



Bose Institute & Calcutta University

Jointly offer

Integrated M.Sc.-Ph.D. Course in Life Sciences

Prospectus

Bose Institute:

Bose Institute was founded by Acharya Jagadis Chandra Bose in 30th November, 1917 with the purpose of investigating fully “the many and ever opening problems of the nascent science which includes both life and non-life.” Bose Institute is one of the earliest modern Institutes of India with a strong of scientific research. Bose Institute is one of the earliest modern institutes of India with a strong tradition of scientific research.

Acharya Jagadis Chandra Bose:

Acharya Jagadis Chandra Bose (November 30, 1858 – November 23, 1937) was a Bengali polymath: a great physicist, biologist, philosopher and dreamer of scientific research. He pioneered research in radio and microwave optics, made highly significant contributions to plant science, and laid the foundations of experimental science in the Indian subcontinent. He is considered the father of radio science, and is also considered the father of Bengali science fiction. He was the first from the Indian subcontinent to get a US patent, in 1904.

Calcutta University:

Established on 24 January 1857, Calcutta University is located in the city of Kolkata (previously Calcutta), and is one of the most renowned universities in the Indian subcontinent. Over time, it has played a vital role in the development of India’s nationhood not only by spreading progressive social ideas and values but also by establishing the ability of Indian researchers to carry out advanced scientific and technological research and rediscover the great philosophical, cultural and literal heritage of the country.

Academic Status:

An integrated M.Sc.- Ph.D. course on Life Sciences with specialization in : (i) *Molecular & Cellular Biology*, (ii) *Plant Molecular Biology & Biotechnology*, (iii) *Biophysical Chemistry*, and (iv) *Computational & Systems Biology* has been developed in collaboration between both the institutions under nodal area of ‘**Modern Biology**’.

Course Chronicle:

The idea has emerged in recent times for broadening the existing M.Sc.-Ph.D. programme on “Plant Molecular Biology and Biotechnology” to “Life Sciences” to cover core areas of Biological Sciences. Bose Institute and Calcutta University decided to extend the collaboration between to develop an integrated M.Sc.- Ph.D. course on “Life Sciences” with effect from 15th September 2011, for the 2011-2012 Academic Session.

Course Objectives:

The integrated M.Sc. - Ph.D. course on Life Sciences has been formulated as a combination of two year, four semester Post-Graduate M.Sc. curriculum and a four-year (approximately) Ph.D. programme in related areas with the following objectives:

To develop human resource with expertise in the broader area of – *Molecular & Cellular Biology, Plant Molecular Biology & Biotechnology, Biophysical Chemistry, and Computational & Systems Biology*. One of the major objectives of the programme is to motivate young inspiring students to choose a career in basic sciences and its application to relevant fields.

Course Highlights:

The academicians of Bose Institute and other leading Institutes in Kolkata and across the country will teach and mentor the students for competitive research.

Students will get extensive exposure to theory and equipment of modern Biology as well as computational techniques of Modern Biology.

They will be encouraged to participate in the institutional seminars, journal club seminars and interactive sessions in the institutional scientific activities.

All necessary institutional facilities including Library and Internet facilities will be available for use by the students during the course.

During M.Sc. course all students will be offered a fellowship at par with other institutions offering such course, subject to the condition that if a student fails to secure 60% marks in a

particular semester, his/her fellowship will be discontinued till he/she secures 60% or above marks in next semester.

This course shall be 2+4 = 6 academic years. Exceptionally proficient students may even finish earlier

Qualifications:

A student seeking admission to this course must have passed B.Sc. (Honors in Botany, Zoology, Microbiology, Biochemistry, Chemistry, Physics, B.E., B. Tech., M.B.B.S. or any other related field, with at least 60% marks in the main subject, or in aggregate. Final selection will be made on the basis of written test and interview.

No person shall be qualified for admission to the M.Sc. Course unless he/she is 20 years or above of age, on the date of admission.

Examination:

There shall be following four examinations in the M.Sc. course in the span of two years.

Examination I: On completion of the course specified for the first semester.

Examination II: On completion of the course specified for the second semester

Examination III: On completion of the course specified for the third semester

Examination IV: On completion of the course specified as assigned project work.

