



VIVEKANANDA COLLEGE

(GOVT. SPONSORED) (NAAC ACCREDITED GRADE 'A')

DEPARTMENT OF ZOOLOGY

LIST OF ADD-ON COURSES

1	BASIC BIOSTATISTICS USED FOR RESEARCH
2	BEE KEEPING AND HONEY PROCESSING
3	ESSENTIALS OF RESEARCH METHODOLOGY IN BIOLOGY (P.G)

IQAC recommendation

IQAC, Vivekananda College, Thakurpukur, met on 04 May 2018, to envisage, formulate, and design Add-On Courses, beyond the prescribed Curriculum.

A. It was decided that all the departments of Humanities, Science and Commerce would design and formulate 30 hour Add-On Courses for 2018-19 Academic calendar, as per UGC guidelines.

B. It was decided that the Departments would be free to choose the Courses based on their (subject) relevance, practicality, and feasibility.

C. It was decided that the Departments would have a Course Coordinator, who would design the Course and Course material in consultation with all teachers of the Department.

D. It was decided that each Department would design its format.

E. It was decided that the Departments would be encouraged to use and utilize their resources while formulating the Add-On Courses, rather than relying on Outsourcing.

F. IQAC would send its recommendations to the Principal/TIC for perusal and implementation.


25/5/18
Coordinator
IQAC
Vivekananda College
Kolkata-700 093



VIVEKANANDA COLLEGE

(GOVT. SPONSORED) (NAAC ACCREDITED GRADE 'A')

Ref. No. _____

Date 10/05/18

Notice

It is hereby notified that Vivekananda College, Thakurpukur, will offer Add-On Courses to All Honours students for the Academic year 2018-19.

Each Department will offer an Add-On Course as per UGC guidelines. Each Course will be structured & overseen by a Course Coordinator, selected from the respective Department. Departmental Heads are requested to take up the matter on an urgent basis.

H. Padder
10/05/18

Principal
Vivekananda College
Thakurpukur, Kol-63

269, DIAMOND HARBOUR ROAD, THAKURPUKUR, KOLKATA- 700 063
Website : www.vckolkata63.org email : vivekanandacollege63@gmail.com

DEPARTMENT OF ZOOLOGY

A departmental meeting will be held on **03.07.2018** at **12:00 noon** to discuss the following Agenda. All teachers are requested to kindly attend the meeting.

AGENDA OF THE MEETING:

1. Introduction of Add-on course on “*Bee keeping and Honey processing*” in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited for **3rd year Hons [1+1+1]** and **UG Sem II Honours [CBCS]** students for the session 2018-2019.
2. Introduction of Add-on course on “*Basic Biostatistics used for Research*” for **UG Sem I Honours [CBCS]** students for the session 2018-2019.
3. Introduction of Add-on course on “*Bird Watching: Identification and Ecology*” for **3rd year Hons [1+1+1]** and **2nd year Hons [1+1+1]** students for the session 2018-2019.
4. Introduction of Add-on course on “*Reagents and Buffer Preparation for Biological Experiments*” for **3rd Year Bioscience General** students for the session 2018-2019

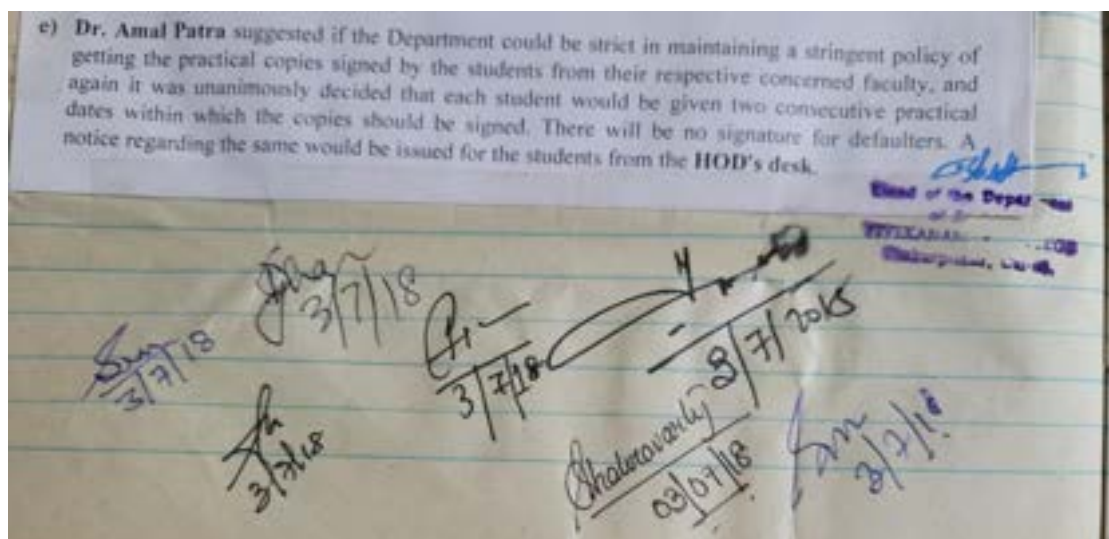


Dr. Malabika Bhattacharjee
Head of the Department
Dated: 29.06.2018

DEPARTMENT OF ZOOLOGY

Resolution of the Departmental Meeting held on 03.07.2018

A) TEACHERS PRESENT IN THE MEETING:



B) MINUTES OF THE MEETING

1. In the Departmental meeting dated **03.07.2018** the teachers of the UG & PG Department of Zoology unanimously decided that
 - a. The **3rd year Hons [1+1+1]** and **UG Sem II Honours [CBCS]** students would be offered a 30-hour Add-on Course on "***Bee keeping and Honey processing***" in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited.
 - b. The **UG Sem I Honours [CBCS]** students would be offered a 30-hour Add-on Course on "***Basic Biostatistics used for Research***".
 - c. The **3rd year Hons [1+1+1]** and **2nd year Hons [1+1+1]** students would be offered a 30-hour Add-on Course on "***Bird Watching: Identification and Ecology***".
 - d. The UG Bioscience General Sem III students would be offered a 30-hour Add-on Course on "***Reagents and Buffer Preparation for Biological Experiments***".
2. It was decided in the meeting that
 - a. **Dr. Amal Patra** would be the **Course Coordinator** for the UG Hons Add-On Course on "***Bee keeping and Honey processing***" and the **Course Structure** of the course would be submitted by Dr. Patra, which was accepted by all Faculty of the Department present in the meeting.
 - b. **Dr. Samita Kundu** would be the Course Coordinator for the UG Hons Add-On Course on "***Basic Biostatistics used for Research***" and the **Course Structure** of the course would be submitted by Dr. Kundu, which was accepted by all Faculty of the Department present in the meeting.
 - c. **Dr. Shaoli Majumder** would be the Course Coordinator for the UG Hons Add-On Course on "***Bird Watching: Identification and Ecology***" and the **Course Structure** of the course would be submitted by Dr. Majumder, which was accepted by all Faculty of the Department present in the meeting.
 - d. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the UG General Add-On Course on "***Reagents and Buffer Preparation for Biological Experiments***" and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
3. Certificates would be given to each student at the successful completion of the Course.

VIVEKANANDA COLLEGE
DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Rationale for Selecting the Course for UG Semester I Zoology Honours students

Biostatistics is the scientific study dealing with the methods for collection, presentation, mathematical analysis and interpretation of data derived from biological organisms. The scope of biostatistics is very wide, spanning both academic research and real-world applications. The introduction of an Add-on course on ‘Basic Biostatistics used in research’ for the 1st semester Under-graduate students of Zoology Honours serves several important purposes.

1. The present CBCS syllabus has no paper dealing with biostatistics. Most of the Honours students after graduation pursue higher studies and even choose a research career. Hence, it is of utmost importance to inculcate in them the basic concepts of statistics from the very beginning.
2. Let it be any dissertation/project work during higher academic degree or for thesis submission, the correct analysis and interpretation of data is very crucial. This is where the methods and principles of Biostatistics need to be applied.
3. Using appropriate statistics, students will be able to make sense of the large amount of data they collect during the course of research.
4. From designing an experiment to protocol development, biostatistics helps the research realm in various ways.
5. Biostatistics is an essential tool of scientific research and is applied in areas like medicine, public health, and research to analyse data and draw conclusions.

Thus, Biostatistics emerges as a powerful tool to equip individuals with the skills necessary for meaningful data analysis and also positions them at the forefront of driving advancements in research.

VIVEKANANDA COLLEGE
DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Outline Syllabus

Course	30 Hours
Module 1: Basic concept of Statistical Data <ul style="list-style-type: none">• Basic Definitions• Presentation of Data• Frequency Distribution• Graphical representation of data• Applications of Statistics in Research	4 hours
Module 2: Sampling <ul style="list-style-type: none">• Concept of Population and Sample• Sampling Methods• Parameter and Statistic	2 hours
Module 3: Measures of Central Tendency <ul style="list-style-type: none">• Arithmetic Mean• Median• Mode	6 hours
Module 4: Measures of Dispersion <ul style="list-style-type: none">• Standard Deviation• Variance• Standard error of Mean	4 hours
Module 5: Correlation and Regression <ul style="list-style-type: none">• Correlation• Regression	4 hours
Module 6: Probability <ul style="list-style-type: none">• Basic concept of Probability	2 hours
Module 6: Testing of Hypothesis <ul style="list-style-type: none">• Null Hypothesis• Levels of Significance• Student's t-test	3 hours
Module 7: Analysis of Variance <ul style="list-style-type: none">• One-way ANOVA	3 hours
*Assessment	2 hours

***Assessment:** 20% Weightage on Attendance and 80% on Multiple choice-based questions.

References:

1. Statistics in Biology and Psychology. D. Das and A. Das. Academic Publishers, Kolkata.
2. Introduction to Biostatistics. P.K. Banerjee. S. Chand & Company Pvt. Ltd. New Delhi.
3. Statistical Methods in Bio-Medical Research. B.B. Mukhopadhyay. Current Books International, Kolkata
4. Biostatistical Analysis. J.H. Zar. Pearson

VIVEKANANDA COLLEGE
DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Faculty Planner

Course	30 Hours	Faculty
Module 1: Basic concept of Statistical Data <ul style="list-style-type: none"> • Basic Definitions • Presentation of Data • Frequency Distribution • Graphical representation of data • Applications of Statistics in Research 	4 hours	Dr. Samita Kundu
Module 2: Sampling <ul style="list-style-type: none"> • Concept of Population and Sample • Sampling Methods • Parameter and Statistic 	2 hours	Dr. Samita Kundu
Module 3: Measures of Central Tendency <ul style="list-style-type: none"> • Arithmetic Mean • Median • Mode 	6 hours	Dr. Samita Kundu
Module 4: Measures of Dispersion <ul style="list-style-type: none"> • Standard Deviation • Variance • Standard error of Mean 	4 hours	Dr. Samita Kundu
Module 5: Correlation and Regression <ul style="list-style-type: none"> • Correlation • Regression 	4 hours	Dr. Malabika Bhattacharjee
Module 6: Probability <ul style="list-style-type: none"> • Basic concept of Probability 	2 hours	Dr. Malabika Bhattacharjee
Module 6: Testing of Hypothesis <ul style="list-style-type: none"> • Null Hypothesis • Levels of Significance • Student's t-test 	3 hours	Dr. Malabika Bhattacharjee
Module 7: Analysis of Variance <ul style="list-style-type: none"> • One-way ANOVA 	3 hours	Dr. Malabika Bhattacharjee

IQAC recommendation

IQAC, Vivekananda College, Thakurpukur, met on 04 May 2018, to envisage, formulate, and design Add-On Courses, beyond the prescribed Curriculum.

A. It was decided that all the departments of Humanities, Science and Commerce would design and formulate 30 hour Add-On Courses for 2018-19 Academic calendar, as per UGC guidelines.

B. It was decided that the Departments would be free to choose the Courses based on their (subject) relevance, practicality, and feasibility.

C. It was decided that the Departments would have a Course Coordinator, who would design the Course and Course material in consultation with all teachers of the Department.

D. It was decided that each Department would design its format.

E. It was decided that the Departments would be encouraged to use and utilize their resources while formulating the Add-On Courses, rather than relying on Outsourcing.

F. IQAC would send its recommendations to the Principal/TIC for perusal and implementation.


04/5/18
Coordinator
I Q A C
Vivekananda College
Kolkata-700 093



VIVEKANANDA COLLEGE

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Ref. No. _____

Date 10/05/18

Notice

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Handwritten signature
10/05/18

Principal
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Thakurpukur, Kol-60

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Website : www.vckolkata63.org email : vivekanandacollege63@gmail.com

DEPARTMENT OF ZOOLOGY

A departmental meeting will be held on **03.07.2018** at **12:00 noon** to discuss the following Agenda. All teachers are requested to kindly attend the meeting.

AGENDA OF THE MEETING:

1. Introduction of Add-on course on “*Bee keeping and Honey processing*” in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited for **3rd year Hons [1+1+1]** and **UG Sem II Honours [CBCS]** students for the session 2018-2019.
2. Introduction of Add-on course on “*Basic Biostatistics used for Research*” for **UG Sem I Honours [CBCS]** students for the session 2018-2019.
3. Introduction of Add-on course on “*Bird Watching: Identification and Ecology*” for **3rd year Hons [1+1+1]** and **2nd year Hons [1+1+1]** students for the session 2018-2019.
4. Introduction of Add-on course on “*Reagents and Buffer Preparation for Biological Experiments*” for **3rd Year Bioscience General** students for the session 2018-2019



Dr. Malabika Bhattacharjee

Head of the Department

Dated: 29.06.2018

HOD

Resolution of the departmental meeting held on 08.08.2022

e) Dr. Amal Patra suggested if the Department could be strict in maintaining a stringent policy of getting the practical copies signed by the students from their respective concerned faculty, and again it was unanimously decided that each student would be given two consecutive practical dates within which the copies should be signed. There will be no signature for defaulters. A notice regarding the same would be issued for the students from the HOD's desk.

