Course Specification

Programme on which the course is given: M.Sc. Zoology (Genetic engineering and molecular biology).

Major or Minor Element of Programme:

Department offering the progarmme: Zoology

Department offering the course: Zoology.

Academic Year/Level: 2012

Date of Specification approval:1012

A- Basic Information

Title: *Biotechnology* Code: *Z6620*

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:

A. Demonstrate knowledge of basic concepts in application of DNA and protein technology in biotechnology production of biomaterials used in diagnosis and production of antibodies.

B. Application of biotechnology to improve our lifestyle.

2- Intended Learning Outcomes (ILOs):

a- Knowledge and Understanding:

a1- Know the application of nucleic acid and protein techniques in the field of biotechnology.

a2. Illustrate the production of biomaterials by biotechnology

a3. Name the biomaterials, drugs, antibodies produced by biotechnology.

a4. Describe the relationship between transgenic animals and production of biomaterials in their milk

b5. Describe the production of transgenic animals by cloning techniques

b- Intellectual Skills:

b1- Conclude different techniques applied in biotechnology

b2. Synthesis of biomaterials

b3. Apply and analysis of biomaterials

b4. Apply of biotechnology in industries and agriculture

b5. Apply of biotechnology in production of drugs

b6. Modify some methods for production of biomaterials

c- Professional and Practical Skills:

c1- Use appropriate lab equipment and tools for biotechnology.

c2- Design and perform experiments in the lab and field within proper technical, scientific and ethical frameworks for animal use in biotechnology.

c3- Collect, preserve, store and handle samples and specimens obtained for biotechnological techniques.

d- General and Transferable Skills:

d1- Computer-based mining of databases and references about biotechnology.

d2- PowerPoint- based presentations for reports in seminars or group meetings.

d3- Work coherently and successfully as a part of team in projects and assignments.

d4- Study and find information independently, and finding realistic solutions through right analysis and anticipation.

3- Contents:

Topic	No. of hours	Tutorial/ Practical	Lecture
Introduction to the Biotechnology	2	-	2
Introduction to the Biotechnology	2	-	2
Biotechnology and DNA	4	2	2

Biotechnology and DNA	4	2	2
Biotechnology and RNA	4	2	2
Biotechnology and RNA	4	2	2
Biotechnology and protein	4	2	2
Biotechnology and protein	4	2	2
Production of biomaterials used in diagnosis	4	2	2
Production of antibiotics	4	2	2
Applications of Biotechnology in disease diagnosis	4	2	2
Applications of Biotechnology in animal production	4	2	2
Applications of Biotechnology in animal production	4	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

- Aquaculture and Fisheries Biotechnology: Genetic Approaches. By: Rex A. Dunham, 2011.
- Biotechnology: Academic Cell Update. By: David P. Clark, Nanette J. Pazdernik, 2010.
- Biotechnology: Our Future As Human Beings and Citizens. By: Sean D. Sutton, 2009.

6.2. Recommended Books:

- Biotechnology: The Science and the Business. By: V. Moses, D. G. Springham, Ronald E. Cape, 1999.
- Biotechnology unzipped: promises & realities. By: Eric S. Grace, 1997.
- Environmental Biotechnology: Principles and Applications. By Murray Moo-Young, William A. Anderson, Ananda M. Chakrabarty, 1996.

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/nuccore
- Protein database: http://www.ncbi.nlm.nih.gov/protein

7- Facilities Required for Teaching and Learning:

- Dark class room equipped with Data show device and a high-speed internet connection.
- Molecular biology lab equipped with: PCR cycler, electrophoresis units, trans-illuminator, incubator and water path-shaker.
- Slide microscopes.
- Different DNA staining and banding dyes.

Course coordinator: Prof. Sobhy Hassab El-naby

Head of Department. Prof. Saber Sakr