will accept the nomination except in extraordinary circumstances; and in such cases the parent institution will submit another application for consideration.

6. Every student under the program shall pursue their research program which is developed in consultation with the parent institution, and which is not in conflict with the regulations of the host institution. The appointed supervisor at the host institution will provide a report on the student to the parent institution on the completion of his/her tenure/term. However, the two supervisors will jointly guide the students, until they complete their theses and are awarded degrees.

To be With... ..... ....

STAL PVENDOR MATTANCHERRY

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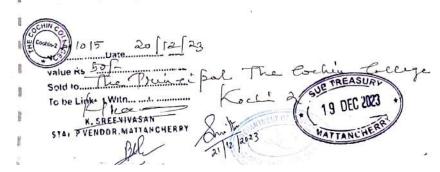


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CR 055851



- $7_{\!\! k}$  Each student will have the rights and responsibilities enjoyed by other students on the host campus.
- 8. The host institution will provide assistance to students in finding appropriate accommodation.
- 9. Project fees of students have to be paid to the host institution, before the start of the academic project and no fee needs to be paid at the parent institution.
- 10. The faculty concerned of the Department will be responsible for arranging the study program of the student.
- 11. PVT Merit Biolabs will provide various training programmes for the benefit of the students in the dept. for a fees mutually agreed upon by the two institutions in the Department premises. The Dept. shall provide space and other amenities for providing such training programmes and the Faculty & course materials will be provided by Merit.







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#### ARTICLE-3 MANAGEMENT AND ADMINISTRATION

- Negotiation, implementation and co-operation of the Memorandum of Understanding fall under the responsibility of PVT Merit Biolabs, Kochi and department of Zoology, The Cochin College
- 2. Issues about specific activities including rights and obligations of each party shall be notified or communicated to the offices mentioned above
- 3. The contact person mentioned above can nominate a member of the staff from within their institutions to co-ordinate the activities.
- 4. This memorandum of Understanding shall have a duration of three years and renewable for another three years, unless either party gives notice of termination not later than three months prior to the expiration of the existing Memorandum of Understanding. However, either party can also terminate by giving notice of termination not less than six months.
- The Memorandum of Understanding will take effect upon ratification by the Proprietor of PVT Merit Biolabs and Head of Department Zoology, The Cochin College

FOR PVT MERIT BIOLABS, KOCHI

Signature:

21 December 2023

FOR DEPARTMENT OF ZOOLOGY

Signature:

21 December 2023









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#### 37.1.2 Report



# 38 Dr. Liance Mathew, Assistant Professor, Department of Commerce: Linkage with National Institute of Securites Market

• Start Date: 23/08/2023

• End Date: 23/08/2024





# THE COCHIN COLLEGE

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### 38.1 Financial Education Programmes

- Date/Period: 10 hour Training sessions for a period of one Year
- Number of Beneficiaries from The Cochin College: 120 students

### 38.1.1 Linkage Document

National Institute of Securities Markets



Certificate of Empanelment as NISM Resource Person For Kotak Securities Financial Education Program - "Kona Kona Shiksha"

General Manager, NISM Tel No: 02192 660001 Email: sanjeev.bajaj@nism.ac.in

> N/SO/KERA/119 23-Aug-2023

#### Dr. Liance Mathew

Panakkal House, House Number: 5/1207, Kombaramukku P.O, Mattancherry, Kochi Ernakulam

Ernakul 682002 Kerala



#### Madam / Sir,

- Please refer to our interactions with respect to enrolling you as Resource Person (RP) for NISM –
  Kotak Securities CSR ("Kona Kona Shiksha") project. This was followed by your training during
  June 2021.
- 2. We are pleased to certify you as NISM's RP for conducting Investor Financial Education session at various colleges. You are called upon to spread Financial education by conducting Financial Education Programs of 10 hours duration for the benefit of for students who are pursuing final year of graduation and post graduate courses as per the Operational Guidelines of NISM as amended from time to time.
- 3. Accordingly, this Kotak Securities CSR project executed by NISM on Financial Education for young citizen endeavors to impart participants with a better understanding of securities market. The program will also make them aware about the career opportunities available in Securities Markets. The Kona Kona Shiksha Program would cover the following topics (amongst others):
  - i. Importance of Investments
  - ii. Introduction to Securities Markets;
  - iii. Primary Markets and Secondary Markets;





# THE COCHIN COLLEGE

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- iv. Mutual Funds;
- v. Precautions for Investing;
- vi. Investor Protection and Grievances Redressal Mechanism;
- vii. Career opportunities in securities markets
- viii. Any other topic as approved by NISM.
- 4. In line with the guidelines, you are requested to conduct Financial Education Programs at the colleges of your respective cities. NISM may also instruct to conduct similar program at the college identified by NISM. You may organize and conduct this 10 hours at a mutually convenient date and time as decided between you and respective college authorities, and intimate NISM at least 30 days in advance. The training program shall be interactive in nature and would be for duration of about 10 hours. NISM's educational material shall be distributed free of cost to the participants. As a NISM empanelled Resource Person, you shall not charge any honorarium for any program conducted under this initiative, from the participants or from the college authorities.
- As an empanelled RP, you will abide by the NISM Guidelines and terms and conditions associated with this program as amended from time to time.
- It is informed that your name as NISM empanelled Resource Person has been made available on NISM Website. https://www.nism.ac.in
- For any further information related to empanelment and post program queries, please contact Shri
   Aamir Sayyad,Email- aamir.sayyad@nism.ac.in. We look forward to your kind co-operation in
   this regard.
- 8. This certificate is valid from 23-Aug-2023, initially for a period of one year i.e upto 23-Aug-2024.

Yours sincerely,

Sanjeev Bajaj

General Manager, NISM

Encl: Terms and Conditions of RPs for NISM - Kotak Securities CSR project.





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Rajagiri College of Social Sciences (Autonomous)

### **Investment Awareness Program**

Sponsored by Securities and Exchange Board of India (SEBI)
and National Stock Exchange (NSE)

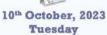


### Dr. Liance Mathew

### **Approved Trainer**

SEBI (Securities and Exchange Board of India) NISM (National Institute of Securities Market) NSE (National Stock Exchange)









For Teaching: 2.00 pm to 3.00 pm @ Golden Aureole Hall For Non-teaching: 3.00 pm to 4.00 pm @ GLC

Hill Campus, Kalamassery





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#### 38.1.2 Report

#### 3 Associateship of Dr. Liance Mathew with NISM-2023 0nwards

Dr. Liance Mathew, Assistant Professor, Department of Commerce, has been empanelled as a Resource Person (RP) by the National Institute of Securities Markets (NISM) for the Kotak Securities Financial Education Program - "Kona Kona Shiksha." This association, which commenced on 23rd August 2023, underscores Dr. Mathew's expertise in financial education and her commitment to spreading financial literacy among young citizens. The program is part of a Corporate Social Responsibility (CSR) initiative by Kotak Securities and is executed by NISM to educate students on the importance of investments, the functioning of securities markets, and related topics.

#### 3.1 Overview of NISM and "Kona Kona Shiksha" Program

The National Institute of Securities Markets (NISM) is an educational initiative of SEBI (Securities and Exchange Board of India) that focuses on enhancing the quality of securities markets through knowledge dissemination and capacity building. The "Kona Kona Shiksha" program is a CSR project by Kotak Securities aimed at imparting financial education to young citizens, particularly students nearing graduation. The program's goal is to provide participants with a better understanding of the securities markets and to inform them about various career opportunities in this field.

#### 3.2~ Dr. Liance Mathew's Role as a Resource Person

As an empanelled Resource Person, Dr. Liance Mathew is responsible for conducting Investor Financial Education sessions at various colleges. These sessions are designed to benefit students in their final year of graduation and postgraduate courses. Dr. Mathew's role includes:

- Conducting Financial Education Programs: Dr. Mathew will organize and conduct 10-hour training sessions
  that cover a range of topics related to the securities markets. These topics include:
  - Importance of Investments
  - Introduction to Securities Markets
  - Primary Markets and Secondary Markets
  - Mutual Funds
  - Precautions for Investing
  - Investor Protection and Grievances Redressal Mechanism
  - Career Opportunities in Securities Markets
- Interactive Teaching Methodology: The training programs will be interactive in nature, ensuring that participants are actively engaged and can apply the concepts learned in practical scenarios. NISM's educational material will be distributed free of cost to the participants, making it accessible to all.







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No Honorarium Policy: As per the guidelines provided by NISM, Dr. Mathew will not charge any honorarium
for conducting these sessions. This policy ensures that the focus remains on the dissemination of knowledge rather
than on financial compensation.

Dr. Mathew's association with NISM as a Resource Person is a significant achievement that highlights her expertise in the field of financial education. Her involvement in the "Kona Kona Shiksha" program aligns with her commitment to empowering students with the knowledge needed to navigate the financial markets effectively. Through her efforts, students will gain valuable insights into investment strategies, market functioning, and the protections available to investors, thereby preparing them for a financially secure future.

#### 3.3 Terms and Duration of the Association

The certificate of empanelment is valid from 23rd August 2023 and will initially cover a period of one year, up to 23rd August 2024. Dr. Mathew is expected to adhere to the NISM Guidelines and the terms and conditions associated with the program. Her name has been made available on the NISM website as an empanelled Resource Person, reflecting her official status within this prestigious initiative.