[Handwritten signatures and dates follow:]

Sun 3/7/18
3/7/18
3/7/18
Pr - 3/7/18
Sharmavarty 03/07/18
Sun 3/7/18






[Stamp:]
Head of the Department
Physics
Date: _____
Signature: _____

Vivekananda College

Post-Graduate Department of Zoology

Add on Course Title: **Bee keeping & Honey processing**

The objectives of introducing the Add-on course on “Beekeeping & Honey Processing” by the department of Zoology of Vivekananda College are:

-  To develop additional Skill of the Students for practical knowledge in the field of Economic Zoology.
-  To empower the students with knowledge to introduce themselves in practical field.
-  To provide the students the opportunity to go beyond their curriculum.
-  To facilitate them to extend their interest level in different areas, and
-  To provide the students the opportunity to complete the certificate course within the stipulated time period of their regular UG programme.

Vivekananda College

Post-Graduate Department of Zoology

TITLE: ADD-ON COURSE ON “BEE KEEPING AND HONEY PROCESSING”

SYLLABUS

A: THEORY

Sl NO	Topics	Sub -Topics	Time in hours
1	Introduction to Apiculture: Scope and Importance	i. Definition ii. Bee keeping worldwide and in India. iii. Apiculture development in India - institutions involved. iv. Role of Central Honey Bee Research & Training Institute. v. Scope and privilege of Bee-keeping in West Bengal	1
2	Biology of Honey Bees	i. Systematic position (Ruppert and Barnes, 1994). ii. Indigenous and exotic species of Honey bees and their differences. iii. Morphology, anatomy and life cycle of Honey bee (<i>Apis indica</i>) iv. Social organization in honey bees. v. Annual biological cycle of the bee colony. vi. Sizes and shapes of bee-cells.	2
3.	Honeybee Plants and Floral Calendar	i. Bee flora - importance propagation - congenial conditions for starting up of apiculture. ii. Migratory Bee Keeping - designing floral Calendar.	1
4	Bee keeping	i. Traditional ii. Modern iii. Urban or backyard beekeeping	1
5	Modern Bee keeping	i. Artificial Bee-hives. ii. Parts of Newton hive. iii. Tools and Equipments for Bee-Keeping by Newton hive only. iv. Methods of making artificial hives.	2

6	Honeybee Enemies and Diseases	i. Enemies ii. Diseases	1
7	Honey and other Bee Hive products	i. Properties of honey ii. Composition of honey iii. Application of honey iv. Processing of Honey & Bee wax v. Bee venom	2
8	Economics of bee keeping and Marketing of bee products.	i. Economics in small scale and large scale bee keeping. ii. Economic Value of Commercial Beekeeping. iii. Marketing of Bee products	1

B: PRACTICAL

Sl NO	TOPICS	Time in hours
1.	Identification of honey bee (<i>Apis indica</i>) and its body parts	2
2	Dissection and display of the mouth parts and sting of honey bees	2
3	Dissection and display of the pollen basket of honey bees	2
4	Identification of different parts of Newton hives and tools for beekeeping.	2
5	Identification of different strains of honey bees in bee hive	2
6.	Identification of Developmental stages of honey bees in bee hive.	2
7.	Process of honey collection	2
8	Methods of honey processing	4
9	Field visit	4

Vivekananda College

Post-Graduate Department of Zoology

FACULTY PLANNER

A: THEORY

SI NO	Topics	Time in hours	Faculty
1	Introduction to Apiculture: Scope and Importance	1	TN
2	Biology of Honey Bees	2	SRM
3.	Honeybee Plants and Floral Calendar	1	AM
4	Bee keeping	1	SRM
5	Modern Bee keeping	2	AP
6	Honeybee Enemies and Diseases	1	AP
7	Honey and other Bee Hive products	2	RC
8	Economics of bee keeping and Marketing of bee products.	1	RC

B: PRACTICAL

SI NO	TOPICS	Time in hours	Faculty
1.	Identification of honey bee (<i>Apis indica</i>) and its body parts	2	AP
2	Dissection and display of the mouth parts and sting of honey bees	2	RC
3	Dissection and display of the pollen basket of honey bees	2	SM
4	Identification of different parts of Newton hives and tools for beekeeping.	2	SRM
5	Identification of different strains of honey bees in bee hive	2	AP
6.	Identification of Developmental stages of honey bees in bee hive.	2	SRM
7.	Process of honey collection	2	AP
8	Methods of honey processing	4	GD
9	Field visit	4	SRM+RC+SM+AP

SRM - Dr. Senuti Roy Mukherjee

GD - Dr. Gunan Dhar

RC- Smt. Ranu Chakravorty

SM- Dr. Shaoli Maumder

TN - Dr. Triit Nanda

AM- Dr. Ashutosh Mukherjee

AP - Dr. Amal Patra

IQAC recommendation

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A. It was decided that all the departments of Humanities, Science and Commerce would design and formulate 30 hour Add-On Courses for 2019-20 Academic calendar, as per UGC guidelines.

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C. It was decided that the Departments would have a Course Coordinator, who would design the Course and Course material in consultation with all teachers of the Department.

D. It was decided that each Department would design its format.

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F. IQAC would send its recommendations to the Principal/TIC for perusal and implementation.


03/5/19
Coordinator
IQAC
Vivekananda College
Ph. No. 700 063



VIVEKANANDA COLLEGE

(GOVT. SPONSORED) (NAAC ACCREDITED GRADE 'A')

Ref. No. _____

Date 08.5.19

Notice

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H. K. Das
08.5.19

Principal
Vivekananda College
Thakurpukur Kol-63

DEPARTMENT OF ZOOLOGY

A departmental meeting will be held on **19.08.2019** at 12:00 noon to discuss the following Agenda. All teachers are requested to kindly attend the meeting.

AGENDA OF THE MEETING:

1. Introduction of Add-on course on “*Bee keeping and Honey processing*” in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited for **3rd year Hons [1+1+1]** and **UG Sem II Honours [CBCS]** students for the session 2019-2020.
2. Introduction of Add-on course on “*Basic Biostatistics used for Research*” for **UG Sem I Honours [CBCS]** students for the session 2019-2020.
3. Introduction of Add-on course on “*Bird Watching: Identification and Ecology*” for **UG Sem IV Honours [CBCS]** students for the session 2019-2020.
4. Introduction of Add-on course on “*Reagents and Buffer Preparation for Biological Experiments*” for **3rd Year Bioscience General Students [1+1+1]** students for the session 2019-2020.
5. Introduction of Add-on course on “*Essentials of Research Methodology in Biology*” for **PG Sem I Students** for the session 2019-2020.



Dr. Malabika Bhattacharjee

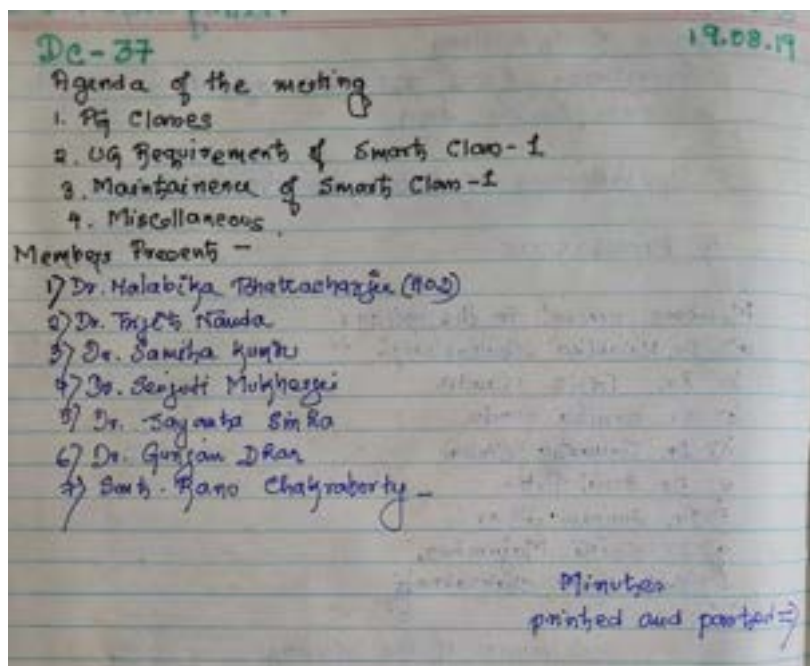
Head of the Department

Dated: 12.08.2019

DEPARTMENT OF ZOOLOGY

Resolution of the Departmental Meeting held on 19.08.2019

A) TEACHERS PRESENT IN THE MEETING:



B) MINUTES OF THE MEETING

1. In the Departmental meeting dated **19.08.2019** the teachers of the UG & PG Department of Zoology unanimously decided that
 - a. The **3rd year Hons [1+1+1]** and **UG Sem II Honours [CBCS]** students would be offered a 30-hour Add-on Course on **"Bee keeping and Honey processing"** in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited.
 - b. A 30-hour Add-on course on **"Basic Biostatistics used for Research"** will also be offered to **UG Sem I Honours [CBCS]** students for the Session 2019-2020.
 - c. The **UG Sem IV Honours [CBCS]** students would be offered a 30-hour Add-on Course on **"Bird Watching: Identification and Ecology"**.
 - d. The **3rd Year Bioscience General Students [1+1+1]** students would be offered a 30-hour Add-on Course on **"Reagents and Buffer Preparation for Biological Experiments"**.
 - e. Another 30-hour Add-on course on **"Essentials of Research Methodology in Biology"** will be offered to PG Sem I students for the Session 2019-2020
2. It was decided in the meeting that
 - a. **Dr. Amal Patra** would be the **Course Coordinator** for the UG Hons Add-On Course on **"Bee keeping and Honey processing"** and the **Course Structure** of the course would be submitted by Dr. Patra, which was accepted by all Faculty of the Department present in the meeting.
 - b. **Dr. Samita Kundu** would be the Course Coordinator for the UG Hons Add-On Course on **"Basic Biostatistics used for Research"** and the **Course Structure** of the course would be submitted by Dr. Kundu, which was accepted by all Faculty of the Department present in the meeting.
 - c. **Dr. Shaoli Majumder** would be the Course Coordinator for the UG Hons Add-On Course on **"Bird Watching: Identification and Ecology"** and the **Course Structure** of the course would be submitted by Dr. Majumder, which was accepted by all Faculty of the Department present in the meeting.
 - d. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the UG General Add-On Course on **"Reagents and Buffer Preparation for Biological Experiments"** and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
 - e. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the PG Add-On Course on **"Essentials of Research Methodology in Biology"** and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
3. Certificates would be given to each student at the successful completion of the Course.

Vivekananda College

Post-Graduate Department of Zoology

Add on Course Title: Essentials of Research Methodology in Biology

Rationale for Selecting the Course for PG Sem-1 Students

The introduction of "Essentials of Research Methodology in Biology" in the first semester of a postgraduate program serves several important purposes. Below is a rationale outlining the reasons for including this course in the curriculum:

- 1. Foundation for Research Skills:** The course provides a foundational understanding of research methodology, ensuring that students entering the postgraduate program have a strong grasp of the essential research skills needed for advanced studies and future research endeavors.
- 2. Early Exposure to Research Practices:** By introducing research methodology early in the postgraduate program, students gain exposure to research practices from the beginning of their academic journey. This exposure helps them develop a research-oriented mindset and encourages them to integrate research thinking into their coursework.
- 3. Aligning with Advanced Courses:** Research methodology is a critical component for successfully undertaking advanced courses in specialized areas of biology. Early exposure ensures that students are well-equipped with the necessary skills to engage with more complex and specialized subjects later in their program.
- 4. Preparation for Thesis/Dissertation Work:** Calcutta University Postgraduate programs require students to conduct original research for their theses or dissertations in 3rd and 4th Semester. Introducing research methodology in the first semester prepares students for the independent research work they will undertake later in the program, allowing them to approach their thesis projects with confidence.
- 5. Critical Thinking and Problem-Solving:** Research methodology emphasizes critical thinking and problem-solving skills, which are crucial for students pursuing postgraduate studies. These skills are not only valuable for research but also contribute to a deeper understanding of biological concepts and the ability to analyze complex scientific problems.
- 6. Ethical Considerations:** Understanding the ethical principles of research is vital in any field. By introducing research methodology early, students are sensitized to ethical considerations in scientific research, ensuring responsible and ethical conduct throughout their academic and professional careers.

Vivekananda College

Post-Graduate Department of Zoology

Add on Course Title: Essentials of Research Methodology in Biology

Outline Syllabus

Course	30 Hours
Module 1: Introduction to Biological Research	2 Hours
<ul style="list-style-type: none"> Definition and significance of research in biology Historical context and landmark studies Overview of contemporary research areas in biology Ethical considerations in biological research 	
Module 2: Formulating Research Questions and Hypotheses	2 Hours
<ul style="list-style-type: none"> Developing clear and testable research questions Constructing hypotheses in biological research Significance of hypotheses in experimental design 	
Module 3: Experimental Design in Biology	6 Hours
<ul style="list-style-type: none"> Basics of experimental design Control groups, variables, and replication Randomized controlled trials in biology Field studies and observational research 	
Module 4: Sampling Techniques in Biological Research	4 hours
<ul style="list-style-type: none"> Overview of sampling methods in ecology and biology Random sampling, stratified sampling, and systematic sampling Importance of representative samples Sample size determination in biological studies 	
Module 5: Data Collection Methods in Biology: A basic conceptual Approach	3 Hours
<ul style="list-style-type: none"> Laboratory techniques (e.g., PCR, ELISA, microscopy, FACS) Fieldwork and ecological surveys Molecular biology techniques (e.g., DNA extraction, sequencing) 	
Module 6: Measurement and Analysis in Biology	5 Hours
<ul style="list-style-type: none"> Quantitative and qualitative data in biology Statistical analysis in biological research Data interpretation and visualization techniques 	
Module 7: Advanced Techniques in Biological Research: A brief in-view	2 Hours
<ul style="list-style-type: none"> Genomics and proteomics CRISPR-Cas9 technology Advanced microscopy and imaging techniques 	
Module 8: Research Proposal and Project Presentation	6 Hours
<ul style="list-style-type: none"> Developing a research proposal in biology Effective presentation skills for scientific research Peer review and constructive feedback 	

Assessment:

- Module quizzes and participation and MCQ based Examination

Vivekananda College

Post-Graduate Department of Zoology

Add on Course Title: Essentials of Research Methodology in Biology

FACULTY PLANNER

Course	30 Hours	Faculty
Module 1: Introduction to Biological Research	2 Hours	TN
<ul style="list-style-type: none"> Definition and significance of research in biology Historical context and landmark studies Overview of contemporary research areas in biology Ethical considerations in biological research 		
Module 2: Formulating Research Questions and Hypotheses	2 Hours	MB
<ul style="list-style-type: none"> Developing clear and testable research questions Constructing hypotheses in biological research Significance of hypotheses in experimental design 		
Module 3: Experimental Design in Biology	6 Hours	MB
<ul style="list-style-type: none"> Basics of experimental design Control groups, variables, and replication Randomized controlled trials in biology Field studies and observational research 		
Module 4: Sampling Techniques in Biological Research	4 hours	TN & MB
<ul style="list-style-type: none"> Overview of sampling methods in ecology and biology TN Random sampling, stratified sampling, and systematic sampling MB Importance of representative samples TN Sample size determination in biological studies MB 		
Module 5: Data Collection Methods in Biology: A basic conceptual Approach	3 Hours	SMK, TN & MB
<ul style="list-style-type: none"> Laboratory techniques (e.g., PCR, ELISA, microscopy, FACS) SMK Fieldwork and ecological surveys TN Molecular biology techniques (e.g., DNA extraction, sequencing) MB 		
Module 6: Measurement and Analysis in Biology	5 Hours	MB
<ul style="list-style-type: none"> Quantitative and qualitative data in biology Statistical analysis in biological research Data interpretation and visualization techniques 		
Module 7: Advanced Techniques in Biological Research: A brief in-view	2 Hours	MB & SMK
<ul style="list-style-type: none"> Genomics and proteomics MB CRISPR-Cas9 technology MB Advanced microscopy and imaging techniques SMK 		
Module 8: Research Proposal and Project Presentation	6 Hours	MB & TN
<ul style="list-style-type: none"> Developing a research proposal in biology MB Effective presentation skills for scientific research TN Peer review and constructive feedback MB 		

TN: Dr. Trijit Nanda; MB : Dr. Malabika Bhattacharjee; SMK: Dr. Samita Kundu

IMAGES OF SOME ONLINE CLASSES TAKEN



IQAC recommendation

IQAC, Vivekananda College, Thakurpukur, met on 03 May 2019, to envisage, formulate, and design Add-On Courses, beyond the prescribed Curriculum.

