

Report on
Add-On Course
on
Computational Biophysics
by The Department of Physics,
in collaboration with
the IQAC,
St. Paul's Cathedral Mission College,
Kolkata

COURSE OBJECTIVES

The course was so designed so that Science students would be exposed to certain interesting areas of Biological Science. On the other hand, the students of Biological Sciences would experience a physical science approach towards the subject and learn computational technique. The course guided to open up research opportunities for the students in future. The main topics that were covered:

- Sequence in Biology & Analysis
- Mechanics of molecules
- From Sequence space to the Born-Oppenheimer approximation
- Mathematical Modeling
- Machine learning techniques for analysis of large data
- Integrative approaches of systems biology and medicine.

Eligibility Criterion:

B. Sc. students in their 3rd or 5th semester were allowed to apply for this course provided they had basic knowledge of computer programming

Course Duration:

Total duration of the course was designed for about 42 hours

Timing:

Classes were conducted on Saturdays during 2:30 - 5:30 p.m. (3 hrs which included a 30m duration question-answer session).

Course Fee:

Rs 1,000/- (Rupees One thousand Only) per student.

Course structure:

1. Basic Biology: cellular & molecular level
2. Define Computational Biophysics.
3. Information in Biology: how it works
4. Sequence of information & how to analyze them:
 - Biological Sequence Evolution
 - Searching Databases of Biological Sequences
 - Sequence Alignment algorithms
5. Structure based understanding of Bio-systems:
 - Structural Information, Extraction & analysis
 - Simulation & Analysis of structure function of Proteins
 - Protein, DNA & RNA, Cell wall
6. Systems Biology:
 - Higher level (full body & functioning) to lower level (molecular)
 - Understanding of Disease.

Resource persons:



Prof. Indira Ghosh, Rtd. Prof. at School of Computational & Integrative Sciences, JNU, New Delhi was the key Resource person. Indira Ghosh was working in JNU since 2008 as Dean & Professor to start & steer the School of Computational & integrative sciences, which deals with computational approach to Biology, Chemistry, and Economics etc. Till 2019 (retired), she has nourished the school as Center of Excellence under Department of Biotechnology (DBT), Govt. of India (GoI) in Computational Biology and spearheaded to initiate a new stream supported by UGC, called Complex Systems, harvesting few faculties from Physics and Econophysics. She has been one amongst the earlier scientists to realize the importance of

Bioinformatics and initiated M.Sc courses in Pune University (SPPU) when she joined as Professor in Institute of Bioinformatics & Biotechnology in Pune in 2003, leaving her corporate job from AstraZeneca in Bangalore.

The teachers of the Department of Physics, also assisted her, mainly in the laboratory sessions.

INAUGURAL DAY

The course on Computational Biophysics was inaugurated on **23rd September 2023** with 11 students from our college. The first class also started on that very day.



ATTENDANCE SHEET

NAME OF THE COURSE: COMPUTATIONAL BIOPHYSICS
 TYPE OF COURSE: ADD-ON DEPARTMENT: PHYSICS
 DATE: 23/9/23 TIME: 2:30pm

Sl	NAME OF THE STUDENT	ROLL NO	YEAR AND DEPARTMENT	SIGNATURE
1	Sucheta Das.	1187	2nd year Physics	Sucheta Das
2	Wasim Reza	1183	2nd year Physics	Wasim Reza
3	Sirvegon Dey	1178	2nd year Physics	Sirvegon Dey
4	Biswajit Debnath	1259	3rd year Physics	Biswajit Debnath
5	Subhajit Kr. Paul	1235	3rd year Physics	Subhajit Kr. Paul
6	Alexy Samkresh Palai	1193	3rd year, Microbiology	Alexy Samkresh palai
7	Sumelle Mohanta	1178	3rd year Microbiology	Sumelle Mohanta
8	Sayan Chakraborty	1209	2nd year Chemistry	Sayan Chakraborty
9	Swastika Dalui	1169	2nd year microbiology	Swastika Dalui
10	Kuldeep Roy	1229	3rd year Physics	Kuldeep Roy
11	Hemita Mondal	1192	3rd year Microbiology	Hemita Mondal
12				
13				
14				
15				

