Ministry of Education

Zero Draft Document On Competencies And Courses Identification For Exit Examination Program: Natural Resources Management
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# Test Blue Print for National Exit Examination to be held in 2015 E.C

## Band: 4

**Program:- BSc. in Animal Sciences**

**BSc. Animal and Range Sciences**

**BSc. Animal production and Technology**

**BSc. Animal Sciences and feed Technology**

**Compiled By:**

**Competencies & Courses Suggested For Exit Examination For Bsc In Animal Sciences Graduates To Be Held In 2015 E.C**

**Competencies & Courses Suggested For Exit Examination For Bsc In Animal Sciences Graduates To Be Held In 2015 E.C**

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## 1. Introduction

The Ministry of Education of Ethiopia has announced the implementation of exit exam for all undergraduate program students (public and private), beginning with the 2022/2023 academic year, in order to improve the quality of graduates produced by higher learning institutions. The exit exam aimed at checking whether students have acquired the required knowledge, skills and attitudes or not. To implement this, it requires determining competency areas for a specific program, which is already completed.

Based on the competency areas prepared, it needs to plan the construction of tests. Planning of a test is a first and vital step in the construction of an achievement test. An achievement test demands very systematic and careful planning, as a fact that good planning is a symbol of success. Tests are the tools that provide scores that measure level of student learning and study program learning outcomes. In order to achieve the valid and reliable measurement of student and program learning outcomes, the development of valid and reliable test is the mandatory. Test should be able to measure student performance in all dimensions of knowledge, skill and attitude.

The carefully planned test construction contributes to improve the overall quality of the test in terms of test content validity, difficulty level, discrimination power and test reliability. Test preparation is not an easy task; it requires a careful planning and guideline to make the task simple. Test construction needs the preparation of test blue print. Test blueprint is defined as a complete plan that explains how to develop a test. The term refers to a map or specification of assessment to ensure that all aspects of the curriculum and educational domains are covered by the assessment programs over a specified period of time.

Generally, test blueprint will help to ensure tests: 1) Appropriately assess the achievement of instructional objectives of the course; 2) Appropriately

reflect key course goals, objectives and the material learned or covered during the instruction period; and 3) Include the appropriate item formats along with the knowledge and skills being assessed.

The major points considered in the process of preparing this test blue print guideline were the core competencies that have been already identified for the themes of courses, the course contents, course credit hours, and the learning outcomes with their corresponding levels of achievement by learning domains.

## 2. Objective of Test Blueprint

Test blueprint preparation is generally opted to assist the preparation of a test that is representative, broadly sampled, and consisting of complete knowledge domain expected of the Ethiopian higher education students on completion of their study program. The specific objectives of test blueprint are to:

- Facilitate the construction of a representative and balanced test items for the selected courses in accordance with the competencies identified.
- Guide test developers or writers to write or set appropriate test items.

## 3. Significance of the document

This test blueprint document will help to ensure tests appropriately assess the achievement of instructional objectives of the course; reflect key course goals, objectives and the material learned or covered during the instruction period; and include the appropriate item formats along with the knowledge and skills being assessed.

## 4. Expected Profiles of Graduates

Upon completion of the BSc degree in animal sciences, the graduates:

- Could work as professionals at universities/colleges, research institutes, business sectors, government and non-government organizations.
- Realize scientific methods of raising farm animals either directly as entrepreneur or indirectly through extension;
- Design and conduct research geared towards enhancement of livestock production and productivity.
- Consult/advice in the area of livestock development;
- Manage livestock sector;
- Plan or design, implement, monitor and evaluate livestock development projects;
- Supervise livestock development activities;
- Would be capable to integrate livestock production with other farming enterprises;
- Formulate and advocate livestock production and products marketing policies and strategies.
- Identify and analyze problems related to livestock production and health management intervention,
- Able to work in animal feed processing plants
- Able to process livestock products and by-products; and
- Able engage, and assist in livestock and livestock products marketing.

Graduates of Animal Sciences are well–equipped with theoretical knowledge, practical skill, and working attitudes required to implement principles, techniques, and scientific methods in animal production, feeding, and health management, and product quality development.

### ❖ Knowledge

- Understand the application of modern animal production technologies and management practices;
- Explain the mechanisms and role of animal physiology in livestock production;
- Understand and use knowledge of animal physiology, behaviors, and handling techniques to successfully interact with animals in a safe and humane manner; and
- Understand the role of nutrition in animal production.

