
Genetics

Benha University **Faculty of Veterinary Medicine**

Program on which the course is given: **Bachelor of Veterinary Medical Science**

Department offering the course: **Animal Wealth Development Department**

Academic year: **2nd year**

Date of specification approval: Ministerial Decree No 921,on 15/9/1987.
(Then approved in this recent template by department council on 21/5/2006)

A- Basic Information

Title : Genetics **Code: Vet 00627 a**

Lecture: 30 hrs **Practical: 30 hrs** **Total: 60 hrs**

B- Professional Information

1- Overall aims of course

- Understand the basis of inheritance of different genetic traits.
- Provide the students with the necessary knowledge about fine structure of chromosome.
- Know and understand the genetic material, replication, expression and mutation.

2- Intended learning outcomes of the course (ILO_s):

a- Knowledge and understanding:

After successful completion of this course the students should have the ability to:-

a.1-Describe Basis of inheritance.

a.2- Mention and Explain different mechanisms of chromosomal aberration and its reflection on phenotype of individual diseases.

b- Intellectual skills

By completion of the course the student should be able to:

b.1-differentiate among different stages of the cell cycle microscopically including mitosis and meiosis.

b.2- Interpret the karyotype reports.

b.3- Recognize the chromosomal aberrations (numerical or structural).

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c- Professional and practical skills

By completion of the course the student should be able to:

c.1- Identify chromosome number and karyotyping of different species.

c.2- Diagnose phenotypic malformation and sterility problems associated with chromosomal aberations.

c.3- Identify normal and abnormal spermatogenesis through preparation of chromosome from the tests.

d- General and transferable skills

By completion of the course the student should be able to

d.1- Explain different methods for inheritance of traits.

d.2- Gain experience in karyotyping for different species by using different materials (bone marrow, blood, feather bulb from chicken, kidney and gills from fish).

d.3- Discuss and explain genetic variations.

3- Contents :

Topic	No. of hours	Lecture	Practical
1- Cytological basis of inheritance	8	2	6
2- Mathematical principles required for genetic problems	6	2	2
3- Transmission and quantitative genetics	8	2	6
4- Phenotypic expression	6	2	4
5- Linkage, crossing over and chromosome mapping	10	2	8
6- Some special cases of interphase chromosome	6	2	4
7- Kariological (chromosomal) studies	2	2	-
8- Chromosomal banding technique	2	2	-
9- Chromosomal aberrations: • Numerical changes. • Structural changes.	4	4	-
10- Sex determination	2	2	-
11- Fertility as affected by chromosome	2	2	-
12- The genetic material	2	2	-
13- DNA replication	2	2	-
14- The genetic code	2	2	-
Total	**60**	**30**	**30**

4- content-ILOs matrix

	Content	ILOs			
		Knowledge and understanding	**Intellectual**	**Professional and practical**	**General and transferable**
1.	Cytological basis of inheritance	**A1, a2**	**b1, b2,b3**	**c1, c2 , c3**	**d1, d2,d3**
2.	Mathematical Mathematical principles required for genetic problems principles required for genetic problems	**a1**			**d1**
3.	Transmission and quantitative genetics	**a1, a2**	**b1, b2,b3**	**c1, c2**	**d1, d2, d3**
4.	Phenotypic expression	**A2**		**C2**	**D3**
5.	Linkage, crossing over and chromosome mapping	**a2**	**b3**	**c2**	**d1**
6.	- Some special cases of interphase chromosome	**a1, a2**	**b1, b2**	**c1, c2**	**d1, d2**
7.	Kariological (chromosomal) studies	**a2**	**b2,b3**	**c1, c2**	**d1, d2**
8.	- Chromosomal banding technique	**a2**	**b2,b3**	**c1, c2**	**d2**
9.	Chromosomal aberrations: • Numerical changes. Structural changes	**A2**	**b2,b3**	**c1, c2**	**d2**
10.	Sex determination	**a2**	**b2,b3**	**c1, c2 , c3**	**d2**
11.	Fertility as affected by chromosome	**a2**	**b2,b3**	**c1, c2 , c3**	**d2**
12.	The genetic material				
13.	DNA replication				
14.	The genetic code				

5- Assessment-ILOS matrix

Assessment	**ILOs**			
	Knowledge and understanding	**Intellectual**	**Professional and practical**	**General and transferable**
Mid – Term exam	**A1,a2**	**b1, b2,b3**		
Practical exam	**a1,a2**	**b1, b2,b3**	**c1, c2 , c3**	
Oral exam	**a1, a2**	**b1, b2,b3**		
Final term exam	**A1,a2**	**b1, b2,b3**	**C1,c2,c3**	
Assignments and research	**A1,a2**	**b1,b2,b3**		**d1, d2, d3**

6- Teac

Vao day nghe bai nay di ban http://nhatquanglan.xlphp.net/

4.1- Lectures

4.2- Clinical and small group sessions.

a) Microscopical demonstration of slides.
b) Practical training for methods of karyotyping..
c) Gene mapping by linkage studies.
d) Restriction mapping.

4.3- CD's-slides and video tapes.

Demonstration of instruments used in genetic engineering like PCR, DNA sequencing and DNA electrophoretic system.

4.4- Experimental animal and tissue culture.

7- Student assessment methods

5.1- Written examination for assessment of knowledge and understanding.

5.2- Oral examination for assessment of understanding, intellectual and transferable skills.

5.3- Practical sheet examination for assessment of understanding of the theoretical part of the practical course.

5.4- Microscopical slides examination for assessment practical and intellectual skills.

Assessment schedule

Assessment 1	Written examination	15	Week
Assessment 2	Oral examination	15	Week
Assessment 3	Practical examination	13	Week.
Assessment 4	Mid term examination	6,10	Week.

Weighting of assessment

Mid-term examination	5 %
Final examination	50%
Oral examination	20%
Practical examination	20%
Semester work	5%
Other types of assessments	0%
Total	100%

8- List of references

6.1- Department books: available for students to purshase from book shops in front of the faculty.

6.2- Essential books (Text books): Concept of genetics "William, Michael, Charlot 2006".

- Genetics "P.S. Verma, V.K. Aggarwal 2006".
- Cytogenetics "S. Sundara Rajan 2005".
- Genetic of population " Philip W.H. 2006".

6.3- Periodicals, Web sites, . . . etc.

- www. Pubmed.com
- Journal of Animal Science.
- Genetics Journal.
- Genomic Journal.

9- Facilities required for teaching and learning

7.1. Lecture Hall: writing board, over head and slide projector and Data show.

7.2. Genetics Lab.

7.3. Experimental and Lab. Animals.

Course coordinator: Prof. Dr. Shabaan Abd-Elatif hemeda

Head of the department: Prof. Dr. Hatem H. El-Bakry

Date : 9-1-2011