



ASHOKA
UNIVERSITY

M.Sc. Biology

Academic Information

Batch – 2022-23 and beyond.

Course introduction

Biology is inherently interdisciplinary and employs deep crosstalk across systems and scales. It thus warrants a perception that includes revealing patterns and processes that define our environment and biodiversity, genes and genetics, pathogens and disease, our socio-cultural practices and innovations gleaned through areas as diverse as medicine, agriculture, environmental laws, urbanization, and much more. The Masters in Biology program at Ashoka University is uniquely designed and poised to impart such holistic training in the fundamentals of physical and chemical principles of biology, encouraging crosstalk between diverse areas, from evolution and organismal biology to cell-molecular and computational biology. Our approach is to provide information to enable students to synthesize knowledge by an in-depth understanding of theory and to develop analytical skills. Ashoka's unique Masters in Biology program allows students to customize their specialized learning based on individual interests. Students will learn through hands-on training aided by contemporary and innovative pedagogical methods as well as through extensive independent research.

Besides, the program also promotes a culture of exploration and collaboration in all areas of human creativity and innovation spanning natural sciences, social sciences, and humanities as a true representation of Ashoka's spirit of liberal education to solve societal problems. Finally, students will be encouraged to harness the unique cross-disciplinary opportunities provided by Ashoka University to acquire skills in the emerging areas of science journalism, biomedical entrepreneurship, molecular archaeology, and economics of health and disease. This will substantially enhance the intellectual and professional growth of students and enable them to explore opportunities beyond academia.

Course outline

MSc in Biology is a two-year program with a total requirement of 80 credits, distributed across four semesters. Each student will be assigned a 3-member Graduate Advisory Committee (GAC) that will guide and approve the customized course plan of the student before declaring a concentration/specialization. The program begins with a mandatory one week preparatory biology and/or mathematics bootcamp course. In the first year, students primarily focus on diverse modules of modern biology through few mandatory courses and a wide range of elective courses covering Cell-Molecular-Biology (CMB) to Evolution-Organismal-Biology (EOB). The elective courses span disciplines of biophysics and biochemistry, cell and developmental biology, computational and mathematical biology, behavior, ecology and evolutionary biology, thus establishing the fabric of interdisciplinarity. In this year, the students also prepare themselves for research by selecting 2 short lab projects to obtain hands on experience in advanced methods and techniques relevant to individual customized area of interest. In the second-year, students completely focus on their independent research and dissertation either within or outside the university including opportunities in leading biotech industries.

The EOB-related courses will encompass the study of organisms, their relationships with the environment at time scales ranging from minutes to millennia. These courses allow the students to focus on multiple aspects of organismal biology such as ecology, evolution, systematics, genetics, and behavior. The strength of the EOB-related courses lie in their emphasis on a quantitative and research-based approach to learning concepts and the wide range of research questions/study systems pursued by EOB faculty in the department. These cross-disciplinary courses in the context of Indian higher education are designed to bridge the fundamentals of evolutionary and population biology concepts with their applications in emerging areas such as Biodiversity, Health, Disease, and Climate change. Parallely, CMB-related courses will cover unique and comprehensive modules that span the entire spectrum of molecular to cellular biology and systems biology. A multidisciplinary team of scientists and teaching faculty will help in uncovering the frontier areas of modern biology such as

biophysics, cell biology, molecular and expression genetics, computational methods, synthetic biology, immunology, neuroscience, disease biology, virology and many more. Most strikingly, the diverse sets of available elective courses will enable the students to customize their semester with courses as per their interests and future plan. Overall, the program provides the ample flexibility for interdisciplinary and inter-departmental crosstalk. It is also designed to foster technical and professional skill sets in the students for their academic and biomedical industrial careers.

Graduate Advisory Committee (GAC)

Students will be assigned a 3-member Graduate Advisory Committee (GAC). Every semester the students will design their course plan and present it to the GAC for approval. After approval, students are expected to meet the GAC should there be any alteration of plan. At the end of the 2nd semester, the students are expected to submit the choice of their laboratory to the GAC for approval. Mid-semester meetings with the GAC can be arranged if required. Some of the courses will need separate approval from the GAC.

Course Structure

The key features of the proposed course structure are summarized below—

1. Preparatory course

Before the start of the first semester, a 6 day mandatory biology and/or math bootcamp is designed especially to provide a platform to students without adequate training in Biology or Mathematics. Through the bootcamp, the students will also shadow a lab as an introduction to laboratory research, where they will watch and learn from experiments being done by lab personnel.