## ❖ Skill

- Demonstrate advanced, comprehensive and applicable understanding in animal nutrition, physiology, breeding, genetics and biotechnology;
- Demonstrate critical thinking and problem-solving abilities as graduates to use scientific ideas in a range of animal production;
- Develop feeding methods for farm animal productivity;
- Demonstrate the breadth of animal sciences in terms of the range of career routes, the diversity of the animal industries, the numerous functions of animals in society, and the modern concerns affecting animals and their habitats; and
- Evaluate and accurately explain scientific information for problem solving and applications in animal production.

## ❖ Attitude

- Appreciate the role of animal production and management for food security and poverty reduction;
- Develop sense of enthusiasm to serve and work with farmers and farming communities in rural areas,
- Involve in an intellectually stimulating and satisfying experience of learning and studying,
- Desire to run private farms, animal feed processing plants and other agro-industries as self –employment.

- Develop interest to manage livestock sectors, supervise livestock development activities
- Desire to plan or design, implement, monitor and evaluate livestock development projects;
- Appreciate the animal science profession and to be a dedicated animal science expert who loves his profession.

# 5. Objectives of Courses' Core Competencies

## 5.1. General Objective

- Use the principles and theories of animal nutrition to describe major nutrients and their mechanisms of digestion in farm animals,
- Understand the theories of animal nutrition to use potential feed resources for farm animals,
- Understand about theories principles and practices of forage and pasture production, and Management
- Understand the ecological theories and principles in rangeland management
- Understand basic principles and theories of farm animal genetics
- Understand principles, theories and methods of animal breeding.
- Apply principles of reproductive physiology and techniques of artificial insemination.
- Understand and apply principles and theories of camel production and management practices.
- Understand the theories and technical aspects of poultry production and management.
- Apply knowledge obtained from principles and theories of sheep and goat production and management practices
- Understand the basic principles and theories of dairy cattle production and management to apply
- modern dairy animal production and management practices

- Use the basic principles and theories of beef cattle production and management.

## 5.2. Specific Objectives

**Theme -1**

- Know the characteristics and functions of basic nutrients;
- Understand the similarities and differences among digestive systems of farm animals;
- Discuss processes of digestion, absorption and metabolism of nutrients; and
- Understand nutritional deficiencies and toxicities related to the nutrients, and metabolic disorders.

- Understand systems of feed nomenclature and different feed evaluation techniques;
- Classify feedstuffs based on their nutritive value;
- Analyze chemical composition and digestibility of feedstuffs;
- Determine nutrient requirements and formulate balanced rations for various classes of livestock;
- Involve in the process of feed conservation and processing; and
- Understand the role and application of biotechnology in animal nutrition.
- Identify the major livestock feed resources;
- Identify some of the most important grass, legume and forage tree species that yield maximum production under tropical conditions;
- Clarify about factors affecting pasture improvement and methods of improving natural pasture;
- Know appropriate agronomic practices that will help to establish pasture crops and increase their productivity;
- Know important pasture management practices that yield maximum forage production; and thereby support optimum animal production.

- Understand about the distribution and types of rangelands;
- Understand about the ecology of rangelands and how it differs from other ecosystems;
- Gain knowledge to undertake rangeland inventory and rangeland improvement planning; and
- Understand the role of rangelands in wildlife conservation and their interactions.

**Theme-2**

- Develop a general understanding regarding the genetics of animals;
- Describe the basic principles of gene actions influencing animals;
- Explain basic genetic principles including DNA replication and mutations, Mendelian inheritance, co-dominance, epistasis, and complex traits;
- Discuss the principles of chromosomal aberration and gene mutations; and
- Explain the practical application of genetic engineering in animal reproduction and production.
- Understand tools available to maximize response to genetic selection;
- Understand the effects of inbreeding and crossbreeding, heritability and repeatability, and breeding value estimation;
- Understand selection theory and breeding methods;
- Predicting the rate of genetic improvement;
- Optimize selection and mating decisions;
- Estimate genetic parameters and breeding values; and
- Designing breeding program.
- Identify and describe the different structures of male and female reproductive system in Farm Animals;
- Develop skills to palpate and diagnose pregnancy in female animals;
- Explain the endocrinology of female and male reproductive system;
- Know techniques to collect and freeze semen of different domestic

animals;

- Describe and explaining the advantages and disadvantages of AI;
- Apply techniques, producers and equipment's of AI in different farm Animals; and
- Realize techniques for increasing reproductive efficiency in farm animals.

