MAHISHADAL RAJ COLLEGE

(Govt. Sponsored)

NAAC Accredited 'A' Grade College
DST (FIST) Govt. Of India approved College, NSDC Training Partner
Estd. : 1946

Mahishadal : Purba Medinipur   **Phone STD 03224** No. 240220

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Ref. No........................   **Date:**

ADD ON COURSE 2019-20
Organised by Department Zoology
Topic: Biological data analysis
Add on course summary:

REPORT:

Name of the course- Biological data analysis

Course coordinator: *Dr. Shubhamoy Das*, (Associate Professor, HOD, Department of Zoology , Mahishadal Raj College)

Date of commencement: 09.09.2019

Date of completion: - 25.09.2019

Number of participant enrolled: 30

Total duration day: 15

Total duration hour: 30

Evaluation method:- Paper pen MCQ and practical work

RESULT DETAILS:-

Number of student participate in this program: 30

Number of student completes this program: 26

Number of student got certificate in this program: 26

Name of the course: Biological data analysis

Course coordinator: *Dr. Shubhamoy Das*, (Associate Professor, HOD, Department of Zoology , Mahishadal Raj College)

Biological data analysis

About the course:

Data analysis is the process of cleaning, manipulating, and processing raw data and extracting conclusive, relevant information that makes informative decisions. It provides useful insights and statistics, often presented in charts, tables, images, and, graphs. In essence, biostatistics is a versatile field that contributes significantly to research and decision-making in the biological and health sciences by providing the tools to analyze and interpret data in a rigorous and meaningful way.

Learning outcomes:

A data analysis course typically covers the principles, techniques, and tools used in the process of extracting meaningful insights from raw data. Such courses are designed to equip individuals with the skills required to manipulate, analyze, and visualize data effectively.Job opportunities in biological data analysis may be found in academic institutions, research organizations, healthcare settings, pharmaceutical companies, biotechnology firms, and government agencies. The demand for professionals with expertise in handling and interpreting biological data is likely to continue growing as advancements in technology generate increasingly large and complex datasets in the biological sciences.

Target audience:

Any Life science branch students (UG & PG), Scholars, and faculties.

Course content overview:

Excel, SPSS, and R- software

Schedule: Total 30 hours

DAY	SCHEDULE
Day 1	Introduction to biostatistics. (2 hours)
Day 2	Installation of SPSS, R and R studio software (T + P) (2 hours)
Day 3	Data formatting, data manipulation, descriptive statistics (T + P) (2 hours)
Day 4	One sample T teat and Independent T test (T + P) (2 hours)
Day 5	Paired T test and Z test. (T + P) (2 hours)
Day 6	One way ANOVA and two ways ANOVA. (T + P) (2 hours)
Day 7	Repeated measures of ANOVA and ANOVA. (T + P) (2 hours)
Day 8	Data visualization I. (T + P) (2 hours)
Day 9	Data Visualization II (T + P) (2 hours)
Day 10	Correlation and regression (T + P) (2 hours)
Day 11	Multiple regression (T + P) (2 hours)
Day 12	Chi square and Wilcoxon rank test (T + P) (2 hours)
Day 13	kruskalwallis test and Friedman test. (T) (2 hours)
Day 14	Principle component analysis (PCA) (2 hours)
Day 15	Random forest analysis and overall discussion.Overall discussion. Doubts clear and revision (2 hours)

