Ministry of Education Identified Competency Focus Areas and Core Courses for Ethiopian Higher Education Institutions' Exit Examination

(Revised)

Program:- BSc. in Animal Sciences

BSc. Animal and Range Sciences

BSc. Animal production and Technology

BSc. Animal Sciences and feed Technology

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1. INTRODUCTION

Human resource development is essentially the task of higher learning institutions to create competent graduates with appropriate knowledge, skill, and attitude proficiencies. Taking into account the relevance of educational success, the government of Ethiopia is spreading higher education throughout the country. Various programmes are taught by various colleges across the country. One of many academic divisions at Ethiopian institutions devoted to the development of skilled professionals for the advancement of livestock productivity. The programme has had a big impact on Ethiopia's livestock industry for more than half - century. The development of professionals, researchers, and professionals who can educate, conduct research to address problems, and generate technologies to solve challenges in the field, such as feed, breeding and genetic, and animal health issues, depends heavily on the curriculum. Farmers, educational institutions, research institutes, the Ministry of Agriculture, governmental and non-governmental organizations, and the private business sector/industries all benefit from animal science.

However, there are notable differences in how graduates are entering the workforce. In order to increase the comparability of grades and degrees across the nation, it is necessary to develop a system that evaluates students' learning outcomes as exit exams systems or central exams for all students who take the same final assessments. This system would be developed centrally, nationally, locally, nationally, and locally for all universities across the nation that train in a similar program. Nationally harmonized curriculum for rural development and agricultural extension programs was developed in 2021 with the expected professional profile and graduate profile having key competencies in knowledge, skill, and attitude. The graduating students should acquire these required competencies and, lastly, need to be assessed. To assess students, main competencies are revised by focusing on the major courses of the program. Therefore, major courses need to be selected based on the revised graduate and professional profile of competences for the assessment purpose.

As a result, the Ministry of Education plans to offer a comprehensive exit exam for undergraduate programs nationally to be started in 2022/2023 AY (2015 E.C). The objectives of the exit exam to assess students based on the key competencies learned in their stay in their universities that enhances quality of education. Thus, to assess students based on the revised competencies, major courses drawn from the key competencies is mandatory which enables the

students to focus on those selected courses and for teachers to formulate exam questions to achieve those competencies and learning outcomes.

In a newly (2021) updated curriculum, the BSc degree in Animal Sciences is structured as a four-year study course with 60 courses. The courses are grouped into four categories, namely major, supporting, common, and optional courses, and each category has 32, 7, 19, and 2 courses, respectively (Appendix). In the program, students are required to study a minimum of 148 and a maximum of 150 credit hours, with an equivalent of 224 and 243 ECTS, respectively. Following the guidelines of the exit exam, 14 courses from major courses under 5 competences, namely, feed production and rangeland management, animal nutrition and its application, animal genetics and breed improvement, non-ruminant animal production, and ruminant animal production, are suggested to be included in the assessment.

Although exit tests for professional licensure are becoming common for certain particular fields such as law and health in Ethiopia, these kinds of exams for students who are earning their bachelor's science degree in Animal Sciences have not yet been enacted. Therefore, this document is made to facilitate the implementation of exit examinations for the BSc in Animal Sciences program. The paper is produced, stressing the following features: the test should be a curriculum-based exit exam derived from a graduate profile by categorizing important courses into core competencies.