**Theme-3**

- Characterize camel production systems;
- Recognize role of camel in the world as well as in Ethiopian economy;
- Identify economically important camel breed types ;
- Explain origin, taxonomy, domestication and current distribution of camels;
- Identify camel diseases and organize control measures to be taken;
- Identify constraints and opportunities of camel production;
- Explain how to manage feeding and reproduction of camels;
- Understand the difference between old world and new world camels; and
- Familiarize with adaptive features of camel in the tropics.
- Demonstrate knowledge of poultry production facilities;
- Demonstrate competence of technical subject matter in poultry;
- Select appropriate chicken breeds adapted to the environment;
- Advise different stakeholders on poultry houses for different age groups;
- Understand techniques of incubation and manage hatchery process;
- Formulate ration for different age groups of egg-type and meat-type chickens;
- Take prevention and control measures on poultry diseases; and

Know how to manage a poultry farm business.

**Theme-4**

- Have a clear image of domestication and distribution of sheep and goats;

- Get scientific and theoretical background of sheep and goats management leading to improved production and give professional advice;
- Develop keen interest in sheep and goats farming practices; and
- Advise and encourage farmers to involve in modern sheep and goat farming

- Have the general backgrounds of dairy cattle breeds and production systems;
- Formulate dairy cattle feed for different animal groups;
- manage dairy cattle farms;
- Describing lactation physiology, milk handling and processing procedures;
- Undertake dairy cattle body condition scoring and judging;
- Developing keen interest in dairy cattle business;
- Realize major challenges and opportunities of dairying in Ethiopia; and
- Give training on dairy cattle production and management.
- Identify opportunities and challenges of beef cattle production;
- Differentiate tropical and temperate beef breeds;
- Know beef cattle production systems;
- Formulate beef cattle ration;
- Grade beef cattle and undertake beef quality assessment;
- Measure growth, score body condition and record performance measurements;
- Undertake routine management activities; and
- Know how to transport and market beef cattle

**Theme-5**

- Know the contribution of beekeeping to ecosystem, pollination, domestic and foreign trade;

- Understand taxonomy, general biology, anatomy and physiology of honeybees;
- Know Species and races of honeybees;
- Understand how sex and cast are determined in honeybee colony;
- Work with different types of hives and beekeeping equipment;
- Know seasonal management of honey bees, honeybee nutrition, and flora of Ethiopia;
- Know how to maximize the quantity and quality of bee products and protect honeybees from various problems which endanger their lives; and
- Successfully manage, advise, and encourage farmers to involve in modern bee farming.

- Explain the Importance of sericulture;
- Know the types of silk and classifications of silkworms;
- Understand silkworm rearing, and host plant cultivation;
- Have a know-how on silkworm and hostplant diseases and pest protection;
- Describe the process of mountage, spinning, cocoon harvesting and sericulture products and by-product utilization and marketing;
- develop skills to manage sericulture; and
- Advise and encourage farmers to involve in sericulture.

## 6. List of thematic areas or core competencies

**Table 1. Core competences/ Course themes**

| № | Themes of Courses | List of Courses | Credit Hours |
|---|---|---|---|
| 1 | Feed production and Animal Nutrition | 1. Principle of Animal Nutrition | 3 |
| | | 2. Applied Animal Nutrition | 3 |
| | | 3. Forage and Pasture Production, and Management | 3 |
| | | 4.Range Ecology and Management | 3 |

| | | | |
|---|---|---|---|
| | | **Total Cr.hours of the theme -1** | **13** |
| 2 | Animal Genetics and Breed Improvement | 1. Principle of Genetics | 3 |
| | | 2. Animal Breeding | 3 |
| | | 3. Reproductive Physiology and Artificial Insemination | 2 |
| | | **Total Cr.hours of the theme-2** | **8** |
| 3 | Pseudo and Non-Ruminant Animals Production | 1.Camel Production and Management | 2 |
| | | 2. Poultry Production and Hatchery Management | 4 |
| | | **Total Cr.hours of the theme-3** | **6** |
| 4 | Ruminant Animals Production | 1. Sheep and Goat Production and Management | 3 |
| | | 2. Dairy Cattle Production and Management | 3 |
| | | 3. Beef Cattle Production and Management | 3 |
| | | **Total Cr.hours of the theme-4** | **9** |
| 5 | Beneficiary Insects Production and Management | 1. Apiculture | 3 |
| | | 2. Sericulture | 2 |
| | | **Total Cr.hours of the theme-5** | **5** |
| | **Total Credit Hours of the Program** | | **41** |