+ **Detail Work Schedule**

Date	Day	Contents	Time	Duration	Experts	Designation
02.12.19	1	Introduction to biostatistics	12 to 2pm	2	Dr.Subhamoy Das	HOD, Zoology, MRC
03.12.19	2	Installation of SPSS, R and R studio software (T + P)	1 to 3 pm	2	Dr.Subhamoy Das	HOD, Zoology, MRC
04.12.19	3	Data formatting, data manipulation, descriptive statistics (T + P)	3 to 5pm	2	Prof.Manik Das	SACT Mahishadal Raj College
05.12.19	4	One sample T teat and Independent T test, (T + P)	03 to 05pm	2	Prof.Manik Das	SACT Mahishadal Raj College
06.12.19	5	Paired T test and Z test. (T + P)	02 to 04pm	2	Prof.Manik Das	SACT Mahishadal Raj College
09.12.19	6	One way ANOVA and two way ANOVA. (T + P)	01 to 03pm	2	Prof.Saheli Maiti	SACT Mahishadal Raj College
10.12.19	7	Repeated measures of ANOVA and ANCOVA (T + P)	03 to 05pm	2	Prof. Saheli Maiti	SACT Mahishadal Raj College
11.12.19	8	Data visualization I (T + P)	02 to 04pm	2	Prof. Sagnik Mondal	SACT Mahishadal Raj College
12.12.19	9	Data Visualization II (T + P)	02 to 04pm	2	Prof. Sagnik Mondal	SACT Mahishadal Raj College
13.12.19	10	Correlation and regression (T + P)	01 to 03pm	2	Prof. Moumita Jana	SACT Mahishadal Raj College
16.12.19	11	Multiple regression. (T + P)	02 to 04pm	2	Prof. Moumita Jana	SACT Mahishadal Raj College
17.12.19	12	Chi square and Wilcoxon rank test. (T + P)	01 to 03pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
18.12.19	13	kruskalwallis test and Friedman test (T+P)	01 to 03pm	2	Dr. Rajkumar Guchhait	SACT Mahishadal Raj College
19.12.19	14	Principle component analysis (PCA)	01 to 03pm	2	Dr. Rajkumar Guchhait	HOD, Zoology, MRC,
20.12.19	15	Random forest analysis and overall discussion.	12 to 2 pm	2	Dr. Subhamoy Day, Dr.	HOD & SACT.,

				Rajkumar Guchhait, Prof. Sagnik Manadal, Prof. Manik Das and Prof. Moumita Jana. DR.Asim Kr Bera	Zoology; Principal, MRC
			30 hours		

⬥ Course structure and examination scheme:

Course name	Theory classes (hr.)	Practical classes (hr.)	Theory marks	Practical marks	Total marks
Biological data analysis	15	15	20	80	100

⬥ Participant's Details and attendance:

Enrolment Details of Students

Add on course- 2019-2020

Organized by Department Zoology

Topic: - Microscopy

Attendance Record (Day 1-Day 8)

Sl. No.	Name of Students	09.09.19	10.09. 19	11.09. 19	12.09. 19	13.09. 19	14.09. 19	16.09. 19	17.09. 19
1.	MONOJ SHEE								
2.	SUCHANDA MAITY								
3.	TAMALIKA DAS								
4.	MAMPA DAS								
5.	SANGITA ADHIKARY								
6.	AMIT PRAMANIK								
7.	NAIMA AKTAR								
8.	SOUMYATTAM BERA								
9.	SK . MUSTANGIR								
10.	SUDIP DAS								
11.	BITHI BERA								
12.	SRABANTI MISTRI								
13.	NAMITA BERA								
14.	SOUMYADIP PANDA								
15.	SUTALIKA MAITY								
16.	RAHUL ROY								
17.	PAPIYA MAITY								
18.	SHUVASIS KUNDU								
19.	TINA JANA								
20.	MOUSUMI GHORAI								
21.	JAYASHREE BHOWMIK								
22.	PARAMITA MAJI								

23.	ARNAB DAS								
24.	RESHMA KHAN								
25.	PABITRA PATRA								
26.	SHRABANTI PRAMANIK								
27.	SUPRIYA GIRI								
28.	SUVENDU DAS								
29.	RESHMA KHATUN								
30.	TRISHA MANDAL								

Attendance Record (Day9-Day 15)

Sl. No.	Name of Students	18.09.19	19.09.19	20.09.19	21.09.19	23.09.19	24.09.19	25.09.19
1.	MONOJ SHEE							
2.	SUCHANDA MAITY							
3.	TAMALIKA DAS							
4.	MAMPA DAS							
5.	SANGITA ADHIKARY							
6.	AMIT PRAMANIK							
7.	NAIMA AKTAR							
8.	SOUMYATTAM BERA							
9.	SK . MUSTANGIR							
10.	SUDIP DAS							
11.	BITHI BERA							
12.	SRABANTI MISTRI							
13.	NAMITA BERA							
14.	SOUMYADIP PANDA							
15.	SUTALIKA MAITY							
16.	RAHUL ROY							
17.	PAPIYA MAITY							
18.	SHUVASIS KUNDU							
19.	TINA JANA							
20.	MOUSUMI GHORAI							
21.	JAYASHREE BHOWMIK							
22.	PARAMITA MAJI							
23.	ARNAB DAS							