1.1 OBJECTIVES OF THE EXIT EXAMINATION
The Animal science exit exam shall have the following objectives

- To produce skilled and competent manpower to national and international market
- Assessing students' educational achievement in major areas Animal science Ensuring whether the graduation profile of Animal science curriculum have achieved at least common standards of knowledge and practical skills
- Improving public trust and confidence in Animal science activities of professionals
- Facilitating the efforts of students to revise the core learning outcomes of the courses covered by the exit examination

- Ensuring all graduates from HEIs satisfy the requirements of the labor market and employability through the national wide implementation of competency-based exit exam
- Creating competitive sprit among Animal science departments in Ethiopia with the vies to encouraging them to give due attention to the national standards

1.2 SIGNIFICANCE OF THE DOCUMENT

It is important to set competency areas of the subject matter (program) in order to measure the how much graduates are acquired with skills, knowledge and attitudes. The following shows us the significance or setting competencies and identifying core courses of the program;

- To set competencies that helps to assess the basic skills, knowledge and attitude of graduating students;
- To systematically identify the core courses which will be included the exit exam;

2. 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.

3. COMPETENCIES AND LEARNING OUTCOMES

Animal science graduates must possess a wide range of qualities such as versatility, impartiality, openness, flexibility, innovativeness, persistence, and so on. In general, graduates in their profession will have the following competencies and learning outcomes to improve the living conditions of poor urban and rural farmers whose problems are inextricably linked to feed quantity and quality, disease outbreaks, and parasite infestations. The aim of the program is to equip graduates with the scientific knowledge and skills required to implement principles, techniques, and scientific methods in livestock production, feeding, and health management, and product quality development. Thus, the program aims to produce qualified professionals who are knowledgeable, skilled, and capable of working with an appropriate and desired attitude. Graduates will be able to acquire the following competencies:

3.1. 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, behaviour, and handling techniques to successfully interact with animals in a safe and humane manner; and
- Understand the role of nutrition in animal production.

3.2. 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;

- Describe 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
- Critically analyse and properly interpret scientific research for problem solving and applications in animal production.

3.3. Attitude

- Appreciate the role of animal production and management for food security and poverty reduction and alleviation;
- 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.
- Desire to plan or design, implement, monitor and evaluate livestock development projects;
- Develop interest to manage livestock sectors, supervise livestock development activities
- Appreciate the animal science profession and to be a dedicated animal science expert who loves his/her profession.

4. THEMES OF THE PROGRAM

The following six major themes that correspond to the expected minimum competency level of graduates were identified considering the major tasks of graduate in Animal science. Weights are assigned to each major theme based on their significance for the perspective of the industry. Thus,

proportion of exit exam questions should follow the weight given to the themes.

There are:-

- Feed production and Animal Nutrition
- Animal Genetics and Breed Improvement
- Non- Ruminant Animals Production
- Ruminant Animals Production
- Beneficiary Insects Production and Management
- Animal products processing technology

5. SELECTED COURSES TO BE INCLUDED IN EXAM

Based on the graduate profile and competence of the program, the following sixteen (16) major courses has been selected courses in curriculum for exit examination to evaluate knowledge, skill and attitude of the prospect graduates of Animal science.

Table 2. Core competences/ Course themes

№	Themes of program	List of Courses	Cr.hr	ECTS
1	Feed production and Animal Nutrition	1. Principle of Animal Nutrition	3	5
		2. Applied Animal Nutrition	**4**	6
		3. Forage and Pasture Production, and Rangeland Management	3	5
2	Animal Genetics and Breed Improvement	1. Principle of Genetics	3	5
		2. Animal Breeding	3	5
		3. Reproductive Physiology and Artificial Insemination	2	3
		4. Animal Biotechnology	3	5
3	Non- Ruminant Animals Production	1. Swine Production and Management	2	3
		2. Poultry Production and Hatchery Management	4	6
4	Ruminant Animals Production	1. Sheep and Goat Production and	3	5

		Management		
		2. Dairy Cattle Production and Management	3	5
		3. Beef Cattle Production and Management	3	5
		4. Camel Production and Management	2	3
5	Beneficiary Insects Production and Management	1. Apiculture		
		2. Sericulture		
6	Animal products processing technology	Livestock Products Processing Technology	3	5
Total			**41**	**66**