Mrudula Menon V.
Principal-in-Charge
The Cochin College

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Rajagiri College of Social Sciences (Autonomous)

### **Investment Awareness Program**

Sponsored by Securities and Exchange Board of India (SEBI) and National Stock Exchange (NSE)



### Dr. Liance Mathew

### Approved Trainer

SEBI (Securities and Exchange Board of India) NISM (National Institute of Securities Market) NSE (National Stock Exchange)







For Teaching: 2.00 pm to 3.00 pm @ Golden Aureole Hall For Non-teaching: 3.00 pm to 4.00 pm @ GLC

Hill Campus, Kalamassery

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39 Dr.Rajani B Bhat, Assistant Professor, Department of Commerce: Linkage with Mahatma Gandhi University

• Start Date: 21/08/2023

• End Date: 21/08/2026

• Period: Three Years

39.1 Subject Matter Expert at the Mahatma Gandhi University Centre for Online Education

• Date/Period: Three Years

 $\bullet\,$  Number of Beneficiaries: 62





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#### 39.1.1 Linkage Document

#### Memorandum of Agreement

The SME hereby agrees to deliver course content for the courses/course modules assigned upon mutual concurrence via e-mail by the University, and deliver the academic resources and content as per the guidelines indicated and any future amendments or updates thereof as proposed in documented form by the University during the period of validity of this agreement.

The Online Degree Programmes offered by University's COE at Bachelors (3 years / 6 Semesters) and Masters (2 years / 4 Semesters) level shall be delivered as a combination of recorded lectures, live interactive sessions, internal and external assessment components across the course. The University shall design the content outline and course components for each module and the SME shall be designated to follow the same and deliver the module to the course participants. The SME shall work closely with the University and prepare the lesson plan for the module(s) assigned, incorporating topic discussions, real world case studies and discussions, working out application level examples, quizzes, activities and assignments etc; and effectively transact the module contents and meet the course and programme outcomes ultimately.

The courses shall follow four quadrant approach, where:

Quadrant-I is e-Tutorial; which shall contain; Video and Audio Content in an organised form, Animation, Simulations, Video Demonstrations, Virtual Labs, etc, along with the transcription of the video.

Quadrant-II is e-Content; which shall contain; Self-Instructional material (digital Self-Learning Material), e-Books, Illustrations, Case studies, Presentations etc, and also contain Web Resources such as further references, related Links, open source content on Internet, Video, Case Studies, books including e-books, research papers and journals, Anecdotal information, Historical development of the subject, Articles, etc.





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Quadrant-III is the Live Discussion Forum for the students to raise their doubts. The SME shall interact with the students and clarify their doubts in these sessions.

Quadrant-IV is Assessment, which shall contain; Problems and Solutions, which could be in the form of Multiple Choice Questions, Fill in the blanks, Matching Questions, Short Answer Questions, Long Answer Questions, Quizzes, Assignments and solutions, etc.

#### Key Responsibilities of an SME

The SME shall have the following responsibilities with regard to the quadrant/quadrants to which they are assigned with.

#### 1. Quadrant 1- Recorded Video Lecture Creation

#### i. Lesson Plan

The SME shall prepare a detailed lesson plan of the topic to be dealt with and handed over to University's COE before delivery of each session . The SME has the liberty to adapt it to suit their specific styles of delivery.

### ii. Video Lecture Preparation: PowerPoint Presentation

Each slide in the PowerPoint Presentation should be comprehensive and topic-oriented Each Unit's PPT should end with an evaluation consisting of 10 Multiple Choice Questions and Answers

### iii. Lecture-Content Structure

1.Unit Introduction

- 2.Unit-Detailed Explanation
- 3. Examples
- 4. Conclusion
- 5. Assessment

#### iv. Suggested Delivery Structure:

Coverage	Duration (in minutes
Unit-Introduction	1
Unit-Detailed explanation	10
Examples	2
Summary	1
Assessment	1
Total	15





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#### 2. Quadrant II- Self -learning materials

The SME is expected to provide the soft copy of the detailed notes of the topics that he/she deals with in order to publish in the Learning Management System(LMS). At least 60 percent, of the content contributed by the SME shall be developed by themselves and original in form. The remaining percent, of the meterials can be sourced from available resources such as other Higher Educational Institutions, Open Educational Resources (OER), and SWAYAM, duly approved by the statutory authorities of the Higher Educational Institution:

#### 3. Quadrant III -Live Discussion Forums

- · The objective of this session is to interact with the students and clarify their doubts.
- Each subject shall have at least 2 live discussion forums, each of 1 hour and 30 minutes.
- The SME along with the Programme Coordinator is expected to address the previously raised questions as well as spot questions.

#### 4. Quadrant-IV - Assessment

- Assessment shall be conducted in two forms namely, internal assessment and external assessment
- There will be weekly assessments which contribute towards internal evaluation.
- . The SME shall provide a sufficient number of questions from every topic of the week.
- There shall be two assignments per course per semester. The SME shall assign relevant topics to the students and value the same.
- The SME shall contribute towards the Question Bank repository for the purpose of conducting external assessment.
- The SME is bound to maintain the confidentiality of all assessment related resources.

#### Procedures with respect to Quadrant I

- · Each subject is divided into smaller units of deliverable form (Units).
- · Each video recording is called a session.
- · Each session is expected to be of maximum 15 minutes.
- The lecture videos shall be recorded either at the facilities arranged by the University
  or at any facilities available to the SME's. When the SME uses facilities other than
  those provided by the University, no additional charges will be paid for the same.
- The help and cooperation of SME is expected white editing/reviewing the recorded videos if the circumstances demand so.
- The finalised video will be reviewed by one external expert and one internal expert and will be certified accordingly.
- · After receiving the above certification, the COE will make payments.
- The SMEs are expected to share the sources of all reference materials and links of e-books used for the preparation of the content.





## THE COCHIN COLLEGE

### **KOCHI - 682 002**

The parties hereby sign this agreement at Mahatma Gandhi University, Kottayam on

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SME	University
Signature: Rejan 1. NET	Signature:
Namo: Th. DAJANI B BHAT	Registrar Prof. (Dr.) pp. 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
Designation: ASST. PROFESSOR	Prof. (Dr.) PRAKASH KUN Mahatma Gandhi University REGISTRAR Mahatma Gandhi Universit Priyadarshini Hills P. O. Mahatma
Address: THE COLHIN COLLERE	Priyadarshini Hills, P.O., Kottayan-
Koc41-652002	Kottayam-686560, Kerala
ERNAKULAM	
Witness 1:	Witness 2:
Signature June	Signature:
Namo: Typomilianam. N.T.	Name: Sachin Dev. S
Dosignation Section officer	Designation: Arriefant
Address: Centre for Oreline Educe	Address: CoE-1
Mahatma Gandhi Conversety	Mahatma Gardhi University
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#### 39.1.2 Report

5 Association between Dr. Rajani B Bhat and Mahatma Gandhi University

#### 5.1 Nature of Association

Dr. Rajani B Bhat, Assistant Professor in the Postgraduate and Research Department of Commerce at The Cochin College, Kochi-2, has entered into a formal agreement with Mahatma Gandhi University (MG University) to serve as a Subject Matter Expert (SME). This association is specifically for the University's Centre for Online Education (COE), where Dr. Bhat will act as a course instructor for the M.Com program. The agreement is effective from the date of execution and remains valid for a period of three years, with provisions for earlier termination by the University or withdrawal by Dr. Bhat under specified conditions.

#### 5.2 Course Content Delivery:

Dr.rajani Bhat is responsible for delivering course content for the M.Com program, which includes recorded video lectures, self-learning materials, live interactive sessions, and assessment components. All content must adhere to the guidelines provided by MG University, with updates incorporated as required.

#### Four Quadrant Approach

- Quadrant I (e-Tutorial):
  - Creation of recorded video lectures, structured with PowerPoint presentations, examples, and assessments
  - Each session should be concise, lasting a maximum of 15 minutes, and must include an evaluation component with multiple-choice questions.
- Quadrant II (e-Content):
  - $-\,$  Development of self-learning materials such as digital notes, e-books, and case studies.
  - Dr. Bhat is expected to develop at least 60% of this content herself, with the remainder sourced from approved resources like Open Educational Resources (OER) and SWAYAM.
- $\bullet\,$  Quadrant III (Live Discussion Forums):
  - Conducting interactive sessions where students can raise questions and clarify doubts.
  - A minimum of two live sessions per subject, each lasting 1 hour and 30 minutes, are required.

#### $\bullet$ Quadrant IV (Assessment):

 Dr. Bhat will be involved in both internal and external assessments, providing weekly assessment questions, assignments, and contributing to the question bank repository.







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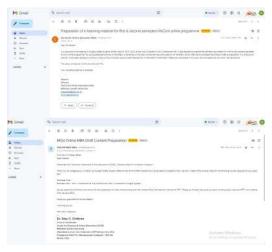
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#### 5.3 Lesson Plan and Video Lecture Structure:

- Dr. Bhat must prepare detailed lesson plans for each session, which will be shared with the COE before delivery.
- PowerPoint presentations must be thorough, topic-oriented, and include a concluding assessment section.