**Table 2.** Test Blueprint Preparation for BSC in Animal Sciences

| Themes and Share of the themes in % | Name of Courses and Share of the course in % | Cr.hr | General objective | Specific objectives /learning outcomes | Learning outcomes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Cognitive (%) | | | | | | Affective (%) | Psychomotor | No. of items |
| | | | | | Remembering | Understanding | Application | Analysis | Evaluation | Creation/ | | | |
| Feed production and Animal Nutrition **(32%)** | Principle of Animal Nutrition **(7%)** | 3 | Use the principles and theories of animal nutrition to describe major nutrients and their mechanisms of digestion in farm animals | Know the characteristics and functions of basic nutrients; | 2 | 3 | - | 1 | 1 | - | **-** | **-** | **7** |
| | | | | Understand the similarities and differences among digestive systems of farm animals; | | | | | | | | | |
| | | | | Discuss processes of digestion, absorption and metabolism of nutrients; | | | | | | | | | |
| | | | | Understand nutritional deficiencies and toxicities related to the nutrients, and metabolic disorders. | | | | | | | | | |
| | Applied Animal Nutrition **(11%)** | 4 | Understand the theories of animal nutrition to use potential feed resources for farm animals | Understand systems of feed nomenclature and different feed evaluation techniques; | 2 | 2 | 1 | 1 | 2 | - | 2 | 1 | **11** |
| | | | | Classify feedstuffs based on their nutritive value; | | | | | | | | | |
| | | | | Analyze chemical composition and digestibility of feedstuffs; | | | | | | | | | |
| | | | | Determine nutrient requirements and formulate balanced rations for various classes of livestock; | | | | | | | | | |
| | | | | Involve in the process of feed conservation and processing; and | | | | | | | | | |
| | | | | Understand the role and application of biotechnology in animal nutrition | | | | | | | | | |
| | Forage and Pasture Production, and Management **(7%)** | 3 | Understand about theories principles and practices of forage and pasture production, and Management | Identify the major livestock feed resources; | 2 | 3 | 1 | - | 1 | - | - | - | **7** |
| | | | | Identify some of the most important grass, legume and forage tree species that yield maximum production under tropical conditions; | | | | | | | | | |
| | | | | Clarify about factors affecting pasture improvement and methods of improving natural pasture; | | | | | | | | | |
| | | | | Know appropriate agronomic practices that will help to establish pasture crops and increase their productivity; | | | | | | | | | |
| | | | | Know important pasture management practices that yield maximum forage production; and thereby support | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | optimum animal production | | | | | | | | | |
| | | | | | | | | | | | | | |
| | Range Ecology and Management **(7%)** | 3 | Understand the ecological theories and principles in rangeland management | Understand about the distribution and types of rangelands; | 2 | 3 | 1 | - | 1 | **-** | **-** | **-** | **7** |
| | | | | Understand about the ecology of rangelands and how it differs from other ecosystems; | | | | | | | | | |
| | | | | Gain knowledge to undertake rangeland inventory and rangeland improvement planning; and | | | | | | | | | |
| | | | | Understand the role of rangelands in wildlife conservation and their interactions. | | | | | | | | | |
| Animal Genetics and Breed Improvement **(20%)** | Principle of Genetics **(8%)** | 3 | Understand basic principles and theories of farm animal genetics | Develop a general understanding regarding the genetics of animals; | 3 | 3 | 1 | 1 | - | - | - | - | **8** |
| | | | | Describe the basic principles of gene actions influencing animals; | | | | | | | | | |
| | | | | Explain basic genetic principles including DNA replication and mutations, Mendelian inheritance, co-dominance, epistasis, and complex traits; | | | | | | | | | |
| | | | | Discuss the principles of chromosomal aberration and gene mutations; and | | | | | | | | | |
| | | | | Explain the practical application of genetic engineering in animal reproduction and production. | | | | | | | | | |
| | Animal Breeding **(8%)** | 3 | Understand principles, theories and methods of animal breeding. | Understand tools available to maximize response to genetic selection; | 2 | 3 | 1 | 1 | 1 | - | - | - | **8** |
| | | | | Understand the effects of inbreeding and crossbreeding, heritability and repeatability, and breeding value estimation; | | | | | | | | | |
| | | | | Understand selection theory and breeding methods; | | | | | | | | | |
| | | | | Predicting the rate of genetic improvement; | | | | | | | | | |
| | | | | Optimize selection and mating decisions; | | | | | | | | | |
| | | | | Estimate genetic parameters and breeding values; | | | | | | | | | |
| | | | | Designing breeding program. | | | | | | | | | |
| | Reproductive Physiology and Artificial Insemination **(5%)** | 2 | Apply principles of reproductive physiology and techniques of artificial insemination. | Identify and describe the different structures of male and female reproductive system in Farm Animals; | 1 | 2 | 1 | - | - | - | 1 | -- | **5** |
| | | | | Develop skills to palpate and diagnose pregnancy in female animals; | | | | | | | | | |
| | | | | Explain the endocrinology of female and male reproductive system; | | | | | | | | | |
| | | | | Know techniques to collect and freeze semen of different domestic animals; | | | | | | | | | |
| | | | | Describe and explaining the advantages and disadvantages of AI; | | | | | | | | | |

