



**Ministry of Education**

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

**Program: Bachelor of Science in Applied Chemistry**

**By: Ayalew Temesgen (PhD), University of Gondar**

**Assefa Sergawie (PhD), Addis Ababa Science and  
Technology University**

**August, 2022  
Addis Ababa  
Ethiopia**

## Table of Contents

### Contents

1. Introduction .....	1
2. Objectives of the Exit Examination.....	1
3. Significance of the Document .....	2
4. Expected Profiles of Graduates .....	3
5. Competencies and Learning Outcome.....	3
5.1. Competencies .....	3
5.2. Learning Outcome.....	4
6. Categorizing Courses into Themes.....	4
7. Courses to be included in the Exit Exam.....	5

Courses and Competencies Identified for Exit Exam 2015 (First Draft)

## 1. Introduction

Chemical sciences play key role in improving the living standard of the society in the world. Particularly, the knowledge of chemistry is indispensable in understanding many areas of related disciplines such as biology, medicine, materials science, etc. Moreover, in line with progress of science and technology, the demand of well-trained chemists in different sectors such as manufacturing, regulatory and research centers is vital.

The following are some of the objectives of the undergraduate B.Sc. program in Applied Chemistry.

- Produce well trained and skilled chemists capable of taking up positions in the growing demand of the various sectors of the economy such as various industries, research institutions, learning institutions, as well as various environmental conservation endeavors of the country;
- Develop capabilities for the provision of consultancy and technical services as well as short term specialized training to both public and private sectors
- To produce chemists who create job opportunities by applying the acquired knowledge and skills.

To assure whether the objectives of the program are met or not, an exit exam is required in all government Universities. Exit exam is the last comprehensive exam students have to sit for before graduating in B.Sc. in Applied Chemistry. It is a test taken as part of the requirements for graduation from government Universities. It aims at determining the progress the student has made over the years. It also aims at checking, albeit indirectly, the program's effectiveness in delivering what it promised to deliver from the beginning.

## 2. Objectives of the Exit Examination

The Chemistry Applied 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 applied Chemistry.

- Ensuring whether the graduation profile of applied Chemistry curriculum have achieved at least common standards of knowledge and practical skills.
- Improving public trust and confidence in Chemistry Applied 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 spirit among applied Chemistry departments in Ethiopia with the aim of encouraging them to give due attention to the national standards.

### 3. Significance of the Document

It is important to set competency areas of the subject matter (program) in order to measure how much graduates are acquired with skills, knowledge and attitudes. 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 the exit exam;

To achieve the above mentioned objectives of the exit exam, five thematic areas are selected for the Exit Exam of Applied Chemistry. These are Analytical Chemistry, Inorganic Chemistry, Organic Chemistry, Physical Chemistry and Applied Chemistry. A total thirteen courses are selected in the five thematic areas. The courses that are given in parts are taken together as one.

## 4. Expected Profiles of Graduates

- To provide students with a broad and balanced foundation of chemical knowledge and practical skills.
- To develop the ability to apply chemical knowledge and skills to the solution of theoretical and practical problems in chemistry.
- To instill in students an appreciation of the importance of chemistry in an industrial, environmental and social context

## 5. Competencies and Learning Outcome

Graduates of Applied Chemistry are expected to develop the following knowledge, skills and attitudes.

### 5.1. Competencies

#### 5.1.1. Skill

- An ability to operate scientific instruments.
- organize tasks into a structured form
- Understand the evolving state of knowledge in a rapidly developing area
- Transfer appropriate knowledge and methods from one topic within the subject to another

#### 5.1.2. Knowledge

- Capacity for analysis and synthesis
- Apply fundamental concepts and techniques of chemistry
- Develop environmentally conscious attitude
- An ability to fulfill a multiplicity of roles as research scientist, quality control and as lab/unit/ manager.