#### 5.4 Confidentiality and Compliance:

- Dr. Bhat is required to maintain the confidentiality of all assessment-related materials.
- Compliance with the University's standards for content delivery, video recording, and material submission is mandatory.





Mrudula Menon V.
Principal-in-Charge
The Cochin College

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40 Dr.Manju V Subramanian: Association with KSCSTE as part of the Science Popularization Programme

• Start Date: 25/06/2018

• End Date: 08/03/2020

• Period: One Year

40.1 Biomag 2017:Community Based Solid and Bio Waste Management Project through Recycling and Upcycling

• Date/Period: 25/06/2018 to 08/03/2020

• Number of Beneficiaries:78





## THE COCHIN COLLEGE

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#### 40.1.1 Linkage Document

### KERALA STATE COUNCIL FOR SCIENCE, TECHNOLOGY AND ENVIRONMENT SCIENCE DODULARIZATION DROGRAMME (SPP) PROJECT COMPLETION REPORT Title of the Project: "BIOMAG' 2017 - Community Based Solid and Bio Waste Management Project through re-cycling and up-cycling in an adopted ward of Corporation of Kochi" Name and address of Principal Investigator(s) and Co-Investigator(s) with mobile No : Dr. Manju V Subramanian Assistant Professor, Dept. of Zoology, The Cochin College, Kochi-2 Mobile. No: 9495336605 Telephone No: 04842222303 E-mail ID: manjubiju906@gmail.com Implementing Institution(s) and other collaborating Institution(s) : Planatearth, NGO, Aluva. 4. Duration of the project 5. Date of commencement : 25th June 2018 : 25th June 2019 6. Proposed date of completion : 8 th March 2020 7. Actual date of completion Objectives as stated in the project proposal: Create awareness among the local community for a decentralized system of waste Management Start and operate a community based composting unit for domestic food waste . Start and operate a door to door collection system for dry waste Arrange a space for storage and sorting or dry waste with forward linkage for Quantification and Documentation of all wastes thus collected and processed · Make the compost ready and available for the local community Train kudumbasree workers to make upcycle products from plastic wastes and marketing them Deviation made from original objectives if any, while implementing the project and reasons there of: Nil

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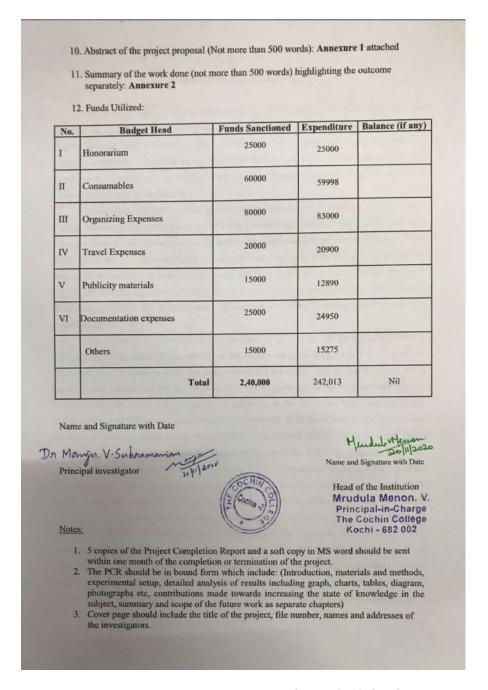


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#### 40.1.2 Report

### 4 Dr. Manju V Subramanian-Association with KSCSTE as part of the Science Popularization Programme, 2018-2020

Dr. Manju V Subramanian, Assistant Professor in the Department of Zoology at The Cochin College, Kochi, served as
the Principal Investigator (PI) for the BIOMAG project. Sponsored by the Kerala State Council for Science, Technology
& Environment (KSCSTE), Government of Kerala, this project was a part of the Science Popularization Programme
(SPP). Her leadership and expertise were pivotal in driving the project's success, which focused on community-based
solid and bio-waste management through recycling and up-cycling in an adopted ward of the Corporation of Kochi. This
report highlights her role, the significance of the BIOMAG project, and the outcomes achieved under her guidance.

#### 4.1 Overview of the BIOMAG Project

The BIOMAG 2017 project, titled "Community Based Solid and Bio Waste Management Project through Recycling and Up-cycling in an Adopted Ward of Corporation of Kochi," was an interdisciplinary research initiative aimed at addressing the challenges of waste management within the community. The project involved the development and application of sustainable practices for managing solid and bio-waste, with a focus on recycling and up-cycling.

#### 4.2 Dr. Manju's Role as Principal Investigator

As the Principal Investigator, Dr. Manju V Subramanian was responsible for the overall leadership and management of the BIOMAG project. Her responsibilities included:

- Project Planning and Execution: Dr. Manju was instrumental in developing the research framework, setting
  objectives, and defining the scope of the BIOMAG project. She led the planning and execution of various research
  activities, ensuring that the project adhered to its timeline and budget.
- Community Engagement: The project involved active participation from the local community in the adopted ward of the Corporation of Kochi. Dr. Manju facilitated community involvement in the waste management process, emphasizing the importance of recycling and up-cycling. She organized awareness programs and workshops to educate residents on sustainable waste management practices.
- Technical Development: Under Dr. Manju's guidance, the project team developed innovative methods for recycling and up-cycling solid and bio-waste. These methods aimed to reduce the environmental impact of waste and promote sustainable living within the community. She oversaw the implementation of these methods in the adopted ward, monitoring their effectiveness and making necessary adjustments.
- Collaboration and Networking: Dr. Manju established collaborations with local government bodies, environmental organizations, and academic institutions to support the project's objectives. She represented the BIOMAG



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project at various forums, sharing insights and findings with stakeholders and the broader scientific community.

Research Outcomes and Reporting: The BIOMAG project, under Dr. Manju's leadership, resulted in significant outcomes, including the successful implementation of waste management practices in the adopted ward and the publication of findings in various reports. The project completion report was submitted to the Kerala State Council for Science, Technology & Environment, detailing the methodologies used, results achieved, and recommendations for future initiatives.

#### 4.3 Significance of the BIOMAG Project

The BIOMAG project is a pioneering initiative in the field of community-based waste management. Its outcomes have demonstrated the potential of recycling and up-cycling as viable solutions for managing solid and bio-waste at the community level. Dr. Manju's leadership as Principal Investigator was critical in navigating the complexities of this interdisciplinary research and ensuring the project's success.





Mrudula Menon V.
Principal-in-Charge
The Cochin College

368 Home



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41 Dr. Vijeesh P, Assistant Professor of Physics: Association with the
Triangle Universities Nuclear Laboratory, Duke
University, Durham, NC, USA

• Start Date: 11/09/2023

• End Date: 15/09/2023

• Period: 5 Days

### 41.1 2023 International Conference on Nuclear Photonics

• Date/Period: 11/09/2023 to 15/09/2023

• Number of Beneficiaries from The Cochin College: 32 Students





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#### Linkage Document 41.1.1

#### Triangle Universities Nuclear Laboratory



September 18, 2023

Dr. Vijeesh Padmanabhan The Cochin College Cochin, Kerala, India

RE: Letter of participation in the 2023 International Conference on Nuclear Photonics Date of Conference: September 10 – 16, 2023 Location of Conference: Durham, North Carolina, USA

Dear Dr. Padmanabhan:

The Fourth International Conference on Nuclear Photonics was hosted by the Triangle Universities Nuclear Laboratory (TUNL) and held in Durham, North Carolina, USA on September 10 – 16, 2023. The conference brought together scientists from around the world who are conducting research in the development and use of ultrahigh intensity lasers and gamma-ray beams in nuclear physics research and applications. Details are available at <a href="https://sites.duke.edu/np2023/">https://sites.duke.edu/np2023/</a>

On behalf of the conference organizers, I am pleased that you were able to attend the Conference On centar of the contrence organizers, I am pieased that you were able to attend the Contrence his year. I enjoyed meeting you and having discussions with you about your research and sharing aspects of my research with you. Thank you volunteering to wear the dosimeter on the tour of the TUNL accelerator facilities on Thursday (September 14, 2023) and for sharing with me the photographs you took during the tour. We will post some of them on the conference website later this week.

I hope your travel back home was safe. I look forward to seeing you at the Nuclear Photonics Conference in 2025 at Darmstadt, Germany.

Calvin R. Havell Calvin R. Howell, on behalf of the Conference Chairs

Professor Calvin R. Howell, Duke University and TUNL, USA
Professor Mohammad W. Ahmed, North Carolina Central University and TUNL, USA
Professor Christopher Barty, University of California at Irvine





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#### 41.1.2 Report

Report on Association of Dr. Vijeesh P., Assistant Professor of Physics, with the 2023 International Conference on Nuclear Photonics and Related Academic Collaborations

Introduction: The participation in the 2023 International Conference on Nuclear Photonics, held from September 10 to 16, 2023, at the Triangle Universities Nuclear Laboratory (TUNL), Durham, North Carolina, USA, has significantly contributed to the academic and research development of our institution. The conference brought together esteemed scientists and researchers from around the world to discuss advancements in the field of ultrahigh-intensity lasers, gamma-ray beams, and nuclear physics research.