A. It was decided that all the departments of Humanities, Science and Commerce would design and formulate 30 hour Add-On Courses for 2019-20 Academic calendar, as per UGC guidelines.

B. It was decided that the Departments would be free to choose the Courses based on their (subject) relevance, practicality, and feasibility.

C. It was decided that the Departments would have a Course Coordinator, who would design the Course and Course material in consultation with all teachers of the Department.

D. It was decided that each Department would design its format.

E. It was decided that the Departments would be encouraged to use and utilize their resources while formulating the Add-On Courses, rather than relying on Outsourcing.

F. IQAC would send its recommendations to the Principal/TIC for perusal and implementation.


63/5/19
Coordinator
IQAC
Vivekananda College
Kolkata-700 063



VIVEKANANDA COLLEGE

(GOVT. SPONSORED) (NAAC ACCREDITED GRADE 'A')

Ref. No. _____

Date 08-5-19

Notice

It is hereby notified that Vivekananda College, Thakurpukur, will offer Add-On Courses to All Honours students for the Academic year 2019-20.

Each Department will offer an Add-On Course as per UGC guidelines. Each Course will be structured & overseen by a Course Coordinator, selected from the respective Department. Departmental Heads are requested to take up the matter on an urgent basis.

Hkpoddar
08.5.19

Principal
Vivekananda College
Thakurpukur Kol-63

269, DIAMOND HARBOUR ROAD, THAKURPUKUR, KOLKATA- 700 063
Website : www.vckolkata63.org email : vivekanandacollege63@gmail.com

DEPARTMENT OF ZOOLOGY

A departmental meeting will be held on **19.08.2019** at 12:00 noon to discuss the following Agenda. All teachers are requested to kindly attend the meeting.

AGENDA OF THE MEETING:

1. Introduction of Add-on course on “*Bee keeping and Honey processing*” in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited for **3rd year Hons [1+1+1]** and **UG Sem II Honours [CBCS]** students for the session 2019-2020.
2. Introduction of Add-on course on “*Basic Biostatistics used for Research*” for **UG Sem I Honours [CBCS]** students for the session 2019-2020.
3. Introduction of Add-on course on “*Bird Watching: Identification and Ecology*” for **UG Sem IV Honours [CBCS]** students for the session 2019-2020.
4. Introduction of Add-on course on “*Reagents and Buffer Preparation for Biological Experiments*” for **3rd Year Bioscience General Students [1+1+1]** students for the session 2019-2020.
5. Introduction of Add-on course on “*Essentials of Research Methodology in Biology*” for **PG Sem I Students** for the session 2019-2020.

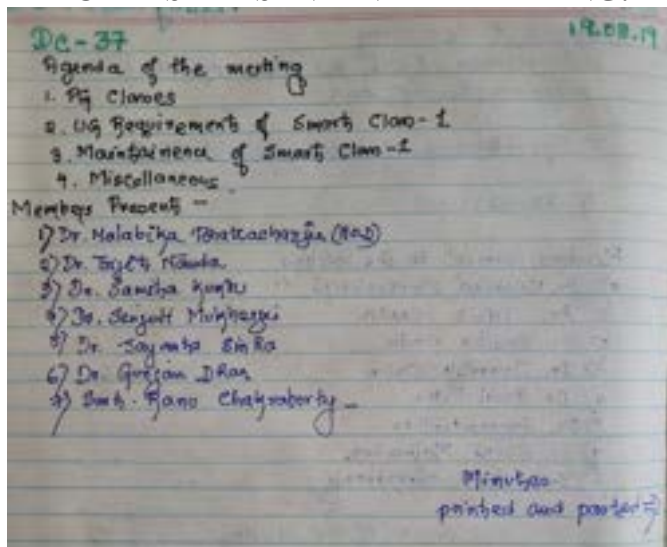


Dr. Malabika Bhattacharjee
Head of the Department
Dated: 12.08.2019

DEPARTMENT OF ZOOLOGY

Resolution of the Departmental Meeting held on 19.08.2019

A) TEACHERS PRESENT IN THE MEETING:



B) MINUTES OF THE MEETING

1. In the Departmental meeting dated **19.08.2019** the teachers of the UG & PG Department of Zoology unanimously decided that
 - a. The **3rd year Hons [1+1+1]** and **UG Sem II Honours [CBCS]** students would be offered a 30-hour Add-on Course on **"Bee keeping and Honey processing"** in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited.
 - b. A 30-hour Add-on course on **"Basic Biostatistics used for Research"** will also be offered to **UG Sem I Honours [CBCS]** students for the Session 2019-2020.
 - c. The **UG Sem IV Honours [CBCS]** students would be offered a 30-hour Add-on Course on **"Bird Watching: Identification and Ecology"**.
 - d. The **3rd Year Bioscience General Students [1+1+1]** students would be offered a 30-hour Add-on Course on **"Reagents and Buffer Preparation for Biological Experiments"**.
 - e. Another 30-hour Add-on course on **"Essentials of Research Methodology in Biology"** will be offered to PG Sem I students for the Session 2019-2020
2. It was decided in the meeting that
 - a. **Dr. Amal Patra** would be the **Course Coordinator** for the UG Hons Add-On Course on **"Bee keeping and Honey processing"** and the **Course Structure** of the course would be submitted by Dr. Patra, which was accepted by all Faculty of the Department present in the meeting.
 - b. **Dr. Samita Kundu** would be the Course Coordinator for the UG Hons Add-On Course on **"Basic Biostatistics used for Research"** and the **Course Structure** of the course would be submitted by Dr. Kundu, which was accepted by all Faculty of the Department present in the meeting.
 - c. **Dr. Shaoli Majumder** would be the Course Coordinator for the UG Hons Add-On Course on **"Bird Watching: Identification and Ecology"** and the **Course Structure** of the course would be submitted by Dr. Majumder, which was accepted by all Faculty of the Department present in the meeting.
 - d. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the UG General Add-On Course on **"Reagents and Buffer Preparation for Biological Experiments"** and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
 - e. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the PG Add-On Course on **"Essentials of Research Methodology in Biology"** and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
3. Certificates would be given to each student at the successful completion of the Course.

VIVEKANANDA COLLEGE
DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Rationale for Selecting the Course for UG Semester I Zoology Honours students

Biostatistics is the scientific study dealing with the methods for collection, presentation, mathematical analysis and interpretation of data derived from biological organisms. The scope of biostatistics is very wide, spanning both academic research and real-world applications. The introduction of an Add-on course on ‘Basic Biostatistics used in research’ for the 1st semester Under-graduate students of Zoology Honours serves several important purposes.

1. The present CBCS syllabus has no paper dealing with biostatistics. Most of the Honours students after graduation pursue higher studies and even choose a research career. Hence, it is of utmost importance to inculcate in them the basic concepts of statistics from the very beginning.
2. Let it be any dissertation/project work during higher academic degree or for thesis submission, the correct analysis and interpretation of data is very crucial. This is where the methods and principles of Biostatistics need to be applied.
3. Using appropriate statistics, students will be able to make sense of the large amount of data they collect during the course of research.
4. From designing an experiment to protocol development, biostatistics helps the research realm in various ways.
5. Biostatistics is an essential tool of scientific research and is applied in areas like medicine, public health, and research to analyse data and draw conclusions.

Thus, Biostatistics emerges as a powerful tool to equip individuals with the skills necessary for meaningful data analysis and also positions them at the forefront of driving advancements in research.

VIVEKANANDA COLLEGE

DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Outline Syllabus

Course	30 Hours
Module 1: Basic concept of Statistical Data <ul style="list-style-type: none"> • Basic Definitions • Presentation of Data • Frequency Distribution • Graphical representation of data • Applications of Statistics in Research 	4 hours
Module 2: Sampling <ul style="list-style-type: none"> • Concept of Population and Sample • Sampling Methods • Parameter and Statistic 	2 hours
Module 3: Measures of Central Tendency <ul style="list-style-type: none"> • Arithmetic Mean • Median • Mode 	6 hours
Module 4: Measures of Dispersion <ul style="list-style-type: none"> • Standard Deviation • Variance • Standard error of Mean 	4 hours
Module 5: Correlation and Regression <ul style="list-style-type: none"> • Correlation • Regression 	4 hours
Module 6: Probability <ul style="list-style-type: none"> • Basic concept of Probability 	2 hours
Module 6: Testing of Hypothesis <ul style="list-style-type: none"> • Null Hypothesis • Levels of Significance • Student's t-test 	3 hours
Module 7: Analysis of Variance <ul style="list-style-type: none"> • One-way ANOVA 	3 hours
*Assessment	2 hours

***Assessment:** 20% Weightage on Attendance and 80% on Multiple choice-based questions.

References:

1. Statistics in Biology and Psychology. D. Das and A. Das. Academic Publishers, Kolkata.
2. Introduction to Biostatistics. P.K. Banerjee. S. Chand & Company Pvt. Ltd. New Delhi.
3. Statistical Methods in Bio-Medical Research. B.B. Mukhopadhyay. Current Books International, Kolkata
4. Biostatistical Analysis. J.H. Zar. Pearson

VIVEKANANDA COLLEGE

DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Faculty Planner

Course	30 Hours	Faculty
Module 1: Basic concept of Statistical Data <ul style="list-style-type: none"> • Basic Definitions • Presentation of Data • Frequency Distribution • Graphical representation of data • Applications of Statistics in Research 	4 hours	Dr. Samita Kundu
Module 2: Sampling <ul style="list-style-type: none"> • Concept of Population and Sample • Sampling Methods • Parameter and Statistic 	2 hours	Dr. Samita Kundu
Module 3: Measures of Central Tendency <ul style="list-style-type: none"> • Arithmetic Mean • Median • Mode 	6 hours	Dr. Samita Kundu
Module 4: Measures of Dispersion <ul style="list-style-type: none"> • Standard Deviation • Variance • Standard error of Mean 	4 hours	Dr. Samita Kundu
Module 5: Correlation and Regression <ul style="list-style-type: none"> • Correlation • Regression 	4 hours	Dr. Malabika Bhattacharjee
Module 6: Probability <ul style="list-style-type: none"> • Basic concept of Probability 	2 hours	Dr. Malabika Bhattacharjee
Module 6: Testing of Hypothesis <ul style="list-style-type: none"> • Null Hypothesis • Levels of Significance • Student's t-test 	3 hours	Dr. Malabika Bhattacharjee
Module 7: Analysis of Variance <ul style="list-style-type: none"> • One-way ANOVA 	5 hours	Dr. Malabika Bhattacharjee

IQAC recommendation

IQAC, Vivekananda College, Thakurpukur, met on 03 May 2019, to envisage, formulate, and design Add-On Courses, beyond the prescribed Curriculum.

A. It was decided that all the departments of Humanities, Science and Commerce would design and formulate 30 hour Add-On Courses for 2019-20 Academic calendar, as per UGC guidelines.

B. It was decided that the Departments would be free to choose the Courses based on their (subject) relevance, practicality, and feasibility.

C. It was decided that the Departments would have a Course Coordinator, who would design the Course and Course material in consultation with all teachers of the Department.

D. It was decided that each Department would design its format.

E. It was decided that the Departments would be encouraged to use and utilize their resources while formulating the Add-On Courses, rather than relying on Outsourcing.

F. IQAC would send its recommendations to the Principal/TIC for perusal and implementation.


63/5/19
Coordinator
IQAC
Vivekananda College
Ph. No. 700 063



VIVEKANANDA COLLEGE

(GOVT. SPONSORED) (NAAC ACCREDITED GRADE 'A')

Ref. No. _____

Date 08.5.19

Notice

It is hereby notified that Vivekananda College, Thakurpukur, will offer Add-On Courses to All Honours students for the Academic year 2019-20.

Each Department will offer an Add-On Course as per UGC guidelines. Each Course will be structured & overseen by a Course Coordinator, selected from the respective Department. Departmental Heads are requested to take up the matter on an urgent basis.

H. Padhee
08.5.19

Principal
Vivekananda College
Thakurpukur Kol-63

DEPARTMENT OF ZOOLOGY

A departmental meeting will be held on 19.08.2019 at 12:00 noon to discuss the following Agenda. All teachers are requested to kindly attend the meeting.

