



MINISTRY OF EDUCATION

Identified Competencies Focus Areas and Core Courses for Ethiopian Higher Education Institutions' Exit Examination

Program: Bachelor of Science in **Leather Product Engineering**

Prepared By:

1. Lioul Getachew (M.Sc. Leather Product and Engineering) Bahir Dar University
2. Biniyam Solomon (M.Sc. Leather Product and Engineering) Bahir Dar University
3. Genet Teka (M.Sc. Leather Product and Engineering), Bahir Dar University

December 2022

Addis Ababa

Ethiopia

Table of Contents

1. Introduction.....	3
2. Expected profiles of Leather product Engineering graduates	5
3. Competencies and Learning Outcomes.....	6
1. Competence in Introduction to Leather Materials and Process.....	6
2. Competence in Fundamentals of Leather Product Design	6
3. Competence in Pattern Making.....	6
4. Competence in closing technology	6
5. Competence in Footwear Finishing Technology	7
6. Competence in Leather quality Management and Testing.....	7
3.1. Fundamental Knowledge and Skills	7
5. Categorizing Courses into Themes	9
Conclusion.....	10

1. Introduction

Ethiopia started to implement the Agricultural Development Led Industrialization (ADLI) in the mid-1990s and provides a broad policy vision and direction for Ethiopia by defining the fundamental role of Agriculture in early industrialization. Leather and textile industries have a vital role of transforming countries into industrialization-manufacturing led economy and the government allows for both local and foreign investors to take part on these sectors. According to the 2015 World Food and Agriculture Organization's report, Ethiopia is the first in Africa and the fifth country in the World for its cattle inventory so it has a high potential for raw material for leather industries due to its vast animal resources and Ethiopian government gives priority for the development of leather industries like Mojo leather city, foot wear industries, leather garment industries etc. As the sector is labor intensive, which involves all level of skill, it had created tremendous amount of employment opportunity for the Ethiopian population but the number of graduates from the universities in leather product engineering and related fields is small compared to the industry labor and expertise requirement. In spite of the above advantages and opportunities, the leather and textile industries in Ethiopia has not advanced beyond exporting their products after adding minimum value and remained as a supplier of raw materials only, an activity which could not take a country anywhere. So the government gives attention for those sectors as backbone of Ethiopia economy development.

The leather industry sector is one of the leading foreign currency generating sectors of the country. Therefore, the sector needs more foreign and local investments to come in the areas of footwear, glove, leather garment, leather goods and articles. In addition, the sector is one of the sectors that is believed to play a significant role in strengthening the overall economy of the country, thereby making a major contribution to the achievement of the five-year goals of the ongoing Growth and Transformation Plan (GTP) Ethiopia is known to be the leading African country in terms of livestock and this huge potential resource will play a significant role for the leather tannery and leather product sector which leads making Ethiopia as a leading exporter to the rest of the world.

Leather product engineering is a profession that deals with the application of scientific and engineering principles to the design and controls of all aspects of leather and leather product manufacturing and to capable the students on creativity, development, and making them influential in in the challenges of the leather engineering profession. This profession also aims

to apply existing gained knowledge from the profession in new ways thereby creating new systems and opportunities as well as adapting existing technology to local production conditions and solve the challenges of leather industries. Additionally, the professionals are also enabled to do research on leather industry plant layout and facility design, leather product manufacturing design and improvement, and designing and creating leather products.

Ethiopian Ministry of Education set to introduce an exit examination for all undergraduate programs in the universities of Ethiopia as a measurement of quality of education improvement and intended to assess the knowledge, skill and competencies for the student for the market they will join. Based on those directions and aims, exit exams for all graduates in all undergraduate programs will begin in 2015 E.C.

1.1.Objectives of the Exit Exam

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 leather product engineering
- ❖ Ensuring whether the graduation profile of leather product engineering curriculum have achieved at least common standards of knowledge and practical skills
- ❖ Improving public trust and confidence in leather and leather product industries administration 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 in leather product engineering satisfy the requirements of the labor market and employability through the national wide implementation of competency-based exit exam
- ❖ Creating competitive spirit among leather product engineering departments in Ethiopia with the vies to encouraging them to give due attention to the national standard.

