Ministry of Education

Test Blueprint Manual for National Exit Examination

Band-3

Program: - Bachelor of Science Degree in optometry

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1. Introduction

The Ministry of Education of Ethiopia has announced the implementation of exit exam for all undergraduate program students (public and private), beginning with the 2022/2023 academic year, in order to improve the quality of graduates produced by higher institutions. The exit exam is aimed at assessing whether students have acquired the planned knowledge, skills and attitudes or not in optometry program. Optometry is one of medical science program which has internationally well framed core competencies focused on optical technology, visual function, diagnostics and therapeutics domains. For the current program of interest, five thematic areas namely, clinical Optometry, applied optics, Medical Optometry, optometry speciality and surgical Optometry were already identified. Based on the identified competency themes, developing test blueprint is considered as a means to implement the exit exam. The test blueprint will help to ensure tests: 1) Appropriately assess the achievement of instructional objectives of the course; 2) Appropriately reflect key course goals, objectives and the material learned or covered during the instruction period; and 3) Include the appropriate item formats along with the knowledge and skills being assessed. Keeping these in mind, the team has prepared this test blueprint document for optometry underregulate program.

The major points considered in the process of preparing this test blue print is the core competencies that have been already identified for the themes of courses, the course contents, course credit hours, and the learning outcomes with their corresponding levels of achievement by learning domains. In line with these, the percent of test items that should adequately assess the performance of students for all selected courses under a theme is determined.

2. Objective/ Significance of Test Blueprint Preparation

The main objectives of this test blueprint are as follows:

- To increase quality of education by ascertaining students' achievement through test;
- To make sure balanced test items for knowledge, attitude and skill domains;
- To address identified thematic areas through test items;
- To establish baseline platform for future use based on knowledge, skill, and attitude competencies

3. Expected Profile of the Graduates

A graduate's profile is a quality of the students that should be possessed by them after the completion of their intended program. Graduates' profile helps to determine the students' theoretical knowledge, practical skills, and behavioral attitude that they possess in optometric field. A graduate profile can be strengthened through experience after the graduates joining a work environment. In general, graduates are expected to have excellent knowledge, skill, and attitude in diagnosing and treating eye diseases, performing minor surgery, prescribing optical correction, planning and managing eye projects, and counseling patients. Generally, the program is aimed at producing graduates that can have adequate knowledge, skills and attitude towards eye conditions and their management. Specifically:

- Perform skilled refraction procedures
- Prescribe and dispense optical and non-optical devices for all indicated eye conditions
- Control the quality of optical service including the manufacturing
- Perform minor ocular surgical procedures
- Perform advanced diagnostic procedures
- Diagnose and manage ocular disease
- Prescribe topical and systemic medications to treat ocular diseases
- Perform preoperative and postoperative care

- Manage post- operative patients in inpatient department
- Give first line management to ocular emergencies
- Counsel and educate patients and their families
- Manage school eye health programs and actively engage in research activities.

4. Program Objectives

4.1. General Objective

- Communicate with the patient properly
- Apply eye examination to diagnose eye disease
- Plan appropriate management modalities for eye and or visual conditions
- Communicate with the patient properly
- Assess refractive status of the eye and visual function
- Plan appropriate management modalities for refractive error and or visual function disorders
- Understand theories, principals, procedures and techniques of refraction
- Understand the therapeutics, adverse effect, indication and contraindication of drugs pertaining for treatment of eye disease.
- Understand fundamental principles of ophthalmic lens
- Measure, interpret and dispense ophthalmic lens prescriptions
- Apply the basic science, optics, pathological and clinical foundations to diagnose and manage childhood eye disorders or diseases properly
- Understand basic optics and clinical application of contact lens
- Understand basics of low vision aids and its clinical application for low vision patients
- Understand the basic ophthalmic sciences, examination techniques, and interpretation of the findings for binocular vision disorders