2. Credit distribution

Types of courses	Total credits assigned
Mandatory bootcamp	2
Mandatory core courses	20
Elective courses	20
Research and dissertation	38
Grand total	80

3. Recommended courses structure (core courses in bold, while others are elective)

(Customized course structure needs to be approved by the GAC)

Pre-semester bootcamp:

Bridging Math and Biology (Credit: 2)

1st Semester (Monsoon):

Cells and molecules of life (Credit: 4)

Organismal and evolutionary biology (Credit: 4)

Multiple course choices on Statistics (Credit: 4)

Seminar series in biological sciences I (Credit: 4)

Any one or two courses offered in any department (**Total Credit: 4**)

2nd Semester (Spring):

Research methodology (Credit: 4)

Options in advanced techniques (Credit: 4)

*Seminar series in biological sciences II (Credit: 4)**

Two short research projects within Ashoka (Total Credit: 4)

Any one or two courses offered in any department (Total Credit: 4)

Choice of research lab approved by the GAC

*Attendance mandatory with built-in customizable elements

Optional summer workshops/ short courses

In addition to the conventional academic courses mentioned above, students will be highly encouraged to engage in a summer academic activity of their choice. The activities may include but not limited to workshops/ short courses during the summer break (June-August) to aid the training and development of graduate students. The proposed research can also be initiated in the summer semester in agreement with the chief of the laboratory of choice.

3rd Semester (Monsoon):

MSc dissertation research I (Credit: 18)

(The evaluation components will include written and oral research proposal presentations, comments from research mentor and research data presentation)

4th Semester (Spring):

MSc dissertation research II (Credit: 20)

(The evaluation components will include comments from research mentor, research thesis submission and oral thesis defense presentation)

Master's dissertation

Writing a Master's Dissertation is mandatory in the second year of the program. The dissertation research can be done in a laboratory within or outside Ashoka including in relevant laboratories in biotech/pharma industries. At the end of the second semester, students will decide on PI and organization to perform their thesis research. Contacts with industries for the purpose will be facilitated by the department. The selection of PI and organization will be in agreement of the student, PI and/or organization, and the GAC. Students will be required to submit the master's thesis at least two weeks ahead of the thesis presentation. The dissertation will carry a total of 38 credits over two semesters. Failure in the dissertation or substandard work will require completion within the next two months. Evaluation will be done at the end of the fourth semester.

Graduation requirements

To complete the M.Sc. in Biology degree, students must meet the following requirements:

- Students are required to pass all the courses.
- Dissertation is mandatory.
- If a student fails a core course, in the first, second, or third semester, they are strongly encouraged to appear for a re-examination at the beginning of the next semester.
- If a student fails the re-examination, then they must sit for the course again

- Students are allowed to retake one core course each semester even when they have passed the course on the first attempt. The transcript will show all course attempts, but grades from only the final course attempt will count towards the CGPA. The grade obtained in the earlier attempt will be cancelled and won't be considered even if it turns out to be superior.
- If a student, who has failed a core course, decides to skip the re-examination and directly retake the course, they should note three points— (1) they would be able to do so only after a year. The student's responsibility is to check with the instructor to make sure that the course is offered in the next year. All interim transcripts will report F grade for the said course. (2) The Department does not guarantee that the compulsory course would not clash with any other courses in the next semester timetable. (3) If the student is unable to qualify in the next attempt, it might put the student's graduation plan at risk. The instructor of the repeat course may change, which may make the course harder for the student.
- If a student fails an elective course, they may take additional electives to fulfil the graduation criteria. However, grades of all courses that have been taken for credit will be included in the transcripts and factored in calculating student's CGPA
- All fees need to be cleared and no disciplinary actions should be pending against the student.
- In all, students will have a maximum of 2 years to complete the degree program.

Assessments

Methods of examination, evaluation and the overall assessment of students is entirely set by the faculty member teaching the course. Hence, they may vary from one course to another. Faculties at Ashoka University generally use unique and innovative formats that include (but are not limited to) class participation, assignments, projects, term papers, online discussion forum contributions, oral presentations, quizzes, midterms, and final exams. Students must interact with the respective faculty members and find out if they have any specific expectations regarding examinations or assignments for their courses.

Typically, the final grade for the course is arrived at through a weighted average of the various examinations conducted. Students are awarded a letter grade based on their performance in a course. Students who due to extraordinary circumstances cannot complete their coursework in a given semester may request their faculty to grant them an Incomplete (I) grade. Failure to complete the coursework as per the timeline stipulated by the faculty results in a failing grade (F). For further details, please consult the Incomplete Grade Policy on the myAshoka portal, which can be found in the documents section associated with the Office of Academic Affairs.

Except when a student fails a compulsory course, there are no provisions for a student to improve their grades in any course. The grading scheme below is used for all courses at Ashoka University at large.

The grading scheme below is used for all courses at Ashoka University at large. The final CGPA is calculated by taking an average of the GPA quality points from each course.

Letter Grade	GPA Quality Points
A	4.0
A-	3.7
B+	3.3
B	3.0
B-	2.7
C+	2.3
C	2.0
C-	1.7
D+	1.3
D	1.0
D-	0.7
F	0.0

The Ashoka Liberal Arts Audits

In the spirit of Ashoka's liberal arts policy, students can not only credit courses from other departments but can also audit courses above 300 level with approval from their GAC. Generally, the approval requires justification from the student for auditing a course and its relevance with the student's graduation plan. The grades for the audit courses won't be mentioned in the transcripts.

