



**KAAU**

**KING ABDULAZIZ UNIVERSITY  
ACADEMIC ASSESSMENT UNIT**

# **COURSE PORTFOLIO**

**FACULTY OF SCIENCE**

**DEPARTMENT of Biology**

**COURSE NAME:**

**Comparative Development of vertebrates**

**COURSE NUMBER: Bio 765**

**SEMESTER/YEAR: Second semester 1436/1437**

**DATE: 17/1/2016 – 7/4/1437**

**PART II**



**COURSE SYLLABUS**

### Instructor Information

- ✍ Name of the instructor  
Fatma Al-Qudsi
- ✍ Office location  
Building 7- Ground floor – Room 1-171
- ✍ Office hours

<b>Monday</b>	<b>9-10, 1-2</b>
<b>Tuesday</b>	<b>12-2</b>
<b>Thursday</b>	<b>9-10, 1-2</b>

- ✍ Contact number(s)  
Office Tel 26380
- ✍ E-mail address  
falqudsi@kau.edu.sa
- ✍ Instructor's profile (optional)  
Bsc in Zoology  
Msc in Experimental Embryology  
PhD in Developmental Biology  
***I welcome you in the course of “Comparative Developmental Biology of vertebrates”  
hoping that you will like it and benefit from it***

### Course Information

- ✍ Course name and number      ***Comparative Developmental Biology of vertebrates***  
Bio 765 SA1 (24623)
- ✍ Course meeting times, places      Thursday 10:00-13:00 room TBA
- ✍ Course website address  
<http://www.kau.edu.sa/falqudsi>
- ✍ Course prerequisites and requirements      Bio 355
- ✍ Description of the course (what, why, philosophy, teaching methodology)  
By the end of this course the student should be able to
  - ❖ Understand the origin of developmental Biology
  - ❖ Define the terminologies related to Developmental Biology.
  - ❖ *Understand the developmental biology of vertebrates*
  - ❖ *Know the origins of organs and organogenesis*
  - ❖ *Develop new and high cognitive skills such as analysis*

### Course Objectives

- ✍ **A statement of what the student will know and be able to do as the result of learning**
  - ❖ Define exactly the terminologies related to developmental biology.
  - ❖ Enumerate the known cell-cell communications during vertebrate development
  - ❖ Analyses, tracks and predicts different cell pathway during development.
  - ❖ Understand the levels of thinking and reach a higher level of thinking by the end of the semester
  - ❖ Conduct advanced search for reliable scientific material related to developmental biology, download it, store it in references databases
  - ❖ Read, understand and analyze the searched material.

## ACADEMIC ASSESSMENT UNIT

✍ A statement on how students will be expected to demonstrate their learning

- Mid-term 30 marks
- Final exam 40 marks
- Assignments 30 marks (explanation below)

### a. Knowledge

#### (i) Description of the knowledge to be acquired

- Describe the anatomical development of vertebrates.
- Compare between the anatomical development of vertebrates.
- Define and explain cell-cell communication in development of vertebrates.
- Understand and define cell specification, determination and differentiation.
- Analyze cell behavior during development.

#### (ii) Teaching strategies to be used to develop that knowledge

Active learning (Thinking based learning methods, read, discuss, compare relate, debate, analyze)  
PowerPoint presentations

#### (iii) Methods of assessment of knowledge acquired

Written exams.

### b. Cognitive Skills

#### (i) Cognitive skills to be developed

Understand the levels of thinking and help the student reach a higher level of thinking by the end of the semester

#### (ii) Teaching strategies to be used to develop these cognitive skills

Thinking based learning methods

#### (iii) Methods of assessment of student's cognitive skills

From the second lecture till the end the students will be given material to prepare for next lecture and should be solving thinking based learning exercise related to what they have prepared.

### c. Interpersonal Skills and Responsibility

#### (i) Description of the interpersonal skills and capacity to carry responsibility to be developed

Be on time for lecture or apologize if not able to come, be prepared as requested by the instructor for each lecture, the ability to present, explain and debate in a reasonable and polite way

#### (ii) Teaching strategies to be used to develop these skills and abilities

Attendance is taken for each lecture; the student is responsible for herself. No material is going to be repeated for careless students. Skills for explaining, debating and presenting are going to be taught through thinking based learning.

#### (iii) Methods of assessment of student's interpersonal skills and capacity to carry responsibility

Delay in handling required material will cause deduction of marks

#### (iv) Communication, Information Technology and Numerical Skills

##### (i) Description of the skills to be developed in this domain.

All work handed from the student to the instructor should be printed showing the student name and page number on each page.

Students have to conduct internet advanced search using scientific databases for reliable material related to the topics they are going to be given

✍ A list all of the materials needed for the course and where to obtain them (*i.e.*, text books, reading material, lab guide, and websites)

● الكريم صالح و القدسي فاطمة، (٢٠٠٨ - ١٤٢٩) علم الاجنة الوصفي المقارن، مركز النشر العلمي جامعة الملك عبد العزيز، جدة

