2017

Ph.D. Course Work (24 credits, 44 periods)

Paper I (100 marks, 12 credits)

- Research methodology + Research Ethics (4 periods, 2 credits, 20 marks)
- Quantitative Analysis (8 periods, 4 credits, 30 marks)
- Computer techniques (8 periods+2 periods(practice), 4 credits, 30 marks)
- Review of literature (2 credits, 20 marks)

Paper II - 60(written)+40(assignment)= 100 marks, 12 credits

Module I (12 periods, 6 credits)

Module II (12 periods, 6 credits)

Course Work 2017 (For All Scholars)

Phase 1 - Time-Table **Venue: RM.29B, R.K. HALL**

Date/Day	Time/Subject/ Prof. A.CHANDRA	Time/Subject/ Prof. A.NATH
6.11.2017/MON.	10.00- 11 A.M. (QUANTITATIVE ANALYSIS)	11 AM-1.00 PM (MATLAB)
7.11.2017/TUE.	10.00- 11 A.M. (QUANTITATIVE ANALYSIS)	11 AM-1.00 PM (MATLAB)
8.11.2017/WED.	10.00- 11 A.M. (QUANTITATIVE ANALYSIS)	11 AM-1.00 PM (MATLAB)
9.11.2017/THURS.		1.30 -3.30 PM (MATLAB)
10.11.2017/FRI.	10.00- 11 A.M. (QUANTITATIVE ANALYSIS)	11 AM-1.00 PM (MATLAB)
13.11.2017/MON.	10.00- 11 A.M. (QUANTITATIVE ANALYSIS)	11 AM-1.00 PM (MATLAB)
14.11.2017/TUE.	10.00- 11 A.M. (QUANTITATIVE ANALYSIS)	11 AM-1.00 PM (MATLAB)
15.11.2017/WED.	10.00- 12 A.M. (QUANTITATIVE ANALYSIS)	

Syllabus of Quantitative Analysis

Lecture 1: Types of data – Qualitative and Quantitative, Frequency and Non-Frequency.

Lecture 2: Basic Characteristics – Central Tendency, Dispersion, Skewness and Kurtosis.

Lecture 3: Characteristics of Bivariate data – Correlation and Regression.

Lecture 4: Basic concepts of Probability.

Lecture 5: Binomial, Poisson and Normal distributions and their basic properties.

Lecture 6: Introduction to the theory of inference.

Lecture 7: Tests of significance concerning a single population and comparison of two populations using Normal distribution.

Phase 2 Class Routine (For All Ph. D Scholars)		
Subject: Research Methodology and Ethics in Research	**Venue: R. K. Hall (C)**	
Dates (Days)	**Time**	**Faculty Member**
24th November, 2017 (Friday)	12.30 PM to 1.30 PM	Sanjib Kumar Basu
	2.00 PM to 4.00PM	Samrat Roy
25th November, 2017 (Saturday)	12.30 PM to 1.30 PM	Shivaji Banerjee
	2.00 PM to 4.00PM	Samrat Roy and Sanjib Kumar Basu

Ph. D. Course work Syllabus for Biotechnology, November, 2017

Biotechnology -I

[50 Marks]

1. Spectroscopy: UV-Visible, Fluorescence, Circular Dichroism.

2. Structural Biology: Secondary, tertiary and quaternary structure of protein; Analysis of sequence and structural databases, Sequence and structural alignments, BLAST search, Brief introduction to the structure determination methods by X-ray crystallography

3. Enzyme kinetics: principle of transition state stabilization; steady state kinetics – Michaelis-Menten equation, Lineweaver-Burke plot, enzyme inhibition; effect of pH and temperature on enzyme rates (qualitative); enzymes used in recombinant technology.

4. Epigenetic Regulation: Concepts of chromatin and chromatin modifications (nucleosome structure and function, higher order compaction, histone proteins); histone modifying enzymes; chromatin remodelers.

5. Biochemistry and Molecular Biology: Protein transport in bacteria.

6. Phylogeny (by Guest Professor)

Biotechnology -II

[50 Marks]

7. Green fluorescent Protein : Protein localisation

8. Biostatistics: Concepts of Paired and Unpaired T-test, One-way and Two-way ANNOVA, Chi-square test and contingency analysis

9. Animal Cell and Tissue Culture: Principles & concepts with special reference to stem cell biology & cancer biology.

10. Cloning strategies, Gene transfer methods in plants

11. Toxicology: overview of ecotoxicology, types and effects of toxicity (neurotoxicity, cardiac toxicity, reproductive toxicity etc), current concepts.

