SYLLABUS

Course Code	*Course Num.*	*Course Name*	*Credit Hours*	*Lec.*	*Lab.*	*Tut.*	*Private study*	*Pre-requisites*	*Course Level*	*Teaching Language*
BIO	**415**	**Embryology**	**4**	**3**	**2**	**0**	**5**	**BIO314**	**7**	**English**

A. Course Description

This course is designed to provide MBS students with a foundation in human embryonic and fetal development from fertilization to birth. This course focuses on the morphological changes that take place during development. Underlying molecular mechanisms and relevant congenital anomalies may be briefly considered.

B. Course Outcomes

At the end of this course the student will be able:

1. To define the basic concepts and principles of Embryology.
2. To describe the an understanding and appreciation of Embryo development.
3. To explain the basic cellular of determination and differentiation.
4. To explain the basic cellular of determination and differentiation.

C. References:

Required Textbook

- *Scott .f .Gilbert Developmental Biology, 10th ed,(2013).* ISBN-13: 978-0878939787.
- *Bruce M.Carlson MD PhD.Human Embryology and Developmental Biology:* With Student Consult Online Access, 5e 5th Edition,(2013). ISBN-13: 978-1455727940
- *Pankai Talwar Manual of Assisted Reproductive Technologies and Clinical Embryology (2012).* ISBN-13: 978-9350255063.
- *Laboratory Manual: Schoenwolf, G. C. 1995.* Laboratory Studies of Vertebrate and Invertebrate Embryos. 7th ed. Prentice Hall. ISBN 0-02-407602-3.

Other references:

- *Essentials od Domestic Animal Embryology by Poul Hyttel et al. (Dec 6, 2009)* Published: SEP-2009 **ISBN 10:** 0-7020-2899-1, ISBN **13:** 978-0-7020-2899-1.
- *Atlas of Descriptive Embryology (Book Review),* a Descriptive Embryology Atlas by Gary Schoenwolf and Willis Mathews.2008.

Course Website*:* *Google Classroom Webpage: http://www.imamm.org/*

D. Topics Outline

D1. Lectures topics

1. ***Introduction & Welcome to Embryology!*** *The saga of the sex cells: gametogenesis overview. Female sex cells: oogenesis. Male sex cells: spermatogenesis & spermatogenesis.Transport of gametes & fertilization.*
2. ***Cleavage.***
3. ***Gastrulation -*** *becoming trilaminar.Implantation Embryonic membranes.*
4. ***Twining.*** *Neurulation.Nervous system.*
5. ***Maternal support & fetal interactions.*** *Critical periods in development.*
6. ***Determination and Differentiation.***
7. ***Organogenesis.*** *Regeneration.*
8. ***Congenital Malformation. Embryonic cells and Tumor.***
9. ***Tissues and Embryonic Cells Culture.***
10. ***Stem cells.*** *Assisted reproductive technologies.*

D2. Laboratories topics

1. ***Introduction to embryology and microscopy.***
2. ***Female and male anatomy.***
3. ***Sperm motility.***
4. ***Frog cleavage, gastrulation, & neurulation (4.7.10mm)***
5. ***Staging frog embryos.***
6. ***Limbs.***
7. ***Live 11 mm frog embryos.***
8. ***Digestive.***
9. ***Chick cleavage, gastrulation, & neurulation (33..48hr chick).***
10. ***72-hr chick.***
11. ***Planarian regeneration.***
12. ***Live chick embryos.***
13. ***Finish planarian regeneration & checkout slides.***
14. ***Introduction to embryology and microscopy.***

E. Office Hours

Office hours give students the opportunity to ask in-depth questions and to explore points of confusion or interest that cannot be fully addressed in class.

F. Exams & Grading System

The semi-official dates of the exams for this course are:

- **Midterm 1:** 6th or 7th week**.**
- **Midterm 2:** 11th or 12th week.
- **Quizzes & Homeworks:** During the semester.
- **Final lab. Exam :** 14th or 15th week.
- **Final Exam :** 16th week**.**

Your course grade will be based on your semester work as follows:

Midterm 1: 15 %	**Midterm 2:** 15 %	**Final lab. Exam: 20%**	**Final Exam:** 40 %
Quizzes, Homework, Attendance & Participation: 10 %			

The grading distribution:

A^+	A	B^+	B	C^+	C	D^+	D	F
[95, 100]	[90, 95)	[85, 90)	[80, 85)	[75, 80)	[70, 75)	[65, 70)	[60, 65)	[0, 60)

G. Student Attendance/Absence

Only three situations will be considered as possible excused absences:

- Occurrence of a birth or death in the immediate family will be excused. ("Immediate family" is defined by the University as spouse, grandparents, parents, brother, or sister).
- Severe illness in which a student is under the care of a doctor and physically unable to attend class will be excused. Students are not excused for a doctor's appointment. Do not make appointments that conflict with rehearsals. Notes from the University Health Center will be accepted.

Executive Rules for Study Regulations and Exams

www.goo.gl/ykm7t3