#### Key Outcomes:

- 1. Discussion on Future Research Collaboration: The conference provided an excellent platform for initiating discussions on potential research collaborations between our institution and TUNL. The interactions with leading researchers and professors highlighted several areas of mutual interest, particularly in nuclear and space physics, paving the way for future joint research projects.
- International Interaction: The event facilitated interactions between scientists and professors from various parts of the world. These engagements not only broadened the academic horizon but also allowed for the exchange of innovative ideas and methodologies in nuclear photonics and related fields.
- 3. Visits to Cutting-Edge Research Facilities:
  - Nuclear Laboratory Facilities at Duke University: During the conference, we
    were granted permission to visit the state-of-the-art nuclear laboratory facilities at
    Duke University. This visit offered an invaluable opportunity to observe firsthand
    the sophisticated instruments and research techniques employed in nuclear
    physics.
  - Particle Accelerator Facility Tour: A highlight of the conference was the tour of the TUNL particle accelerator facility on September 14, 2023. Wearing a dosimeter, I was able to explore the accelerator and gain insights into its operational mechanics and applications in research.
- 4. Enrichment of Academic Research and Teaching: The knowledge and experiences gained from these visits and interactions have immensely enriched our approach to scientific research and teaching. The exposure to cutting-edge technologies and methodologies has provided a robust foundation for enhancing the experimental aspect of science education at our institution.
- 5. Visit to NASA Station at Orlando, Florida: As part of the post-conference activities, we had the privilege of visiting the NASA station in Orlando, Florida. This visit allowed us to witness the latest scientific developments in space physics, further broadening our understanding and appreciation of advancements in this critical field.
- Experience Sharing with Students: Upon returning to our institution, the experiences
  and knowledge gained from the conference and visits were shared with students through
  various experience-sharing sessions. These sessions have inspired students and





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- provided them with a deeper understanding of the practical applications of nuclear and space physics.
- Networking with Duke University Scholars: The conference also provided an
  opportunity to meet and interact with a research scholar at Duke University. This
  interaction led to the exchange of research ideas and practices, further strengthening
  our academic network.

**Conclusion:** The participation in the 2023 International Conference on Nuclear Photonics, along with the subsequent visits to research facilities and NASA, has been a transformative experience. It has not only expanded our research capabilities but also enriched the teaching methodologies at our institution. The insights and connections gained from this experience will undoubtedly contribute to the advancement of our academic and research initiatives.







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42 Collaboration between Department of Physics, The Cochin College,
Kochi:02 and The Kerala State Council for Science, Technology, and
Environment (KSCSTE)

• Start Date: 30/12/2018

• End Date: 30/12/2021

• Period: Three Years

### 42.1 SARD Programme

• Date/Period: 30/12/2018 to 30/12/2021

• Number of Beneficiaries: 120





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#### 42.1.1 Linkage Document

#### File No.KSCSTE/2409/2018-SARD



KERALA STATE COUNCIL FOR SCIENCE, TECHNOLOGY AND ENVIRONMENT An Autonomous body of the Government of Kerala

KSCSTE – SARD - "Infrastructure Strengthening of the Department of Physics, The Cochin College, Kochi" by Dr. Annieta Philip K., Associate Professor, Department of Physics, The Cochin College, Kochi - Financial assistance for the first year - sanctioned - orders issued

Council (P) Order No866/2018/KSCSTE Dated: Thiruvananthapuram,30/12/2018

Ref: - (1) File No. KSCSTE/2409/2018-SARD

(2) 16<sup>th</sup> SARD Committee decision dated 24-25 September 2018.

#### <u>ORDER</u>

1. As per the reference (2) cited above, Kerala State Council for Science, Technology and Environment (KSCSTE) is pleased to sanction the financial assistance for the strengthening of the infrastructure and R&D facilities to a total cost of Rs. 15,00,000/- (Rupees Fifteen Lakh only) for a period of three years to the Department of Physics, The Cochin College, Kochi with Dr. Annieta Philip K. as the Coordinator.

2. The budget details are given below:

Sl.	Items	Year I	Year II	Year III	Total
No.		(Rs.)	(Rs.)	(Rs.)	(Rs.)
1	Equipment  a. Crystallizer Set-up and related assembly	1,80,000/-	-	-	
	b. Spectrophotometer	3,60,000/-			
	C. Schlieren Imaging System	4,05,000/-			
	d. DSLR Camera with image capturing control and high resolution for Imaging studies				14,40,000/-
	e. Mach Zehnder Interferometer set up	1,50,000/-			
	f. Computer with image processing software	50,000/-			
	g. Air conditioner to create low temperature lab for crystal growth	35,000/-			
	h. Vacuum Pump	25,000/-			
	i. Muffle furnace	1,50,000/-			
	j. Miscellaneous	25,000/-			
2	Maintenance	-	30,000/-	30,000/-	60,000/-
Total	l (Rs.)	14,40,000/-	30,000/-	30,000/-	15,00,000/-

3. An amount of Rs. 14,40,000/- (Rupees Fourteen Lakh Forty Thousand Only) will be released as the first year SARD grant by means of Electronic Fund Transfer (NEFT) as per their





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#### File No.KSCSTE/2409/2018-SARD

bank details given below in favour of The **Principal**, **The Cochin College**, **Kochi**. The expenditure in this regard will be met from the Council fund "**SARD-III-D-I**"

Beneficiary Account Name	SARD-Coordinator
Beneficiary Account Number (SB/CC)	38139974816
Beneficiary IFSC code	SBIN0070140
Beneficiary Name and Branch	SBI, Koovapadam, Cochin
Beneficiary Address	Koovapadam, Cochin
Beneficiary Mobile No:	9447810790
Beneficiary email id	annietaphilip@gmail.com

- 4. The utilization certificate (UC) and statement of expenditure (SE) will be submitted in an yearly basis, so as to be received within 30 days on completion of every year.
- 5. The date of implementation of the scheme at the institution shall be within 15 days on the receipt of this order, and the same shall be intimated to the office of the Council by return post.

S. PRADEEP KUMAR MEMBER SECRETARY,KSCSTE

. 1	
1	v

The Principal, The Cochin College, Kochi 2

Copy to: <b>Dr. Annieta Philip K.</b>
Associate Professor, Dept. of Physics, The Cochin College
Kochi-2
Cash Section, Stock File/ Office Copy





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42.1.2 Report

Department of Physics Association with KSCSTE-SARD

Introduction: The Kerala State Council for Science, Technology, and Environment (KSCSTE) sanctioned financial assistance for the "Infrastructure Strengthening of the Department of Physics" at The Cochin College, Kochi. This assistance was provided under the SARD progr with the first year's grant of  $\gtrless$ 14,40,000, as part of a three-year funding totaling  $\gtrless$ 15,00,000. This report outlines the key outcomes achieved through this association.

#### Kev Outcomes:

- 1. Enhanced Laboratory Infrastructure: The SARD grant facilitated significant upgrades to the laboratory infrastructure of the Department of Physics at The Cochin College. The procurement of advanced equipment, including:
  - Crystallizer Setup and Assembly

  - Spectrophotometer Schlieren Imaging System
  - DSLR Camera with High-Resolution Imaging Capabilities
  - Mach Zehnder Interferometer Setup
  - Computer with Image Processing Software
  - Vacuum Pump
  - Muffle Furnace
- 2. These enhancements have greatly improved the department's ability to conduct sophisticated research and offer hands-on experience with state-of-the-art equipment to students.
- 3. Creation of a Specialized Research Environment: The installation of an air conditioning system to create a low-temperature lab specifically for crystal growth has been pivotal. This facility has enabled the department to undertake advanced research in material science, particularly in the area of crystallography, which was previously limited by the lack of appropriate environmental controls.
- 4. Strengthening Research Capabilities: The introduction of the Schlieren Imaging System and Mach Zehnder Interferometer has allowed the department to explore new research avenues in fluid dynamics and optical physics. These tools are essential for visualizing and analyzing phenomena that are otherwise invisible to the naked eye.
- 5. Support for Undergraduate and Postgraduate Research: The enhanced infrastructure has directly benefited students at both undergraduate and postgraduate levels. The new equipment has been integrated into the curriculum, providing students with exposure to cutting-edge technology and research techniques. This practical
- experience is invaluable in preparing students for future research and industry roles.

  6. Improved Research Output: The department's research output has seen a significant improvement due to the availability of advanced equipment. The new tools have enabled





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faculty and students to undertake more complex experiments and contribute to the body of knowledge in their respective fields. This has also led to an increase in publications in reputed journals and participation in national and international conferences.

7. Foundation for Future Funding: The successful implementation and utilization of the SARD grant have positioned the Department of Physics at The Cochin College as a strong candidate for future funding opportunities. The demonstrated ability to effectively use resources for infrastructure development strengthens the department's case for additional grants to further enhance research capabilities.

Conclusion: The association with the KSCSTE-SARD program has been instrumental in transforming the Department of Physics at The Cochin College. The financial assistance provided has enabled the department to significantly upgrade its research infrastructure, thereby enhancing both the quality of education and the scope of research activities. These developments not only benefit the current students and faculty but also contribute to the long-term academic and research goals of the institution.