- Understand ocular and visual disorders of the eyes with their respective epidemiology, Pathophysiology, clinical presentation, mode of diagnosis, and mode of management.
- Use knowledge and skills of ophthalmic diagnostics procedures and techniques to differentiate normal and abnormal conditions of the eye
- Understand basic concepts and clinical entity of ophthalmic surgeries and operation theatre

4.2. Specific Objectives

- Properly taking patient data
- Properly record and document patient data
- Formulate eye examination plan
- Perform indicated eye examination
- Analyze and interpret ocular findings
- Diagnose eye conditions
- Prescribe and administer drugs for treatment of ocular conditions
- Link and support patients for better management to appropriate service center
- Perform minor ocular surgeries
- Properly taking patient history pertaining to refractive error and or visual function
- Perform objective and subjective clinical refraction procedures and visual function tests proficiently
- Interpret refractive data and put accurate diagnosis
- Prescribe optical devices to treat refractive error and or visual functions
- Dispense optical devices prescribed for treatment of refractive error and or visual function disorder
- Understand and demonstrate the knowledge of the relevant basic visual science with regard to refractive error
- Understand the optics of refractive error and its clinical features
- Understand the optical basis of retinoscopy
- Recognize the fundamental procedures and techniques of clinical

refraction

- Understand the therapeutics effect of ocular drugs
- Identify ocular diagnostics drugs
- Recognize indication and contraindication ocular drugs
- Recognize the adverse effect of drugs applied for diagnostic and treatment purpose
- Understand the theoretical background in the design of modern spectacle frames and lenses.
- Use appropriate calculations to justify dispensing decisions and correctly dispense clinically
- Determine and measure ophthalmic lens parameters
- Analyze ophthalmic prescriptions
- Take accurate patient and frame measurement
- Glaze and fit spectacle lens
- Distinguish the dimensions between normal and abnormal visual &child development
- Recognize and evaluate clinical significance of typical presentation of childhood ocular conditions
- Differentiate etiologies of childhood eye disease
- Develop appropriate examination techniques and instruments for children and demonstrate pertinent procedures
- Understand all ranges of management options for childhood eye conditions
- Explain properties of contact lens materials and its design
- Demonstrate contact lens fitting, insertion and removal.
- Apply contact lenses to manage optical, cosmetic and none optical ocular abnormalities
- Recognize the ocular complications of contact lens and its management
- Characterize the optical basis of low vison aids
- Identify and demonstrate low vision examination techniques and procedures
- Determine low vision aids technologies

- Recognize rehabilitation and counselling mechanisms for low vision patients
- Identify investigative techniques and procedures for binocular vision
- Demonstrate how to evaluate binocular vision with objective and subjective methods
- Interpret test results of oculomotor and binocular vision examinations
- Identify all possible ranges of binocular vision disorders
- Apply basic anatomy and physiology of the eye to understand eye diseases
- Characterize and distinguish the epidemiological factors, aetiologias, pathophysiology, and clinical features of eye diseases
- Diagnose and differentiate possible ranges of eye diseases
- Explain management modalities of eye diseases
- Explain the principles of ophthalmic diagnostics instruments
- Explain clinical procedures and techniques of ophthalmic diagnostics procedures
- Demonstrate ophthalmic diagnostics procedures
- Determine relevant procedures for a patient
- Analyze and Interpret findings of ophthalmic diagnostics
- Demonstrate the knowledge on minor and major ophthalmic surgical procedures including the preoperative and postoperative management
- Demonstrate the knowledge on infection prevention in operation theater
- Demonstrate minor surgical procedures
- Identify preoperative and postoperative evaluation for ocular surgeries
- Recognize features and management intraoperative and postoperative ocular surgery complication

