

Course Specification

Programme on which the course is given: M.Sc. Zoology (Protoza and Invertebrates).

Major or Minor Element of Programme:

Department offering the programme: Zoology

Department offering the course: Zoology.

Academic Year/Level:

Date of Specification approval: 2012

A- Basic Information

Title: *Genetics*

Code: *Z6626*

Credit Hours: 3

Lecture:2

Tutorial:2

Practical:2

Total: 3

B- Professional Information

1- Overall aims of the course: By the end of this course, the student will be able to:

Demonstrate knowledge of the basic concepts in DNA structure, hybridization, DNA sequencing, restriction enzymes, as well as getting of DNA into cells, plasmids and bacteriophages as cloning vectors.

2- Intended Learning Outcomes (ILOs):

a- Knowledge and Understanding:

- a1- Understanding the central dogma of genetics and molecular biology.
- a2- Know the main items of molecular biology like DNA, RNA, and protein.
- a3- Describe the gene structure, expression, and regulation.
- a4- Understanding the main steps of protein synthesis.
- a5- Understanding the main techniques applied in genetics.

b- Intellectual Skills:

- b1- Demonstrate the relationship between DNA, RNA, and protein.
- b2- Discuss the mechanisms of gene expression, transcription, and translation.
- b3- Diagnosis of some diseases induced by mutations.
- b4- Determination of DNA fingerprint and dynamic mutation.

c- Professional and Practical Skills:

c1- Use appropriate lab equipment and tools for genetics and molecular biology lab.

c2- Design and perform experiments in the lab and field within proper technical, scientific and ethical frameworks in animal handling and genetics.

c3- Collect, preserve, store, handle samples and specimens for DNA and RNA processing.

d- General and Transferable Skills:

d1- Write reports for PCR results.

d2- Computer-based mining of databases and references about DNA, RNA, and protein structure, synthesis and functions.

d3- PowerPoint- based presentations for reports in seminars or group meetings.

d4- Work coherently and successfully as a part of team in projects and assignments.

d5- Study and find information independently, and finding realistic solutions through right analysis and anticipation.

3- Contents:

Topic	No. of hours	Tutorial/ Practical	Lecture
DNA	2	-	2
RNA	2	-	2
Chromatin	4	2	2
Mendel Laws and Modern Genetics	4	2	2
Chromosomes	4	2	2
Gene structure and expression	4	2	2

Replication	4	2	2
DNA and RNA Replication	4	2	2
Hybridization	4	2	2
Hybridization: Blots	4	2	2
Hybridization: Blots	4	2	2
FISH techniques and histological significance	2	-	2
FISH techniques and histological significance	2	-	2

4- Teaching and Learning Methods

- 4.1- Lectures
- 4.2- Oral presentations.
- 4.3- Research assignment.
- 4.4- Exams.

5- Student Assessment Methods

- 5.1- Reports to assess collection of course material.
- 5.2- Mid-term exam to assess mid-term performance.
- 5.3- Final exam to assess final term performance.

Assessment Schedule

Assessment 1: Reports	a report/ three weeks.
Assessment 2: Report defense	a presentation/ three weeks.
Assessment 3: Mid-Term	week 8 (Mid-Term week)
Assessment 4: Final term exam	week 15 -16 (final-Term week)

Weighing of Assessments

Mid-term examination:	20 %.
Final-term examination	40 %.
Oral examination	00%
Practical examination	20%
Semester work	20%
Other types of assessment	00%
Total	100%

6- List of references

6.1. Essential Books

- Genetic Engineering: Dream or Nightmare? : Turning the Tide on the Brave New World of Bad Science and Big Business . By: Mae-Wan Ho, 2000.
- Genetic Engineering: Principles and Methods. By: Jane K. Setlow, 2005.
- Genetic engineering. By: Mark Youngblood Herring, 2006.

6.2. Recommended Books:

- Genetic engineering: a reference handbook. By: Harry Le Vine, 1999.
- Genetic engineering: a documentary history. By: Thomas Anthony Shannon, 1999

6.3. Periodicals, Websites,etc

- Google books: <http://books.google.com/bkshp?hl=en&tab=wp>
- <http://www.sciencedirect.com/>
- <http://www.ncbi.nlm.nih.gov/pubmed/>
- Nucleotide database:
<http://www.ncbi.nlm.nih.gov/nucleotide>
- Protein database:
<http://www.ncbi.nlm.nih.gov/protein>
- Sanger Institute genome database:
www.sanger.ac.uk

7- Facilities Required for Teaching and Learning:

- Dark class room equipped with Data show device.
- Molecular biology lab equipped with: PCR cycler, electrophoresis units, trans-illuminator, incubator and water path-shaker.

Course coordinator: Prof. Dr. Sobhy Hasab El-Nabi

Head of Department: Prof. Dr. Saber Sakr