Agenda of the meeting:

- i) Introduction of Add-on course on “*Bee keeping and Honey processing*” in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited for UG Sem II and UG IV Honours students.
- ii) Introduction of Add-on course on “*Essentials of Research Methodology in Biology*” for PG Sem I Students from the session 2019-2020

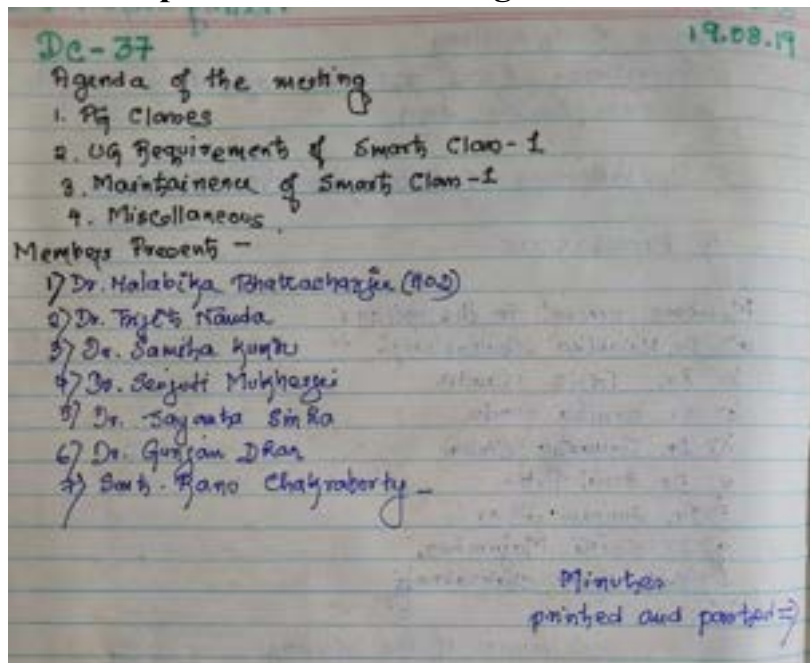


Dr. Malabika Bhattacharjee
Head of the Department
Dated: 12.08.2019

DEPARTMENT OF ZOOLOGY

Resolution of the Departmental Meeting held on 19.08.2019

A) Teachers present in the meeting:



B) Minutes of the meeting






1. In the Departmental meeting dated **19.08.2019** the teachers of the UG & PG Department of Zoology unanimously decided that
 - a. The **3rd year Hons [1+1+1]** and **UG Sem II Honours [CBCS]** students would be offered a 30-hour Add-on Course on **“Bee keeping and Honey processing”** in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited.
 - b. A 30-hour Add-on course on **“Basic Biostatistics used for Research”** will also be offered to **UG Sem I Honours [CBCS]** students for the Session 2019-2020.
 - c. The **UG Sem IV Honours [CBCS]** students would be offered a 30-hour Add-on Course on **“Bird Watching: Identification and Ecology”**.
 - d. The **3rd Year Bioscience General Students [1+1+1]** students would be offered a 30-hour Add-on Course on **“Reagents and Buffer Preparation for Biological Experiments”**.
 - e. Another 30-hour Add-on course on **“Essentials of Research Methodology in Biology”** will be offered to PG Sem I students for the Session 2019-2020
2. It was decided in the meeting that
 - a. **Dr. Amal Patra** would be the **Course Coordinator** for the UG Hons Add-On Course on **“Bee keeping and Honey processing”** and the **Course Structure** of the course would be submitted by Dr. Patra, which was accepted by all Faculty of the Department present in the meeting.
 - b. **Dr. Samita Kundu** would be the Course Coordinator for the UG Hons Add-On Course on **“Basic Biostatistics used for Research”** and the **Course Structure** of the course would be submitted by Dr. Kundu, which was accepted by all Faculty of the Department present in the meeting.
 - c. **Dr. Shaoli Majumder** would be the Course Coordinator for the UG Hons Add-On Course on **“Bird Watching: Identification and Ecology”** and the **Course Structure** of the course would be submitted by Dr. Majumder, which was accepted by all Faculty of the Department present in the meeting.
 - d. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the UG General Add-On Course on **“Reagents and Buffer Preparation for Biological Experiments”** and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
 - e. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the PG Add-On Course on **“Essentials of Research Methodology in Biology”** and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
3. Certificates would be given to each student at the successful completion of the Course.

Vivekananda College

Post-Graduate Department of Zoology

Add on Course Title: Bee keeping & Honey processing

The objectives of introducing the Add-on course on “Beekeeping & Honey Processing” by the department of Zoology of Vivekananda College are:

-  To develop additional Skill of the Students for practical knowledge in the field of Economic Zoology.
-  To empower the students with knowledge to introduce themselves in practical field.
-  To provide the students the opportunity to go beyond their curriculum.
-  To facilitate them to extend their interest level in different areas, and
-  To provide the students the opportunity to complete the certificate course within the stipulated time period of their regular UG programme.

Vivekananda College

Post-Graduate Department of Zoology

TITLE: ADD-ON COURSE ON “BEE KEEPING AND HONEY PROCESSING”

SYLLABUS

A: THEORY

Sl NO	Topics	Sub -Topics	Time in hours
1	Introduction to Apiculture: Scope and Importance	i. Definition ii. Bee keeping worldwide and in India. iii. Apiculture development in India - institutions involved. iv. Role of Central Honey Bee Research & Training Institute. v. Scope and privilege of Bee-keeping in West Bengal	1
2	Biology of Honey Bees	i. Systematic position (Ruppert and Barnes, 1994). ii. Indigenous and exotic species of Honey bees and their differences. iii. Morphology, anatomy and life cycle of Honey bee(<i>Apis indica</i>) iv. Social organization in honey bees. v. Annual biological cycle of the bee colony. vi. Sizes and shapes of bee-cells.	2
3.	Honeybee Plants and Floral Calendar	i. Bee flora - importance propagation - congenial conditions for starting up of apiculture. ii. Migratory Bee Keeping - designing floral Calendar.	1
4	Bee keeping	i. Traditional ii. Modern iii. Urban or backyard beekeeping	1
5	Modern Bee keeping	i. Artificial Bee-hives. ii. Parts of Newton hive. iii. Tools and Equipments for Bee-Keeping by Newton hive only.	2

**Add on Course on “Bee keeping and Honey processing”, UG Department of Zoology,
Vivekananda College**

		iv. Methods of making artificial hives.	
6	Honeybee Enemies and Diseases	i. Enemies ii. Diseases	1
7	Honey and other Bee Hive products	i. Properties of honey ii. Composition of honey iii. Application of honey iv. Processing of Honey & Bee wax v. Bee venom	2
8	Economics of bee keeping and Marketing of bee products.	i. Economics in small scale and large scale bee keeping. ii. Economic Value of Commercial Beekeeping. iii. Marketing of Bee products	1

B: PRACTICAL

Sl NO	TOPICS	Time in hours
1.	Identification of honey bee (<i>Apis indica</i>) and its body parts	2
2	Dissection and display of the mouth parts and sting of honey bees	2
3	Dissection and display of the pollen basket of honey bees	2
4	Identification of different parts of Newton hives and tools for beekeeping.	2
5	Identification of different strains of honey bees in bee hive	2
6.	Identification of Developmental stages of honey bees in bee hive.	2
7.	Process of honey collection	2
8	Methods of honey processing	4
9	Field visit	4

Vivekananda College
Post-Graduate Department of Zoology
FACULTY PLANNER

A: THEORY

SI NO	Topics	Time in hours	Faculty
1	Introduction to Apiculture: Scope and Importance	1	TN
2	Biology of Honey Bees	2	SRM
3.	Honeybee Plants and Floral Calendar	1	AM
4	Bee keeping	1	SRM
5	Modern Bee keeping	2	AP
6	Honeybee Enemies and Diseases	1	AP
7	Honey and other Bee Hive products	2	RC
8	Economics of bee keeping and Marketing of bee products.	1	RC

B: PRACTICAL

SI NO	TOPICS	Time in hours	Faculty
1.	Identification of honey bee (<i>Apis indica</i>) and its body parts	2	AP
2	Dissection and display of the mouth parts and sting of honey bees	2	RC
3	Dissection and display of the pollen basket of honey bees	2	SM
4	Identification of different parts of Newton hives and tools for beekeeping.	2	SRM
5	Identification of different strains of honey bees in bee hive	2	AP
6.	Identification of Developmental stages of honey bees in bee hive.	2	SRM
7.	Process of honey collection	2	AP
8	Methods of honey processing	4	GD
9	Field visit	4	SRM+RC+SM+AP

SRM - Dr. Senuti Roy Mukherjee
GD - Dr. Gunan Dhar
RC- Smt. Ranu Chakravorty
SM- Dr. Shaoli Maumder

TN - Dr. Triit Nanda
AM- Dr. Ashutosh Mukherjee
AP - Dr. Amal Patra

IQAC recommendation

IQAC recommendation

IQAC, Vivekananda College, Thakurpukur, met on 14/Sept/2021, to envisage, formulate and design Add-On Courses, beyond prescribed Curriculum

A. It was decided that all the departments of Humanities, Science and Commerce would design and formulate 30 hour Add-On Courses for the session 2021-22, Academic calendar, as per UGC guidelines.

B. It was decided that the Departments would be free to choose the Courses on the basis of their (subject) relevance, practicality and feasibility.

C. It was decided that the Departments would have a Course Coordinator, who would design the Course and Course materials, in consultation with all teachers of the Department.

D. It was decided that each Department would design its own format; and could follow a blended mode of instruction.

E. It was decided that the Departments would be encouraged to use and utilize their own resources while formulating the Add-On Courses, rather than relying on Outsourcing.

F. IQAC would send its recommendations to the Principal/TIC for perusal and implementation.


14/09/21
Co-ordinator
IQAC
Vivekananda College
Kolkata-700 063



VIVEKANANDA COLLEGE

(GOVT. SPONSORED) (NAAC ACCREDITED GRADE 'A')

Ref. No. _____

Date 21/9/21

Notice

It is hereby notified that Vivekananda College, Thakurpukur, will offer Add-On Courses to All Honours students for the Academic year 2021- 22.

Each Department will offer an Add-On Course as per UGC guidelines. Each Course will be structured & overseen by a Course Coordinator, selected from the respective Department. Departmental Heads are requested to take up the matter on an urgent basis.

Principal
Principal Vivekananda College
Thakurpukur, Kol-63

269, DIAMOND HARBOUR ROAD, THAKURPUKUR, KOLKATA- 700 063
Website : www.vckolkata63.org email : vivekanandacollege63@gmail.com

DEPARTMENT OF ZOOLOGY

A departmental meeting will be held on **19.04.2022** to discuss the following Agenda. All teachers are requested to kindly attend the meeting.

AGENDA OF THE MEETING:

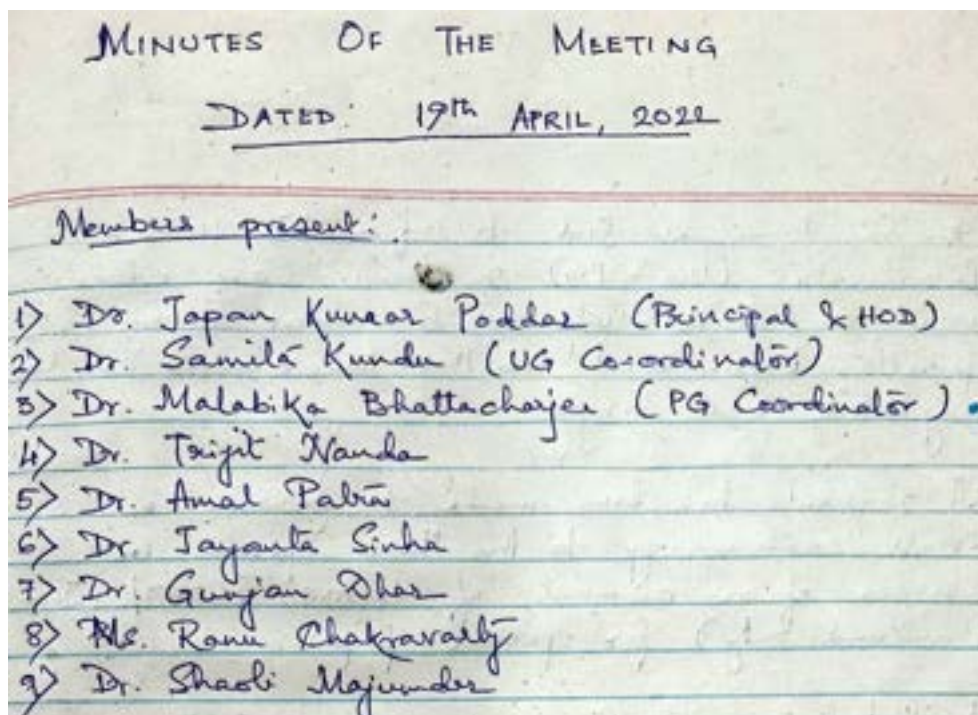
1. Introduction of Add-on course on “***Basic Biostatistics used for Research***” for UG Sem I Honours [CBCS] students for the session 2021-2022.
2. Introduction of Add-on course on “***Reagents and Buffer Preparation for Biological Experiments***” for 2nd Semester Bioscience General students for the session 2021-2022.
3. Introduction of Add-on course in Online Platform “***Essentials of Research Methodology in Biology***” for PG Sem I Students for the session 2021-2022.

Head of the Department

DEPARTMENT OF ZOOLOGY

Resolution of the Departmental Meeting held on 19.04.2022

A) TEACHERS PRESENT IN THE MEETING:



B) MINUTES OF THE MEETING

1. In the Departmental meeting dated **19.04.2022** the teachers of the UG & PG Department of Zoology unanimously decided that
 - a. A 30-hour Add-on course on "**Basic Biostatistics used for Research**" for UG Sem I Honours students under CBCS from the session 2021-2022.
 - b. A 30-hour Add-on course on "**Essentials of Research Methodology in Biology**" will be offered to PG Sem I students from the Session 2021-2022
 - c. The UG Bioscience General Sem III students would be offered a 30-hour Add-on Course on "**Reagents and Buffer Preparation for Biological Experiments**".
2. Dr. Samita Kundu would be the Course Coordinator for the Add-On Course on "**Basic Biostatistics used for Research**" for the Academic session 2021-2022. Dr. Malabika Bhattacharjee would be the Course Coordinator for the Add-On Course on "**Essentials of Research Methodology in Biology**"
3. It was also decided in the meeting that Dr. Malabika Bhattacharjee would be the Course Coordinator for the Add-On Course on "**Reagents and Buffer Preparation for Biological Experiments**" for the Academic session 2021-2022.
4. The Course structure of the course on "**Basic Biostatistics used for Research**" would be submitted by Dr. Kundu and that of "**Essentials of Research Methodology in Biology**" would be submitted by Dr. Bhattacharjee and was accepted by all teachers of the department.
5. The Course structure of the course on "**Reagents and Buffer Preparation for Biological Experiments**" would be submitted by Dr. Bhattacharjee and was accepted by all teachers of the department.
6. Certificates would be given to each student at the successful completion of the Course.