Academic Awards

At the time of graduation, students are awarded the following Honours, based on CGPA calculated for courses taken at Ashoka University over the four semesters. Note that only those students are eligible who successfully completed 80 academic credits towards the MSc Biology degree, excluding P grade(s).

CUM LAUDE (CGPA \geq 3.40)

MAGNA CUM LAUDE (CGPA \geq 3.60)

SUMMA CUM LAUDE (CGPA \geq 3.80)

Structure of Courses

Each 4-credit course is taught over 13 to 14 weeks and every week there will be two lectures for 90 min each. Each 2-credit course will be taught over one 90 min lecture in a week. The format of teaching may vary from one instructor to another. Generally, a course is composed of teaching classes, discussions, presentations, quizzes, exams, etc. A typical class usually involves both lecture and substantial student participation. Students are expected to do all the work assigned for the everyday class as required by the instructor.

Semester 1 consists primarily of core courses with fewer electives, while Semester 2 consists primarily of electives towards customization of the coursework. Certain core courses also come with in-built elective options within the course to enable customized learning. Semester 2 includes two short research projects that can be executed anytime during the semester over a period of 15 days based on the agreement with the chosen

research mentors. Semesters 3 and 4 consists of full-fledged research within or outside the campus in academia or industry. The credits are earned through the submission of proposals, seminar presentations and evaluation from the respective research mentor.

Late Graduation Policy

A student who has not met the graduation requirements by the end of their second year may graduate late. There are three reasons for which a student may fail to meet their graduation requirements within two years:

1. **Incomplete grades in the transcript:** If a student fails to submit pending coursework or complete their thesis by the relevant deadline in a given semester, the faculty at their own discretion may grant an Incomplete grade. A student cannot graduate with an Incomplete grade on the transcript. Once a student completes their course requirements – either past the usual deadline in the same semester or in a later semester – they will be graduating as late graduates.
2. **Failed a compulsory course or passed less than 9 electives:** A student may have to retake courses or take additional courses to meet the graduation requirements.
3. **Leave of absence (LoA) in the first two years:** If a student has availed leave of absence in any semester, they will have to take courses to meet the graduation requirements.

A student who has not met the degree requirement in two years will continue to be classified as an "enrolled student" by the university. The usual semester fees will be charged for enrolled students, except for the following two exceptions:

1. The student only needs to finish Incompletes to meet the degree requirements. If such a student fails to submit the work specified by the faculty within the next semester, the grade turns into an F and they have to repeat the course, and then, have to submit the semester fees.
2. The enrolled student has been granted a leave of absence for the semester by the Office of Academic Admissions (OAA). In this case, the University levies a holding fee of Rs. 20,000 for the LoA semester. Please refer to the leave of absence policy as specified by the OAA. For late graduates, the transcript and the degree will reflect the date on which the degree has been officially awarded to the student by the appropriate University bodies. For example, if a late graduate meets their degree requirements in Monsoon 2022 and the degree has been awarded on 12 February 2023, then the transcript will reflect "February 2023" while the degree will reflect "Degree awarded on 12 February 2023".

Attendance

We insist on regular attendance and active participation in classes. Each course instructor will announce their own attendance policy. A student may withdraw from a course in any semester, subject to certain deadlines and conditions or permissions. They may withdraw from a course at any time in the first 2 weeks of a semester. However, to drop a course in weeks 3-4, they will need permission from the Dean of Academic Affairs. If they wish to withdraw from a course in weeks 5-8, then they will require the Dean's permission and the transcript will show a 'W' for such a course, which does not affect the GPA. If they withdraw in week 9 or later, the transcript will show 'WF' (Fail notation) or 'WX' (Exceptional circumstances notation). WF affects the CGPA like an F grade while WX has no effect on the CGPA. In extraordinary circumstances, it may become necessary for a student to take a leave of absence for the entire semester. In such circumstances, the student must submit a request for a

LoA to the OAA. Please consult the Leave of Absence Policy on the myAshoka portal, which can be found in the documents section associated with the Office of Academic Affairs.

Plagiarism, Cheating and Grades

The programme expects students to display utmost integrity in all forms of academic assessment. Plagiarism is the use of another's original work, such as articles, reports and presentation materials (in full or part), or codes, formulas and ideas, without acknowledging or seeking permission where necessary from the author or source. Accordingly, verbatim reproduction of sentences in part or full without acknowledgement or permission to do so is considered plagiarism. We encourage students to explore plagiarism.org, an excellent website that can help understand plagiarism and also do a first-level self-check. Any violation of academic integrity will be reported to the Office of Academic Affairs (OAA) where a confidential record of all such instances are kept. Please read the Academic Integrity Policy available in the Office of Academic Affairs section on myAshoka portal. Course instructors, Teaching Fellows and invigilators are charged with communicating ways of preventing the violations mentioned above to students in the context of their particular class. Instructors are responsible for specifying the level of interaction, exchanges of ideas and discussions allowed for each group or individual assignment.

Feedback

To keep the graduation program student-friendly, contemporary, and useful to the student's future plan, we encourage the students to provide their feedback. Students must submit their feedback on academic courses every term. Grades for a course will only be released once the feedback has been received from students