5. Themes and list of courses

Table 1. List of themes and courses identified

S. n	List of Themes	List of courses	ECTS
1	Clinical Optometry	Medical and surgical Optometric Practice I-II	29
		Clinical Refraction Practice and dispensing I-II	29
		Ocular pharmacology	5
		Clinical Refraction II	8
2	Applied Optics	Ophthalmic dispensing	6
3	Optometry specialty	Pediatric Optometry	5
		Contact lens	5
		Low vision and rehabilitation	5
		Binocular Vision	5
4	Medical Optometry	Ocular Disease I-II	10
		Ophthalmic diagnostics procedure and instrument I-II	10
5	Surgical Optometry	Ophthalmic Surgery and operation theatre	3
	Total ECTS		**120**

6. Share of the Themes/Courses/Items in Percentage (%)

a. Share of themes (T) = $\frac{a}{b} x 100$,Where “a” is the credit hour of a theme and “b” is the total credit hour of the program. Credit hour of a theme is the sum of credit hours of courses in the theme.

b. Share of courses per theme (C) =

$$\frac{Credit\,hour\,of\,the\,course}{Credit\,hour\,of\,the\,theme} x 100$$

c. Share of items per course =

$$Share\,of\,the\,course\,X\,Total\,number\,of\,items$$

d. knowledge, skill and attitude

Table 2: Share of the Themes/Courses/Items in Percentage (%)

Themes	Course Name	Learning outcomes	ECTS	Weight of course or proportion	Percent of test items from each course	Cognitive						Affective	Psychomotor	Total
						Rememb	Understa	Apply	Analyze	Evaluate	Create			
Clinical Optometry Share items = 59.16 % from the total items	Medical and surgical Optometric Practice I-II		29	29/71 = 0.41	0.41*59.16%= 24.26%	-		1	1	1	-	1	20.26	24.26%
	Clinical Refraction Practice and dispensing I-II		29	29/71 = 0.41	0.41*59.16%= 24.26%	-	2	2	2	2.24	-	4	12.02	24.26%
	Ocular Pharmacology		5	5/71 = 0.07	0.07*59.16%=4.14%	-	2	-	2.14	-	-	-	-	4.14%
	Clinical Refraction II		8	8/71 = 0.11	0.11*59.16% = 6.51%	-	1	2	2	0.66	-	0.2	0.651	6.51%
	Theme total ECTS		**71**											
Applied Optics Share = 5% from the total items	Ophthalmic Dispensing		6	6/6= 1	1*5%= 5%	-	1	1	1.25	1			0.75	5%
	Theme total ECTS		**6**											
Optometry specialty Share = 16.67% items from the total	Pediatric Optometry		5	5/20 = 0.25	0.25*16.67% = 4.17%	-	1	1	1	-	-	1	0.17	4.17%
	Contac lens		5	5/20= 0.25	0.25*16.67% = 4.16%	-	2	1	1	--	-	-	0.16	4.16%
	Low vision rehabilitation		5	5/20 = 0.25	0.25*16.67% = 4.17%	-	1	1	1	-	-	1	0.17	4.17%
	Binocular vision		5	5/20 = 0.25	0.25*16.67% = 4.17%	-	1	1	1	-	-	1	0.17	4.17%
	Theme total ECTS		**20**											
Medical optometry	Ocular disease I-II		**10**	10/20 = 0.50	0.50*16.67% = 8.34%	-	2	2.34	2	2	-	-	-	8.34%
	Ophthalmic diagnostics		**10**	10/20 = 0.50	0.50*16.67% = 8.33%	-	1	2	2	1	-	-	2.33	8.33%

Share = 16.67% items from the total	procedures and instrument I-II													
	Theme total ECTS		**20**											
Surgical optometry Share = 2.5% items from the total	Ophthalmic Surgery and operation theatre		**3**	3/3=1	1*2.5% = 2.5%	-	1	-	-	-		0.5	1	2.5%
	Theme total ECTS		3											
Total for the program			120				15	14.34	16.39	7.9	-	8.7	37.67	100

Note: The number of items assigned in the levels of domains is based on the nature of learning outcomes/objectives