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| | | | | Apply techniques, producers and equipment's of AI in different farm Animals; and | | | | | | | | | |
| | | | | Realize techniques for increasing reproductive efficiency in farm animals | | | | | | | | | |
| Pseudo and Non-Ruminant Animals Production **( 15%)** | Camel Production and Management **(5%)** | 2 | Understand and apply principles and theories of camel production and management practices. | Characterize camel production systems; | 2 | 3 | - | - | - | - | | - | **5** |
| | | | | Recognize role of camel in the world as well as in Ethiopian economy; | | | | | | | | | |
| | | | | Identify economically important camel breed types ; | | | | | | | | | |
| | | | | Explain origin, taxonomy, domestication and current distribution of camels; | | | | | | | | | |
| | | | | Identify camel diseases and organize control measures to be taken; | | | | | | | | | |
| | | | | Identify constraints and opportunities of camel production; | | | | | | | | | |
| | | | | Explain how to manage feeding and reproduction of camels; | | | | | | | | | |
| | | | | Understand the difference between old world and new world camels; and | | | | | | | | | |
| | | | | Familiarize with adaptive features of camel in the tropics | | | | | | | | | |
| | Poultry Production and Hatchery Management **(10%)** | 4 | Understand the theories and technical aspects of poultry production and management. | Demonstrate knowledge of poultry production facilities; | 2 | 3 | 1 | 1 | 1 | - | 1 | 1 | 10 |
| | | | | Demonstrate competence of technical subject matter in poultry; | | | | | | | | | |
| | | | | Select appropriate chicken breeds adapted to the environment; | | | | | | | | | |
| | | | | Advise different stakeholders on poultry houses for different age groups; | | | | | | | | | |
| | | | | Understand techniques of incubation and manage hatchery process; | | | | | | | | | |
| | | | | Formulate ration for different age groups of egg-type and meat-type chickens; | | | | | | | | | |
| | | | | Take prevention and control measures on poultry diseases; and | | | | | | | | | |
| | | | | Know how to manage a poultry farm business | | | | | | | | | |
| Ruminant Animals Production **(22 %)** | Sheep and Goat Production and Management **(7%)** | 3 | Apply knowledge obtained from principles and theories of sheep and goat production and management practices | Have a clear image of domestication and distribution of sheep and goats; | 2 | 2 | 1 | 1 | - | - | - | 1 | **7** |
| | | | | Get scientific and theoretical background of sheep and goats management leading to improved production and give professional advice; | | | | | | | | | |
| | | | | Develop keen interest in sheep and goats farming practices; | | | | | | | | | |
| | | | | Advise and encourage farmers to involve in modern | | | | | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | sheep and goat farming | | | | | | | | | |
| | Dairy Cattle Production and Management **(7%)** | 3 | Understand the basic principles and theories of dairy cattle production and management to apply modern dairy animal production and management practices | Know the general backgrounds of dairy cattle breeds and production systems; | 2 | 2 | 1 | - | 1 | - | - | 1 | **7** |
