Jordan University of Science and Technology
Faculty of Science and Arts
Department of Biotechnology and Genetic Engineering
Semester 2007

Course Information	
Course Title	Developmental Biology (Embryology)
Course Number	B. 411
Prerequisites	B.102
Course Website	
Instructor	Professor Ahmed Elbetieha
Office Location	Deanship/Faculty of Science and Arts
Office Phone	23480
Office Hours	Monday, Wed. from 11-12:30
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Teaching Assistant	None

Course Description

The course will focus on studying the developmental stages in different organisms as Amphibians, Sea Urchins, *Drosophila* and human. Current approaches in developmental biology including genetic engineering and molecular biology will be discussed.

Text Book	
Title	Analysis of Biological Development
Author(s)	Kalthoff, K.
Publisher	McGraw Hill
Year	2001
Edition	Second
Book Website	
References	

Assessment Policy		
Assessment Type	**Expected Due Date**	**Weight**
First Exam	5th week of the semester	30%
Second Exam	11th week of the semester	30%
Final Exam	To be announced by the university	40%
Assignments		

Course Objectives	Weights
1. To Understand the different developmental periods in different organisms	20%
2. To comprehend the different stages of animal development starting from gametogenesis , through cleavage, gastrulation and morphogenesis	25%
3. To understand cell fate, potency and determination	15%
4. To comprehend the principle of genomic equivalence and differential gene expression	20%
5. To appreciate the role of localized cytoplasmic determinants in cell determination	10%

6. To comprehend the molecular basis of development	10%

Teaching & Learning Methods
1. Lecturing and using the overhead projector as a tool of teaching

Learning Outcomes: Upon successful completion of this course, students will be able to		
Related Objective(s)		Reference(s)
1,2	Recognize the main features distinguishing each stage of development	Chapter 1,,3,4,5,10,12 and Handouts
3	Know the differences between cell fate, potency and determination	6
4,5	Comprehend the principle of genomic equivalence and the role of cytoplasmic determinants in development	7
6	Appreciate the molecular basis of development	1-14

Useful Resources

Course Content		
Week	**Topics**	**Chapter in Text (handouts)**
1	Introduction	
2	Overview of development	1
3	Gametogenesis	3
4	Fertilization	4
5	Cleavage	5
6	Cell fate, potency and determination	6
7	Genomic equivalence and the cytoplasmic determinants	7
8	Localized cytoplasmic determinants	8
9	Gastrulation	10

10	Neurulation and axix induction	12
11	Ectoderm organs	13
12	Endodermal and mesodermal organs	14
13 and 14	Selected topics	

Additional Notes	
Assignments	Reading textbook chapters
Exams	The first and second exams 60% (30%) each and 40% for the final
Cheating	Prohibited by the university regulations
Attendance	Very important according the university regulation
Workload	
Graded Exams	
Participation	
Laboratory	
Projects	

Biology strives to describe and understand the dierent processes taking place in living organisms. One strategy for dealing with the complexity of biological systems involves the construction and use of models. âˆ—First made available March, 2012. Last updated June, 2012.Â We hope that an extensible and open framework can aid in the development of improved biological models and analysis procedures through the combined eort of both communities, and improve the reproducibility of results [43]. Towards this goal, in this report we review theoretical and experimental results from both elds and demonstrate preliminary steps towards the encoding and analysis of several biological modeling formalisms through formal, SMT-based methods. or analyses. The chemical composition of each biological additive was compiled in a spreadsheet and annotated to aid subsequent analysis. The annotations indicate vendor, raw material source, product type, digestion method and ACF status (Table 1). Where measurement units differed between vendors, these measurement units were standarized so that the data sets were comparable.Â CHO Media Library: An Efficient Platform for Rapid Development and Optimization of Cell Culture Media Supporting High Production of Pharmaceutical Proteins in Chinese Hamster Ovary Cells (poster). The development of plants involves similar processes to that of animals. However plant cells are mostly immotile so morphogenesis is achieved by differential growth, without cell movements. Also, the inductive signals and the genes involved are different from those that control animal development.Â Generalized scheme of embryonic development. Slack "Essential Developmental Biology" Fig.2.8. The initial stages of human embryogenesis. Step-by-step analysis of biological data. Summary. Here I describe how you should determine the best way to analyze your biological experiment. How to determine the appropriate statistical test.Â The biological null hypothesis is "Different amino acid sequences do not affect the biochemical properties of PGM, so glycogen content is not affected by PGM sequence." The biological alternative hypothesis is "Different amino acid sequences do affect the biochemical properties of PGM, so glycogen content is affected by PGM sequence." By thinking about the biological null and alternative hypotheses, you are making sure that your experiment will give different results for different answers to your biological question. Modeling of Biological Systems. A Workshop at the National Science Foundation. March 14 and 15, 1996.Â The developments in physics and chemistry have played fundamental roles in enabling structure determination of the essential molecules in biology - proteins, nucleic acids, membranes and saccharides - and in that fashion, helping one to understand their function. Some aspects of these efforts are described below in the sections on PROTEIN STRUCTURE and NUCLEIC ACIDS.Â Sequencing technology is being applied directly to sequence diversity analysis and gene expression analysis via high throughput, chip-based, automated assay systems. This influx has changed both the questions that are asked, as well as the range of the interactions considered.