FORMAN CHRISTIAN COLLEGE

(A Chartered University)

School of Life Sciences

Course Name: Development and Regenerative Biology		
Course Code: BIOL 413	**Course Type: (Elective)**	**Course Credits: 3+1**
Class Timings: 12:00-12:50 AM (Monday, Wednesday, Friday) **Lab: 8:00-9:50**	**Section: A**	**Student Meeting Hours/ Office Hours:**
Instructor Name: Dr. Deeba Noreen Baig		

Course Description:
This subject introduces students to advanced research topics in modern stem cell biology with respect to current roles of stem cells in development of organisms, regenerative medicine and ethical considerations of biotechnological applications.

Main Mode of Instruction: *(Face-to Face)*
Technology Requirements. Zoom Link on Moodle will be available. Students need to log in Moodle account and click on the zoom link mentioned under course title.
Technology Etiquettes:
Students with limited internet resources can download the lecture recording.

Study Material:
Applied Zoology (ZOO516DB)

Course Objectives
Upon successful completion of this course, participants will:
1. To develop student awareness and knowledge of the major concepts relating to developmental biology and regenerative medicine.
2. To cultivate an appreciation and understanding of the major areas of ethical contention in medical applications
3.To increase students' knowledge of the experimental approaches and strategies used in stem cell research and medicine.
4. to teach students to think critically about the new potentials, limitations and weaknesses that are associated with scientific advances in stem cell biology.
ole and potential of stem cells for therapeutic purposes.

Course Rubrics:
The breakup is as follows:

Quizzes:	20%
Class Participation/attendance	5%
Midterm	20%
Final term exam:	30%
Lab exam	**20%**
Lab notebook	**5**%
TOTAL	**100%**

Course Content, Learning Material & Activities Schedule

Wk	Topic/ Title	Teaching-Learning Activities			Assessment & Rubrics
		Synchronous		Lab activities	
		In-Person	Online	Off-campus and offline	
1	Introduction to the course, Vertebrate Developmental biology: An Overview	Power point lecture	Zoom meeting If required	Overview of lab activities in developmental Biology	
2	Structure of Ovum and Sperm, Oogenesis, Spermatogenesis	Power point lecture	Zoom meeting If required	Study of cleavage patterns in different animals	
3	Fertilization, Cleavage, Developmental stages up to gastrulation	Power point lecture	Zoom meeting If required	Study of Blastula patterns in different animals	
4	Organogenesis, development of different organs	Power point lecture	Zoom meeting If required	Study of gastrulation patterns in different animals	Quiz 1 (5%)
5	Organogenesis, development of different organs	Power point lecture	Zoom meeting If required	Study of organogenesis	Quiz 2 (5%)
6	Different types of stem cells will be discussed with emphasis on embryonic stem cells compared to adult stem cells and.	Power point lecture	Zoom meeting If required	Study of organogenesis	
7	Role of stem cells in embryonic development and adult tissue regeneration	Power point lecture	Zoom meeting If required	Study of organogenesis	Quiz 3 (5%)
8	New therapies based on stem cells such as in vitro production of organs, stem cell transplantation and cloning will be presented along with the ethical dilemmas posted by these advances.	Power point lecture	Zoom meeting If required	Regeneration observation in common life	

9	Diseases such as cancer, anaemia etc., will be discussed in terms of dysregulation of tissue regeneration.	Power point lecture	Zoom meeting If required	Study of different types of regeneration	Quiz 4 (5%)
10	Dysregulation of tissue regeneration in cancer	Power point lecture	Zoom meeting If required	Presentations	
11	Dysregulation of tissue regeneration in anemia	Power point lecture	Zoom meeting	Presentations	
12	Nature of pluripotency.	Power point lecture	Zoom meeting	Presentations	
13	Dysregulation of tissue regeneration in cancer	Power point lecture	Zoom meeting	Lab Exam	
14	**Presentations**	Power point lecture	Zoom meeting	**Presentations**	
	Lab exam				20%
15	**Final Exam**				30%

Grading Legend

Below is the grading legend of FCCU (published in all catalogues and available on the FCCU website) as approved by the Academic Council and applies for Fall 2020 as well

Grade	Point Value	Numerical Value	Meaning
A	4.00	93-100	Superior
A-	3.70	90-92	
B+	3.30	87-89	Good
B	3.00	83-86	
B-	2.70	80-82	
C+	2.30	77-79	Satisfactory
C	2.00	73-76	
C-	1.70	70-72	
D+	1.30	67-69	Passing
D	1.00	60-66	
F	0.00	59 or below	Failing