



COURSE SPECIFICATION

(2016 / 2017)

1 - Basic Information:

Code number:.....

Course title: Veterinary Genetics and Genetic Engineering

Academic Year: 2016-2017 year *of B. V. Sc. Program*

Total teaching hours: 75 hrs

- Lectures: 45 hrs

- Practical: 30hrs.

2 - OVERALL AIMS OF THE COURSE:

To provide the student by:

- Different mechanisms of chromosomal aberrations and its reflection on phenotype of individual diseases
- Different characteristics of genetic material and different methods of its manipulation and applications (PCR, RFLP.....ect)
- Relationship between the genetic material, diseases, immunity and the genetic control of these.
- knowledge about Genetic engineering and its application

3 - INTENDED LEARNING OUTCOMES (I. L. Os.):

3-A: KNOWLEDGE and UNDERSTANDING:

By the end of the course, students should be able to:

- A1-** Recognize the basis of inheritance in relation to animal morphology, development, function, production and behaviour,
- A2-** Discuss mechanisms of chromosomal aberrations and its reflection on individual phenotype and fertility,
- A3-** Describe the characteristics of genetic material and different methods of its manipulation
- A4-** Explain the relationship between genome structure, disease and immunity of domestic animals, poultry and fish.

A5- Outline the methods used for genetic control of infectious and inherited diseases,

A6 - Identify the role of molecular genetics in the veterinary field.

A7- Explain the basics of the genetic resistance and the control of inherited disorders and diseases

3-B: INTELLECTUAL SKILLS:

By the end of the course, students should be able to:

B1- Link between chromosomal aberrations and some kinds of anatomical malformations in newborn and some cases of sterility,

B2- Correlate between the exposure to environmental pollutants and incidence of chromosomal aberrations and increased incidence of cancer,

B3- Relate between the variation in genetic structure at the molecular level with normal individual identification (DNA fingerprinting) and abnormal diseased individual (Genetic diseases).

B4- Analysis the severity of the carcinogens .

B5- Compare the inborn metabolic disease and their control .

3- C: PRACTICAL AND PROFESSIONAL SKILLS:

By the end of the course, students should be able to:

C1- Identify chromosome number and structure of different species microscopically and in electronic slide within one minuet.

C2- Diagnose phenotypic malformation and sterility problems associated with chromosomal aberrations by chromosome karyotype.

C3- Give examples in the use of genetic material (chromosome and/or DNA) as measurement tool to measure genotoxicity of different environmental pollutants

C4- Prepare Karyotyping for different species by using different materials (blood, bone marrow, feather bulb from chicken, kidney and gills from fish,

C5- Perform sexing of animal species based on cytogenetical techniques

3- D: GENERAL SKILLS:

By the end of studying the course, the graduate should be able to:

D1- Search on thr internet

D2- Communicate: direct, emails ...etc.

D3- Presentat: capacity to make oral presentations

D4- Apply Self-learning (retrieve information from different sources independentl



4- COURSE CONTENTS:

4. semester topics:-

TOPIC	Total hours (Semester)	Hours for lecture	Hours for practical
<u>Part I:</u> Cytogenetics:	22	14	8
<u>Part II:</u> Molecular Genetics:	41	23	18
<u>Part III:</u> Mutation	4	2	2
<u>Part IV:</u> Immunogenetics:	8	4	4
Total	75	45	30

5- TEACHING & LEARNING METHODS:

*Lectures

(using data show, white board and brain storming)

*Practical and small group sessions:

2-1 (Clinical demonstrations, practice and skills, and discussion)

- (a) Microscopically demonstration of slides
- (b) Practical training for methods of karyotyping
- (c) General experimental tests teaching
- (d) Gene mapping by linkage studies

* Self learning

- Computer researches and faculty library visits to prepare essays and presentations.
 - Library researches.
 - Internet researches.
 - Discussion in the researches.
 - Preparation of scientific reports.

6. METHODS FOR STUDENTS With limited capabilities:-

- No disabled students until now, but if present the methods are:-
 - Activation of office hours.
 - Discussion with them during practical session.



7. STUDENT ASSESSMENT:-

<u>7.a Used methods</u>	Written examination	Oral examination	Practical examination	Activities
<u>7.b time</u>	At the end of the second semester	At the day of the written exam	In the 14th Week of the second semester	In the 5th Week of the second semester
<u>7.c grads</u>	25	10	10	5

8. LEARNING AND REFERENCE MATERIALS:

8-1: BASIC MATERIALS:

- **Department notes:** available for students to purchase from the department.

8-2: Recmonded books & texts :

- R. Frankham, et al.: Introduction to Conservation Genetics Cambridge University Press 2005
- James D. Watson, Nancy H. Hopkins, Jeffrey W. Roberts, Joan Argetsinger Steitz + Alan M. Weiner Molecular Biology of the Gene
- a comprehensive overview of the entire field of molecular genetics Benjamin/Cummings
- Griggith, A. J. F., Gelbart, W. M., Lewentin, R. C. and Miller, J. H. (2002): Modern Genetic Analysis . 2nd ed.
- Benjamin l. (2008) : Genes IX . Jones and Barlett. Canada, UK
- Molecular Biology of the Gene (2007) 2. James D. Watson, Stephen P. Bell, Alexander Gann, Michael Levine, Tania A. Baker Paperback, Addison- Wesley (2008).
- Leland Hartwel (2006). Genetics: From Genes to Genomes McGraw-Hill Science/Engineering/Math, published: 2006-10-09

8.4: web sites and jouranlsand so on

- Mutation Research
- Chromosoma
- Heridats
- J. Heredity
- Nature Genetics
- Animal Genetics

* Web sites:

- <http://learn.genetics.utah.edu/>
- <http://ghr.nlm.nih.gov/>
- <http://www.dnafb.org/>
- http://www.ornl.gov/sci/techresources/Human_Genome/genetics.shtml



Intended learning out comes of each topic

TOPIC	K.U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
Part I: Cytogenetics:	A1-A2	B1-B2-	C1-C2-C4-C5	D1-D4
Part II: Molecular Genetics:	A3-A4-A5-A6	B3	C3	D1-D4
Part III: Mutation	A5	B2-B4	C3	D1-D4
Part IV: Immunogenetics:	A7	B5	C2	D1-D4

Intended learning out comes Evaluation

Methods	I.L.O.S Evaluation				Marks allocated
	Knowledge	Intellectual	Practical	general	
Written examination	A1.A2.A3.A4. A5.A6.A7.				25
Oral examination	A1.A2.A3.A4. A5.A6.A7.				10
Practical examination			C1.C2.C3.C4. C5.		10
Activities				D1.D2.D3.D4.	5

Course Coordinator	Head of Department
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