Vivekananda College

Post-Graduate Department of Zoology

Add on Course Title: Essentials of Research Methodology in Biology

Rationale for Selecting the Course for PG Sem-1 Students

The introduction of "Essentials of Research Methodology in Biology" in the first semester of a postgraduate program serves several important purposes. Below is a rationale outlining the reasons for including this course in the curriculum:

- 1. Foundation for Research Skills:** The course provides a foundational understanding of research methodology, ensuring that students entering the postgraduate program have a strong grasp of the essential research skills needed for advanced studies and future research endeavors.
- 2. Early Exposure to Research Practices:** By introducing research methodology early in the postgraduate program, students gain exposure to research practices from the beginning of their academic journey. This exposure helps them develop a research-oriented mindset and encourages them to integrate research thinking into their coursework.
- 3. Aligning with Advanced Courses:** Research methodology is a critical component for successfully undertaking advanced courses in specialized areas of biology. Early exposure ensures that students are well-equipped with the necessary skills to engage with more complex and specialized subjects later in their program.
- 4. Preparation for Thesis/Dissertation Work:** Calcutta University Postgraduate programs require students to conduct original research for their theses or dissertations in 3rd and 4th Semester. Introducing research methodology in the first semester prepares students for the independent research work they will undertake later in the program, allowing them to approach their thesis projects with confidence.
- 5. Critical Thinking and Problem-Solving:** Research methodology emphasizes critical thinking and problem-solving skills, which are crucial for students pursuing postgraduate studies. These skills are not only valuable for research but also contribute to a deeper understanding of biological concepts and the ability to analyze complex scientific problems.
- 6. Ethical Considerations:** Understanding the ethical principles of research is vital in any field. By introducing research methodology early, students are sensitized to ethical considerations in scientific research, ensuring responsible and ethical conduct throughout their academic and professional careers.

Vivekananda College

Post-Graduate Department of Zoology

Add on Course Title: Essentials of Research Methodology in Biology

Outline Syllabus

Course	30 Hours
Module 1: Introduction to Biological Research	2 Hours
<ul style="list-style-type: none"> Definition and significance of research in biology Historical context and landmark studies Overview of contemporary research areas in biology Ethical considerations in biological research 	
Module 2: Formulating Research Questions and Hypotheses	2 Hours
<ul style="list-style-type: none"> Developing clear and testable research questions Constructing hypotheses in biological research Significance of hypotheses in experimental design 	
Module 3: Experimental Design in Biology	6 Hours
<ul style="list-style-type: none"> Basics of experimental design Control groups, variables, and replication Randomized controlled trials in biology Field studies and observational research 	
Module 4: Sampling Techniques in Biological Research	4 hours
<ul style="list-style-type: none"> Overview of sampling methods in ecology and biology Random sampling, stratified sampling, and systematic sampling Importance of representative samples Sample size determination in biological studies 	
Module 5: Data Collection Methods in Biology: A basic conceptual Approach	3 Hours
<ul style="list-style-type: none"> Laboratory techniques (e.g., PCR, ELISA, microscopy, FACS) Fieldwork and ecological surveys Molecular biology techniques (e.g., DNA extraction, sequencing) 	
Module 6: Measurement and Analysis in Biology	5 Hours
<ul style="list-style-type: none"> Quantitative and qualitative data in biology Statistical analysis in biological research Data interpretation and visualization techniques 	
Module 7: Advanced Techniques in Biological Research: A brief in-view	2 Hours
<ul style="list-style-type: none"> Genomics and proteomics CRISPR-Cas9 technology Advanced microscopy and imaging techniques 	
Module 8: Research Proposal and Project Presentation	6 Hours
<ul style="list-style-type: none"> Developing a research proposal in biology Effective presentation skills for scientific research Peer review and constructive feedback 	

Assessment:

- Module quizzes and participation and MCQ based Examination

Vivekananda College

Post-Graduate Department of Zoology

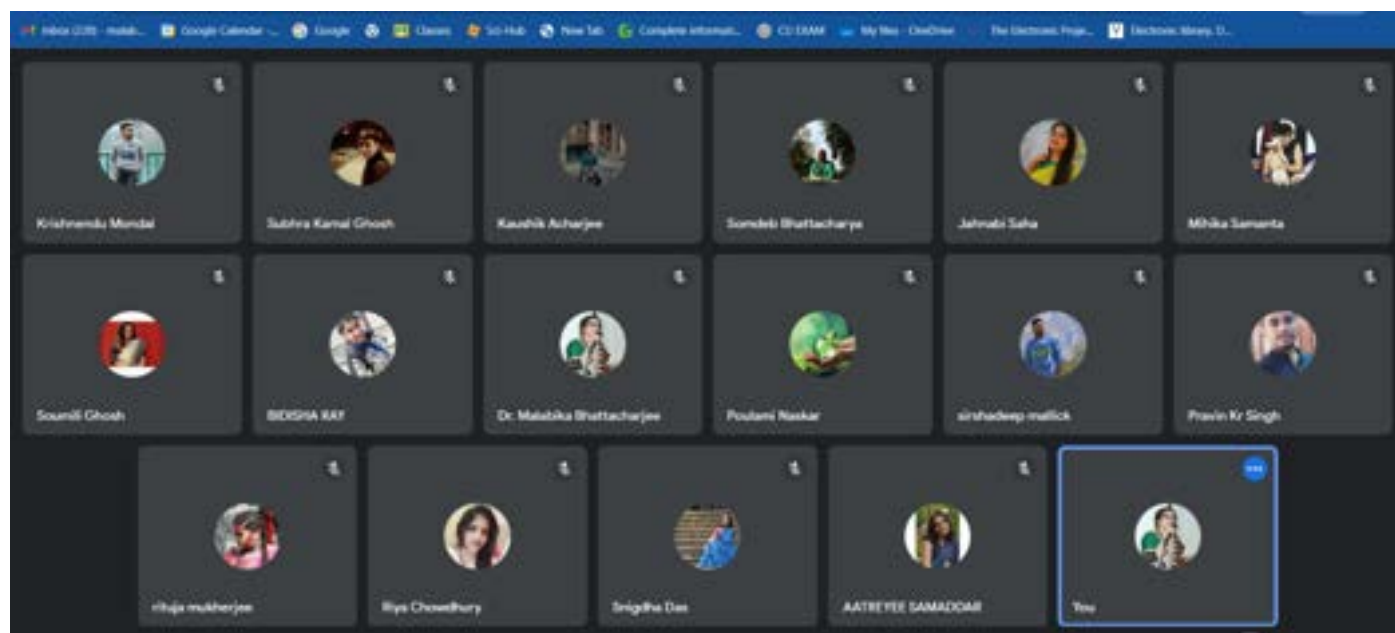
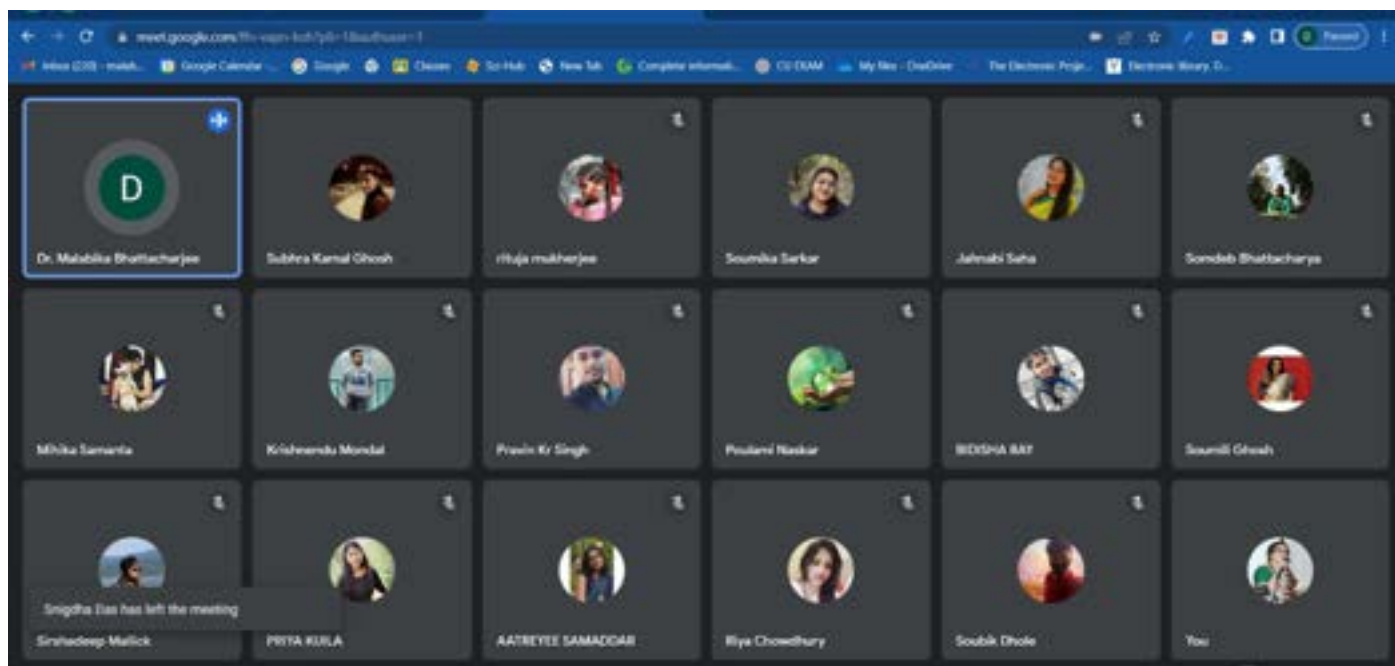
Add on Course Title: Essentials of Research Methodology in Biology

FACULTY PLANNER

Course	30 Hours	Faculty
Module 1: Introduction to Biological Research	2 Hours	TN
<ul style="list-style-type: none"> Definition and significance of research in biology Historical context and landmark studies Overview of contemporary research areas in biology Ethical considerations in biological research 		
Module 2: Formulating Research Questions and Hypotheses	2 Hours	MB
<ul style="list-style-type: none"> Developing clear and testable research questions Constructing hypotheses in biological research Significance of hypotheses in experimental design 		
Module 3: Experimental Design in Biology	6 Hours	MB
<ul style="list-style-type: none"> Basics of experimental design Control groups, variables, and replication Randomized controlled trials in biology Field studies and observational research 		
Module 4: Sampling Techniques in Biological Research	4 hours	TN & MB
<ul style="list-style-type: none"> Overview of sampling methods in ecology and biology TN Random sampling, stratified sampling, and systematic sampling MB Importance of representative samples TN Sample size determination in biological studies MB 		
Module 5: Data Collection Methods in Biology: A basic conceptual Approach	3 Hours	SMK, TN & MB
<ul style="list-style-type: none"> Laboratory techniques (e.g., PCR, ELISA, microscopy, FACS) SMK Fieldwork and ecological surveys TN Molecular biology techniques (e.g., DNA extraction, sequencing) MB 		
Module 6: Measurement and Analysis in Biology	5 Hours	MB
<ul style="list-style-type: none"> Quantitative and qualitative data in biology Statistical analysis in biological research Data interpretation and visualization techniques 		
Module 7: Advanced Techniques in Biological Research: A brief in-view	2 Hours	MB & SMK
<ul style="list-style-type: none"> Genomics and proteomics MB CRISPR-Cas9 technology MB Advanced microscopy and imaging techniques SMK 		
Module 8: Research Proposal and Project Presentation	6 Hours	MB & TN
<ul style="list-style-type: none"> Developing a research proposal in biology MB Effective presentation skills for scientific research TN Peer review and constructive feedback MB 		

TN: Dr. Trijit Nanda; MB : Dr. Malabika Bhattacharjee; SMK: Dr. Samita Kundu

Glimpses of Some ONLINE CLASSES taken



IQAC recommendation

IQAC recommendation

IQAC, Vivekananda College, Thakurpukur, met on 14/Sept/2021, to envisage, formulate and design Add-On Courses, beyond prescribed Curriculum

A. It was decided that all the departments of Humanities, Science and Commerce would design and formulate 30 hour Add-On Courses for the session 2021-22, Academic calendar, as per UGC guidelines.

B. It was decided that the Departments would be free to choose the Courses on the basis of their (subject) relevance, practicality and feasibility.

C. It was decided that the Departments would have a Course Coordinator, who would design the Course and Course materials, in consultation with all teachers of the Department.

D. It was decided that each Department would design its own format; and could follow a blended mode of instruction.

E. It was decided that the Departments would be encouraged to use and utilize their own resources while formulating the Add-On Courses, rather than relying on Outsourcing.

F. IQAC would send its recommendations to the Principal/TIC for perusal and implementation.


14/09/21
Co-ordinator
IQAC
Vivekananda College
Kolkata-700 063



VIVEKANANDA COLLEGE

(GOVT. SPONSORED) (NAAC ACCREDITED GRADE 'A')

Ref. No. _____

Date. 21/9/21

Notice

It is hereby notified that Vivekananda College, Thakurpukur, will offer Add-On Courses to All Honours students for the Academic year 2021- 22.

Each Department will offer an Add-On Course as per UGC guidelines. Each Course will be structured & overseen by a Course Coordinator, selected from the respective Department. Departmental Heads are requested to take up the matter on an urgent basis.

Principal
Vivekananda College
Thakurpukur, Kol-63

DEPARTMENT OF ZOOLOGY

DEPARTMENT OF ZOOLOGY

A departmental meeting will be held on **19.04.2022** to discuss the following Agenda. All teachers are requested to kindly attend the meeting.

