**Ministry of Education**

Zero Draft Document On Competencies And

Courses Identification For Exit Examination

Program: Natural Resources Management

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Program: Natural Resources Management

Identified Competency Focus Areas and Core Courses for National Exit Examination:

Program: Bachelor of Science in Plant Science

Competencies & Courses Suggested For Exit Examination For Bsc In

Animal Sciences Graduates To Be Held In 2015 E.C

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Animal Sciences Graduates To Be Held In 2015 E.C

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# **INTRODUCTION**

The agricultural sector greatly influences economic performance in Ethiopia. The country has diverse physical and social environments and a great diversity of tropical, subtropical and temperate climates, soil and vegetation.. A wide variety of crops is found growing in various parts of the country. The country is a centre of origin and/or diversity for many plant species including several cultivated crops.

Some of the challenges facing the agricultural sector currently are inappropriate, exploitative and unscientifically planned natural resources’ utilization and management; serious environmental degradation on the cultivated and potentially cultivable lands by over-farming, over-grazing and over-deforestation; biotic and abiotic stresses decreasing the productivity of land; and climate change. Thus, there is an increasing demand from the stakeholders and the country at large for trained/highly qualified and skilled professionals to take care of and tackle the multifaceted problems related to agriculture and development of natural resources.

The current crop production and productivity of the country in general need to be reversed and increased through the use of improved production technologies, reduction of pre- and post- harvest crop losses, and efficient use and proper management of natural resources. Such a program seeks to produce competent professionals who are equipped with both academic and practical knowledge, skills, and attitudes in managing all phases of the crop production and management; and conducting various research and extension activities which can contribute to the development of the country and ensuring food security and self-sufficiency.This can be attained if and only if a large number of well-trained and qualified human resources through knowledge, skill and attitude is involved in all processes of technology generation, dissemination and development. Currently ministry of education has supposed to implement exit exam for 2015EC graduation students to test the student knowledge, skill, attitude, and to be achieve and improve the quality of education. According to this direction, from five themes 10-15 major courses are selected and suggested to include on the exit exam to be measure the student’s competencies.

# **EXPECTED PROFILES OF GRADUATES**

Graduates of the Department of Plant Sciences program are well equipped with knowledge, skills and attitude needed to:

## **2.1. Knowledge**

* Identify and analyse problems related to plant sciences and devise appropriate solutions;
* Assist in planning, implementing, monitoring and evaluating programs/projects related to crop production, protection and management in sustainable base
* Design and conduct trainings for specialized skill and knowledge in areas of plant sciences;
* Promote and disseminate agricultural technology through training of farmers and extension worker;
* Involve in research undertakings in the areas of crop production, protection, and natural resources;
* Identify sustainability issues in relation to crop production, protection and value addition
* Building teams comprising of different fields of expertise to address complex agricultural specifically crop production problems in a multi-disciplinary way
* Possesses capabilities to positively influence the community and serve as an agent of change in matters pertaining to his/her field.
* Identify different income generating mechanisms related to crop production and management
* Generate self-employment, establish and mange private enterprises related to their profession and related fields; and
* Providing advice on agricultural production, marketing, post-harvest production and other profitable technologies for farmers;
* Involve in consultancy and advisory services in the field of plant sciences.

##  **2.2. Skill**

* Generate self-employment opportunities related to crop production and management
* Conduct research in the area of plant sciences
* Facilitate to organize farmers for development activities
* Provide effective and efficient consultancy and advisory services on crop production and management practices
* Plan, implement, monitor, and evaluate crop production activities

##  **2.3. Attitude**

* Develop sense of passion to plan, implement, and monitor and evaluate projects and programs related to agricultural development initiatives;
* Aware the need for crop production and management practices;
* Appreciate initiatives of development interventions to enhance production and productivity of crops;
* Aware the importance of strong linkages among researcher, extension agent and farmers for improvement of technology dissemination;
* Aware significant contribution of crop production and value addition for sustainable development;

# **COMPETENCIES AND LEARNING OUTCOMES**

The profession of plant sciences requires a wide range of qualities such as versatility, impartiality, openness, flexibility, persistence, etc. In general, the graduate in their profession will have the following competencies and learning outcomes to uplift the living standard of the rural poor farmers. Upon completion of the program, the graduate students will be able to achieve the following competencies;