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- Moore, K. (1982) The developing Human, With Islamic additions Abdul-Majeed Al Zandani Third edition. Saunders. Dar Al-Qibla
- Nagy (2003) Manipulating the mouse embryo, A laboratory manual, 3<sup>rd</sup> edition. Cold spring harbor Laboratory Press, New York.
- Slack, J.M.W. (2013) Essential developmental biology, Third edition, Wiley-Blackwell Publishing Ltd.
- Wolpert (2014), Principles of Development, 5<sup>th</sup> edition, Oxford University Press. UK.
- Arendt, D. & Nübler-Jung, K., 1999. Rearranging gastrulation in the name of yolk: evolution of gastrulation in yolk-rich amniote eggs. *Mechanisms of development*, 81(1), pp.3–22.
- Baker, C.V. & Bronner-Fraser, M., 2001. Vertebrate cranial placodes I. Embryonic induction. *Developmental biology*, 232(1), pp.1–61.
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- Mitsiadis, T.A. et al., 2003. Development of teeth in chick embryos after mouse neural crest transplantations. *Proceedings of the National Academy of Sciences*, 100(11), pp.6541–6545.
- Patil, P. et al., 2015. scaRNAs regulate splicing and vertebrate heart development. *Biochimica et Biophysica Acta (BBA)-Molecular Basis of Disease*, 1852(8), pp.1619–1629.
- Schenke-Layland, K. et al., 2007. Collagen IV induces trophoblast differentiation of mouse embryonic stem cells. *Stem Cells*, 25(6), pp.1529–1538.
- Schuff, M. et al., 2010. FoxO genes are dispensable during gastrulation but required for late embryogenesis in *Xenopus laevis*. *Developmental biology*, 337(2), pp.259–273.
- Van Keymeulen, A. et al., 2011. Distinct stem cells contribute to mammary gland development and maintenance. *Nature*, 479(7372), pp.189–193.

✍ If the course involves a computer, list usage and software needed

- Word, PowerPoint,
- Internet surfing program such as google chrome
- Reference manager such as endnote.

✍ **Student responsibilities to the course**

Students are expected to participate in the lecture in asking questions and responding to questions and handling work on time

### Course Requirements and Grading

#### Student assessment: A clear rationale and policy on grading

- Mid-term 30 marks
- Final exam 40 marks
- Student assignment (table 1 and 2) 30 marks

Table 1

Student name and ID	Task	Submission date
Abrar Al-Ahmadi 1600591	Write a detailed review of <u>mouse heart development</u> ; explaining in detail all cell movements, interactions, molecular aspects, and factors affecting heart development in mice.	
Sulafa Azzouz 1601794	Write a detailed review of <u>Chick brain development</u> ; explaining in detail all cell movements, interactions, molecular aspects, and factors affecting brain development in chick.	

Table 2

	Assessment task	Proportion of Final Assessment												
1	Used Scientific papers as references	4												
2	<p>Good structure and writing which include all the points mentioned in Table 1</p> <p>Write a detailed review of <u>the topic related to the organ</u> (in table 1- each student according to their topic), this will be graded as follows:</p> <table><tr><th>Topic</th><th>Grade</th></tr><tr><td>What is the organ in question? (importance, function)</td><td>2</td></tr><tr><td>Cell lineage for the organ in question</td><td>3</td></tr><tr><td>Morphological development of the organ</td><td>4</td></tr><tr><td>Molecular development of the organ</td><td>4</td></tr><tr><td>Factors affecting cell differentiation within the organ.</td><td>3</td></tr></table>	Topic	Grade	What is the organ in question? (importance, function)	2	Cell lineage for the organ in question	3	Morphological development of the organ	4	Molecular development of the organ	4	Factors affecting cell differentiation within the organ.	3	16
Topic	Grade													
What is the organ in question? (importance, function)	2													
Cell lineage for the organ in question	3													
Morphological development of the organ	4													
Molecular development of the organ	4													
Factors affecting cell differentiation within the organ.	3													
3	Produced a word document containing the assignment	1												
4	Produced a clear informative power point presentation containing the assignment	4												
5	Write the references at the end of the document in a right scientific method (Harvard)	4												
6	The work was submitted on time	1												

#### Expectations from students: Attitudes, involvement, behaviors, skills, and ethics

Students are expected to attend lectures and participate and to behave according to the rules of the country and the University

**Course Schedule Model**  
**(meeting once a week)**

Week #	Date	Topic	Reading Assignment	What is Due?
1	Thursday 21/1/2016	The origin of developmental Biology Historical overview	Please refer to Schedule of Assessment Tasks for Students During the Semester written earlier in this document	
2	Thursday 28/1/2016	Concepts of Developmental Biology		
3	Thursday 4/2/2016	Cell movements, cell signaling, determination, differentiation		
4	Thursday 11/2/2016	Life cycle stages; fertilization, cleavage, blastula, gastrula Gastrulation; concept, what is it????		
5	Thursday 18/2/2016	Comparative gastrulation in vertebrates		
6	Thursday 25/2/2016	Embryonic induction in vertebrates		
7	Thursday 3/3/2016	Molecular aspects of embryonic induction in vertebrates		
8	Thursday 10/3/2016	Organogenesis Ectodermal derivatives (part1)		
9	Thursday 24/3/2016	Organogenesis Ectodermal derivatives (part2)		
10	Thursday 31/3/2016	<b>Mid-Term Exam</b>		
11	Thursday 7/4/2016	Organogenesis Mesodermal derivatives (part1)		
12	Thursday 14/4/2016	Organogenesis Mesodermal derivatives (part2)		
13	Thursday 21/4/2016	Organogenesis Endodermal derivatives (part1)		
14	Thursday 28/4/2016	Organogenesis Endodermal derivatives (part2)		
15	Thursday 5/5/2016	<b>Presentation</b>		