1.2.Significance of the Document

Setting competency areas of the subject matter (program) is important in order to measure how much graduates are acquired with skills, knowledge and attitudes and can be a bench mark

for the graduates. The following shows us the significance of 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 in the exit exam

2. Expected profiles of Leather product Engineering graduates

- ❖ To be able to utilize the knowledge of mathematics and science in the Leather product engineering profession.
- ❖ To have basic and modern knowledge about Leather Science, Leather Technology, chemistry of tanning.
- ❖ To be able to design leather products and collections
- ❖ To be able to define, interpret and solve the problems related to Leather product Engineering
- ❖ To be able to design and apply a trial/project in the Leather product Engineering field and to make a conclusion by evaluating the experimental data.
- ❖ To be able to use advanced techniques and modern tools necessary for Leather product Engineering applications.
- ❖ To be able to perform executive abilities (leadership, organization, time and risk management, quality awareness, productivity, etc.)
- ❖ To have a social responsibility and ethically conscious.
- ❖ To show awareness of the universal subjects such as environment, health, productivity, product design, quality, and security in solving Leather product Engineering problems and to realize the solutions.
- ❖ To be able to use the information technologies necessary for the Leather product Engineering field.
- ❖ To be able to show the skill of evaluating and marketing leather items.

3. Competencies and Learning Outcomes

1. Competence in Introduction to Leather Materials and Process

This course enables leather product engineering students to know all about the raw materials of leather, leather production process, and defects and their remedies. So those includes

- ❖ Deliver knowledge on raw hides/skins nature, classification, defects, and skill on how to preserve, characterize and process into leather.
- ❖ Deliver knowledge and skills on pre-tanning operations (soaking, liming, de-liming, bating, degreasing and pickling)
- ❖ Capable acquiring knowledge and skills on basic concepts of tanning technologies, tanning materials, auxiliaries and their properties.
- ❖ Deliver knowledge and skills on basic concepts of post-tanning, crust preparation, dyeing and finishing of leathers

2. Competence in Fundamentals of Leather Product Design

This course intended to teach all about the principles an element of design to make the student effective on inspiration and development of design and helps the student to be

- ❖ Get better understanding of basic design elements and principles.
- ❖ It also helps the student to be familiar with fashion terminologies, fashion movements, and fashion cycles, sketching, and illustration skills.
- ❖ To make Emphasis on basic design techniques for leather products.

3. Competence in Pattern Making

- ❖ The pattern-making courses help students to gain an understanding of the processes and principles of leather product pattern making.
- ❖ Computer Application in Product Design helps students to gain an understanding of designing and developing patterns using CAD and grade using appropriate CAD software.
- ❖ It focuses on the development of skills, attitudes, and knowledge of students in applying the concepts and approaches for designing and creation designs, patterns, and grading the patterns.

4. Competence in closing technology

- ❖ Leather goods construction aims to provide students the knowledge, skills, and attitudes

required to assemble and fabricate various types of leather goods components and products using appropriate construction techniques, tools, and equipment.

- ❖ Footwear closing technology course attempts to introduce the fundamental concepts of operating the different types of ancillary machines, making different types of seams and top lines.
- ❖ Students are expected to perform the process of making children, derby, and oxford and court shoe upper.
- ❖ Students are expected to understand about different types of conveyor systems, quality checkpoints, and reports.
- ❖ Leather garment construction course helps students to gain an understanding of assembling and stitching leather garment using appropriate technique.

5. Competence in Footwear Finishing Technology

- ❖ Bottom component technology attempts to introduce the fundamental concepts of making bottom components of footwear.
- ❖ Gives the student to understand about the different types of bottom components, their properties, interlocking process while cutting the bottom components, insole making process, machines used for making the insoles, and cost calculation the insole.
- ❖ Lasting technology deals to perform hand and machine lasting.
- ❖ The students are expected to know basic finishing practices that include identification of different types of foot wear finishes, application of foot wear finishing techniques and required tools.