Evaluation:

Attendance: In case of eligibility for Examination I, II, and III no candidate shall be deemed to have pursued a regular course of study unless he/she has attended at least 75% of theory, practical and tutorial classes, in each course he/she is registered.

Course Structure:

Theory & Practical papers for 1st semester

- I. Molecular Biology of Cell
- II. Basic Biochemistry
- III. Plant Biology
- IV. Basic Molecular Biology Techniques
- V. Cell Signaling

Theory & Practical papers for 2nd semester

- VI. Structural Biology & Computational Biology
- VII. Microbial Genomics & Virology

VIII. Proteomics, Transcriptomics and Gene Regulation

IX. Biostatistics and Bioinformatics

X. Research Methodology

Theory & Practical papers for 3rd semester (specialization in one area)

X. Molecular & Cellular Biology

XI. Plant Molecular Biology & Biotechnology

XII. Biophysical Chemistry

XIII. Computational & Systems Biology

4th Semester entirely research project oriented

Dissertation: Dissertation shall consist of either original project work, or a detailed Review of Literature, or both, in thesis format, to be evaluated at the end of the second year.

Grand Total: Theory **450** +Practical **225** +Grand Viva **75** +Project **250** (Dissertation, presentation, *Viva voce*) = **1000** marks.

Scheme of Examination

Semester	Theory	Practical	Grand Viva	Total
I	150 (30x5)	75	25	250
II	150 (30x5)	75	25	250
III	150 (150x1)	75	25	250
IV (Project)		150	100	250
GRAND TOTAL				1000

Note:

- The medium of instruction and examination shall be English
- Practical paper will be based on continuous assessment throughout each semester.
- No candidate shall be permitted to proceed to the next semester unless he/she has secured at least 40% marks in the aggregate in the examinations prescribed for the previous semesters.

Eligibility for entering into the integrated Ph.D. Program:

A candidate who will obtain 60% and above marks in the 1st, 2nd and 3rd semesters individually and at least 75% marks in the 4th semester, will be allowed to continue for Ph.D. degree in the related program under the guidance of particular supervisor, provided they have qualified in an Nation-wide competitive examination like NET, GATE etc. They will also be declared as having passed M.Sc. Examination.

Candidates who do not qualify for Ph.D. program (as mentioned above), but fulfill the requirements of the M.Sc. degree (*i.e.* secure at least 40% marks in each paper and 50% marks in aggregate) will obtain M.Sc. degree in ***Life Science*** with specialization in ***(i) Molecular & Cellular Biology, (ii) Plant Molecular Biology & Biotechnology, (iii) Biophysical Chemistry, (iv) Computational & System Biology.***

A candidate who fails to appear or fails in one Semester examination may be allowed to appear/reappear in one or more courses of that Semester along with the next Semester examination. He/She has to give in writing that he/she were foregor results of the previous examination, in case he/she had previously appeared for the same.

This shall be subject to the following conditions:

(i) No candidate will be allowed to appear in any course more than twice, including the examination originally held and no candidate will be allowed to appear in any course beyond four years of his/her first admission to the M.Sc. Course.

(ii) A candidate must choose only once, the course in which he/she proposes to reappear. No further changes will be permitted.

(iii) A candidate who opts to reappear in a certain course at an examination but was unable to do so, may reappear in the concerned course at a later examination, if otherwise eligible.

Minimum Pass Marks and Classification of Successful Candidates:

(a) In order to qualify for the degree of M.Sc., a candidate must secure at least 50% marks in the aggregate of theory, practical and project work of all four sentences.

(b) First Class: 60% or above marks in the aggregate of all the examinations.

Second Class: 50% or above marks in the aggregate of all the examinations.

If at the end of the second year, he/she fails to secure the minimum marks required for the award of the degree, he/she may reappear in all such courses of the first and second year in which he/she has not already appeared twice at the examination to be held in the stipulated month of next year. However, a candidate must pass M.Sc. Examination within four years of his/her admission to the M.Sc. Course.

Note: If a student qualifies in the project work of fourth semester but fails in theory of 3rd Semester, he/she may appear for theory examination only along with fourth Semester examination.

Detail Course Curricula will be provided at the time of admission

