Course Specification
(Bachelor)

Course Title:	**Embryology**
Course Code:	**BIOL_419**
Program:	**Biology**
Department:	**Biology Department**
College:	**College of Science**
Institution:	**Majmaah University**
Version:	3rd
Last Revision Date:	Ref# 7 10/**10/2023**

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: 3 (2+1)	Equivalent to credit points ECTs:4.5

2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐ Elective		

3. Level/year at which this course is offered: (8th level/4th year)

4. Course General Description:

This course includes gamete formation, fertilization, and embryonic development of chordates. As well as cleavage, blastulation, gastrulation and organogenesis in chordates animals' showing the extra-embryonic membranes. Also, it covers human pregnancy stages, events in each stage, multiple births, and twin formation.

5. Pre-requirements for this course (if any): Comparative Anatomy

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6. Co-requisites for this course (if any):

N/A

7. Course Main Objective(s):

This course aims to differentiate the developmental stages of some chordate's animals describing the embryogenic phenomenon's such as fertilization, gametogenesis, gastrulation, organogenesis…etc.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	80%
2	E-learning	15	20%
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	**30**
3.	**Field**	**0**
4.	**Tutorial**	0
5.	**Others (specify)**	**0**
Total		60

Workload (based on the academic semester)

No	Activity	Workload /Hrs.
1.	**Contact hrs.**	**60**
2.	**Self-study (Assignments, quizzes, reports, Discussions, Library, research….)**	**60**
	Total Workload	**120**
	Equivalent to credit points ECTs	**4.5**

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.3.1	Describe embryogenic terms and stages in different vertebrate animals.	K3	Lecture – Lectures with discussion	Quizzes' Midterm and final exams
2.0	**Skills**			
2.3.1	Differentiate the blastula, gastrula and orogenesis in three chordates animals showing the function of the embryonic membranes.	S3	Brainstorming /solving problems	Quizzes' Midterm and final exams
2.4.1	Examine the living specimen, slides, and models of developmental stages	S4	Practical Sessions	Practical exam/lab report

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	**Values, autonomy, and responsibility**			
3.2.1	Communicate professionally individually or in groups in the activities related to tasks, training and community work …etc.	V2	Teamwork	Assignments, Homework, report
…				

C. Course Content

No	List of Topics	Contact Hours
1.	Reproduction and Embryonic Development	3
2.	Introduction of Fertilization	2
3.	Cell division	2
4.	Gametogenesis	2
5.	Basics of cleavage	2
6.	Embryonic Development of Amphioxus	2
7.	Embryonic Development of Frog	2
8.	Embryonic Development of Chicks-Part1	3
9.	Embryonic Development of Chicks-Part2	3
10.	Embryonic Development of Humans-Part1	3
11.	Embryonic Development of Humans-Part2	3
12.	Assisted Reproductive Technologies (ART)	3
13.	**Total (Theory)**	**30**
1	S. in ovary (Mammals-Amphibia)	2
2	S. in testis of (Mammals-Amphibia)	2
3	Types of ova (Amphioxus-Amphibia-Chick)	2
4	Types of Egg membranes	2
5	Cleavage of Amphioxus	2
6	Blastula and Gastrula of Amphioxus	2
7	Cleavage of Frog	2
8	Blastula and Gastrula of Frog and tadpole larvae	2
9	Cleavage of chick	2
10	Blastula and Gastrula of chick	2
11	Chicken embryos stages 24hrs,48hrs,72hrs and 96hrs	8
12	Revision	2
	Total (Practical's)	**30**
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz's, Assignments, Homework	Once every 2 weeks once on as applicable	10%
2.	Mid-term Exam-1	5th -6th week	10%
3.	Mid-term Exam-2	9th -10th week	10%
4.	Black Board, e-Exam	12th week	10%
4.	Practical Exam and lab reports	14th -15th week	20%
5.	Final Exam	16th -18th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	1. Appasani, K. and R. Appasani. 2011. Stem Cells & Regenerative Medicine (electronic resource). From Molecular Embryology to Tissue Engineering. Totowa, NJ: Humana Press 2. Carlson, B. 2003. Patten's Foundations of Embryology. (6th International editon) McGraw Hill, Inc. 3. Desalle, R. and B. Schierwater. 2011. Key transactions in animal evolution. Enfield, New Hampshire. Science Publishers 4. Gilberts, S. 2006. Developmental Biology. (8th edition). Sinauer Associates, Inc. Publishers. 5. Kubiak, J. 2011. Cell Cycle in Development (electronic resource). Berlin, Heidelberg: Springer. Berlin Heidelberg. 6. Poole, DA, Warren, A.N. Nunez. 2007. The Story of human development. Upper Saddle River, NJ: Pearson/Prentice Hall. 7. Schoenwolf, G. 2009. Laboratory studies of vertebrate and invertebrate embryos: guide and atlas 8. Wolpert, L. 2011. Developmental Biology: a very short introduction. Oxford: Oxford University Press **9.** Carlson, Bruce M. and Kantaputra, Piranit N. (2014). Human embryology and developmental biology. Philadelphia,
Supportive References	Developmental Biology (8th edition) Gilbert, Scott F. Sunderland (MA): Sinauer Associates, Inc.; c 2000.
Electronic Materials	https://embryology.med.unsw.edu.au/embryology/index.php/Animal_Development

Other Learning Materials	CD prepared by the staff members containing U-tube videos. Multi-media associated with the textbook and the relevant websites. Biological charts. Microsoft office package.

2. Required Facilities and Equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Existing facilities are satisfactory
Technology equipment (projector, smart board, software)	Existing facilities are satisfactory
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Direct/ Indirect methods through Questionaries and %CLOs
Effectiveness of Students' assessment	Dep. reviewer/Students	Direct/indirect
Quality of learning resources	Faculty members/students	Indirect methods through Questionaries
The extent to which CLOs have been achieved	students	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**B**IOLOGY DEP. COUNCIL
REFERENCE NO.	**7**
DATE	**7/10/2024**