6. Competence in Leather quality Management and Testing

This course aims to give better understanding and knowledge about:

- ❖ Quality control aspects in leather and leather Product industries,
- ❖ Physical tests of leather and leather products ,Types of standards to be competitive in international markets,

3.1.Fundamental Knowledge and Skills

The graduates of the “Leather product Engineering” study program shall acquire the following capabilities and skills:

- ❖ Strong mathematical and analytical competencies to use the engineering sciences,

- ❖ Basic knowledge of leather technology and processing leading to an understanding and modifying optimizing of leather processing and manufacturing processes,
- ❖ Knowledge of scientific principles
- ❖ Skills of product design and collection development
- ❖ Knowledge of on-trend and fashion forecasting
- ❖ Skills to manage production and control processes
- ❖ An understanding of the effects of raw material on products
- ❖ Ability to computer application for data logging and analysis as well as utilization of Software.
- ❖ Communication skills and team spirit enable me to work with various professionals including businessmen.
- ❖ Ability in “scientific writing” for technical reports in management, projects and research
- ❖ Skills in organizing and carrying out systematic activities e.g., flow charts
- ❖ Skills in simulating industrial practice.
- ❖ Recognize and appreciate social, political, economic, and environmental impacts of Leather product Engineering projects on scales that range from local to global.
- ❖ Understand and adhere to the highest standards of professional engineering and ethical behavior.
- ❖ Ability to provide leadership in the Leather product Engineering profession.
- ❖ Understand and meet new challenges facing the Leather product Engineering profession.
- ❖ Understanding of business, public policy, and public administration fundamentals
- ❖ Recognition of the need for, and an ability to engage in life-long learning.

4. List of Course

This document includes 15 core courses which must be included in exit exam for leather product engineering students and those are presented in table 1 below.

Table 1 list of core courses

S. No	Courses Name	Course code	ECTS
1	Basic leather processing	LpEg3111	5
2	Tanning and post Tanning	LpEg3113	5
3	Leather Dyeing and finishing	LPEg3122	4

4	Creative design	LpEg2104	5
5	Leather goods pattern making	LpEg3111	6
6	Footwear pattern making	LpEg3113	6
7	Leather garment pattern making	LpEg3112	5
8	Leather Cutting Technology	LpEg3121	5
9	Foot wear closing technology	LpEg3132	5
10	Leather goods construction	LpEg3133	5
11	Leather garment construction	LpEg4131	6
12	Bottom component technology	LpEg3142	3
13	Lasting and finishing technology	LpEg4141	5
14	Physical testing of leather and leather product	LpEg4201	4

5. Categorizing Courses into Themes

The proposed core courses for the exit exam are grouped in to 6 themes as shown in table 2 below.

Table 2 Categorization of Courses into themes

S.No	Course theme	Courses	Course code	ECTS
1	Introduction to Leather material and process	Basic Leather Processing	LpEg3111	5
		Tanning and post tanning	LpEg3113	5
		Leather Dyeing and finishing	LPEg3122	4
2	Fundamentals of Leather Product Design	Creative Design	LpEg2104	5
3	Pattern Making	Leather Goods Pattern Making	LpEg3111	6
		Footwear Pattern Making	LpEg3113	6
		Leather Garment Pattern Making	LpEg3112	5
		Cutting technology	LpEg3121	5
4	Closing Technology	Footwear Closing technology	LpEg3132	5

		Leather Goods Construction	LpEg3133	6
		Leather Garment Construction	LpEg4131	6
5	Footwear Finishing Technology	Bottom Component Technology	LpEg3142	3
		Lasting and Finishing Technology	LpEg4141	5
6	Leather quality Management and Testing	Physical Testing of Leather and leather products	LpEg4201	4

Conclusion

As a conclusion, these draft documents start with the rationale behind the implementation of Exit Exam which is bringing quality education in Ethiopian higher education institutions and the document summarizes the major requirements (core) which are expected from every Leather Product Engineering up on successful completion of the program. In relation to these the requirements major areas of competencies, courses and themes are included and can be taken as the major focus areas in the preparation of exit exam for the students who have finalized their study in the department of Leather Product Engineering in undergraduate program. Since Leather Product Engineering is the broadest of all engineering disciplines which has lots of modules and course including the common and general engineering course; the core course (14) are selected in in 6 course themes in this document and those core course can be considered as basics for leather product engineering accomplishment which measures the student's fundamental knowledge, skill and attitudes about leather, leather products, and related to every sub-discipline in the field and considered as major focus area for the Exit Exam preparation.

Validator

1. Zerihun Teshome (M.Sc. Leather Product and Engineering), Bahir Dar University
2. Ketema Alemu (M.Sc. Leather Product and Engineering), Bahir Dar University