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43 Dr.Sathya Narayanan K, Assistant Professor, Department of
Physics:Collaboration with Inter university centre for Astronomy
and Astrophysics

• Start Date: 01/08/2023

• End Date: 01/08/2026

• Period: Three Years

### 43.1 Visiting Associateship at IUCAA

### 43.2 Workshop on UVIT Data Analysis

• Date/Period: 24/08/2022 to 26/08/2022

• Number of Beneficiaries from The Cochin College: 47





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#### Linkage Document 43.2.1



अंतर-विश्वविद्यालय केंद्र : खगोलविज्ञान और खगोलभौतिकी



Inter-University Centre for Astronomy and Astrophysics An Autonomous Institution of the University Grants Commission

Dr. Sathya Narayanan K.

10 August, 2023

Department of Physics The Cochin College Ernakulam Kerala- 682 002

I am very happy to inform you that your term of Visiting Associateship at IDCAA has been extended for a further period of three years with effect from August 1, 2023. We hope that this will enable you to continue to make good use of our facilities through your next term, and that your visits to IUCAA will prove to be very productive.

I am enclosing along with this letter of invitation (1) a copy of the letter I have sent to the Principal of your College, explaining the programme and requesting him/her to treat your visits to IUCAA under this programme as "on duty (2) a copy of a letter sent in September 2, 2004 to the Vice-Chancellors of different universities by Professor Arun Nigavekar, the then Chairman of the University Grants Commission (UGC). You may use these letters when you apply for leave for visits to IUCAA, if you find that necessary.

I shall look forward to your response to this letter of invitation and hope that you will contribute to IUCAA activities and your research will benefit from your regular visits, participation and advice. The Terms and Conditions of the Associateship Programme are also enclosed along with this letter.

With kind regards,

Sincerely.

Komapalash

Encl: (1) Copy of the letter sent to the Principal of your College; (2) Copy of letter sent by UGC;

(3) Terms and Conditions of the Associateship Programme.

Address : IUCAA, Savitribai Phule Pune University Campus, Ganeshkhind, Pune 411007. India. पता : IUCAA, साविशीबाई फुले पुणे विश्वविद्यालय परिसर, गणेशर्विङ, पुणे ४११०००, भारत. Phone / कुरमाप : (91) (20) 25604100 E-mail/ईपेल . apr@iucaa.in Web Page/वेब पेज : https://www.ucaa.in





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### अंतर-विश्वविद्यालय केंद्र : खगोलविज्ञान और खगोलभौतिकी



Inter-University Centre for Astronomy and Astrophysics.
An Autonomous Institution of the University Grants Commission

Prof. A. N. Ramaprakash Dean, Visitor Academic Programs

10 August, 2023

The Principal, The Cochin College, Cochin College Road, Mattancherry. <u>Kochi - 682 002</u>

Dear Sir / Madam,

As you are aware, the Inter-University Centre for Astronomy and Astrophysics (IUCAA) has been set up by the University Grants Commission (UGC) to promote and nucleate astronomy and astrophysics in the universities and affiliated colleges. To this end, IUCAA has launched a number of programmes on its campus at Pune and also on the campuses of various universities and colleges. In particular, arrangements have been made to facilitate the usage by interested students and faculty of universities and colleges of centralized facilities at Pune, such as an advanced Computer Centre with High Performance Computing facility, a state-of-the-art library, the lastrumentation Laboratory and observational facilities including the Southern African Large Telescope (SALT) at Sutherland, IUCAA is also involved in a number of large projects of national and international importance like ASTROSAT, Aditya-LI Mission, LIGO-India, the Thirty Metre Telescope, etc.

One major activity in this context is the Associateship Programme. Under this programme, faculty members of universities and colleges, who are selected as Visiting Associates of IUCAA, can make visits to IUCAA for specified periods to participate in teaching, training, research and development activities in astronomy and astrophysics. For such purposes, the universities and colleges are encouraged to regard IUCAA as their field station, whose facilities are at their disposal. Indeed, Professor Arun Nigavekar, the then Chairman of the UGC, has written in 2004 to all the University Vice-Chancellors urging them to look upon IUCAA in this spirit and to make it possible for the Visiting Associates to use its facilities to the maximum extent possible. I enclose for your ready reference a copy of this letter from the then Chairman.

IUCAA selects a limited number of faculty every year to its Associateship Programme. I am happy to inform you that the term of **Dr. Sathya Narayanan K.** from your College has been extended for three years from August 1, 2023. Under the Associateship Programme, IUCAA will pay the travel and per diem of the Visiting Associates coming to IUCAA for their scientific work.

I do hope that you will encourage Dr. Sathya Narayanan K., to take advantage of this offer. I request you to treat Dr. Sathya Narayanan K.'s stay at at IUCAA as a part of his duties and to provide him with leave as "on duty" so that he can make good use of his Associateship. I enclose the Terms and Conditions of the Associateship Programme for your information.

With kind regards,

Sincerely,

Professor A. N. Ramaprakash

Encl : (i) UGC Chairman's Letter. (ii) Terms and Conditions of Associateship Programme.
cc : Dr. Sathya Narayanan K. Department of Physics The Cochin College Mattancherry Ernakulam Kerala-682 002

Address : IUCAA, Savitribai Phule Pune University Campus, Ganeshkhind, Pune 411007, India पता : IUCAA, सावित्रीवाई फुले पुणे विश्वविद्यालय परिसर, गणेशखिंड, पुणे ४११०७०, भारत.

Phone / दूरभाष: (91) (20) 25604100 E-mail/ईमेल: anr@iucaa.in Web Page/वेब पेज: https://www.iucaa.in





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विश्वविद्यालय अनुदान आयोग डॉ. अरूण निगवेकर बहादुर शाह वायन गार्थ, नई विस्त्री, 110 acc अध्यक्ष UNIVERSITY GRANTS COMMISSION DEAM RAFAS HARR RUDAKAN NEW DEUHI 110 002 OFF 0111 (0) Dr. Ann Nigarcher (011) 23221313 (011) 2323 (797 5-mell narun416 hosmad.com O.O. No. F.1-11/2004 (CM/IUC) Seplember 2, 2004 The University Grants Commission has set up a number of Inter-University Centres and Consortia in order to provide front line research and developmental facilities to the staff and students from universities and colleges in selected thrust areas. It is extremely important, therefore, that the prospective users of the Inter-University Centres are freely permitted to participate in their various programmes as if they are "on duty", in some universities, it is noted that the scholars' visits were not considered as on duty. Amongst such Centres, the Inter-University Centre for Astronomy and Astrophysics (IUCAA) has an Associateship programme under which selected Associates from universities and colleges are invited to visit IUCAA as Associates of the Centre. Each Associate has a tenure of three years, which can be renewed depending on his/her performance, in teaching, research and developmental activities. It understood that during these three years, the Associate visits IUCAA several times for visits of at least two weaks duration at a time, without compromising with his/her lecturing and other duties in the parent institution. Their visits are fully covered by IUCAA and hence has no financial implication to the university/college. IUCAA has a number of facilities like an excellent Library, state of the art Computer Centre, Virtual Observatory as well as an instrumentation Laboratory where the university staff members can make their own instruments as well as participate in collaborative instrumentation projects. As of now, IUCAA has over eighty Associates on its roll, in order to improve their efficiency, it is important that they are permitted to take advantage of these facilities as much as possible. I, therefore, urge you to facilitate the participation of Associates from your Institution in the above programme by treating their leave of absence as on duty when they visit IUCAA, which is specifically created by the University Grants Commission as a common facility for all universities. With kind regards, Yours sincerely. 1-1 x-1 x-1 (Arun Nicavekar) To the Vice Chancellors of 150 UOC Funded Universities Prof. Naresh Dadhich, Director, Inter University Centre for Astronomy and Astrophysics, IUCAA, Post Box No. 4, Ganeshkhind Road, Pune - 411 007 Dr. P. Frakash, JS (TAUC), UGC, New Dethi.





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(As on August 2023)

#### TERMS AND CONDITIONS OF IUCAA'S ASSOCIATESHIP PROGRAMME

- Visiting Associateship is awarded to a faculty member of a college, university department or institution, which has the status of a university recognized by the UGC.
- Visiting Associateship is awarded for a period of three years at a time. If a Visiting Associate ceases to have a formal link with a college or university during the period of an Associateship, then the Associateship will come to an end. Information regarding such a change should immediately be conveyed to the Dean, Visitor Academic Programmes.
- A Visiting Associate should visit IUCAA at least once during each academic year, which extends from August 1 to July 31, A maximum of three visits may be made during each academic year.
- A visit under the Visiting Associateship programme is expected to be at least of 15 days duration. A maximum of 150 days can be spent at IUCAA during any one academic year.
- During the three year period of a Visiting Associateship, there can be a maximum of six visits, totaling to a maximum of 365
- Visit requests must be made by sending an email to Dean, Visitor Academic Programmes with a copy marked to Administrative Officer, Visitor Academic Programmes. The email should provide the following details.

1.Your name and affiliation

- 2.Name(s) and relationship(s) of accompanying persons, if any
- 3. Arrival and Departure dates at IUCAA
- 4.Travel support, if needed
- Travel: Please buy your fickets only after receiving a confirmation email approving the visit request. It is expected that journeys will generally be by air or rail or road by the direct shortest route. All Visiting Associates are entitled to travel by Air/train AC-II tier. Travel reimbursement will normally be only to the extent of the actual class of travel up to AC-II tier. The claimant will have to produce to and fro tickets/copies of tickets and Boarding Pass(s) in case of air travel.

