Course Specification

1.Basic Information

Programme(s) on which the course is given:	MSc of Cytology, Histology and Histochemistry
Depaetment responsible for offering the course:	Zoology
Depaetment responsible for teaching the course:	Zoology
Academic year:	2012-2013
Course title and code:	Molecular Biology Z663
Contact hours (credit hours):	Lecture: 2 hrs Practical: 2 hrs Total: 3 hrs
Course coordinator:	Prof. Sobhy Hassab Elnaby

1. Professional Information

The course aim and intended learning outcomes are based on that mentioned in the programme specifications, with more course-related specific details.

2. Overall Aims of Course: By the end of this course, the student should be able to

* Realize the central dogma for molecular Biology.
* Identify the structure of DNA, RNA and protein.
* Analyze gene structure and regulation, as well as protein synthesis mechanisms.
* Practice advanced techniques of molecular biology.

3. Intended Learning Outcomes of Course (ILOs):

a.Knowledge and Understanding:

a1- Outline the concepts of molecular biology.

a2- Recognize the structure of DNA, RNA and protein.

a3- Describe the gene structure, espression and regulation.

a4- Define the main steps of protein synthesis.

a5- List some advanced techniques applied in molecular biology.

b.Intellectual Skills:

b1- Interpret the relationships between DNA, RNA and protein.
b2- Explain the mechanisms of gene expression, transcription and translation.
b3- Diagnose some diseases induced by mutations.
b4- Identify DNA fingerprint and dynamic mutation.

c.Professional and Practical Skills:

c1- Practice different molecular biology techniques.
c2- Design and employ experiments in molecular biology lab within proper technical, scientific and ethical frameworks in animal handling and molecular biology.
c3- Experiment the effect of different materials through animal injection under ethical codes for animal handling, and dissect for sampling tissues and organs.
c4- Collect, preserve, store and handle samples and specimens for DNA and RNA processing.

d.General and Transferable Skills:

d1- Improve writing skills through writing reports.
D2- Discuss and present reports in seminars or group meetings.
D3- Develop skills of teamwork in projects and assignments.
D4- Locate computer-based databases and references about DNA, RNA and protein structure, synthesis and functions.
D5- Study and find information independently and locate realistic solutions through right analysis and anticipation.

4. Course Contents

Topic	No. of hours	Tutorial/ Practical	Lecture
Relationship between physiology and molecular biology.	**2**	**-**	**2**
Central dogma of molecular biology.	**2**	**-**	**2**
DNA, RNA and protein structure.	**4**	**2**	**2**
DNA, RNA and protein expression.	**4**	**2**	**2**
Gene regulation, transcription and	**4**	**2**	**2**

translation.			
In vivo and in vitro transcription and translation.	**4**	**2**	**2**
PCR technique	**4**	**2**	**2**
DNA fingerprinting	**2**	**-**	**2**
Molecular diagnosis of diseases.	**2**	**-**	**2**

6.Teaching and Learning Methods

- Lectures.
- Research assignment.
- Case study.
- Interactive Presentation.
- Brain storming.
- Practical sessions.

1. Student Assessment Methods

- Written Exams.
- Reports presentation
- Interviews.
- Practical exam.
- Oral Presentations.

2. Assessment schedule

Assessment 1	Reports	A report/three weeks
Assessment 1	Report defense	A presentation/three weeks
Assessment 2	Mid-term exams	Week 7
Assessment 3	Oral Exam	Week 11
Assessment 3	Final term exams	Week 14

Weighting of assessments

Mid-term examination 20%
Final-term examination 60%
Practical examination 10%

Oral examination	5%
Semester work	5%
Total	100%

List of references

Essential Books (Text books):

1- Turner, P.C. (2005). Molecular Biology.
2- Tropp, B.E (2008). Molecular Biology. Genes to Proteins.
3- Clark, D.P. and Pazdernik, N.J. (2012). Molecular Biology: Understanding the genetic Revolution.

Recommended Books:

1- Walker, J.M. and Gingold, E.B. (1993). Molecular Biology and Biotechnology.
2- Birren, B. and Green, E.D. (1997). Genome Analysis: A Laboratory Manual.
3- Clark, D.P. and Russel, L.D. (1997). Molecular Biology: Made Simple and Fun.
4- Burton, Z.F. and Kaguni, J.M. (1997). Experiments in Molecular Biology: Biochemical Applications.

Periodicals, Websites, …etc.

1- http://www.sciencedirect.com
2- http://www.ncbi.nlm.nih.gov/pubmed
3- Nucleotide database: http://www.ncbi.nlm.nih.gov/nuccore
4- Protein database: http://www.ncbi.nlm.nih.gov/protein
5- Sanger institute genome database: www.sanger.as.uk

9. Facilities required for teaching and learning

* Dark class room equipped with Data show device.
* Molecular biology lab equipped with
  a. PCR cycler
  b. Electrophoresis units
  c. Trans-illuminator
  d. Incubator
  e. Water path-shaker

* Computers with internet Access**.**

Course coordinator: Prof. Sobhy Hassab Elnaby

Head of Department: Prof. Saber Sakr