Binitalghosh

Indira Ghosh



GPS Map Camera

Kolkata, West Bengal, India
 33/1, Raja Rammohan Roy Sarani, Baitakkhana, Kolkata, West Bengal
 700009, India
 Lat 22.575583°
 Long 88.369425°
 23/09/23 02:10 PM GMT +05:30

Google

SCHEDULED CLASS DATES:

A dedicated Google Classroom was opened particularly for this add on course. At the end of each class several study materials were shared by Prof. Ghosh with the participating students in this classroom. Also the assignments were uploaded from time to time in this platform only. The students were asked to submit the assignments in the same Google Classroom. Prof. Ghosh checked and corrected each of the assignments and students were asked to do the corrections accordingly. Classes were held on the following dates:

23.09.2023	Basics of Cell Biology & Measuring Instruments
30.09.2023	Time scale in biological processes
07.10.2023	Developing Computational Approach to understand Biology
18.11.2023	DNA and RNA Coding Informations
25.11.2023	Biological Data Integration
02.12.2023	Real value estimation for E.coli bacteria
09.12.2023	Chronology of Genome sequencing
06.01.2024	Analysis from NCBI Data set
13.01.2024	Analysis from NCBI Data set
20.01.2024	Analysis of Protein Structure


COURSE Outcome:

Students were acquainted with biological systems and computational methods.


New skill sets were acquired. The students after completion of this course were more able to effectively contribute in the interdisciplinary research.

It was really a stepping stone towards exploring Interdisciplinary area during M. Sc. & Research works.

ParticiPants were awarded with a CertifiCate on compl etion of the course.



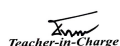
ST. PAUL'S CATHEDRAL MISSION COLLEGE
33/1, Raja Rammohan Roy Sarani, Kolkata-700 009
ADD-ON / CERTIFICATE / VALUE ADDED COURSES





Estd: 1865


CERTIFICATE OF PARTICIPATION

This is to certify that Mk./Ms. Mounita Mondal of the Department of Microbiology, PG / UG Semester IV, of St. Paul's Cathedral Mission College has participated and successfully completed the Add-on / Certificate / Value Added Course entitled Computational Biophysics organised by the Department of Physics of this college. The duration of the course was of 40 hours/weeks, between the dates 23rd Sep 23 to 20th Jan 24


 Teacher-in-Charge

 IQA Co-ordinator

 Binitajhosh
Course Co-ordinator




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ADD-ON / CERTIFICATE / VALUE ADDED COURSES





Estd: 1865


CERTIFICATE OF PARTICIPATION

This is to certify that Mr./Ms. Sayan Chakraborty of the Department of Chemistry, PG / UG Semester IV, of St. Paul's Cathedral Mission College has participated and successfully completed the Add-on / Certificate / Value Added Course entitled Computational Biophysics organised by the Department of Physics of this college. The duration of the course was of 40 hours/weeks, between the dates 23rd Sep 23 to 20th Jan 24.


 Teacher-in-Charge

 IQA Co-ordinator

 Binitajhosh
Course Co-ordinator




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ADD-ON / CERTIFICATE / VALUE ADDED COURSES





Estd: 1865

CERTIFICATE OF PARTICIPATION

This is to certify that Mr./Ms. Subhajit Kumar Paul of the Department of Physics, PG / UG Semester VI, of St. Paul's Cathedral Mission College has participated and successfully completed the Add-on / Certificate / Value Added Course entitled Computational Biophysics organised by the Department of Physics of this college. The duration of the course was of 40 hours/weeks, between the dates 23rd Sep 23 to 20th Jan 24

 Teacher-in-Charge

 IQA Co-ordinator

 Binitajhosh
Course Co-ordinator

CLOSING CEREMONY and distribution of certificates ON 20TH april 2024





Internal Quality Assurance Cell (IQAC)
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(Estd. - 1855)
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Closing Ceremony

ST. PAUL'S COLLEGE