Limited funds are available for air travel of Visiting Associates. Air travel may be permitted subject to the following conditions:

- Grade Pay of the claimant is at least Rs, 5400/- (Level; 09) or equivalent per month. (a)
- Grade Pay of the cultimant is at teast and instant of 15 days.

  The claimant stays at IUCAA for a minimum of 15 days.

  Air tickets have to be booked only from the three government authorized travel agencies [M/s. Balmer Lawrie & Co. Ltd. (BPCL); M/s. Ashok Travels & Tours (ATT); Indian Railways Catering and Tourism Corporation (¢) Ltd. (IRCTC)]. Tickets booked directly through airline websites cannot be reimbursed

Even when these conditions are satisfied, prior approval from the Dean, Visitor Academic Programmes will have to be obtained. Air travel over special sectors, especially in the North-Eastern parts of the country and in special circumstances may be permitted even when the conditions (a) and (b) are not met. Details about this may be had from the Administrative Officer (Visitor Services). The air travel will have to be by the shortest direct route. Those who are not eligible for air travel can choose to travel by air with the understanding that they will be reimbursed only to the extent of eligible train fare or actual air fare, whichever is lower.

- Daily Allowance (DA): Visiting Associates are paid DA @ Rs. 900/- per day with free lodging. Charges for Canteen, Cable TV and cooking gas, wherever applicable, will be recovered.
- Acknowledgement: Visiting Associates who use the IUCAA facilities for research work leading to publications should acknowledge IUCAA in their publication.
- Accommodation: We try to ensure that Visiting Associates are accommodated whenever they wish to visit IUCAA. However, there is very high demand during vacations, when most visitors like to come to IUCAA. All intending visitors are, therefore, urged to write to us about their plans for a stay at IUCAA at least two months in advance. This is particularly necessary for family accommodation, since the number of units, which can accommodate families is very limited. Please write to us well in advance with alternative dates and await confirmation from us. You will be guaranteed accommodation on arrival at IUCAA only if you have a word of confirmation sent by us.

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## THE COCHIN COLLEGE

### **KOCHI - 682 002**

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> IDCAA organizes a number of conferences, workshops, meetings etc. round the year. The details of these events are available at the HUCAA Events webpage. Visiting Associates are encouraged to apply for attending these events which are of their interest. If you are not a participant of an event, especially a large one, it may difficult to obtain accommodation in the guest house during those periods.

- Visit by research students of Visiting Associates: Ph. D. Students of Visiting Associates are also encouraged to visit IUCAA and use its facilities for their research. The Visiting Associate should write to the Dean, Visitor Academic Programmes, to recommend such visits. The email should provide the following details.
  - I Your name and affiliation
  - 2. Name, Affiliation and Ciender of the student
  - 3. Year and status of the student's research work

  - 4.Arrival and Departure dates at IUCAA 5.If you would be visiting IUCAA at the same time as the student. If not, who at IUCAA will get as a host
  - 6.1s travel support needed (please see conditions below)

At a given time, only one student of a Visiting Associate can visit IUCAA. It is not essential for the guide/the concerned Visiting Associate to be present at the time of a student's visit, except for students who are visiting for the first time.

The DA entitlement for research students (registered for M. Phil/Ph.D.) is Rs, 500/- per day with free lodging, and canteen will be charged. They are entitled to travel by train by AC Chair Car or AC -III tier by the direct shortest route. Travel by AC-III tier will be permitted only if the trains on the shortest route do not have any of the above classes. The tickets/copies of the tickets will have to be submitted with the claim. However, the following provisions apply:

Research Students with fellowship: Students with fellowship will have to normally pay for travel from their contingency grant. When such a grant is not adequate, approval should be sought in advance by writing to the Dean, Visitor Academic Programmes for travel reimbursement

Research Students without fellowship: They will be paid for their travel and DA (with free lodging; canteen will be charged), for the full period of their stay. The guide of such students will have to certify that the student does not have followship.

At the end of the visit, all students are required to submit a report to the Dean, Visitor Academic Programmes about the work done at IECAA.

Canteen charges at present are as follows:

Services	es IUCAA members, Visiting Associates, Visiting Students and IUCAA Visitors						
Breakfast	Rs. 30.00	Rs. 60.00					
Lunch	Rs. 44.00	Rs. 88.00					
Dinner	Rs. 44.00	Rs. 88.00					
Tea	Rs. 7.00	Rs. 14.00					
Coffee	Rs. 9.00	Rs. 18.00					

Family members of Visiting Associates will have to pay charges applicable to "All others" category.

#### Canteen Timings:

Services	Timings	Venue
Breakfast	08:30 - 09:30 hrs.	Canteen
Morning Tea/Coffee	10:30 - 11:15 hrs.	Сапtеев
Lunch	13:00 - 14:00 hrs.	Canteen
Afternoon Tea/Coffee	15:30 - 16:15 hrs.	Canteen
Dinner	20:00 - 21:00 hrs.	Canteen

#### Library Timings:

All working days Saturday, Sunday & Closed :

09:00 hrs. till 20:00 hrs. 10:30 hrs till 19:00 hrs.

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#### 43.2.2 Report

Report on the Associateship of Dr. Sathya Narayanan K. with IUCAA

1. Introduction

Dr. Sathya Narayanan K., a faculty member in the Department of Physics at The Cochin College, has been granted an extension of his Visiting Associateship with the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune. This extension, effective from August 1, 2023, for a further period of three years, recognizes Dr. Sathya Narayanan's substantial contributions to astronomy and astrophysics and his potential for continued impactful research.

The Inter-University Centre for Astronomy and Astrophysics (IUCAA) is an autonomous institution funded by the University Grants Commission (UGC). Established to promote and facilitate research in astronomy and astrophysics across Indian universities and affiliated colleges, IUCAA serves as a central hub for academic and scientific endeavors in these fields. It boasts advanced facilities, including:

- High-Performance Computing Centre\*\*: For sophisticated data analysis and simulations.
   Comprehensive Library\*\*: An extensive collection of resources related to astronomy and
- Instrumentation Laboratory\*\*: Equipped with state-of-the-art equipment for experimental research.
- Observational Facilities\*\*: Access to observational tools such as the Southern African Large Telescope (SALT).

IUCAA is actively involved in major national and international projects like ASTROSAT, the Aditya-L1 Mission, LIGO-India, and the Thirty Metre Telescope project. Visiting Associates, such as Dr. Sathya Narayanan, benefit from these projects and utilize IUCAA's resources for their

3. Details of Dr. Sathya Narayanan's Associateship

Dr. Sathva Naravanan's associateship has been extended from August 1, 2023. This continued association highlights his ongoing contributions to astronomy and astrophysics and his potential for further significant advancements in these fields.

Key Aspects of the Associateship:\*\*

- Research and Development\*\*: Dr. Narayanan will engage in collaborative research with IUCAA's scientists, focusing on projects aligned with his expertise
- \*\*Teaching and Training\*\*: He will contribute to IUCAA's academic environment by participating in teaching and training programs, aimed at enhancing the skills of students and
- National and International Projects\*\*: Dr. Narayanan will be involved in significant projects like LIGO-India and the Thirty Metre Telescope, contributing to cutting-edge research.
- 4. Support and Facilities
- Dr. Sathya Narayanan will have access to various resources and facilities at IUCAA:





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- \*\*High-Performance Computing Facilities\*\*: For advanced data analysis and simulations.
- \*\*State-of-the-Art Library\*\*: Offering extensive resources in astronomy and related disciplines.
- \*\*Instrumentation Laboratory\*\*: Providing access to the latest experimental and observational
- equipment.  $\ \ \, \text{-**Observational Facilities**: Opportunities to use observational tools like the Southern African}$ Large Telescope (SALT).

IUCAA will also cover Dr. Narayanan's travel and per diem expenses during his visits for scientific work. The Cochin College is encouraged to consider his time at IUCAA as "on duty" to enable him to make full use of the associateship.

#### 5. Workshop on UVIT Data Analysis

In addition to his research activities, Dr. Sathya Narayanan proposed a workshop on UVIT data analysis, which was approved by IUCAA. The workshop was held from August 24-26, 2022, at The Cochin College. The workshop aims to enhance participants' skills in analyzing UVIT data on galaxies.

#### Workshop Details:

- \*\*Title\*\*: Workshop on UVIT Data Analysis on Galaxies
- \*\*Date\*\*: August 24-26, 2022
- \*\*Location\*\*: The Cochin College, Kerala
- \*\*Coordinators\*\*: Dr. Sathya Narayanan K. and Kanak Saha

IUCAA's financial commitment for the workshop was Rs. 1,81,025. It was recommended to monitor the pandemic situation and follow COVID regulations. A written consent from the Principal of The Cochin College was required to proceed with the workshop

Dr. Sathya Narayanan K.'s extended Visiting Associateship with IUCAA underscores his valuable contributions and ongoing potential in the field of astronomy and astrophysics. His involvement in research, teaching, and significant projects, along with the successful organization of the UVIT data analysis workshop, reflects his active engagement and commitment to advancing scientific knowledge.





