



SYLLABUS

Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Private study	Pre-requisites	Course Level	Teaching Language
BIO	419	Experimental Embryology	3	2	2	0	3-5	BIO 415	8	English

A. Course Description

Experimental Embryology is Comparative study in reproduction, gametogenesis, fertilization, cleavage and morphogenesis; development of organ systems in animals; practical exercises included

B. Course Outcomes

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

1. Explain basic stages of animal development.
2. Explain how to obtain primordial germ cells for experimentation.
3. Describe the developmental anatomy of selected invertebrate and vertebrate embryos.
4. Comprehend the basic molecular and cellular mechanisms of fertilization and embryo development.
5. Explain the processes of fertilization both in lectures and laboratory.
6. Develop and test a hypothesis using experimental embryology techniques learned in the laboratory.
7. Understand and know how to do embryonic explanation.
8. Know the ways and laboratory work for studying the effects of teratogens on embryonic development of animals.
9. development of animals.
10. Explain the processes of regeneration and teratogenesis.
11. Analyze and interpret experimental data in developmental biology.
12. Communicate scientific results and evaluate their significance in the context of current knowledge in experimental biology.
13. Discuss ethical implications and societal impacts of advances in experimental biology research, gene regulation and inherited diseases.

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*
- *Pankaj 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 of 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: review basic stages of development.*
2. *Polarity and basic body plan.*
3. *Pattern formation, determination & differentiation.*
4. *Morphogenesis and regeneration.*
5. *Abnormal development and teratogenesis.*
6. *Apoptosis & aging.*
7. *Fertilization*
8. *AI and IVF*
9. *Twining*
10. *Cryopreservation of Embryo*
11. *General revision.*

D2. Laboratories topics

1. *Introduction to Laboratory Reagents and Equipment Safety*
2. *Structures and anatomy of male and female genital tracts.*
3. *Spermatogenesis process*
4. *Oogenesis process*
5. *Fertilization.*
6. *Amphioxus Amphibians Development*
7. *Birds Development*
8. *Mammals Development*
9. *Assistant Reproductive Techniques*

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](#)

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