| | | | | Formulate dairy cattle feed for different animal groups; | | | | | | | | | |
| | | | | manage dairy cattle farms; | | | | | | | | | |
| | | | | Describing lactation physiology, milk handling and processing procedures; | | | | | | | | | |
| | | | | Undertake dairy cattle body condition scoring and judging; | | | | | | | | | |
| | | | | Developing keen interest in dairy cattle business; | | | | | | | | | |
| | | | | Realize major challenges and opportunities of dairying in Ethiopia; | | | | | | | | | |
| | | | | Give training on dairy cattle production and management. | | | | | | | | | |
| | Beef Cattle Production and Management **(7%)** | 3 | Use the basic principles and theories of beef cattle production and management. | Identify opportunities and challenges of beef cattle production; | 2 | 2 | 1 | - | 1 | - | - | 1 | **7** |
| | | | | Differentiate tropical and temperate beef breeds; | | | | | | | | | |
| | | | | Know beef cattle production systems; | | | | | | | | | |
| | | | | Formulate beef cattle ration; | | | | | | | | | |
| | | | | Grade beef cattle and undertake beef quality assessment; | | | | | | | | | |
| | | | | Measure growth, score body condition and record performance measurements; | | | | | | | | | |
| | | | | Undertake routine management activities; | | | | | | | | | |
| | | | | Know how to transport and market beef cattle | | | | | | | | | |
| Beneficiary Insects Production and Management **(12 %)** | Apiculture **(7%)** | 3 | Understand theories and principles of apiculture to explain the ecological and economic importance of beekeeping and develop skill in queen rearing, and beehives products harvesting and | Know the contribution of beekeeping to ecosystem, pollination, domestic and foreign trade; | | | | | | | | | |
| | | | | Understand taxonomy, general biology, anatomy and physiology of honeybees; | 2 | 3 | 1 | - | 1 | - | - | - | **7** |
| | | | | Know Species and races of honeybees; | | | | | | | | | |
| | | | | Understand how sex and cast are determined in honeybee colony; | | | | | | | | | |
| | | | | Work with different types of hives and beekeeping equipment; | | | | | | | | | |
| | | | | Know seasonal management of honey bees, honeybee nutrition, and flora of Ethiopia; | | | | | | | | | |
| | | | | Know how to maximize the quantity and quality of bee products and protect honeybees from various problems which endanger their lives; | | | | | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | management | Successfully manage, advise, and encourage farmers to involve in modern bee farming. | | | | | | | | | |
| | Sericulture **(5%)** | 2 | Use the basics of principles of sericulture to understand feeding and management practices of silkworm. | Explain the Importance of sericulture;<br>Understand silkworm rearing, and host plant cultivation;<br>Have a know-how on silkworm and host plant diseases and pest protection;<br>Describe the process of montage, spinning, cocoon harvesting and sericulture products and by-product utilization and marketing;<br>develop skills to manage sericulture; and<br>Advise and encourage farmers to involve in sericulture. | 2 | 2 | - | - | - | - | 1 | - | **5** |
| | | | | **Total** | | | | | | | | | **100** |