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44 MoU between The cochin College, Kochi:02 and DBT(Department of Biotechnology), Ministry of Science and Technology, Government of India, New Delhi

• Start Date: 18/11/2021

• End Date: 18/11/2024

• Period: Three Years

### 44.1 Star College Scheme

• Date/Period: 28/09/2021

• Number of Beneficiaries from The Cochin College: 120





## THE COCHIN COLLEGE

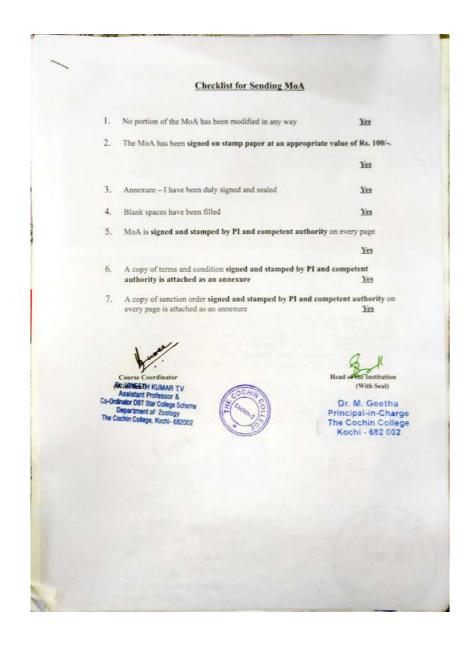
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#### 44.1.1 MoU







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WHEREAS DBT being desirous of capacity building in the area of Biotechnology teaching decided to support <a href="Star College Scheme">Star College Scheme</a> submitted by <a href="The Cochin College">The Cochin College</a>. This Memorandum of Agreement (MoA) defines the role and responsibilities of the participating agencies, monitoring and other matters related to the <a href="Star College Scheme">Star College Scheme</a>.

NOW THE PARTIES HERETO AGREE AS FOLLOWS:-

### 1.0 ROLE OF DEPARTMENT OF BIOTECHNOLOGY, NEW DELHI

To provide funds to the extent of Rs. 82 Lakhs, Eighty Two Lakhs only, over a period of three years from the date of sanction of the project, 28/09/2021, for conducting Star College Scheme. Details of the funds to be provided are given in Annexure II.

- 2.1. ROLE OF The Cochin College
- 2.2. To provide existing facilities as mentioned in the project document.
- 2.3. To accomplish and fulfil the terms and conditions listed at Annexure I. / To be responsible for accomplishing objectives identified and activities listed as per terms and conditions listed at Annexure I.
- 2.4. To submit an annual audited statement of expenditure incurred under the programme.
- 2.5. To ensure effective utilization of the grant given by DBT for the purpose for which it was granted and to ensure timely completion of course work/ examination.
- 2.6. The Cochin College will take up all the liabilities of the teaching programme including Manpower (if any), after completion of the sanction period specified in the sanction order.
- 3.0 DURATION OF PROJECT
- 3.1 Duration of project shall be two or three years (as per the order) from the date the Programme has been sanctioned by DBT.

#### 4.0 RIGHTS OF OWNERSHIP/TECHNOLOGY TRANSFER AND UTILIZATION

4.1 All the assets including the equipment and produce acquired will be the property of DBT and shall not be utilized for purposes other than teaching/capacity building at <a href="The Cochin College">The Cochin College</a>. The rights of DBT under this MoA shall not be transferred to any other party without prior approval in writing of DBT.

(With Seal)

Dr. VINEETH KUMAR T.V Assistant Professor & Co-Ordinator D8T Star College Scheme Department of Zoology The Cochin College, Kochi- 682002



Head of the Institution (With Seal)

Dr. M. Geetha Principal-in-Charge The Cochin Coll-Kochi - 60





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4.2 It shall be the responsibility of <u>The Cochin College</u> to ensure that support of DBT is suitably acknowledged in the publications (papers, reports, etc.) arising out of the programme.

#### 5. MONITORING

- 5.1 The progress of implementation of the programme and proper utilization of grant shall be reviewed by the DBT and by the Advisory Committee set up by <u>The Cochin</u> <u>College.</u>
- 5.2 The periodic progress of physical achievements and the utilization of funds, statement of expenditure shall be evaluated by the Advisory Committee & DBT-UGC Task Force on HRD.
- 5.3 The Comptroller and Auditor General of India, at his discretion shall have the right of access to the books and accounts of <u>The Cochin College</u> for the grants received from DBT for this programme.
- 5.4 The DBT may terminate the grant at any stage if it is convinced that the grant has not been properly utilized or appropriate progress has not been made. In the event, DBT terminates the grant, <u>The Cochin College</u>, shall hand over all documents including technical details and equipment purchased related to the programme.

#### 6.0 DURATION OF MEMORANDUM OF AGREEMENT

This MoA will remain in force for the duration of the programme.

#### 7.0 ARBITRATION

In the event of any question, dispute or difference whatsoever arising between the parties to this Agreement out of or relating to the construction, meaning, scope, operation or effect of this Agreement or the validity of the breach thereof shall be referred to an Arbitrator to be appointed by mutual consent of both the parties herein. If the parties cannot agree on the appointment of the Arbitrator within a period of one month from the notification by one party to the other of existence of such dispute, then the Arbitrator shall be nominated by the Secretary, Department of Legal Affairs, Ministry of Law & Justice, Government of India. The provisions of the Arbitration and Conciliation Act, 1996 will be applicable and the award made thereunder shall be final and binding upon the parties hereto, subject to legal remedies available under the law. Such differences shall be deemed to be a submission to arbitration under the Indian Arbitration and Conciliation Act, 1996, or of any modifications or reenactments thereof.

Course Coordinator
Dr. WHE STR RUMAR T.V
Assistant Professor &
Co-Ordinator DBT Star College Scheme
Department of Zoology
The Cochin College, Kochi- 682002

Cochin-2 m

Head of the Institution

Dr. M. Geetha Principal-in-Charge The Cochin College Kochi - 682 002



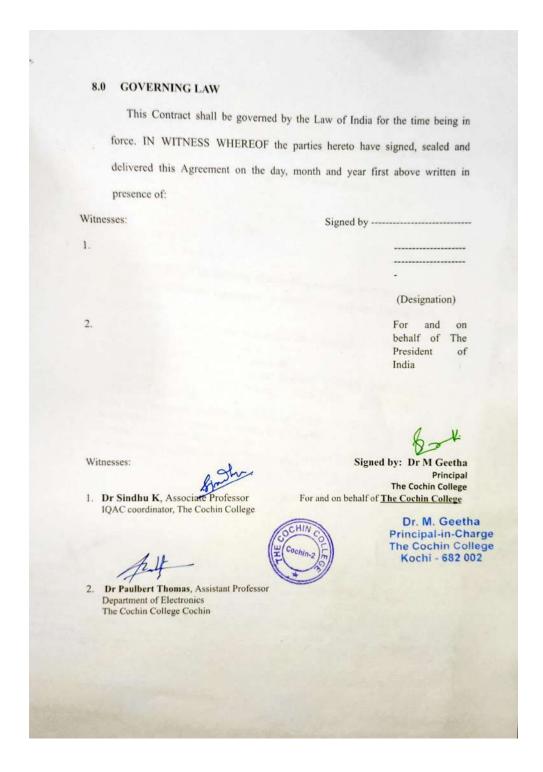


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#### 44.1.2 Report

#### Department of Biotechnology

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

- 1. Name of the College: The Cochin College
- Name of Coordinator, designation, Address, Phone nos: Dr Vineeth Kumar T V, Assistant Professor, 2. Department of Zoology, The Cochin College, Cochin 682002, 8547223144
- Assessment duration: 01.04. 2023 to 31.03.2024

Duration in years: 1 year

Details of Departments Supported

Sl No	Name of Department	Courses (B.Sc./M.Sc./PG Diploma, certificate etc) offered	Regular Faculty	y members
			Tota	I = 17
			With Ph.D.	Without Ph.D.
1	Botany	BSc Botany (Biotechnology)	4	2
2	Chemistry	BSc Chemistry	1	2
3	Physics	BSc Physics, MSc Physics	6	0
4	Zoology	BSc Zoology	3	0

- Number & Date of Advisory committee meeting:
- Qualitative improvements due to DBT support. Please highlight 5 salient points (within 500 words).
  - Completed purchase of all equipment sanctioned by the scheme
     Organised intercollegiate academic events

  - Organised day celebrations

  - Conducted interdisciplinary minor projects
    Organised Research institute visits and nature camps

  - Organised regional seminar on Physics & Astronomy
- Any Novel aspect introduced or planning to introduce during the Scheme duration. Planning
  - Aquaponics system to be installed for projects
- Setting up an entrepreneurship Development Park
- $Lessons\ learnt\ /\ difficulties\ faced\ /suggestions\ if\ any,\ in\ implementation\ of\ the\ programme\ and\ utilization\ of\ DBT\ grant.\ (Max\ 3\ points\ within\ 300\ words).$ 
  - As the refund was credited to ZBSA by September, it caused a short delay in organising





