Embryology

Course Code	Course Num.	Course Name	Credit Hours	Lec	Lab	Tut	Prerequisites
BIO	415	Embryology	4	3	2	0	BIO314

Objectives:

By the successful completion of the course the student will be able

- To address the developmental events during all stages of prenatal development.
- To emphasize human development but with a comparative approach to illustrate key differences in embryological development across animals.
- To study the normal cellular and molecular events associated with development.
- To examine abnormal development and teratological defects to understand how and why things go wrong during development. Through consideration of birth defects and teratology.
- To study the fundamental relationship between structure (anatomy) and function (physiology) will be considered, so that students gain an understanding of the fundamental importance of structure that allows normal physiology, and how anomalies in structure arising from abnormal development adversely affect the normal functioning of a structure.
- To devote an introduction to embryology, gametogenesis, fertilization, and the development of embryo from zygote to neural tube formation.
- To examine the development of organ systems, including the nervous, respiratory, cardiovascular, urogenital, and digestive systems, as well as a look into the development of sensory organs (eyes and ears).
- To have an excellent hands-on experience in embryology.

Syllabus:

- 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, cleavage.
- Gastrulation - becoming trilaminar, implantation.
- Embryonic membranes, Twining.
- Neurulation, Nervous system maternal support & fetal interactions .
- Critical periods in development
- Determination and Differentiation, Organogenesis, Regeneration, Congenital Malformation.
- Embryonic cells and Tumor, Tissues and Embryonic Cells Culture
- Stem cells, Assisted reproductive technologies.

References:

- 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.