AGENDA OF THE MEETING:

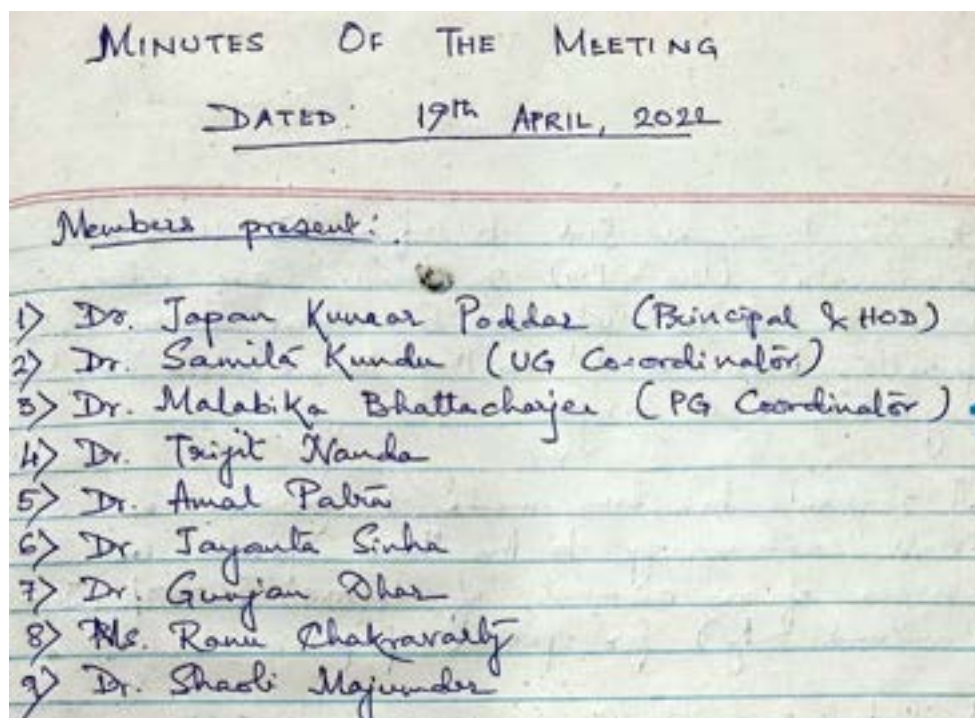
1. Introduction of Add-on course on “*Basic Biostatistics used for Research*” for **UG Sem I Honours [CBCS]** students for the session 2021-2022.
2. Introduction of Add-on course on “*Reagents and Buffer Preparation for Biological Experiments*” for **2nd Semester Bioscience General** students for the session 2021-2022.
3. Introduction of Add-on course in Online Platform “*Essentials of Research Methodology in Biology*” for **PG Sem I Students** for the session 2021-2022.

Head of the Department

DEPARTMENT OF ZOOLOGY

Resolution of the Departmental Meeting held on 19.04.2022

A) TEACHERS PRESENT IN THE MEETING:



B) MINUTES OF THE MEETING

1. In the Departmental meeting dated **19.04.2022** the teachers of the UG & PG Department of Zoology unanimously decided that
 - a. A 30-hour Add-on course on "**Basic Biostatistics used for Research**" for UG Sem I Honours students under CBCS from the session 2021-2022.
 - b. A 30-hour Add-on course on "**Essentials of Research Methodology in Biology**" will be offered to PG Sem I students from the Session 2021-2022
 - c. The UG Bioscience General Sem III students would be offered a 30-hour Add-on Course on "**Reagents and Buffer Preparation for Biological Experiments**".
2. Dr. Samita Kundu would be the Course Coordinator for the Add-On Course on "**Basic Biostatistics used for Research**" for the Academic session 2021-2022. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the Add-On Course on "**Essentials of Research Methodology in Biology**"
3. It was also decided in the meeting that **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the Add-On Course on "**Reagents and Buffer Preparation for Biological Experiments**" for the Academic session 2021-2022.
4. The Course structure of the course on "**Basic Biostatistics used for Research**" would be submitted by Dr. Kundu and that of "**Essentials of Research Methodology in Biology**" would be submitted by Dr. Bhattacharjee and was accepted by all teachers of the department.
5. The Course structure of the course on "**Reagents and Buffer Preparation for Biological Experiments**" would be submitted by Dr. Bhattacharjee and was accepted by all teachers of the department.
6. Certificates would be given to each student at the successful completion of the Course.

VIVEKANANDA COLLEGE
DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Rationale for Selecting the Course for UG Semester I Honours students

Biostatistics is the scientific study dealing with the methods for collection, presentation, mathematical analysis and interpretation of data derived from biological organisms. The scope of biostatistics is very wide, spanning both academic research and real-world applications. The introduction of an Add-on course on ‘Basic Biostatistics used in research’ for the 1st semester Under-graduate students of Zoology Honours serves several important purposes.

1. The present CBCS syllabus has no paper dealing with biostatistics. Most of the Honours students after graduation pursue higher studies and even choose a research career. Hence, it is of utmost importance to inculcate in them the basic concepts of statistics from the very beginning.
2. Let it be any dissertation/project work during higher academic degree or for thesis submission, the correct analysis and interpretation of data is very crucial. This is where the methods and principles of Biostatistics need to be applied.
3. Using appropriate statistics, students will be able to make sense of the large amount of data they collect during the course of research.
4. From designing an experiment to protocol development, biostatistics helps the research realm in various ways.
5. Biostatistics is an essential tool of scientific research and is applied in areas like medicine, public health, and research to analyse data and draw conclusions.

Thus, Biostatistics emerges as a powerful tool to equip individuals with the skills necessary for meaningful data analysis and also positions them at the forefront of driving advancements in research.

VIVEKANANDA COLLEGE

DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Outline Syllabus

Course	30 Hours
Module 1: Basic concept of Statistical Data <ul style="list-style-type: none"> • Basic Definitions • Presentation of Data • Frequency Distribution • Graphical representation of data • Applications of Statistics in Research 	4 hours
Module 2: Sampling <ul style="list-style-type: none"> • Concept of Population and Sample • Sampling Methods • Parameter and Statistic 	2 hours
Module 3: Measures of Central Tendency <ul style="list-style-type: none"> • Arithmetic Mean • Median • Mode 	6 hours
Module 4: Measures of Dispersion <ul style="list-style-type: none"> • Standard Deviation • Variance • Standard error of Mean 	4 hours
Module 5: Correlation and Regression <ul style="list-style-type: none"> • Correlation • Regression 	4 hours
Module 6: Probability <ul style="list-style-type: none"> • Basic concept of Probability 	2 hours
Module 6: Testing of Hypothesis <ul style="list-style-type: none"> • Null Hypothesis • Levels of Significance • Student's t-test 	3 hours
Module 7: Analysis of Variance <ul style="list-style-type: none"> • One-way ANOVA 	3 hours
*Assessment	2 hours

(CLASSES TO BE CONDUCTED IN BLENDED MODE)

***Assessment:** 20% Weightage on Attendance and 80% on Multiple choice-based questions.

References:

1. Statistics in Biology and Psychology. D. Das and A. Das. Academic Publishers, Kolkata.
2. Introduction to Biostatistics. P.K. Banerjee. S. Chand & Company Pvt. Ltd. New Delhi.
3. Statistical Methods in Bio-Medical Research. B.B. Mukhopadhyay. Current Books International, Kolkata
4. Biostatistical Analysis. J.H. Zar. Pearson

VIVEKANANDA COLLEGE
DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Faculty Planner

Course	30 Hours	Faculty
Module 1: Basic concept of Statistical Data <ul style="list-style-type: none"> • Basic Definitions • Presentation of Data • Frequency Distribution • Graphical representation of data • Applications of Statistics in Research 	4 hours	Dr. Samita Kundu
Module 2: Sampling <ul style="list-style-type: none"> • Concept of Population and Sample • Sampling Methods • Parameter and Statistic 	2 hours	Dr. Samita Kundu
Module 3: Measures of Central Tendency <ul style="list-style-type: none"> • Arithmetic Mean • Median • Mode 	6 hours	Dr. Samita Kundu
Module 4: Measures of Dispersion <ul style="list-style-type: none"> • Standard Deviation • Variance • Standard error of Mean 	4 hours	Dr. Samita Kundu
Module 5: Correlation and Regression <ul style="list-style-type: none"> • Correlation • Regression 	4 hours	Dr. Malabika Bhattacharjee
Module 6: Probability <ul style="list-style-type: none"> • Basic concept of Probability 	2 hours	Dr. Malabika Bhattacharjee
Module 6: Testing of Hypothesis <ul style="list-style-type: none"> • Null Hypothesis • Levels of Significance • Student's t-test 	3 hours	Dr. Malabika Bhattacharjee
Module 7: Analysis of Variance <ul style="list-style-type: none"> • One-way ANOVA 	3 hours	Dr. Malabika Bhattacharjee

IQAC recommendation

IQAC, Vivekananda College, Thakurpukur, met on 18/June/2022, to envisage, formulate and design Add-On Courses, beyond prescribed Curriculum. The IQAC has also decided to organise a program on staff training:

- A. It was decided that all the departments of Humanities, Science and Commerce would design and formulate 30 hour Add-On Courses for 2022-23, Academic calendar, as per UGC guidelines.
- B. It was decided that the Departments would be free to choose the Courses on the basis of their (subject) relevance, practicality and feasibility.
- C. It was decided that the Departments would have a Course Coordinator, who would design the Course and Course materials, in consultation with all teachers of the Department.
- D. It was decided that each Department would design their own format; and could follow a blended mode of instruction.
- E. It was decided that the Departments would be encouraged to use and utilize their own resources while formulating the Add-On Courses, rather than relying on Outsourcing.
- F. IQAC would send its recommendations to the Principal/TIC for perusal and implementation.
- G. The IQAC would also organise a Staff Training programme - 'Effective Working Style' Conducted by IPE Of Professional Excellence On 25th June 2022 .



18/06/22

Co-ordinator
I Q A C
Vivekananda College
Kolkata-700 063



(033) 2497 6824
(033) 2497 6834

VIVEKANANDA COLLEGE

(GOVT. SPONSORED) (NAAC ACCREDITED GRADE 'A')

Ref. No.....

Date.....

Notice

It is hereby notified that Vivekananda College, Thakurpukur, will offer Add-On Courses to All Honours students for the Academic year 2022-23.

Each Department will offer an Add-On Course as per UGC guidelines. Each Course will be structured & overseen by a Course Coordinator, selected from the respective Department. Departmental Heads are requested to take up the matter on an urgent basis.

[Handwritten Signature]
24/6/22

Principal

Principal
Vivekananda College
Thakurpukur, Kol-63

DEPARTMENT OF ZOOLOGY

A departmental meeting will be held on **08.08.2022** at 12:00 noon to discuss the following Agenda. All teachers are requested to kindly attend the meeting.

AGENDA OF THE MEETING:

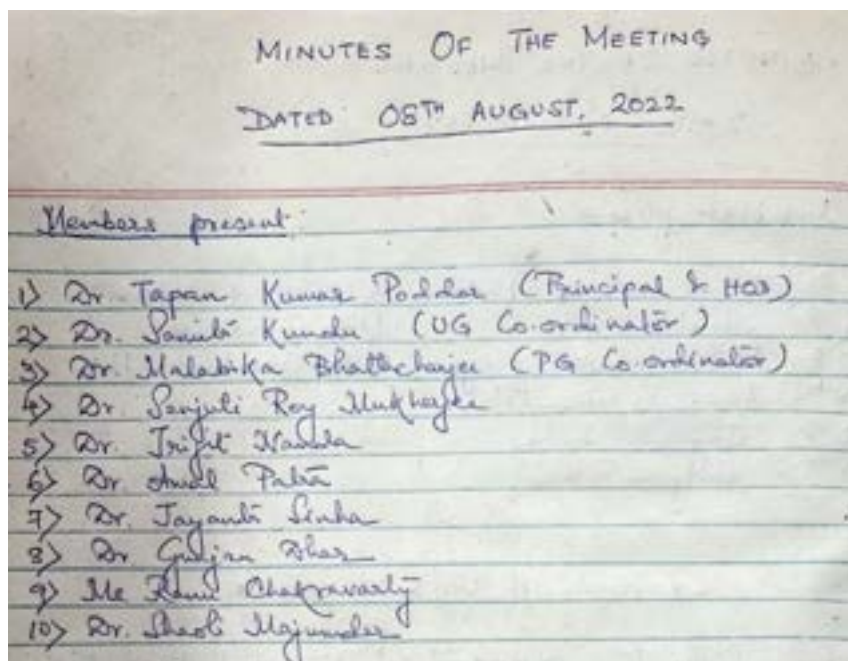
1. Introduction of Add-on course on “***Bee keeping and Honey processing***” in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited for **UG Sem II and UG IV Honours [CBCS]** students for the session 2022-2023.
2. Introduction of Add-on course on “***Basic Biostatistics used for Research***” for **UG Sem I Honours [CBCS]** students for the session 2022-2023.
3. Introduction of Add-on course on “***Bird Watching: Identification and Ecology***” for **UG Sem VI Honours [CBCS]** students for the session 2022-2023.
4. Introduction of Add-on course on “***Reagents and Buffer Preparation for Biological Experiments***” for **1st Semester Bioscience General** students for the session 2022-2023.
5. Introduction of Add-on course on “***Essentials of Research Methodology in Biology***” for **PG Sem I Students** for the session 2022-2023.

HOD

DEPARTMENT OF ZOOLOGY

Resolution of the Departmental Meeting held on 08.08.2022

A) TEACHERS PRESENT IN THE MEETING:



B) MINUTES OF THE MEETING

1. In the Departmental meeting dated **08.08.2022** the teachers of the UG & PG Department of Zoology unanimously decided that
 - a. The UG Sem II and UG IV Honours [CBCS] students would be offered a 30-hour Add-on Course on “**Bee keeping and Honey processing**” in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited.
 - b. A 30-hour Add-on course on “**Basic Biostatistics used for Research**” will also be offered to UG Sem I Honours [CBCS] students for the Session 2022-2023.
 - c. The UG Sem IV Honours [CBCS] students would be offered a 30-hour Add-on Course on “**Bird Watching: Identification and Ecology**” for the Session 2022-2023.
 - d. The 1st Semester Bioscience General students would be offered a 30-hour Add-on Course on “**Reagents and Buffer Preparation for Biological Experiments**” for the Session 2022-2023.
 - e. Another 30-hour Add-on course on “**Essentials of Research Methodology in Biology**” will be offered to PG Sem I students for the Session 2022-2023.
2. It was decided in the meeting that
 - a. **Dr. Amal Patra** would be the **Course Coordinator** for the UG Hons Add-On Course on “**Bee keeping and Honey processing**” and the **Course Structure** of the course would be submitted by Dr. Patra, which was accepted by all Faculty of the Department present in the meeting.
 - b. **Dr. Samita Kundu** would be the **Course Coordinator** for the UG Hons Add-On Course on “**Basic Biostatistics used for Research**” and the **Course Structure** of the course would be submitted by Dr. Kundu, which was accepted by all Faculty of the Department present in the meeting.
 - c. **Dr. Shaoli Majumder** would be the **Course Coordinator** for the UG Hons Add-On Course on “**Bird Watching: Identification and Ecology**” and the **Course Structure** of the course would be submitted by Dr. Majumder, which was accepted by all Faculty of the Department present in the meeting.
 - d. **Dr. Malabika Bhattacharjee** would be the **Course Coordinator** for the UG General Add-On Course on “**Reagents and Buffer Preparation for Biological Experiments**” and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
 - e. **Dr. Malabika Bhattacharjee** would be the **Course Coordinator** for the PG Add-On Course on “**Essentials of Research Methodology in Biology**” and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
3. Certificates would be given to each student at the successful completion of the Course.