**Key:** assume that the total items or exam questions are **100**

**Table 3**. Summary for Share of Competencies per Courses

| S/ No. | Themes | Course Name | Cr. Hours | Share of Courses (%) | Share of Competencies (in %) | | | Remark |
|---|---|---|---|---|---|---|---|---|
| | | | | | Knowledge (Cognitiv | Skill ( Affective) | Attitude ( Psychomot | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | **e)** | | or**)** | |
| 1 | Feed production and Animal Nutrition | Principle of Animal Nutrition | 3 | 7 | 7 | **-** | **-** | |
| | | Applied Animal Nutrition | 4 | 10 | 7 | 2 | 1 | |
| | | Forage and Pasture Production, and Management | 3 | 7 | 6 | 1 | - | |
| | | Range Ecology and Management | 3 | 7 | 7 | **-** | **-** | |
| 2 | Animal Genetics and Breed Improvement | Principle of Genetics | 3 | 8 | 8 | **-** | **-** | |
| | | Animal Breeding | 3 | 8 | 8 | **-** | **-** | |
| | | Reproductive Physiology and Artificial Insemination | 2 | 5 | 4 | 1 | **-** | |
| 3 | Pseudo and Non-Ruminant Animals Production | Camel Production and Management | 2 | 5 | 5 | **-** | **-** | |
| | | Poultry Production and Hatchery Management | 4 | 10 | 8 | 1 | 1 | |
| 4 | Ruminant Animals Production | Sheep and Goat Production and Management | 3 | 7 | 6 | **-** | 1 | |
| | | Dairy Cattle Production and Management | 3 | 7 | 6 | - | 1 | |
| | | Beef Cattle Production and Management | 3 | 7 | 6 | - | 1 | |
| 5 | Beneficiary Insects Production and Management | Apiculture | 3 | 7 | 7 | **-** | **-** | |
| | | Sericulture | 2 | 5 | 4 | 1 | - | |
| **Total** | | | **41** | **100** | **89** | **6** | **5** | |

## 7. Conclusion

Exit examination can have a vital role in producing knowledgeable, skillful and attitudinally matured graduates. It contributes to prepare competent graduates as it can serve as a quality check for effectiveness. It also helps in improving academic programs quality and effectiveness. This document is produced to assist the setting of the exit examinations for BSc in animal sciences program, which is being delivered by Ministry of Education. To meet the graduation profile, competency and learning outcome, exit exam competency selection and identifying core course was done for 2015 EC graduating students. As a result, preparing test blueprint is necessary to prepare fairly distributed items based on the above criteria.

## 8. Appendix

### Table 1. Core competences and Each Course share

| № | Themes of Courses | List of Courses | Credit Hours | Share of the course per theme | No. of items (%) | Share of the theme |
|---|---|---|---|---|---|---|
| 1 | Feed production and Animal Nutrition | 1. Principle of Animal Nutrition | 3 | 3/13x100= **23%** | 0.23x32=7.4 | 13/41x100= **32%** |
| | | 2. Applied Animal Nutrition | 4 | 4/13x100= **31%** | 0.31x32=9.9 | |
| | | 3. Forage and Pasture Production, and Management | 3 | 3/13x100= **23%** | 0.23x32=7.4 | |
| | | 4.Range Ecology and Management | 3 | 3/13x100= **23%** | 0.23x32=7.4 | |
| | | **Total Cr.hours of the theme -1** | **13** | | | |
| 2 | Animal Genetics and Breed Improvement | 1. Principle of Genetics | 3 | 3/8x100= **37.5%** | 0.375x20=7.5 | 8/41x100= **20%** |
| | | 2. Animal Breeding | 3 | 3/8x100= **37.5%** | 0.375x20=7.5 | |
| | | 3. Reproductive Physiology and Artificial Insemination | 2 | 2/8x100= **25%** | 0.25x20=5 | |
| | | **Total Cr.hours of the theme-2** | **8** | | | |
| 3 | Pseudo and Non-Ruminant Animals Production | 1. Camel Production and Management | 2 | 2/6x100= **33.3%** | 0.333x15=5 | 6/41x100= **15%** |
| | | 2. Poultry Production and Hatchery Management | 4 | 4/6x100= **66.7%** | 0.667x15=10 | |
| | | **Total Cr.hours of the theme-3** | **6** | | | |
| 4 | Ruminant Animals Production | 1. Sheep and Goat Production and Management | 3 | 3/9x100= **33.3%** | 0.333x22=7.3 | 9/41x100= **22%** |
| | | 2. Dairy Cattle Production and Management | 3 | 3/9x100= **33.3%** | 0.333x22=7.3 | |
| | | 3. Beef Cattle Production and Management | 3 | 3/9x100= **33.3%** | 0.333x22=7.3 | |
| | | **Total Cr.hours of the theme-4** | **9** | | | |
| 5 | Beneficiary | 1. Apiculture | 3 | 3/5x100 = | 0.60x12=7 | 5/41x100 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Insects Production and Management | | | **60%** | | = **12%** |
| | | 2. Sericulture | 2 | 2/5x100 = **40%** | 0.40x12=5 | |
| | | **Total Cr.hours of the theme-5** | **5** | | | |
| | **Total Credit Hours of the Program** | | **41** | | | |

**Key:** assume that the total items or exam questions are **100**