24.	RESHMA KHAN							
25.	PABITRA PATRA							
26.	SHRABANTI PRAMANIK							
27.	SUPRIYA GIRI							
28.	SUVENDU DAS							
29.	RESHMA KHATUN							
30.	TRISHA MANDAL							

ADD ON COURSE
Department of Zoology & Computer Science, Mahishadal Raj College
Microscopy

| Full Marks: 50 | Time: 2 hrs |

The figures in the right-hand margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.
Illustrate the answers wherever necessary.

A. Answer the following MCQ :   15x2=30

1. Which part of the compound microscope helps in gathering and focusing light rays on the specimen to be viewed?
   a) Eyepiece lens
   b) Objective lens
   c) Condenser lens
   d) Magnifying lens
2. What is the minimum distance for the eye to focus on any object?
   a) 11 cm
   b) 25 cm
   c) 32 cm
   d) 4 2 cm
3. Resolving power of a microscope is a function of _____
   a) Wavelength of light used
   b) Numerical aperture of lens system

8. In light microscopy, which of the following is used as fixatives prior to staining technique?
   a) Osmic acid
   b) Glutaraldehyde
   c) Heat
   d) Osmic acid, glutaraldehyde, heat
9. In Phase contrast microscopy, the rate at which light enters through objects is

   _____
   a) Constant
   b) Inversely proportional to their refractive indices
   c) Directly proportional to their refractive indices
   d) Exponentially related to their refractive indices
10. Which part of the light microscope controls the intensity of light entering the viewing area?
    a) Coarse adjustment screw
    b) Fine adjustment screw
    c) Diaphragm
    d) Condenser lens
11. You place a specimen under the microscope and notice that parts of the specimen begin to emit light immediately. These materials can be described as _____.
    a) Fluorescent
    b) Phosphorescent
    c) Transparent
    d) opaque
12. Who is the probable inventor of the compound microscope?
    a) Girolamo Fracastoro
    b) Zaccharias Janssen
    c) Antonie van Leeuwenhoek
    d) Robert Hooke

13. Which would be the best choice for viewing internal structures of a living protist such as a *Paramecium*?
    a) a brightfield microscope with a stain
    b) a brightfield microscope without a stain
    c) a darkfield microscope
    d) a transmission electron microscope

14. Which type of microscope is especially useful for viewing thick structures such as biofilms?
    a) a transmission electron microscope
    b) a scanning electron microscopes
    c) a phase-contrast microscope
    d) a confocal scanning laser microscope
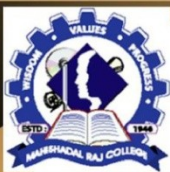
15. Which type of microscope would be the best choice for viewing very small surface structures of a cell?
a) a transmission electron microscope
b) a scanning electron microscope
c) a brightfield microscope
d) a darkfield microscope

B. Answer the following MCQ :   **10x1=10**

Write the principle of Phase contrast and fluorescence microscopy and application of its.   10

🞦 *SAMPLE CERTIFICATE OF COURSE COMPLETION*

CERTIFICATE
OF COURSE COMPLETION

THIS IS TO CERTIFY THAT

Subhada Shankar Mondal

has successfully completed the **Add-on Course** on *Water and soil analysis* held during 2018-19 academic year at Mahishadal Raj College.

Course Co-ordinator

IQAC Co-ordinator

Principal

DATE: 06.09.2019

CERTIFICATE
OF COURSE COMPLETION

THIS IS TO CERTIFY THAT

Soumitra Chatterjee

has successfully completed the **Add-on Course** on *Water and soil analysis* held during 2018-19 academic year at Mahishadal Raj College.

Course Co-ordinator

IQAC Co-ordinator

Principal

DATE: 06.09.2019