



جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي



Description form Academic program colleges and institutes

University: Northern Technical University

College/Institute: College of Health and Medical Technologies /Al-Dour

Scientific Department: Optics techniques

Date of filling the file: 22/6/2025

signature:

Name of Department Head:

Dr. Abeer Talib Abdulqader

Date: 2025/6/22

signature:

Name of scientific assistant:

Dr. Luay Mannaa Ibrahim

Date: 2025/6/22

Check the file before

Division of Quality Assurance and University Performance

Name of the Director of the Quality Assurance and University

Performance Division: Dr. Ghassan Jasim Hadi

Date: 2025/6/22

:signature

Dean's endorsement
Dr. Maqsood Adil Mahmood

Description of The Academic program

This academic program description provides a summary of the most important characteristics of the program and the learning outcomes that the student is expected of achieve, demonstrating whether he or she has made the most of the opportunities available. It is accompanied by a description of each course within the program

Northern Technical University / Medical and Health Technical College / Al-Door	• Educational institution
Department of Optics techniques	• Scientific department/center
Optics techniques	• Name of the academic or professional program
Bachelor's degree in Medical Technology Optometrist	• Name of the final certificate
Courses	• system : Annual/courses/others
Program of the Ministry of Higher Education and Scientific Research	• Accredited accreditation program
Practical training in state institution conferences and , seminars	• Other external influences
2024/9/1	• Date the description was prepared
• Objectives of the academic program	
<p>The college's study aims to prepare a generation of graduates who have the ability to keep pace with development in the field of specialization and who have the ability and competence to provide services in public and private sector institution in a way that serves the community and its individuals, in addition to building their personalities, considering that they are in an advanced stage that differs from the preparatory stage, as it is the stage of Higher Education Construction and formation . stage.</p>	
• Required program outcomes and teaching, learning and evaluation methods	

Cognitive objectives

- A.1. Qualifying the student to apply knowledge in the medical fields in general and the field of optometry techniques in particular
- A.2. The student's knowledge of the professional and ethical principles and responsibilities of the field of specialization
- A.3. Striving to develop students' scientific skills and expand their cognitive awareness by providing ways to achieve the scientific and professional ambitions of the department's students
- A.4. The student learns leadership skills, commitment values, ethical behavior, and respect for others based on the program's skill objectives

B. Skills objectives of the programme

- B . 1 . Preparing students to work and integrate into multi-disciplinary teams.
- B . 2 . Providing medical services to sick citizens through various consultation clinics run by specialist doctors with the assistance of technical staff from the department's graduates
- B . 3 . Preparing students to use modern technologies, skills, and specialized tools in the field of optics techniques
- B . 4 . Qualifying the student to identify the patient's injury and the ability to carry the patient in the correct manner without complications from the injury

Teaching and learning method

Theoretical lectures / practical lectures / field visits / discussion circles / solving) (examples / graduation project / summer training

Evaluation methods

/ Daily tests / quarterly exams - final exams / weekly reports within the subject seminars within the academic subjects, discussions and conversations during the lesson

.C. Emotional and value goals

- C1 . The ability to communicate effectively with those involved in the field of specialization
- .C2 . Recognizing the need and ability to engage in lifelong education
- . C3 . Knowledge of contemporary issues in the field of specialization
- C4 . The broad education necessary to understand solutions at the global level and to the economic, social, and environmental problems of health institutions and their needs of specializations in rehabilitation and treatment of patients in specialized hospitals and consulting clinics

Teaching and learning methods

/ Theoretical lectures / discussion and dialogue / practical lectures / field visits)
discussion circles / laboratories / office activities / solving examples / graduation
.(project / summer training

Evaluation methods

(Oral exams / written exams / observation / student's cumulative record)

C.Affective and Value Objectives

C.1. The ability to communicate effectively with stakeholders in the field of specialization.

C.2. Recognition of the need and ability to engage in lifelong learning.

C.3. Awareness of contemporary issues in the field of specialization.

C.4. A broad education necessary for understanding global solutions and the socio-economic and environmental problems to support healthcare institutions based on their needs for specializations in rehabilitation and patient treatment in specialized hospitals and clinics.

