

## Course Syllabus

1	Course title	Developmental Biology	
2	Course number	0304362	
3	Credit hours	3	
	Contact hours (theory, practical)	2,3	
4	Prerequisites/corequisites	0304102	
5	Program title	Bachelor of Biological Sciences	
6	Program code	0304	
7	Awarding institution	The University of Jordan	
8	School	Science	
9	Department	Biological Sciences	
10	Course level	Third Year	
11	Year of study and semester (s)	First semester 2023/2024	
12	Other department (s) involved in teaching the course	none	
13	Main teaching language	English	
14	Delivery method	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	Online platforms(s)	<input type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....	
16	Issuing/Revision Date	First semester 2023/2024	

### 17 Course Coordinator:

Name: Hana' Alebous, PhD  
 Contact hours: Sunday and Tuesday 10:00 -11:00  
 Office number: Biology Building 113  
 Phone number: 22239  
 Email: h.alebous@ju.edu.jo



## 18 Other instructors:

None

## 19 Course Description:

This course deals with the following topics: Male reproductive system, spermatogenesis, oogenesis, fertilization, assisted reproduction technology, cleavage, gastrulation, neurulation, and early human development. In addition, the course covers development of the following: The skin and its derivatives; the central nervous system, the sense organs; the heart and major blood vessels, the excretory and the reproductive systems, the limbs, the digestive system; the respiratory system. Also a study of the fetal membranes, parturition, and twinning is covered.

### Laboratory:

Histological sections will be used to study gametogenesis in Grasshopper, Ascaris cat, and rabbit. Fertilization in Sea Urchin, cleavage and neurulation in frog will be illustrated using histological sections too. Histological sections of the frog, chick, and the pig embryos will be used to illustrate changes that occur as the embryo develops. Embryo and fetus models will be used to study different developmental stages. Fertilized chicken eggs will be used to study different developmental stages.

Laboratory topics will cover gametogenesis, early development, and the development of the body systems.

## 20 Course aims and outcomes:

A- Aims: This course will enable students to explore and gain further understanding of developmental biology through the investigation of different stages of human and animal development. Provide students with a broad base of knowledge regarding human embryology

B- Students Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to:

SLOs	CLOs					
	SLO (1) An ability to identify, formulate, and solve broadly-defined technical or Scientific problems by applying knowledge of mathematics and science and /or technical topics to areas relevant to discipline.	SLO (2) An ability to formulate or design a system, process, procedure or program to meet desired needs.	SLO (3) An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgement to draw conclusions.	SLO (4) An ability to communicate effectively with a range of audiences.	SLO (5) An ability to understand ethical and professional responsibilities and the impact of technical and /or scientific solutions in global , economic, environmental, and societal contexts.	SLO (6) An ability to function effectively on teams that establish goals plan tasks , meet deadlines and analyze risk and uncertainty
1. Understand gametogenesis, fertilization, and implantation.	x					
2. Demonstrate understanding of Assisted	x					

reproductive technology (ART)							
3. Describe structural features of primordial in gonads at different developmental stages	x						
4. Understand complete details about events in early and systematic embryological development	x						
5. Recognize embryonic tissue of human systems and organs	x						

## 21. Topic Outline and Schedule:

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Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources	
1	1.1	Introduction+ Orientation	-	Face to Face	-	-	-	-	
	1.2	Getting Ready for Pregnancy	1	Face to Face	-	-	Exam	Human Embryology & Developmental Biology (2019) B.M. Carlson, 6 <sup>th</sup> ed	Ch.1
	1.3	Introduction+ Orientation	-	Face to Face	-	-	-	Lab	
2	2.1	Transport of Gametes and Fertilization and ART	1,2,3	Face to Face	-	-	Exam	Human Embryology & Developmental Biology (2019) B.M. Carlson, 6 <sup>th</sup> ed	Ch.2
	2.2	Cleavage and Implantation	1,2,3	Face to Face	-	-	Exam	Human Embryology & Developmental Biology (2019) B.M. Carlson, 6 <sup>th</sup> ed	Ch.4
	2.3	Oogenesis in Ascaris	1	Face to Face	-	-	Exam	Lab. Sheet 1	

