

# COURSE TITLE/CODE: ANIMAL BREEDING (ANSC 3082) ANIMAL GENETICS & BREED IMPROVEMENT

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Principles of Animal Breeding\_Wollega University



## COURSE OUTLINE

**Chapter 1.** Introduction

**Chapter 2.** Historical development of modern animal breeding

**Chapter 3.** Traits in farm animals

**Chapter 4.** Variation

**Chapter 5.** Gene effects

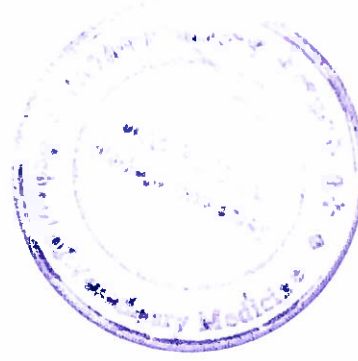
**Chapter 6.** Estimation of genetic parameters

**Chapter 7.** Methods of genetic improvement

**Chapter 8.** Recording

**Chapter 9.** Community-based breeding programs

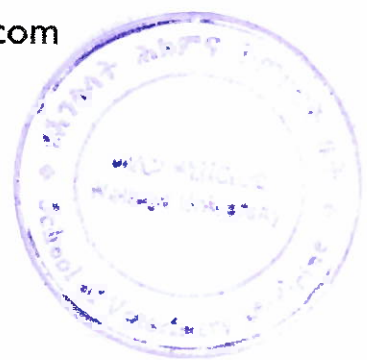
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# Applied Animal Breeding

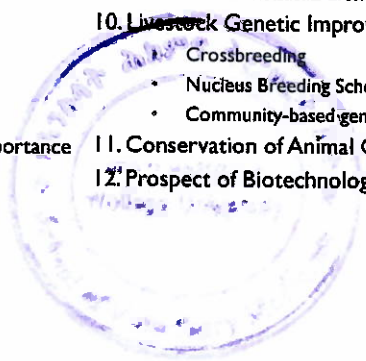
Course Code:ANPR502  
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## Outline

1. **Animal Breeding-Defined**
2. **Historical Development of Animal Breeding**
3. **Importance of Animal Breeding**
  - Characterization of Livestock Breeds
  - Increased Productivity per Animal
  - Genetic Improvement Provides Long Lasting Solution
  - Facilitates Sound Management
4. **Record keeping in Livestock Farms**
5. **Traits in Farm Animals**
  - Qualitative traits
  - Quantitative traits
  - Categorical (Threshold) Traits
6. **Variation in Farm Animals**
  - Types of variation in Traits of Economic Importance
  - Sources of Variation
  - Analysis of variance
7. **Estimation of Genetic Parameters**
  - Heritability
  - Repeatability
  - Genetic Correlation Among Traits
8. **Inbreeding**
9. **Methods of Genetic Improvement**
  - Selection
    - Selection Response and Prediction of Response
    - Genetic Progress from Selection
    - Factors Affecting the Rate of Genetic Change from Selection
  - Mating
    - Pure Breeding
    - Crossbreeding
      - New Breed Formation
      - Upgrading
      - Single Two-way(breed) cross
      - Three-way (breed) cross
      - Four-way (breed) cross
      - Rotational Crossing
10. **Livestock Genetic Improvement In the Tropics**
  - Crossbreeding
  - Nucleus Breeding Scheme
  - Community-based genetic improvement
11. **Conservation of Animal Genetic Resources**
12. **Prospect of Biotechnology in Animal Breeding**



**Haramaya University**  
 School of Animal Sciences and Range land Sciences  
 Animal Breeding and Genetics M.Sc program

**1. M.Sc. in Animal Genetics and Breeding**

*1.1. The Program*

The Master of Science Program in Animal Genetics and Breeding involves a minimum of 30 credits of course work and six credits of research work on which a Thesis must be written and defended successfully. The objective of the program is to train skilled manpower capable of designing and handling research and development strategies towards the conservation and breeding of livestock for sustainable improvement in livestock resources.

*1.4. Distribution of Courses by Year and Semester*

**Year I; Semester I**

Course Code	Course Title	Credit Hours
ANGB 511	Animal Genetic Resources and Conservation	2
ANGB 521	Reproductive Physiology	3
ANGB 531	Animal Genetics	4
ANGB 541	Biometrics	4
ANPR 511	Animal Nutrition (E)	3
ANPR 521	Animal Physiology (E)	3
AGEC 561	Computer Applications (E)	3
<b>Total</b>		<b>13/22</b>

**Year I; Semester II**

Course Code	Course Title	Credit Hours
ANGB 512	Population Genetics	2
ANGB 522	Quantitative Genetics	3
ANGB 532	Biotechnology in Animal Breeding	2
ANGB 542	Applied Animal Breeding	3
ANGB 552	Current Topics in Animal Genetics and Breeding	1
ANPR 522	Meat Production (E)	3
ANPR 532	Milk Production (E)	3
ANPR 552	Poultry Production (E)	3
<b>Total</b>		<b>11/20</b>

(E) Elective course: Each semester one of the ANPR elective course is compulsory depending on the species of animals on which thesis is based

**Year II**

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Moges Deressa (PhD)



Course Code	Course Title	Credit Hours
ANGB 611	Seminar in Animal Genetics and Breeding	P/F
ANGB 612	M.Sc. Thesis Research	6

**ANGB 542 Applied Animal Breeding (3)**

Constraints in livestock breeding in tropics in relation to -Environment, Production Systems and Socio-economic condition. Reproduction, fertility, sterility and their genetic basis. Growth, milk, eggs and meat production and their genetic basis. Field and modern recording systems for growth, egg, milk, meat production and their application. Native breeds performance, scope and methods of improvement. Introduction of improved exotic breeds- choice of breed, selection criteria, interpretation of performance records of different countries. Precautions and procedure of importation. Breeding plans for tropics- production environment, objective, traits, structure, organisation, peoples participation and constraints. Village breeding schemes. Community breeding program. Nucleus herd breeding. New breed formation. Hereditary defects. Breeding for disease resistance, heat tolerance and adaptation.

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**मोगेस डेरजे (PhD.)**  
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 Head, School of Animal  
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Ref.No. ARSC 456/12  
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Date 02/06/2012

**To whom it might concern**

The following description entails **Applied Animal Breeding** course at our School for MSc program in Animal Breeding and Genetics.

**AnBG 523 Applied Animal Breeding (3+0)**

Performance evaluation of indigenous and exotic breeds and their crosses. Genetic improvement tools: selection and mating systems. Response to selection, prediction and measurement of genetic gain. Genetic and physiological basis of inbreeding depression and heterosis. Cross breeding systems and appropriate level of exotic blood. Modern recording systems and their application in animal breeding, Breeding programs (plans), Community based breeding program, definition of breeding goal, deriving economic values of traits, economic aspects of animal cross breeding, Breeding for disease resistance and heat tolerance.

With kind regards

*(Handwritten signature)*  
Mekonen Teye (PhD)  
Director