To
THE PRINCIPAL
Vivekananda College, Thakurpukur
Kolkata-700063

Date: 1/11/2022

Subject: PG Add-on Course for session 2022-2023

Respected Sir,

This is for your kind information that for the purpose of Add-on Course preparation from PG Department of Zoology; the Add-on Course being "Essential of Research Methodology In- Biology" the following expenses will be incurred as per the Head mentioned.

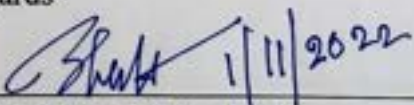
1.	Stationary	Certificates	25@ Rs.10/-	250/-
		Flexi		250
2.	Contingency	Printouts		1000/-
		Xerox		
		Miscellaneous		
			TOTAL	1500.00

This is thus to request your kind self to sanction the Rs.1500.00/- for smooth conductance of the Add-On course of PG.

Thus, earnestly soliciting a positive response in this regard

Yours Sincerely,

Regards


Dr. Malabika Bhattacharjee
Associate Professor
UG & PG Department of Zoology
Vivekananda College, Kolkata-700063



Post-Graduate Department of Zoology

Add on Course Title: Essentials of Research Methodology in Biology

Rationale for Selecting the Course for PG Sem-1 Students

The introduction of "Essentials of Research Methodology in Biology" in the first semester of a postgraduate program serves several important purposes. Below is a rationale outlining the reasons for including this course in the curriculum:

- 1. Foundation for Research Skills:** The course provides a foundational understanding of research methodology, ensuring that students entering the postgraduate program have a strong grasp of the essential research skills needed for advanced studies and future research endeavors.
- 2. Early Exposure to Research Practices:** By introducing research methodology early in the postgraduate program, students gain exposure to research practices from the beginning of their academic journey. This exposure helps them develop a research-oriented mindset and encourages them to integrate research thinking into their coursework.
- 3. Aligning with Advanced Courses:** Research methodology is a critical component for successfully undertaking advanced courses in specialized areas of biology. Early exposure ensures that students are well-equipped with the necessary skills to engage with more complex and specialized subjects later in their program.
- 4. Preparation for Thesis/Dissertation Work:** Calcutta University Postgraduate programs require students to conduct original research for their theses or dissertations in 3rd and 4th Semester. Introducing research methodology in the first semester prepares students for the independent research work they will undertake later in the program, allowing them to approach their thesis projects with confidence.
- 5. Critical Thinking and Problem-Solving:** Research methodology emphasizes critical thinking and problem-solving skills, which are crucial for students pursuing postgraduate studies. These skills are not only valuable for research but also contribute to a deeper understanding of biological concepts and the ability to analyze complex scientific problems.
- 6. Ethical Considerations:** Understanding the ethical principles of research is vital in any field. By introducing research methodology early, students are sensitized to ethical considerations in scientific research, ensuring responsible and ethical conduct throughout their academic and professional careers.

Post-Graduate Department of Zoology

Add on Course Title: Essentials of Research Methodology in Biology

Outline Syllabus

Course	30 Hours
Module 1: Introduction to Biological Research	2 Hours
<ul style="list-style-type: none"> Definition and significance of research in biology Historical context and landmark studies Overview of contemporary research areas in biology Ethical considerations in biological research 	
Module 2: Formulating Research Questions and Hypotheses	2 Hours
<ul style="list-style-type: none"> Developing clear and testable research questions Constructing hypotheses in biological research Significance of hypotheses in experimental design 	
Module 3: Experimental Design in Biology	6 Hours
<ul style="list-style-type: none"> Basics of experimental design Control groups, variables, and replication Randomized controlled trials in biology Field studies and observational research 	
Module 4: Sampling Techniques in Biological Research	4 hours
<ul style="list-style-type: none"> Overview of sampling methods in ecology and biology Random sampling, stratified sampling, and systematic sampling Importance of representative samples Sample size determination in biological studies 	
Module 5: Data Collection Methods in Biology: A basic conceptual Approach	3 Hours
<ul style="list-style-type: none"> Laboratory techniques (e.g., PCR, ELISA, microscopy, FACS) Fieldwork and ecological surveys Molecular biology techniques (e.g., DNA extraction, sequencing) 	
Module 6: Measurement and Analysis in Biology	5 Hours
<ul style="list-style-type: none"> Quantitative and qualitative data in biology Statistical analysis in biological research Data interpretation and visualization techniques 	
Module 7: Advanced Techniques in Biological Research: A brief in-view	2 Hours
<ul style="list-style-type: none"> Genomics and proteomics CRISPR-Cas9 technology Advanced microscopy and imaging techniques 	
Module 8: Research Proposal and Project Presentation	6 Hours
<ul style="list-style-type: none"> Developing a research proposal in biology Effective presentation skills for scientific research Peer review and constructive feedback 	

Assessment:

- Module quizzes and participation and MCQ based Examination

Post-Graduate Department of Zoology
Add on Course Title: Essentials of Research Methodology in Biology
FACULTY PLANNER

Course	30 Hours	Faculty
Module 1: Introduction to Biological Research	2 Hours	TN
<ul style="list-style-type: none"> • Definition and significance of research in biology • Historical context and landmark studies • Overview of contemporary research areas in biology • Ethical considerations in biological research 		
Module 2: Formulating Research Questions and Hypotheses	2 Hours	MB
<ul style="list-style-type: none"> • Developing clear and testable research questions • Constructing hypotheses in biological research • Significance of hypotheses in experimental design 		
Module 3: Experimental Design in Biology	6 Hours	MB
<ul style="list-style-type: none"> • Basics of experimental design • Control groups, variables, and replication • Randomized controlled trials in biology • Field studies and observational research 		
Module 4: Sampling Techniques in Biological Research	4 hours	TN & MB
<ul style="list-style-type: none"> • Overview of sampling methods in ecology and biology TN • Random sampling, stratified sampling, and systematic sampling MB • Importance of representative samples TN • Sample size determination in biological studies MB 		
Module 5: Data Collection Methods in Biology: A basic conceptual Approach	3 Hours	SMK, TN & MB
<ul style="list-style-type: none"> • Laboratory techniques (e.g., PCR, ELISA, microscopy, FACS) SMK • Fieldwork and ecological surveys TN • Molecular biology techniques (e.g., DNA extraction, sequencing) MB 		
Module 6: Measurement and Analysis in Biology	5 Hours	MB
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Module 7: Advanced Techniques in Biological Research: A brief in-view	2 Hours	MB & SMK
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Module 8: Research Proposal and Project Presentation	6 Hours	MB & TN
<ul style="list-style-type: none"> • Developing a research proposal in biology MB • Effective presentation skills for scientific research TN • Peer review and constructive feedback MB 		

TN: Dr. Trijit Nanda; MB : Dr. Malabika Bhattacharjee; SMK: Dr. Samita Kundu
Vivekananda College

IQAC recommendation

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- A. It was decided that all the departments of Humanities, Science and Commerce would design and formulate 30 hour Add-On Courses for 2022-23, Academic calendar, as per UGC guidelines.
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- F. IQAC would send its recommendations to the Principal/TIC for perusal and implementation.
- G. The IQAC would also organise a Staff Training programme - 'Effective Working Style' Conducted by IPE Of Professional Excellence On 25th June 2022 .



Co-ordinator
I Q A C
Vivekananda College
Kolkata-700 063



VIVEKANANDA COLLEGE

(GOVT. SPONSORED) (NAAC ACCREDITED GRADE 'A')

(033) 2497 6824
(033) 2497 6834

Ref. No.

Date.

Notice

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Each Department will offer an Add-On Course as per UGC guidelines. Each Course will be structured & overseen by a Course Coordinator, selected from the respective Department. Departmental Heads are requested to take up the matter on an urgent basis.

Handwritten signature
24/6/22

Principal

Principal
Vivekananda College
Thakurpukur, K-53

269, DIAMOND HARBOUR ROAD, THAKURPUKUR, KOLKATA-700 063
Website : www.vckolkata63.org • email : vivekanandacollege63@gmail.com

DEPARTMENT OF ZOOLOGY

A departmental meeting will be held on **08.08.2022** at 12:00 noon to discuss the following Agenda. All teachers are requested to kindly attend the meeting.

AGENDA OF THE MEETING:

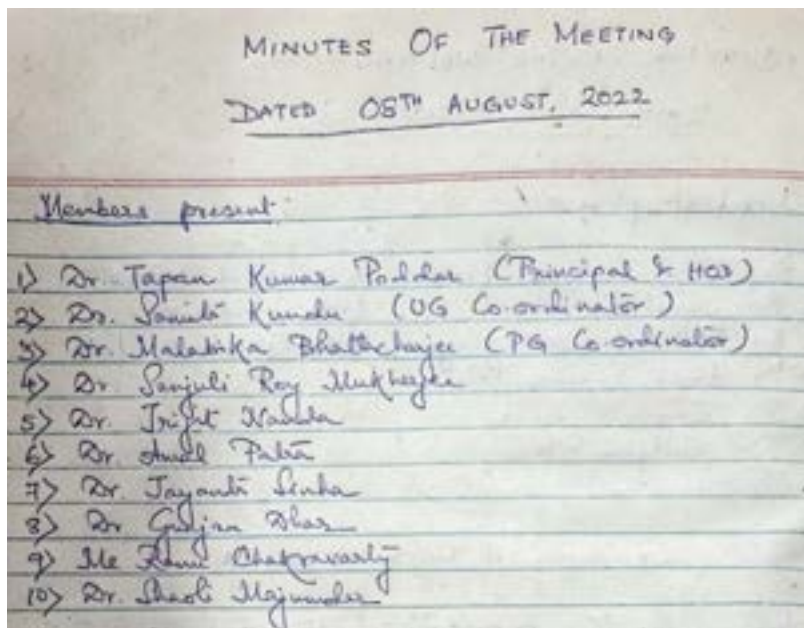
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4. Introduction of Add-on course on “*Reagents and Buffer Preparation for Biological Experiments*” for **1st Semester Bioscience General** students for the session 2022-2023.
5. Introduction of Add-on course on “*Essentials of Research Methodology in Biology*” for **PG Sem I Students** for the session 2022-2023.

HOD

DEPARTMENT OF ZOOLOGY

Resolution of the Departmental Meeting held on 08.08.2022

A) TEACHERS PRESENT IN THE MEETING:



B) MINUTES OF THE MEETING

1. In the Departmental meeting dated **08.08.2022** the teachers of the UG & PG Department of Zoology unanimously decided that
 - a. The **UG Sem II** and **UG IV Honours [CBCS]** students would be offered a 30-hour Add-on Course on "**Bee keeping and Honey processing**" in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited.
 - b. A 30-hour Add-on course on "**Basic Biostatistics used for Research**" will also be offered to **UG Sem I Honours [CBCS]** students for the Session 2022-2023.
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 - e. Another 30-hour Add-on course on "**Essentials of Research Methodology in Biology**" will be offered to PG Sem I students for the Session 2022-2023.
2. It was decided in the meeting that
 - a. **Dr. Amal Patra** would be the **Course Coordinator** for the UG Hons Add-On Course on "**Bee keeping and Honey processing**" and the **Course Structure** of the course would be submitted by Dr. Patra, which was accepted by all Faculty of the Department present in the meeting.
 - b. **Dr. Samita Kundu** would be the Course Coordinator for the UG Hons Add-On Course on "**Basic Biostatistics used for Research**" and the **Course Structure** of the course would be submitted by Dr. Kundu, which was accepted by all Faculty of the Department present in the meeting.
 - c. **Dr. Shaoli Majumder** would be the Course Coordinator for the UG Hons Add-On Course on "**Bird Watching: Identification and Ecology**" and the **Course Structure** of the course would be submitted by Dr. Majumder, which was accepted by all Faculty of the Department present in the meeting.
 - d. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the UG General Add-On Course on "**Reagents and Buffer Preparation for Biological Experiments**" and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
 - e. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the PG Add-On Course on "**Essentials of Research Methodology in Biology**" and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
3. Certificates would be given to each student at the successful completion of the Course.

VIVEKANANDA COLLEGE
DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Rationale for Selecting the Course for UG Semester I Zoology Honours students

Biostatistics is the scientific study dealing with the methods for collection, presentation, mathematical analysis and interpretation of data derived from biological organisms. The scope of biostatistics is very wide, spanning both academic research and real-world applications. The introduction of an Add-on course on ‘Basic Biostatistics used in research’ for the 1st semester Under-graduate students of Zoology Honours serves several important purposes.

1. The present CBCS syllabus has no paper dealing with biostatistics. Most of the Honours students after graduation pursue higher studies and even choose a research career. Hence, it is of utmost importance to inculcate in them the basic concepts of statistics from the very beginning.
2. Let it be any dissertation/project work during higher academic degree or for thesis submission, the correct analysis and interpretation of data is very crucial. This is where the methods and principles of Biostatistics need to be applied.
3. Using appropriate statistics, students will be able to make sense of the large amount of data they collect during the course of research.
4. From designing an experiment to protocol development, biostatistics helps the research realm in various ways.
5. Biostatistics is an essential tool of scientific research and is applied in areas like medicine, public health, and research to analyse data and draw conclusions.

Thus, Biostatistics emerges as a powerful tool to equip individuals with the skills necessary for meaningful data analysis and also positions them at the forefront of driving advancements in research.

