First Course Sheet – BSE652A

Course title: Developmental Biology

1. Objectives: The objective of this course is to provide a comprehensive understanding of the concepts of early animal development. Students taking this course must develop a critical appreciation of methodologies specifically used to study the process of embryonic development in animals. In this course a particular model system will not be discussed in detail. Instead, different concepts of animal development will be elaborated in one model system or the other. Once the concepts are taught the students will be made familiar with different approaches that have been used to study such concepts. Further topics that will be discussed are stem cells and regeneration, the developmental basis of diseases as well as the developmental mechanisms of evolutionary change.

2. Prerequisites: There is no pre-requisite for this course. However, I expect the postgraduate as well as senior undergraduate students taking this course to have a basic understanding of cellular and molecular biology of the standard taught in the courses on cell and molecular biology in the BSBE department. The students outside BSBE, who opt for this course as an open elective are expected to know the contents of LIF101 which is a compulsory course for all undergraduates.

3. Course Contents:

Topic	No. of Lectures
Introduction to animal development	**1**
Methods of studying developmental biology I: Fate mapping and lineage tracing	**2**
Methods of studying developmental biology II: Candidate gene approach	**3**
Morphogenesis: Differentiation and Cell-cell communication	**4**
Axis formation and patterning: Drosophila and Xenopus	**4**
Axis formation and patterning: Limb patterning	**2**
Stem cells	**1**
Regeneration	**2**
Development and disorders	**2**
Developmental mechanism of evolutionary change	**1**
Total lectures	**22**

4. Special Emphasis: (optional): Students must attend all classes where the important aspects of each topic will be discussed and the basic principles of developmental biology explained. Students will need to study the relevant sections of the prescribed text book as well as the primary literature and review papers which will be provided as reading material. Students are not expected to remember the details in these research papers but to understand the key findings of the paper and how it adds to the knowledge on the topic. The relevant book chapters that students should refer to will be mentioned at the end of each class and the literature in the form of journal articles will be provided to them via e-mail.

5. Lecture, Tutorial & Lab Schedule & Venue – All lectures will be held in the Lab Class Room in the BSBE department. There is no tutorial or lab for this course

LEC: Tuesdays 10:30 to 11:50 AM and Thursdays 12:00 noon to 1:15 PM

6. Office Hours or, recommended mode of contact beyond formal contact hours:
   I will be available on class days (Tue and Thu) after class till 4 PM to answer questions. All other days of the week except Mondays I will be available from 3 to 4 PM in my office to answer questions or solve problems. In case this time window is not suitable students should e-mail me to set up an appointment for meeting me outside this time window. There will be one revision class each before the mid-semester exam and the end-semester examination, however these will be extra classes that will have to be scheduled in consultation with the students.

7. Evaluation Components & Policies: Exams, Quizzes, Assignments, Attendance, Participation etc. – There will be NO CREDIT for attendance. Attendance is purely voluntary however, one should note that without attending classes it may be very difficult to answer examination questions. There will be 4 quizzes (two before the midsemester examination and two after) apart from midsemester and endsemester examinations.

   Quizzes (collectively) will have 20% weightage while the mid-semester examination will have 40% and the end-semester examination 40% weightage. Knowledge of portions covered before the midsem would be required to answer the endsemester examination questions. 20% of the endsemester question paper will have questions on topics covered before the midsemester examination.

   No make-up exam if the student misses the midsem exam and/or quizzes. If the student misses the Midsem exam, marks will be pro-rated based on endsem exam marks. If the student misses MORE THAN ONE quiz he/she will receive ZERO in the quizzes he/she missed. If the student missed one quiz the performance in the missed quiz will be pro-rated as the average of the other quizzes.

   Quizzes will be ALL SURPRISE quizzes. No SURPRISE quiz will be conducted on the last (class) day before midsem recess OR the first (class) day after midsem recess OR on a non-Senate-mandated extra class day. A surprise quiz may be conducted on any other official class day.

8. Course Policies: Attendance, Honesty Practices, Withdrawal (within the limits of DOAA Guidelines) Attendance will be taken but no weightage has been assigned to it. If dishonest practices are followed during the quiz or any examination it will result in deduction of 50% marks from that particular quiz or examination.

9. Books & References: Properly Formatted along with listing of possible internet sources.

Textbook – Developmental Biology by Scott F. Gilbert, Ninth Edition OR Tenth edition.

Reference material – Various journal articles including reviews which will be provided to the students. All lecture slides will be shared with the students.