**Ministry of Education**

**Identified Competencies Focus Areas and Core Courses for National Exit Examination:**

# (Revised)

**Program: Bachelor of Science Degree in Food Science and Postharvest Technology (FSPT)**

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## 1. INTRODUCTION

Food Science and Postharvest Technology is a program in which professionals are trained to involve in food production, processing, preservation, formulation, postharvest loss, and packaging of food. Professionals are capable of doing research in the area of Food Science, Postharvest and Technology of foods and related disciplines (particularly as experts in processing, optimizing, modifying, quality control and assurance, and in agricultural bureau as an expert).

Students completing their programs in any disciplines have to be accredited for being professionally fit in that particular program. Among the different mechanisms of evaluating students at the completion of the program is to provide them with an exit examination. In this regard, an exit examination is a test that students must pass to receive a diploma and graduate from a university.

For instance, there is a practice of such an exam namely holistic exam in some universities like Jimma and Hawasa Universities which is being given before the students go for internship. Such practices are useful to evaluate students' performance likewise, exit examination do. The exit exam as an assessment tool for any programs is receiving attention to fulfill the gap of the graduates in the profession which will begin in 2015 EC as planned by Ministry of Education (MoE). The subsequent analysis concluded that the exit examination would generate significant amounts of useful assessment data, and indeed, there should be urgent use of such data as an academic performance indicator. Several notations and conclusions have been drawn; however, the examinee's motivation to pass contributes to the viability of the exam to be taken prior to graduation.

Exit examinations are common for high school graduates who wish to enter university. The exams result in positive effects on student achievement due to hardworking of students to motivate themselves to pass and instructors to make their students to be promoted by the exam. The goal of implementing exit examinations is to encourage students to put effort into their learning. Although examinations for professional licensing are common for different disciplines, exit exams for students who are completing their bachelor's degree are not common in Ethiopia.

Exit examination is an exam a student must pass to complete a course of study, which is given to students towards the end of their higher education tenure. It is Curriculum based exam to assess performance, basic knowledge, skill and attitude. It is supposed to measure the learning outputs of a program as a whole, not the individual course.

## 1.1. Objectives of the Exit Examination

The national public administration 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 of Food Science and Postharvest Technology
- Ensuring whether the graduation profile of FSPT curriculum have achieved at least common standards of knowledge and practical skills
- Improving public trust and confidence in Food Science and Postharvest Technology 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 Food Science and Postharvest Technology 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 (FSPT) 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. GRADUATE PROFILE

Graduates of this program will be equipped with attitude, skill and knowledge in Food Science, Food Processing and preservation, product development, food safety, quality control & assurance and postharvest handling of various agricultural products. They will:

- Consult and advise quality and process control and product development,
- Advise governmental and non-governmental organizations, regulatory agencies (work in inspection, accreditation, standardization, etc), quality standard, health organizations, and the like involved in food processing and preservation, food safety & security and various community development activities,
- Advocate and work towards the standards, codes of conduct and ethics of the food industry, research and food processing,
- Consult stakeholders in the postharvest loss reduction and product quality control,
- Coordinate and consult with stakeholders in the improvement of food retail markets organization, quality handling and structures,
- Conduct food safety and quality tests and manage warehouses,
- Engage in research in food science and postharvest technology and related fields,
- Consult different companies and agencies on food processing, product development and postharvest handling,
- Involve in food security and nutrition programs,
- Involve in food systems monitoring and evaluation to maintain the quality and safety of foods in Ethiopia, and
- Teach at various education levels

### 3. COMPETENCIES AND LEARNING OUTCOMES

### 3.1. Competencies

### 3.1.1 Knowledge

- ➢ have knowledge of food science principles (food chemistry and analysis, food microbiology, food biotechnology, food quality, food safety and nutrition)
- ➢ have knowledge of food handling, processing and preservation principles (including grains, fruits and vegetables, coffee, tea and spices, fermented and non-fermented beverages, dairy products, meat, eggs, fish, and sugar)
- ➢ have knowledge of applied food science (including product development, food fortification, sensory science, quality assurance, and food laws and regulations)
- ➢ have knowledge of food plant sanitation and waste management
- ➢ have knowledge that meet the basics international standards of food science and postharvest technology

### 3.1.2.Skill

- ➢ be able to apply the skill necessary for food science and postharvest technology and value addition of agricultural products.
- ➢ be able to apply the skills of food science and postharvest technology holistically to produce safe and quality foods
- ➢ be able apply food analytical skills and use analytical instruments
- ➢ be able to communicate orally and in writing related to technical and non-technical aspects of food production.

### 3.1.3Attitude

- ➢ have the ability to adapt and/or generate technologies through demand-driven and problem-solving research in the area of food science and postharvest technology.
- ➢ have the ability to think critically, solve problems, be responsible for his/her work independently, and make appropriate decisions based on the available information.
- ➢ have the ability to work in a team with different backgrounds, adaptive, and responsive to the different situations.
- ➢ committed to professionalism and ethical values.

### 3.2 Learning Outcomes

- Identify postharvest problems of the country and provide innovative solutions to problems from farm to fork to contribute to food and nutrition security,
- Identify, plan, design and manage postharvest loss reduction strategies,
- Design and develop new products or modify already existing products,
- Design and implement / optimize processes to suit escalating consumer demand for food of high nutrition and quality, international laws and standards necessary to penetrate the global market with processed food of high values,
- Implement quality control programs, good manufacturing practice (GMP), hazard analysis critical control point programs (HACCP) towards consistent quality production and consumer safety,
- Play advisory and technical roles in document preparation-specification, purchase and commissioning of the pilot and large-scale industries,
- Manage production, marketing, packaging and distribution of food and beverage products along the value chain and
- Teach or provide training in food science, postharvest technology, food biochemical processing and the related areas of study.