6. Conclusion

The graduates in the animal science department are required to satisfy the appropriate competences and learning goals. To observe if graduates acquire these abilities and learning goals, credible and reliable evaluation in the form of a comprehensive exit exam is necessary. The exit exam is initiated by MoE and provide a harmonized exit examination across higher education institutions in Ethiopia. Likewise, this document is made to assist the execution of exit examinations for the BSc degree in Animal Sciences programme to be begun in the 2015 E.C academic year. The curriculum-based exit exam is generated from the graduate profile by organizing significant courses under major core competences. The examination is expected to be administered following graduation. The proportion of exam coverage to each competency will be decided by the number of courses proposed to be included per competency. Therefore, the national exit exam for Animal Science department has been prepared based on the identified competencies and learning outcomes (knowledge, skill and attitude) from the selected 15 courses within 6 major themes which enables qualified professionals trained under the recently (2021) revised curriculum. Finally, the core competencies and specific courses are subjected to revisions and includes modifications and replacement of courses by considering emerging circumstances regarding the programme.

7. Appendix

Appendix Table 1. List of major courses

№	Course name	Cr.hr	ECTS
1	Anatomy and Physiology of Farm Animals	3	5
2	Fishery and Aquaculture	3	5
3	Swine Production and Management	2	3
4	Principle of Genetics	3	5
5	Principle of Animal Nutrition	3	5
6	Sheep and Goat Production and Management	3	5
7	Forage and Pasture Production and Management	3	5
8	Camel Production and Management	2	3
9	Animal Breeding	3	5
10	Reproductive Physiology and Artificial Insemination	2	3
11	Applied Animal Nutrition	4	6
12	Poultry Production and Hatchery Management	4	6
13	Dairy Cattle Production and Management	3	5
14	Practical in Animal Science I	1	2
15	Beef Cattle Production and Management	3	5
16	Equine Production and Draft Animals Management	3	5
17	Biometry	3	5
18	Research Methods in Animal Sciences	2	3
19	Animal Biotechnology	3	5
20	Range Ecology and Management	3	5
21	Veterinary Parasitology	2	3
22	Practical in Animal Science II	1	2
23	Practical Attachment	2	3
24	Apiculture	3	5
25	Sericulture	2	3
26	Animal Behavior and Welfare	2	3
27	Hide and Skin Processing	2	3

28	Animal Health and Disease Control	3	5
29	Senior Seminar	1	2
30	Food Hygiene and Veterinary Public Health	2	3
31	Livestock Products Processing Technology	3	5
32	Senior Research Project	2	3
	Total	81	131

Appendix Table 2. List of supportive courses

№	Course name	Cr.hr	ECTS
1	Biochemistry	3	5
2	General Microbiology	2	3
3	Introduction to Soils	2	3
4	Introduction to Statistics	3	5
5	Rural Sociology and Agricultural Extension	2	3
6	Farm Management	2	3
7	Livestock Economics and Marketing	2	3
	Total	16	25

Appendix Table 3. List of common courses

№	Course name	Cr.hr	ECTS
1	Communicative English Language Skills I	3	5
2	General Physics	3	5
3	General Psychology	3	5
4	Mathematics for Natural Science	3	5
5	Critical Thinking	3	5
6	Physical Fitness	0	0
7	Geography of Ethiopia and the Horn	3	5
8	Communicative English Language Skills II	3	5
9	Social Anthropology	2	3
10	General Biology	3	5
11	General Chemistry	3	5
12	Economics	3	5
13	Introduction to Emerging Technologies	3	5
14	Moral and Civic Education	2	3
15	Introduction to Computer Application	3	5

16	Inclusiveness	2	3
17	Global Trends	2	3
18	Entrepreneurship	2	3
19	Nutrition Sensitive Agriculture	3	5
	Total	49	80

Appendix Table 4. List of elective courses

№	Course name	Cr.hr	ECTS
1	Agricultural Project Planning and Analysis (E)	2	3
2	Farm Stead Structure (E)	2	3
3	Total	4	6