## **3.1. Crop Improvement Competencies**

* Analyze basic concepts of genetics essential for plants improvements
* Conduct breeding activities and develop crop varieties by applying conventional and biotechnological tools
* Produce and handle quality seed under formal and informal seed systems and undertake problem solving research in crop improvement

## **3.2. Agronomy Competencies**

* Identify soil fertility problems and design and implement corrective possible measures
* Identify appropriate agronomic practices for specific crop species and environment setting
* Evaluate biological, physical, and chemical properties of soil and their effects on nutrient availability to plants.
* Design and undertake problem solving research in the area of field crops production and management
* Analyze climatic risk and uncertainty factors and identify and apply mitigation strategies
* Plan and execute agricultural field operations (i.e. from planting to harvest) for proper crop production;
* Identify economically important crops in the field (at seed, germination, vegetative stages; flowering etc.).

## **3.3. Plant Protection Competencies**

* Identify and manage problems associated with diseases and insect pests of economically important plants;
* Identify and manage problems associated with weeds of economic importance and thereby reduce losses due to weeds;
* Design and undertake research in plant protection

##  **3.4. Horticultural Crops Production & Processing Competencies**

* Establish fruit and vegetables farms and manage problems associated with post-harvest losses of horticultural crops.
* Design and undertake problem solving research in the area of horticultural crops production and their management

## **3.5. Research Tools and Skills Competencies**

* Identify researchable problems, plan and execute researches in plant sciences;
* Use statistical packages/software for agricultural data analysis and thereby make available quality information to users;
* Write scientific reports and produce publications on relevant subjects in the field of plant sciences; and present research and related scientific findings to users

# **COURSE TO BE INCLUDED IN THE EXIT EXAM**

In harmonized curriculum plant sciences students has taken 62-64 courses until to graduation. In the meantime, the ministry of education has supposed to implement exit exam in 2015EC graduation students. To be test the student competency (knowledge, skill and attitude) 10-15 major courses has to be included on exit exam. List of courses to be included in the exit exam are;

1. PlSc212: Principle of Genetics
2. PlSc221: Plant Morphology and Anatomy
3. PlSc311: Plant Breeding and Biotechnology
4. PlSc312: Research Methods in Plant Science
5. PlSc321: Plant Physiology
6. PlSc322: Fruit Crops Production and Processing
7. PlSc331: Agricultural Entomology
8. PlSc332: Weeds and Their Management
9. PlSc341: Plant Pathology
10. PlSc342: Seed Science and Technology
11. PlSc351: Principles, Design and Analysis of Agricultural Experiments
12. PlSc372: Soil Fertility and Plant Nutrition
13. PlSc431: Vegetable Crops Production and Management
14. PlSc451: Field Crops Production and Management
15. PlSc461: Principles and Practices of Irrigation

# **CATEGORIZING COURSES IN TO THEMES**

**Theme 1: Crop Improvement**

1. PlSc212: Principle of Genetics
2. PlSc311: Plant Breeding and Biotechnology
3. PlSc342: Seed Science and Technology

**Theme 2: Agronomy**

1. PlSc221: Plant Morphology and Anatomy
2. PlSc321: Plant Physiology
3. PlSc372: Soil Fertility and Plant Nutrition
4. PlSc451: Field Crops Production and Management
5. PlSc461: Principles and Practices of Irrigation

**Theme 3: Plant Protection**

1. PlSc331: Agricultural Entomology
2. PlSc332: Weeds and Their Management
3. PlSc341: Plant Pathology

**Theme 4: Horticultural Crops Production & Processing**

1. PlSc322: Fruit Crops Production and Processing
2. PlSc431: Vegetable Crops Production and Management

**Theme 5: Research Tools and Skills**

1. PlSc312: Research Methods in Plant Sciences
2. PlSc351: Principles, Design and Analysis of Agricultural Experiments

# **CONCLUSION**

In conclusion, the plant sciences students have taken 62 to 64 courses until to graduation. Graduate in plant sciences program will meet the expected competencies and learning outcomes. Currently the ministry of education has supposed to implement the exit exam in 2015EC graduation studentsto be measure the learning outputs of a program as a whole. In this document five categories and fifteen course are selected has to be included on exit exam to be test the student competency. Exam questions based on the selected courses to be included on the exit exam it should be desired knowledge, skills, and behaviours of a student graduating from a program**.**