VIVEKANANDA COLLEGE
DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Outline Syllabus

Course	30 Hours
Module 1: Basic concept of Statistical Data <ul style="list-style-type: none">• Basic Definitions• Presentation of Data• Frequency Distribution• Graphical representation of data• Applications of Statistics in Research	4 hours
Module 2: Sampling <ul style="list-style-type: none">• Concept of Population and Sample• Sampling Methods• Parameter and Statistic	2 hours
Module 3: Measures of Central Tendency <ul style="list-style-type: none">• Arithmetic Mean• Median• Mode	6 hours
Module 4: Measures of Dispersion <ul style="list-style-type: none">• Standard Deviation• Variance• Standard error of Mean	4 hours
Module 5: Correlation and Regression <ul style="list-style-type: none">• Correlation• Regression	4 hours
Module 6: Probability <ul style="list-style-type: none">• Basic concept of Probability	2 hours
Module 6: Testing of Hypothesis <ul style="list-style-type: none">• Null Hypothesis• Levels of Significance• Student's t-test	3 hours
Module 7: Analysis of Variance <ul style="list-style-type: none">• One-way ANOVA	3 hours
*Assessment	2 hours

***Assessment:** 20% Weightage on Attendance and 80% on Multiple choice-based questions.

References:

1. Statistics in Biology and Psychology. D. Das and A. Das. Academic Publishers, Kolkata.
2. Introduction to Biostatistics. P.K. Banerjee. S. Chand & Company Pvt. Ltd. New Delhi.
3. Statistical Methods in Bio-Medical Research. B.B. Mukhopadhyay. Current Books International, Kolkata
4. Biostatistical Analysis. J.H. Zar. Pearson

VIVEKANANDA COLLEGE

DEPARTMENT OF ZOOLOGY

Add on Course Title: BASIC BIOSTATISTICS USED FOR RESEARCH

Faculty Planner

Course	30 Hours	Faculty
Module 1: Basic concept of Statistical Data <ul style="list-style-type: none"> Basic Definitions Presentation of Data Frequency Distribution Graphical representation of data Applications of Statistics in Research 	4 hours	Dr. Samita Kundu
Module 2: Sampling <ul style="list-style-type: none"> Concept of Population and Sample Sampling Methods Parameter and Statistic 	2 hours	Dr. Samita Kundu
Module 3: Measures of Central Tendency <ul style="list-style-type: none"> Arithmetic Mean Median Mode 	6 hours	Dr. Samita Kundu
Module 4: Measures of Dispersion <ul style="list-style-type: none"> Standard Deviation Variance Standard error of Mean 	4 hours	Dr. Samita Kundu
Module 5: Correlation and Regression <ul style="list-style-type: none"> Correlation Regression 	4 hours	Dr. Malabika Bhattacharjee
Module 6: Probability <ul style="list-style-type: none"> Basic concept of Probability 	2 hours	Dr. Malabika Bhattacharjee
Module 6: Testing of Hypothesis <ul style="list-style-type: none"> Null Hypothesis Levels of Significance Student's t-test 	3 hours	Dr. Malabika Bhattacharjee
Module 7: Analysis of Variance <ul style="list-style-type: none"> One-way ANOVA 	3 hours	Dr. Malabika Bhattacharjee

IQAC recommendation

IQAC, Vivekananda College, Thakurpukur, met on 18/June/2022, to envisage, formulate and design Add-On Courses, beyond prescribed Curriculum. The IQAC has also decided to organise a program on staff training:

- A. It was decided that all the departments of Humanities, Science and Commerce would design and formulate 30 hour Add-On Courses for 2022-23, Academic calendar, as per UGC guidelines.
- B. It was decided that the Departments would be free to choose the Courses on the basis of their (subject) relevance, practicality and feasibility.
- C. It was decided that the Departments would have a Course Coordinator, who would design the Course and Course materials, in consultation with all teachers of the Department.
- D. It was decided that each Department would design their own format; and could follow a blended mode of instruction.
- E. It was decided that the Departments would be encouraged to use and utilize their own resources while formulating the Add-On Courses, rather than relying on Outsourcing.
- F. IQAC would send its recommendations to the Principal/TIC for perusal and implementation.
- G. The IQAC would also organise a Staff Training programme - 'Effective Working Style' Conducted by IPE Of Professional Excellence On 25th June 2022 .



Co-ordinator
I Q A C
Vivekananda College
Kolkata-700 063



VIVEKANANDA COLLEGE

(GOVT. SPONSORED) (NAAC ACCREDITED GRADE 'A')

(033) 2497 6824
(033) 2497 6834

Ref. No.....

Date.....

Notice

It is hereby notified that Vivekananda College, Thakurpukur, will offer Add-On Courses to All Honours students for the Academic year 2022-23.

Each Department will offer an Add-On Course as per UGC guidelines. Each Course will be structured & overseen by a Course Coordinator, selected from the respective Department. Departmental Heads are requested to take up the matter on an urgent basis.


Principal

Principal
Vivekananda College
Thakurpukur, Koi-53

DEPARTMENT OF ZOOLOGY

A departmental meeting will be held on **08.08.2022** at 12:00 noon to discuss the following Agenda. All teachers are requested to kindly attend the meeting.

AGENDA OF THE MEETING:

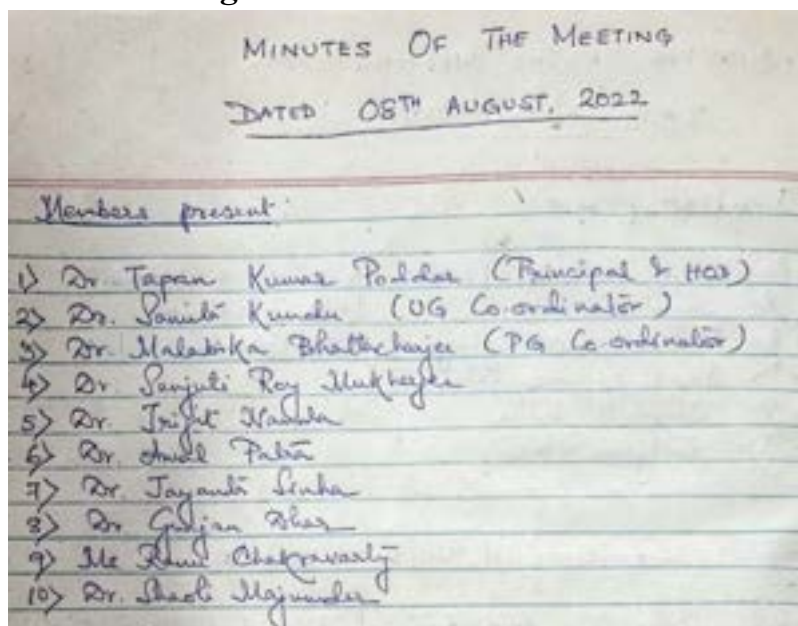
1. Introduction of Add-on course on “*Bee keeping and Honey processing*” in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited for **UG Sem II and UG IV Honours [CBCS]** students for the session 2022-2023.
2. Introduction of Add-on course on “*Basic Biostatistics used for Research*” for **UG Sem I Honours [CBCS]** students for the session 2022-2023.
3. Introduction of Add-on course on “*Bird Watching: Identification and Ecology*” for **UG Sem VI Honours [CBCS]** students for the session 2022-2023.
4. Introduction of Add-on course on “*Reagents and Buffer Preparation for Biological Experiments*” for **1st Semester Bioscience General** students for the session 2022-2023.
5. Introduction of Add-on course on “*Essentials of Research Methodology in Biology*” for **PG Sem I Students** for the session 2022-2023.

HOD

DEPARTMENT OF ZOOLOGY

Resolution of the departmental meeting held on 08.08.2022

A) Teachers present in the meeting:



B) Minutes of the meeting

A) . MINUTES OF THE MEETING






1. In the Departmental meeting dated **08.08.2022** the teachers of the UG & PG Department of Zoology unanimously decided that
 - a. The **UG Sem II** and **UG IV Honours [CBCS]** students would be offered a 30-hour Add-on Course on “**Bee keeping and Honey processing**” in Collaboration with Entrepreneurship Development Cell VC and Baruipur Apiculture Industrial Cooperative Society Limited.
 - b. A 30-hour Add-on course on “**Basic Biostatistics used for Research**” will also be offered to **UG Sem I Honours [CBCS]** students for the Session 2022-2023.
 - c. The **UG Sem IV Honours [CBCS]** students would be offered a 30-hour Add-on Course on “**Bird Watching: Identification and Ecology**” for the Session 2022-2023.
 - d. The **1st Semester Bioscience General** students would be offered a 30-hour Add-on Course on “**Reagents and Buffer Preparation for Biological Experiments**” for the Session 2022-2023.
 - e. Another 30-hour Add-on course on “**Essentials of Research Methodology in Biology**” will be offered to PG Sem I students for the Session 2022-2023.
2. It was decided in the meeting that
 - a. **Dr. Amal Patra** would be the **Course Coordinator** for the UG Hons Add-On Course on “**Bee keeping and Honey processing**” and the **Course Structure** of the course would be submitted by Dr. Patra, which was accepted by all Faculty of the Department present in the meeting.
 - b. **Dr. Samita Kundu** would be the Course Coordinator for the UG Hons Add-On Course on “**Basic Biostatistics used for Research**” and the **Course Structure** of the course would be submitted by Dr. Kundu, which was accepted by all Faculty of the Department present in the meeting.
 - c. **Dr. Shaoli Majumder** would be the Course Coordinator for the UG Hons Add-On Course on “**Bird Watching: Identification and Ecology**” and the **Course Structure** of the course would be submitted by Dr. Majumder, which was accepted by all Faculty of the Department present in the meeting.
 - d. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the UG General Add-On Course on “**Reagents and Buffer Preparation for Biological Experiments**” and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
 - e. **Dr. Malabika Bhattacharjee** would be the Course Coordinator for the PG Add-On Course on “**Essentials of Research Methodology in Biology**” and the **Course Structure** of the course would be submitted by Dr. Bhattacharjee which was accepted by all Faculty of the Department present in the meeting.
3. Certificates would be given to each student at the successful completion of the Course.

Vivekananda College

Post-Graduate Department of Zoology

Add on Course Title: **Bee keeping & Honey processing**

The objectives of introducing the Add-on course on “Beekeeping & Honey Processing” by the department of Zoology of Vivekananda College are:

-  To develop additional Skill of the Students for practical knowledge in the field of Economic Zoology.
-  To empower the students with knowledge to introduce themselves in practical field.
-  To provide the students the opportunity to go beyond their curriculum.
-  To facilitate them to extend their interest level in different areas, and
-  To provide the students the opportunity to complete the certificate course within the stipulated time period of their regular UG programme.

Vivekananda College

Post-Graduate Department of Zoology

TITLE: ADD-ON COURSE ON “BEE KEEPING AND HONEY PROCESSING”

SYLLABUS

A: THEORY

Sl NO	Topics	Sub -Topics	Time in hours
1	Introduction to Apiculture: Scope and Importance	i. Definition ii. Bee keeping worldwide and in India. iii. Apiculture development in India - institutions involved. iv. Role of Central Honey Bee Research & Training Institute. v. Scope and privilege of Bee-keeping in West Bengal	1
2	Biology of Honey Bees	i. Systematic position (Ruppert and Barnes, 1994). ii. Indigenous and exotic species of Honey bees and their differences. iii. Morphology, anatomy and life cycle of Honey bee (<i>Apis indica</i>) iv. Social organization in honey bees. v. Annual biological cycle of the bee colony. vi. Sizes and shapes of bee-cells.	2
3.	Honeybee Plants and Floral Calendar	i. Bee flora - importance propagation - congenial conditions for starting up of apiculture. ii. Migratory Bee Keeping - designing floral Calendar.	1
4	Bee keeping	i. Traditional ii. Modern iii. Urban or backyard beekeeping	1
5	Modern Bee keeping	i. Artificial Bee-hives. ii. Parts of Newton hive. iii. Tools and Equipments for Bee-Keeping by Newton hive only. iv. Methods of making artificial hives.	2

6	Honeybee Enemies and Diseases	i. Enemies ii. Diseases	1
7	Honey and other Bee Hive products	i. Properties of honey ii. Composition of honey iii. Application of honey iv. Processing of Honey & Bee wax v. Bee venom	2
8	Economics of bee keeping and Marketing of bee products.	i. Economics in small scale and large scale bee keeping. ii. Economic Value of Commercial Beekeeping. iii. Marketing of Bee products	1

B: PRACTICAL

Sl NO	TOPICS	Time in hours
1.	Identification of honey bee (<i>Apis indica</i>) and its body parts	2
2	Dissection and display of the mouth parts and sting of honey bees	2
3	Dissection and display of the pollen basket of honey bees	2
4	Identification of different parts of Newton hives and tools for beekeeping.	2
5	Identification of different strains of honey bees in bee hive	2
6.	Identification of Developmental stages of honey bees in bee hive.	2
7.	Process of honey collection	2
8	Methods of honey processing	4
9	Field visit	4

Vivekananda College

Post-Graduate Department of Zoology

FACULTY PLANNER

A: THEORY

SI NO	Topics	Time in hours	Faculty
1	Introduction to Apiculture: Scope and Importance	1	TN
2	Biology of Honey Bees	2	SRM
3.	Honeybee Plants and Floral Calendar	1	AM
4	Bee keeping	1	SRM
5	Modern Bee keeping	2	AP
6	Honeybee Enemies and Diseases	1	AP
7	Honey and other Bee Hive products	2	RC
8	Economics of bee keeping and Marketing of bee products.	1	RC

B: PRACTICAL

SI NO	TOPICS	Time in hours	Faculty
1.	Identification of honey bee (<i>Apis indica</i>) and its body parts	2	AP
2	Dissection and display of the mouth parts and sting of honey bees	2	RC
3	Dissection and display of the pollen basket of honey bees	2	SM
4	Identification of different parts of Newton hives and tools for beekeeping.	2	SRM
5	Identification of different strains of honey bees in bee hive	2	AP
6.	Identification of Developmental stages of honey bees in bee hive.	2	SRM
7.	Process of honey collection	2	AP
8	Methods of honey processing	4	GD
9	Field visit	4	SRM+RC+SM+AP

SRM - Dr. Senuti Roy Mukherjee

GD - Dr. Gunan Dhar

RC- Smt. Ranu Chakravorty

SM- Dr. Shaoli Maumder

TN - Dr. Triit Nanda

AM- Dr. Ashutosh Mukherjee

AP - Dr. Amal Patra