3	3.1	Formation of Germ Layers and Early Derivatives	1,2,3	Face to Face	-	-	Exam	Human Embryology & Developmental Biology (2019) B.M. Carlson, 6 <sup>th</sup> ed Ch.5
	3.2	Formation of Germ Layers and Early Derivatives	1,2,3	Face to Face	-	-	Exam	Human Embryology & Developmental Biology (2019) B.M. Carlson, 6 <sup>th</sup> ed Ch.6
	3.3	Spermatogenesis in Grasshopper	1	Face to Face	-	-	Exam	Lab. Sheet 2
4	4.1	Establishment of the Basic Embryonic Body Plan	1,2,3	Face to Face	-	-	Exam	Human Embryology & Developmental Biology (2019) B.M. Carlson, 6 <sup>th</sup> ed Ch.7
	4.2	Placenta and Extraembryonic Membranes	1,2,3	Face to Face	-	-	Exam	Human Embryology & Developmental Biology (2019) B.M. Carlson, 6 <sup>th</sup> ed Ch.1
	4.3	Fertilization in Sea Urchin	1	Face to Face	-	-	Exam	Lab. Sheet 3

5	5.1	The Axial Skeleton	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.10
	5.2	Muscular System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.11
	5.3	Cleavage +Neurulation in Frog	4	Face to Face	-	-	Exam	Lab. Sheet 4
6	6.1	Limbs	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.12
	6.2	Cardiovascular System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.13
	6.3	Frog Development I (3 mm Embryo).	4	Face to Face	-	-	Exam	Lab. Sheet 5
7	7.1	Cardiovascular System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology

								(2019). Sadler, T. 14 <sup>th</sup> ed. Ch.13	
	7.2	Cardiovascular System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.13	
	7.3	Frog Development II (5-7mm Embryo)	4	Face to Face	-	-	Exam	Lab. Sheet 6	
8	8.1	Cardiovascular System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.13	
	8.2	Respiratory System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.14	
	8.3	Early Chick Development	4	Face to Face	-	-	Exam	Lab. Sheet 7	
9	9.1	Respiratory System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.14	



	9.2	Digestive System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.15
	9.3	24 Hr. Chick Embryo	4	Face to Face	-	-	Exam	Lab. Sheet 8
10	10.1	Digestive System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.15
	10.2	Urogenital System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.16
	10.3	36 Hr. Chick Embryo	4	Face to Face	-	-	Exam	Lab. Sheet 9
11	11.1	Urogenital System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.16
	11.2	Head and Neck	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.17

	11.3	48 Hr. Chick Embryo	4	Face to Face	-	-	Exam	Lab. Sheet 10
12	12.1	Head and Neck	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.17
	12.2	Central Nervous System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.18
	12.3	72 Hr. Chick Embryo	4	Face to Face	-	-	Exam	Lab. Sheet 11
13	13.1	Central Nervous System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.18
	13.2	Central Nervous System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.18
14	14.1	Ear	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.19

	14.2	Eye	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.20
15	15.1	Integumentary System	4,5	Face to Face	-	-	Exam	Langman's Medical Embryology (2019). Sadler, T. 14 <sup>th</sup> ed. Ch.20
	15.2	Fetal Period and Birth	5	Face to Face	-	-	Exam	Human Embryology & Developmental Biology (2019) B.M. Carlson, 6 <sup>th</sup> ed Ch.18

## 22 Evaluation Methods:

Opportunities to demonstrate achievement of the **CLOs** are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	CLOs	Period (Week)	Platform
First Exam	15	Ch.1-7	1,2,3	TBA	School
Mid Lab.	10	Lab. Sheets 1 - 5	1,2,3	TBA	School
Second Exam	15	Ch. 10-15	4,5	TBA	School
Final Lab.	10	All material	1-5	TBA	School
Final Exam	50	All material	4-5	TBA	School



## 23 Course Requirements

(e.g: students should have a computer, internet connection, webcam, account on a specific software/platform...etc):

Data Show Projector, internet access, Microsoft Team

## 24 Course Policies:

A- Attendance policies: Regular class *attendance* is expected, *attendance* by *seating* number.

B- Absences from exams and submitting assignments on time: Absences from exams and handing in assignments on time: Reporting a valid reason of absence is accepted

C- Health and safety procedures: Health and safety procedures: All students should comply with the university Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, misbehavior: All students should comply with the university Honesty policy regarding cheating, plagiarism, misbehavior

E- Grading policy: Depends on average

First Hour Exam: 15 points    Second Hour Exam: 15 points

Final Exam: 40 points    Mid. Term Lab. Exam: 15 points    Final Lab. Exam; 15 points

F- Available university services that support achievement in the course: Data Show Projector, internet access

## 25 References:

A- 1- Human Embryology & Developmental Biology (2019) B.M. Carlson, 6<sup>th</sup> ed  
2- Langman's Medical Embryology (2019). Sadler, T. 14<sup>th</sup> ed.

B- Recommended books, materials, and media:  
Videos sent to the WhatsApp group created for students

## 26 Additional information:

Name of Course Coordinator: - Hana Alebous    -Signature: Hana    Date: 01/2024

Head of Curriculum Committee/Department: ----- Signature: -----  
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وإضمان الجودة  
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