7. Test blueprint Table (Table of Specification)

Themes	Name Courses	ECTS	Share of the themes in %	General Objective/ Expected Competencies to be measured	Specific Objectives/ Learning Outcomes	Competencies								No. of items
						Knowledge						Skill	Attitude	
						Rememberi	Understand	Application	Analysis	Evaluation	-			
Clinical Optometry	Medical and surgical Optometric Practice I-II	29	59.16	Communicate with the patient properly	Properly taking patient data	-		1	1	1	-	1	20.26	24.26%
					Properly record and document patient data									
				Apply eye examination to diagnose eye disease	Formulate eye examination plan									
					Perform indicated eye examination									
					Analyze and interpret ocular findings									
					Diagnose eye conditions									
				Plan appropriate management modalities for eye and or visual conditions	Prescribe and administer drugs for treatment of ocular conditions									
					Link and support patients for better management to appropriate service center									
					Perform minor ocular surgeries									
	Clinical Refraction Practice and dispensing I-II	29		Communicate with the patient properly	Properly taking patient history pertaining to refractive error and or visual function	-	2	2	2	2.24	-	4	12.02	24.26%

				Assess refractive status of the eye and visual function	Perform objective and subjective clinical refraction procedures and visual function tests proficiently									
					Interpret refractive data and put accurate diagnosis									
				Plan appropriate management modalities for refractive error and or visual function disorders	Prescribe optical devices to treat refractive error and or visual functions									
					Dispense optical devices prescribed for treatment of refractive error and or visual function disorder									
	Clinical Refraction II	8		Understand theories, principals, procedures and techniques of refraction	Understand and demonstrate the knowledge of the relevant basic visual science with regard to refractive error	-	1	2	2	0.66	-	0.2	0.651	6.51%
					Understand the optics of refractive error and its clinical features									
					Understand the optical basis of retinoscopy									
					Recognize the fundamental procedures and techniques of clinical refraction									
	Ocular pharmacology	5		Understand the therapeutics, adverse effect, indication and contraindication of drugs pertaining	Understand the therapeutics effect of ocular drugs	-	2	-	2.14	-	-	-	-	4.14%
					Identify ocular diagnostics drugs									
					Recognize indication and									

				for treatment of eye disease.	contraindication ocular drugs									
					Recognize the adverse effect of drugs applied for diagnostic and treatment purpose									
Applied Optics	Ophthalmic Dispensing	6	5%	Understand fundamental principles of ophthalmic lens	Understand the theoretical background in the design of modern spectacle frames and lenses.	-	1	1	1.2.5	1			0.75	5%
					Use appropriate calculations to justify dispensing decisions and correctly dispense clinically									
				Measure, interpret and dispense ophthalmic lens prescriptions	Determine and measure ophthalmic lens parameters									
					Analyze ophthalmic prescriptions									
					Take accurate patient and frame measurement									
					Glaze and fit spectacle lens									
Optometry specialty	Pediatric Optometry	5	16.67 %	Apply the basic science, optics, pathological and clinical foundations to diagnose and manage childhood eye disorders or diseases properly	Distinguish the dimensions between normal and abnormal visual &child development	-	1	1	1	-	-	1	0.17	4.17%
					Recognize and evaluate clinical significance of typical presentation of									

					childhood ocular conditions									
					Differentiate etiologies of childhood eye disease									
					Develop appropriate examination techniques and instruments for children and demonstrate pertinent procedures									
					Understand all ranges of management options for childhood eye conditions									
	Contact lens	5		Understand basic optics and clinical application of contact lens	Explain properties of contact lens materials and its design	-	2	1	1	--	-	-	0.16	4.16%
					Demonstrate contact lens fitting, insertion and removal.									
					Apply contact lenses to manage optical, cosmetic and none optical ocular abnormalities									
					Recognize the ocular complications of contact lens and its management									