12. Graphical representation of data, correlation regression etc. (by Guest Professor)

Tentative dates for Ph. D. Course work:

Date	No. of Classes	Teacher	Time
01.11.2017	**2**	**Dr. Aniruddha Banerjee**	**3-5pm**
02.11.2017	**2**	**Prof. Souvik Roy**	**3-5pm**
03.11.2017	**2**	**Dr. Dipankar Chakraborti**	**12-2pm**
	2	**Dr. Jhimli Dasgupta**	**3-5pm**
06.11.2017	**2**	**Dr. Ronita Nag Chaudhury**	**1.30-3.30PM**
07.11.2017	**2**	**Dr. Priyanka De**	**1.30-3.30PM**
08.11.2017	**2**	**Dr. Aryadeep Roy Choudhury**	**1.30-2.30 PM**
	2	**Dr. Chandana Barat**	**2.30-4.30PM**
09.11.2017	**2**	**Dr. Arindom Chakraborty (guest) Assistant Professor Department of Statistics Visva-Bharati, Santiniketan**	**11am-1pm**
	2	**Dr. Uma Siddhanta**	**3.30-4.30PM**
10.11.2017	**2**	**Dr. Sudipa Saha**	**Date change to 11.11.2017**
	2	**Dr. Debashis Mukhopadhyay (guest) Professor, Saha Institute of Nuclear Physics**	**3-5pm**

Class Routine (For Ph. D Scholars of Commerce Only)		
Subject: Commerce	**Venue: R. K. Hall (C)**	
Dates (Days)	**Time**	**Faculty Member**
27th November, 2017 (Monday)	11.30 AM to 1.30 PM	Sanjib Kumar Basu
27th November, 2017 (Monday)	2.00 PM to 4.00 PM	Partha Pratim Ghosh
28th November, 2017 (Tuesday)	11.30 AM to 1.30 PM	Atish Prosad Mondal
28th November, 2017 (Tuesday)	2.00 PM to 4.00 PM	Shivaji Banerjee
29th November, 2017 (Wednesday)	11.30 AM to 1.30 PM	Samir Kumar Lobwo
29th November, 2017 (Wednesday)	2.00 PM to 4.00 PM	Saswati Choudhury
30th November, 2017 (Thursday)	11.30 AM to 1.30 PM	Sumona Ghosh
30th November, 2017 (Thursday)	2.00 PM to 4.00 PM	Amitava Ghosh
1st December, 2017 (Friday)	11.30 AM to 1.30 PM	Soma Sur
1st December, 2017 (Friday)	2.00 PM to 4.00 PM	Fr. Dominic Savio
2nd December, 2017 (Saturday)	11.30 AM to 1.30 PM	Fr. S. Xavier
2nd December, 2017 (Saturday)	2.00 PM to 4.00 PM	Sanjib Kumar Basu

- Name of the Faculty members are tentative, subject to final confirmation from the concerned faculty members.
- Subject Topic of the Faculty Members will be announced in due course.

Ph. D. Course work Syllabus for Microbiology, November, 2017

Unit 1: **Medical Microbiology, Immunology, Molecular Biology**

No. of Classes: 12 **Full Marks: 50**

Medical Microbiology-The mechanism of pathogenesis in bacterial and viral diseases. Toxigenesis including mechanism of toxin production, structure and its mode of action. Types of toxins. Different mechanism by which host defence system is evaded by the pathogens.

Immunology-Roll of T cell & B cell. Antigen antibody interaction, inflammation, cytokines, Hypersensitivity, Vaccine, toxoid. Techniques like ELISA, Western blot analysis, Immunoprecipitation, Raising of antibody etc.

Molecular Biology- Nucleic acids and gene structure: Replication: Mechanism of DNA replication; mutations. Transcription and Post-transcriptional processing of mRNA
Translation: Recombinant DNA techniques: Enzymes for manipulation of DNA; PCR; plasmid and vectors; cloning and screening strategies.

Unit 2: **Agricultural, Environmental, Industrial Microbiology**

No. of Classes: 12 **Full Marks: 50**

Rhizosphere and phyllosphere microorganisms and their interaction with plants. Mechanism of plant pathogenicity, Molecular basis of plant disease control. Beneficial association between plant and microorganisms. Biocontrol agents, SAR and ISR.
Biology of Hydrosphere, Biology of Atmosphere, Biology of Lithosphere
Biology of Industrial Microorganisms, Fermentation-types and processes.
Recombinant DNA technology used in industry and research

Tentative dates for Ph. D. Course work for Microbiology:

Elective 1 [E1] and Elective 3 [E3]

Date	No. of Classes	Teacher	Time
01.11.2017	**2**	**Dr. Arup Kumar Mitra**	**11-1pm**
	2	**Dr. Jaydip Ghosh**	**1.30 –3.30 pm**
02.11.2017	**2**	**Dr. Anindita Banerjee**	**11- 1 pm**
	2	**Dr. Arup Kumar Mitra**	**1.30-3.30 pm**
03.11.2017	**2**	**Dr. Madhumita Maitra**	**11- 1 pm**
	1	**Dr. Mahasweta Mitra Ghosh**	**1.30 -2.30 pm**
	1	**Dr. Madhumita Maitra**	**2.30 – 3.30 pm**
06.11.2017	**2**	**Dr. Arup Kumar Mitra**	**1.30 – 3.30 pm**
07.11.2017	**2**	**Dr. Riddhi Majumder**	**1.30 -3.30 pm**
08.11.2017	**2**	**Dr. Madhumita Maitra**	**1.30 -3.30 pm**
09.11.2017	**1**	**Dr. Sudeshna Shyam Choudhury**	**1.30 – 2.30 pm**
09.11.2017	**1**	**Dr. Anindita Banerjee**	**2.30-3.30 pm**
10.11.2017	**1**	**Dr. Mahasweta Mitra Ghosh**	**1.30 – 2.30 pm**
10.11.2017	**1**	**Dr. Madhumita Maitra**	**2.30 – 3.30 pm**
11.11.2017	**2**	**Dr. Sudeshna Shyam Choudhury**	**1.30 - 3.30 pm**