#### 5.1.3. Attitude

- Have competences to fit them for entry-level graduate employment in the general workplace, including the chemical industry;
- Ability to work autonomously and Capacity for applying knowledge in practice
- Conduct assigned and professional activities with integrity and

professional ethics

## 5.2. Learning Outcome

- An ability to identify, formulate, and solve broadly defined technical and scientific problems by applying knowledge of mathematics and science and/or technical topics to Industrial Chemistry.
- Ability to formulate or design a system, process, procedure or program in chemical industries to meet desired needs.
- Synthesize, characterize and study chemical compounds
- An ability to develop and conduct experiments analyze and interpret data and use scientific judgment to draw conclusions.
- An ability to understand ethical and professional responsibilities and the impacts of technical and scientific solutions in global, economic, environmental, and societal contexts.
- Ability to demonstrate an understanding of major concepts in all five major disciplines of chemistry: analytical, Applied, inorganic, organic and physical.

## 6. Categorizing Courses into Themes

The Applied Chemistry courses are categorized into five thematic areas. They are:

1. Analytical Chemistry
2. Inorganic Chemistry
3. Organic Chemistry
4. Physical Chemistry
5. Applied Chemistry

## 7. Courses to be included in the Exit Exam

### 7.1. Analytical Chemistry

Course	Cr.hr.
7.1.1. Analytical Chemistry	3
7.1.2. Instrumental Analysis (I, II)	3 + 3
7.1.3. Practical Instrumental Analysis (I, II)	1 + 1
<b>7.1.4.</b> Real Sample Analysis	2

### 7.2. Inorganic Chemistry

Course	Cr.hr
<b>7.2.1.</b> Inorganic Chemistry (I, II)	3 + 3
7.2.2. Practical Inorganic Chemistry(I, II)	1 + 2

### 7.3. Organic Chemistry

Course	Cr.hr
7.3.1. Organic Chemistry (I, II)	3 + 3
7.3.2. Practical Organic Chemistry (I, II)	1 + 1

### 7.4. Physical Chemistry

Course	Cr. Hr.
7.4.1. Chemical Thermodynamics	3
7.4.2. Kinetic and Electrochemistry	3
7.4.3. Practical Physical Chemistry (I, II)	1 + 1

## 7.5. Applied Chemistry

Course	Cr.hr.
5.5.1. Industrial Chemistry (I, II)	3 + 3
5.5.2. Environmental Chemistry and Toxicology/Environmental Chemistry(ASTU)	3

### Conclusion

In this document, five thematic areas and thirteen courses selected for the exit exam in applied chemistry are presented. Exam questions based on the selected courses are believed to test the knowledge, the skills and attitudes that are expected as learning outcome for B.Sc. in Applied Chemistry.



Writers and Evaluators:

**Chemistry /Applied**

ለ2015 መጠ-ጫ ፈተና የተመረጡ ፕሮግራሞች ኮርስና ብቃት ልዩታና ተገቢነት ገምገማ ላይ የተሳተፉ መምህራንና ባለሙያዎች ዝርዝር

ተ.ቁ	ሙሉ ስም	የኒዩርስቴ	የተሳተፍ ዓይነት		ኢ.ግ.ይ.ል	ስልክ ቁ.	ፊርማ	ምርመራ
			አካል	ገምገማ				
R/C 1	አብይ ሙሉ	አካላዊ-የ	✓		W a a s t a o d e r e t assefa.sergawie	094489517	Am	
R/C 2	አያሌ ለመስገን	አያሌ የኒዩርስ	✓		ayalew19234@gmail.com	0913542233		
R/C 3	አብይ ገብረ	አብይ ገብረ		✓	fedulced130@gmail.com	09113018		
R/C 4	አብይ ወይን	አብይ ወይን		✓	stefant05@gmail.com	0910731731		
R/C 5	አብይ አብይ	አብይ አብይ		✓	kassim.kedir08@gmail.com	091701582		
R/C 6	አብይ አብይ	አብይ አብይ		✓	beamlakay@gmail.com	091191826		
R/C 7	አብይ አብይ	አብይ አብይ		✓	muletonaf@gmail.com	0934724082		
R/C 8	አብይ አብይ	አብይ አብይ		✓	S. Sait Ad@gmail.com	0922598889		
R/C 9	አብይ አብይ	አብይ አብይ		✓	MihretuSIO@gmail.com	0910119819		

Courses and Competencies Identified