	Low vision and rehabilitation	5		Understand basics of low vision aids and its clinical application for low vision patients	Characterize the optical basis of low vison aids	-	1	1	1	-	-	1	0.17	4.17%
					Identify and demonstrate low vision examination techniques and procedures									
					Determine low vision aids technologies									
					Recognize rehabilitation and counselling mechanisms for low vision patients									
	Binocular Vision	5		Understand the basic ophthalmic sciences, examination techniques, and interpretation of the findings for binocular vision disorders	Identify investigative techniques and procedures for binocular vision	-	1	1	1	-	-	1	0.17	4.17%
					Demonstrate how to evaluate binocular vision with objective and subjective methods									
					Interpret test results of oculomotor and binocular vision examinations									
					Identify all possible ranges of binocular vision disorders									
Medical Optometry	Ocular disease I-II	10	16.67 %	Understand ocular and visual disorders of the	Apply basic anatomy and physiology of the eye to understand eye diseases	-	2	2.3 4	2	2	-	-	-	8.34%
					Characterize and									

				eyes with their respective epidemiology, Pathophysiology, clinical presentation, mode of diagnosis, and mode of management.	distinguish the epidemiological factors, aetiologies, pathophysiology, and clinical features of eye diseases									
					Diagnose and differentiate possible ranges of eye diseases									
					Explain management modalities of eye diseases									
	Ophthalmic Diagnostics procedure and instrument I-II	10		Use knowledge and skills of ophthalmic diagnostics procedures and techniques to differentiate normal and abnormal conditions of the eye	Explain the principles of ophthalmic diagnostics instruments	-	1	2	2	1	-	-	2.33	8.33%
					Explain clinical procedures and techniques of ophthalmic diagnostics procedures									
					Demonstrate ophthalmic diagnostics procedures									
					Determine relevant procedures for a patient									
					Analyse and Interpret findings of ophthalmic diagnostics									
Surgical Optometry	Ophthalmic surgery and operation theatre	3	2.5%	Understand basic concepts and clinical entity of ophthalmic surgeries and operation theatre	Demonstrate the knowledge on minor and major ophthalmic surgical procedures including the preoperative and	-	1	-	-	-		0.5	1	2.5%

					postoperative management									
					Demonstrate the knowledge on infection prevention in operation theater									
					Demonstrate minor surgical procedures									
					Identify preoperative and postoperative evaluation for ocular surgeries									
					Recognize features and management intraoperative and postoperative ocular surgery complication									

8. Learning outcomes in terms of the three domains (Cognitive, Affective and Psychomotor)

R.No.	Themes	Course Name	ECTS	Share of Courses (%)	Share of Competencies (in %)			Remark
					Knowledge	Skill	Attitude	
1	Clinical Optometry	Medical and surgical Optometric Practice I-II	29	41	12.36	83.5	4.12	
		Clinical Refraction Practice and dispensing I-II	29	41	34	49.5	16.5	
		Ocular Pharmacology	5	7	100	-	-	
		Clinical Refraction II	8	11.3	87	10	3	
2	Applied Optics	Ophthalmic Dispensing	6	100	85	15	-	
3	Optometry specialty	Pediatric Optometry	5	25	72	4	24	
		Contac lens	5	25	96.2	3.8	-	
		Low vision rehabilitation	5	25	72	4	24	
		Binocular vision	5	25	72	4	24	
4	Medical Optometry	Ocular disease I-II	10	50	100	--	--	
		Ophthalmic diagnostics procedures and instrument I-II	10	50	72	28	--	
5	Surgical Optometry	Ophthalmic surgery and operation theatre	3	100	40	40	20	
		Total (Aggregate)	**120**					

9. Conclusion

This test blueprint is prepared based the identified thematic areas for national exit exam, which aims to develop balanced test items for the program. The test item composed of 16 courses with 120 ECTS weight. The courses are categorized in five thematic areas including clinical Optometry (59.16 %), Medical Optometry (16.67%), Optometry specialty (16.67 %), applied Optics (5.0 %), and surgical Optometry (2.5%).

Therefore, the test items for the national exit exam will be prepared based on the corresponding proportion and identified objectives stated under this test blueprint document.