

LIFS 4090 DEVELOPMENTAL BIOLOGY
Fall 2016 Course Outline

Instructor: Prof. Yan YAN, Rm5511, 23585929, yany@ust.hk
Time: Tuesday 12:00-13:20, Thursday 12:00-13:20
Venue: TBC

General Course Description: This course introduces the processes and underlying mechanisms of embryonic development on molecular, cellular, tissue, and organ levels. Key embryonic development events such as fertilization, germ layer formation, body patterning will be discussed and used as examples to highlight principles governing animal development. Important developmental concepts such as stem cell self-renewal and differentiation, growth control and aging will be discussed in depth. Diseases caused by aberrant developmental processes will also be discussed in the class.

Key Learning Outcomes of the Course:

At the end of the course, students should be able to:

1. Be familiar with common operational principles, key molecular players and modulating factors in developmental biology.
2. Have the ability to comprehend and evaluate current literature on a variety of developmental biology context.
3. Solve specific biological questions framed under a developmental platform by
 - Integrating the developmental principles in specific model systems
 - Designing experiment logically
4. Integrate their prior knowledge of genetics, cell, biochemistry and molecular biology to analyze processes and mechanisms guiding the making of a functional life form.
5. Communicate their theoretical interpretation of experimental data and findings effectively in oral presentation and writing.

Course Format: Two 1.5-hour sessions per week. These will include lectures, group presentations and discussion periods. Grades will be based on midterm exam (40%), presentation (20%), and final exam (40%).

Key Reference book:

S.F. Gilbert (2016) Developmental Biology, 11th Ed, Sinauer Asso. Inc. Publishers. Earlier versions are also good.

Prerequisite: Senior UG students and Graduate students with sufficient background on Genetics, Cell Biochemistry and Molecular Biology.

Course Calenda:

Week	Date	Topic
1	Sep 1	Introduction
2	Sep 6, 8	Gametogenesis
3	Sep 13, 15	Early embryo development I: Cell division
4	Sep 20, 22	Early embryo development II: Pattern formation
5	Sep 27, 29	Gastrulation I: Differentiation
6	Oct 4, 6	Gastrulation II: Morphogenesis
7	Oct 11, 13	Organogenesis I
8	Oct 18, 20	Organogenesis II
9	Oct 25, 27	Midterm exam
10	Nov 1, 3	Stem cells and regeneration I
11	Nov 8, 10	Stem cells and regeneration II
12	Nov 15, 17	Growth control
13	Nov 20, 24	Aging
14	Nov 29	Final exam review