## 4. Themes and Core Courses

Course identification is done based on the Food Science Postharvest Technology thematic areas, relevancy to measure the three learning domains (knowledge, skill and attitude) as well as the courses that can measure the stated competencies of the graduates. Accordingly, the core courses for this purpose are selected and categorized in themes as follows (73 total ECTS or 44 Cr.Hr):

| Theme-1 Basics of Food Science | | |
|---|---|---|
| **Courses** | **ECTS** | **Cr.Hr** |
| 1   Food Microbiology | 5 | 3 |
| 2   Food Chemistry | 5 | 3 |
| 3   Food Analysis | 5 | 3 |
| 4   Human Nutrition | 5 | 3 |
| Total ECTS | 20 | 12 |
| Percentage (%) coverage | 27.39% | |

| Theme-2 Food Processing and Postharvest Technology | | |
|---|---|---|
| **Courses** | **ECTS** | **Cr.Hr** |
| 1   Meat, Poultry and Fish Processing Technology | 5 | 3 |
| 2   Sugar, Honey and Confectionary Technology | 5 | 3 |
| 3   Fats and Oils Processing Technology | 3 | 2 |
| 4   Dairy Product Processing Technology | 5 | 3 |
| 5   Beverage Processing Technology | 5 | 3 |
| 6   Food Biotechnology and Fermentation | 5 | 3 |
| 7   Coffee, Tea, Spices and Herbs Processing Technology | 5 | 3 |
| 8   Grains Postharvest Handling and Processing Technology | 5 | 3 |
| 9   Fruits and Vegetables Postharvest Handling and Processing Technology | 5 | 3 |
| Total ECTS | 43 | 26 |
| Percentage (%) coverage | 58.9% | |

| Theme-3 Food Product Development, Quality Control and Safety Standards | | |
|---|---|---|
| **Courses** | **ECTS** | **Cr.Hr** |
| 1   Product Development and Sensory Evaluation | 5 | 3 |
| 2   Food Quality and Safety Management | 5 | 3 |
| Total ECTS | 10 | 6 |
| Percentage (%) coverage | 13.69% | |

## 5. CONCLUSION

An exit examination measures student's capability at the end of their program of study for attainment of the program's intended learning outcomes and the exam will contain questions from the selected core courses. The exam is a mandatory exam and requirement for degree completion administered on campus. It is vital to the improvement of Food Science and Postharvest Technology Programs quality and effectiveness.

For this purpose 15 courses (73 ECTS or 44 Cr.Hr) are selected under three themes. Items in the exit exam should be more of general and mapped with the selected core courses, within which the three learning domains (knowledge, skill and attitude) can be measured

# APPENDIX

Thematizing of the main courses

| Theme-1<br>Basics of Food Science | | |
|---|---|---|
| | **Courses** | **ECTS** |
| 1 | Food Microbiology | 5 |
| 2 | Research Method and Experimental Design | 5 |
| 3 | Food Analysis | 5 |
| 4 | Food chemistry | 5 |
| 5 | Human Nutrition | 5 |

| Theme-2<br>Food Processing,  Postharvest and Technology | | |
|---|---|---|
| | **Courses** | **ECTS** |
| 1 | Principles of food processing and preservation | 5 |
| 2 | Meat, Poultry and Fish Processing Technology | 5 |
| 3 | Engineering Properties of Food Materials | 5 |
| 4 | Food Packaging Technology | 5 |
| 5 | Sugar, Honey and Confectionary Technology | 5 |
| 6 | Fats and Oils Processing Technology | 3 |
| 7 | Dairy Product Processing Technology | 5 |
| 8 | Beverage Processing Technology | 5 |
| 9 | Food Biotechnology and Fermentation | 5 |
| 10 | Coffee, Tea, Spices and Herbs Processing Technology | 5 |
| 11 | Grains Postharvest Handling and Processing Technology | 5 |
| 12 | Fruits and Vegetables Postharvest Handling and Processing Technology | 5 |
| 13 | Principles of Postharvest and Food Processing Machinery | 5 |
| 14 | Roots and Tubers Processing Technology | 5 |
| Theme-3<br>Food Product Development, Quality control and Safety Standards | | |
| | **Courses** | **ECTS** |
| 1 | Product Development and Sensory Evaluation | 5 |
| 2 | Food Fortification, Supplementation and Functional Foods | 5 |

| 3 | Indigenous Practices in Food System | 3 |
|---|---|---|
| 4 | Food Marketing and Value Chain Management | 5 |
| 5 | Food Quality and Safety Management | 5 |
| 6 | Food Toxicology | 3 |
| 7 | Food Waste Management and Environmental Protection | 5 |

# Ministry of Education

# Higher Education Development sub-sector

## Competency and Core Course Identification Validation Workshop for national Exit Examination

## Participants' List

**Hidar 30/ 03/15 E.C (Dec 9/2022 G.C)**

**Band: Four (4)**

**Program:** Food Science and Postharvest Technology

| N<u>o</u> | Name of the Participants | University | Role in the Workshop | Signature |
|---|---|---|---|---|
| 1 | Samuel Mezemir (PhD) | Arsi University | Validator | |
| 2 | Alemgena Ayana (MSc) | Wollega University | Validator | |
| 3 | Woldeab  Alemayehu (MSc) | Wachamo University | Validator | |
| 4 | Mikru Tesfa (MSc) | Injibara University | Validator | |

Coordinated by:- Sisay  Semu                    Approved by:- _____

Date:-   30/03/2015  E.C                         Date:- _____

Signature:-  _____              Signature:-  _____