# THE COCHIN COLLEGE

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#### **Key performance indicators**

S. no	Indicator	Pre-support						During /After Support									Rem arks		
1	No. of students  admitted  Total = 115				Total = 120														
		]	M= 3	32		I	F=83			]		F=79							
		sc 6	ST 0	10	G 14	SC 10	ST 0	овс 24	<b>G</b>	sc 3	ST O	<b>ОВС</b>	G 34	SC			ВС	G 66	$\blacksquare$
2	No. of students passing out (%) Students Admitted/passing out (pass %)	No	No of students – 95 Pass Percentage – 83						9 3 0 4 34 12 0 1 66  No of students – Result  Awaiting  Pass Percentage – Result  Awaiting										
3	Drop-out rates	25								15									$\Box$
4	No. of students opting for MSc	37								Result Awaiting									
5	Average marks	729	72%						Result Awaiting										
6	No. of hands-on experiments being conducted	180	180					180											
7	No. of new experiments introduced	Nil	Nil					Nil (June 2024)											
8	Publications (scopus indexed) /patents, if any.	Nil	Nil					Nil											
9	Training received by faculty	0								10									
10	Exhibitions/seminars /training courses conducted	2	2						10										
11	Books/journals subscribed from grants	Nil					0												
12	Outreach activities (Popular lectures)	0								5									
13	Colleges mentored to apply for DBT Star College grants		Nil						Nil										
14	Invited lectures	1																	

□ 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.







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#### Self evaluation

Department	*Objective (as stated in proposal)	% achieved	Reasons for underachievement / If achieved, state in quantitative metrics
Botany, Chemistry, Physics, Zoology	Faculty development program	100%	2
Physics, Zoology	Invited lectures	100%	2
Zoology, Chemistry	Outreach programs	100%	2
Botany, Chemistry, Physics, Zoology	Training program for Students	100%	2
Botany, Chemistry, Physics, Zoology	Additional Practicals	0%	Due to the implementation of CNA, the purchase of equipment was done during November 2023. Will start from June 2024

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

Course Coordinator (With Seal)

Dr. VINEETH KUMAR T.V Assistant Professor & Co-Ordinator D8T Star College Scheme Department of Zoology The Cochin College, Kochi- 682002 2 ot

Head of the Institution (With Seal)

Principal-in-Charge
The Cochin College
Kochi- 682 002

Dr. M. Geetha







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DBT Star College Scheme The Cochin Colleg Proofs (S.No. 6-14)

- ENVIRONMENTAL DAY: An Invited Talk on "Beat Plastic Pollution" by Mr Sooraj Abraham, Founder Planatearth, NGO was organized on Environmental Day June 5<sup>a</sup>, 2023.
- SHARP Project: Students of the department of Zoology volunteered, A Resource Recovery and Recycling Drive organized by Plan@earth in association with KMRL from 05-06-2023 to 09-06-2023.
- Career Orientation for freshers: Dr Vineeth Kumar T V, Assistant Professor, Department
  of Zoology, discussed and detailed the prospects and opportunities of Life Science education
  with the first year students and their parents on 10 July 2023.
- Tiger Day: An Awareness Session on Tiger Day's Importance and why it is celebrated? A
  Documentary shown on "The Secret life of Bhopal Tigers" at the Session July 31-2023.
- 5. ZOOPP-2023: Zoology online project presentation competition- ZOOPP was launched by the department of Zoology, The Cochin College in 2020 with an aim to provide a platform for the UG students to present their final year (6th semester) project to a large audience, which would be a motivation to take up a research career. ZOOPP is organized every year in June/July. This year the online presentation was scheduled on 4th August 2023. Fourteen students from eight different colleges registered for the competition, of which eight students were shortlisted for the online presentation. G Akshaya, St Teresa's College, Ernakulam bagged the first prize, Megha Maria Lal, St Xavier's College for Women, Aluva and Deepthi Padiyar, Sacred Heart College bagged the second and third prizes respectively.
- 6. Zonal ZOOFEST 2023: Department of Zoology in association with Zoological Society of Kerala Co-funded by DBT Star College Scheme Organised, Zonal ZooFEST 2023 on 20<sup>a</sup> October 2023 at The Cochin College. 106 students from seven colleges (The Cochin College, Cochin, St Teresa's college Ernakulam, St Albert's College, Ernakulam, Maharaja's College Ernakulam, Bharata Mata College, Ernakulam, Sacred Heart College and St Xavier's College, Vaikom) participated in the Fest. Nine Different competitions were organized for UG students. ZOOFEST 2023 was inaugurated by Prof. Dr Mohan Joseph Modayil, Fisheries Adviser & Consultant, Senior Adviser, Govt. of Andhra Pradesh, he also interacted with the students about the career opportunities in Life Sciences. The Cochin College, Cochin won The A K Prema ever rolling trophy for bagging the highest points at the Zonal ZOOFEST 2023.
- 7. State level seminar: Two Day Seminar on "Biodiversity Matter: Conservation for a Vibrant Planet" organized on 17° and 18° of October 2023. The seminar was sponsored by Kerala state biodiversity Board and DBT star college scheme. Two Day Seminar on "Biodiversity Matter: Conservation for a Vibrant Planet" was organized with the following objectives to raise awareness about the importance of marine and Skyland biodiversity and its role in sustaining ecosystems and human well-being, to educate participants about the current threats to marine biodiversity, such as habitat loss, pollution, climate change etc, to inspire and mobilize participants to take action and become advocates for biodiversity conservation in their respective fields and communities. The topics discussed in the seminar also covers the





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conservation aspects of different ecosystems Oceans, Sky islands, coral reefs and deep ocean. The program was inaugurated by **Shri. Sooraj Abraham**, FOUNDER, PLANATEARTH NGO, ALUVA., the resource person for the first session. Ernakulam Sri Sreeraj, Ernakulam District coordinator, KSBB, was also present and felicitated the program.

- Citizen Science Program (REVIVAL) (Rehabilitation of vibrio infested waters of Vembanad lake- Pollution and solution): An orientation of the Citizen Science Program was organized for the first year UG students by Ms. Ancy C Stoy, Research Scholar, CMFRI on 08/11/2023.
- Career orientation: Life science Research and it's carrier prospectus was delivered on 19-06-2023 by Mr Shajee Janardhanan, Beta Life Science Academy, Kannur.
- 10. Carrier Orientation in Medical Coding: IREZ ACADEMY ERNAKULAM gave an orientation to the students about the opportunities in Health Care and Medical coding.
- 11. DROP (Drive to recover Ocean Plastics): Students of the department performed an amazing Street play at Munambam Harbour, Kochi to spread awareness regarding Planatearth's 'DROP: Drive to Recover Ocean Plastics' project. Wonderful wall arts are made to make the public aware of the ocean plastic pollution and how together we can save our oceans from plastic pollution On 31s January 2024.
- 12. Wetland day Celebration 2024: A poster exhibition was organized to spread awareness about the importance of wetlands on 2<sup>--</sup> February 2024 to celebrate wetlands day.
- 13. World Cancer Day 2024: The Department of Zoology Observed World Cancer Day by hosting a poster exhibition on 7<sup>a</sup> February 2024..
- 14. Institute Visit: Final year B.Sc Students visited Central Marine Fisheries Research Institute on February 2nd on its 77th Foundation day. Students got an opportunity to visit the Research labs and Museum.
- 15. Workshop on Vermicomposting: Final year students of department of Zoology were given training in vermicomposting on 13 December 2023.
- 16. Sale of Student's Vermi Compost at Udyami Bazar The vermicompost prepared by students were put for sale at the Entrepreneurs Market (Udyami Bazar) at the IIC regional meet held at CUSAT, Kalamassery on 16 January 2024.
- 17. Capacity building training program: Sreelakshmi, Krishna Dileep, Anagha and Devika of 2nd BSc Zoology and Chaithra of first BSc Zoology successfully completed ICAR Sponsored (SCSP) capacity building training programme "Advanced Analytical Techniques in Fish Biochemistry & Nutrition" from Jan 29 Feb 2nd @ CIFT.
- 18. Field Trip Gokarnam- Dandeli field visit was organized for final year students from 15-18 February 2024.

#### Interdisciplinary Minor Projects - DBT Star College Scheme

- EcoWash: A Comprehensive Study on Biodetergent Manufacturing, Social Influence, and Performance Testing- (Ongoing - Chemistry and Zoology).
- Assessment of Vembanad Lake's Physico-Chemical and Biological Characteristics: Effects of Water Hyacinth Elimination (Ongoing - Botany, Chemistry and Zoology).





## THE COCHIN COLLEGE

### **KOCHI - 682 002**

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in email: email@thecochincollege.edu.in

Student Achievements: 7th Rank in BSc Zoology (M G University, Kottayam)

#### Faculty Achievements:

 Dr Manju V. Subramanian successfully completed MA in Psychology from IGNOU and was awarded the degree at the 37 th Convocation ceremony at Municipal Town Hall, Ernakulam on March 20th 2024.

 $\label{lem:university} \textbf{Results}. \ A is wary a Elizabeth (20-23 \ batch): 7 th \ Rank \ at \ University \ Level, \ A archa \ P \ Soman: A+, Eight students \ bagged \ A \ grade \ during \ the \ year.$ 





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