Teaching and learning methods

(In-person learning), summer and vocational training, graduation projects, and
graduate lessons in computing and communication laboratories

Evaluation methods

Conducting daily, quarterly and final tests , submitting reports Weekly tests, in
addition to oral tests that express the ability to speak and communicate with others
. using modern dialogue techniques

• Program structure

Credit hours		Name of the course or course	Course or course code	Educational level
practical	theoretical			
-	2	English	NTU200	The second
1	1	Computer	NTU201	The second
-	2	Arabic Language	NTU202	The second
-	2	The crimes of the baath regime in iraq	NTU203	The second
-	2	Professional behaviour	NYU204	The second

-	2	Medical psychology	MTCD201	The second
2	2	Metabolism	MTCD202	The second
2	2	Biostatistics	MTCD203	The second
3	2	Physiology of the eye and vision	OPT201	The second
3	2	Physiology of the retina eye	OPT202	The second
4	2	Optical devices and tools	OPT203	The second
4	2	Advanced Optical Equipment	OPT204	The second
3	3	Ocular health	OPT205	The second
3	3	Eye problems	OPT206	The second
3	2	Refractive	OPT207	The second
-	2	pharmacology	OPT208	The second
2	2	Laser in ophthalmology	OPT209	The second
---	---	----	----	Third
---	---	----	----	Fourth

• Planning for personal development

- .Developmental and qualification courses to work in specialized centers
- .Training courses for working on the dialysis machine with advanced cadres
- Conducting scientific studies and research specialized in the field of vision examination
- . Attending specialized scientific seminars
- Correspondence and self-education

• Admission standard (establishing regulations related to admission to the college or institute

- Scientific section
- the average (GPA)

• The most important sources of information about the program

- .Methodical books
- . Additional sources such as the digital library and Internet sources
- Specialized scientific articles
- The library inside the college
- scientific messages

قسم تقنيات البصريات

المستوى الأول المحدث للعام الدراسي 2023-2024

حسب كتاب وزارة التعليم العالي والبحث العلمي / دائرة الدراسات والتخطيط / قسم الدراسات والتخطيط

ذي العدد ت م 3/4524 في 14/8/2023

وكتاب الجامعة التقنية الشمالية قسم الشؤون العلمية ذي العدد 7/2/10555 في 23/10/2023 وكتاب

الجامعة التقنية الشمالية / قسم الدراسات والتخطيط ذي العدد 7/2/11748 في 14/11/2023 وكتاب

الجامعة التقنية الشمالية قسم الدراسات والتخطيط ذي العدد 7/2/12398 في 29/11/2023

الخطة الدراسية للعام (2023-2024)								
القسم : تقنيات البصريات			الكلية التقنية الطبية الدور			الجامعة التقنية الشمالية		
المستوى الاول								
الرمز	الممهد ان وجد	الفصل الدراسي	عدد الوحدات	عدد الساعات العملية	عدد الساعات النظرية	اسم المقرر		نوع المتطلب
						باللغة الانكليزية	باللغة العربية	
NTU 100		ف1	2	-	2	Human rights and Democracy	حقوق الانسان والديمقراطية	المتطلبات الجامعية
NTU101		ف1	2	0	2	English Language	اللغة الانكليزية	
NTU102		ف2	2	1	1	Computer	الحاسوب	
NTU103		ف1	2	-	2	Arabic Language	اللغة العربية	
NTU112	يتم اختيار مادة واحدة	ف2	2	0	2	French Language	اللغة الفرنسية	
NTU113				1	1	Sports	التربية الرياضية	
27.8%	النسبة		10	1	5		مجموع وحدات الجامعة	
								متطلبات الكلية
0.0%	النسبة		0	0	0		مجموع وحدات الكلية	
OPT 101		ف1	4	4	2	Anatomy of the head and neck	تشريح الراس والرقبة	متطلبات القسم العلمي
OPT 102		ف2	4	4	2	Anatomy of the eye	تشريح العين	
OPT 103		ف1	3	3	2	Principles of Chemistry	مبادئ الكيمياء	
OPT 104		ف2	3	3	2	Biochemistry	الكيمياء الحياتية	
OPT 105		ف1	3	3	2	Principles of Medical Biology	مبادئ علم الاحياء الطبية	
OPT 106		ف2	3	3	2	Medical MicroBiology	أحياء مجهرية طبية	
OPT 107		ف1	3	3	2	Optical physics	الفيزياء البصرية	
OPT 108		ف2	3	3	2	Medical physics	الفيزياء الطبية	
72.2%	النسبة		26	26	16		مجموع وحدات القسم العلمي	
			36			مجموع وحدات المستوى الاول		

الخطة الدراسية للعام (2023-2024)								
القسم : تقنيات البصريات			الكلية التقنية الطبية الدور			الجامعة التقنية الشمالية		
المستوى الثاني								
الرمز	الممهد ان وجد	الفصل الدراسي	عدد الوحدات	عدد الساعات العملية	عدد الساعات النظرية	اسم المقرر		نوع المتطلب
						باللغة الانكليزية	باللغة العربية	
NTU200			2	0	2	English Language	اللغة الانكليزية	المتطلبات الجامعية (المعرفية)
NTU201			2	1	1	Computer	الحاسوب	
NTU202		ف1	2	-	2	Arabic Language	اللغة العربية	
NTU203			2	0	2		جرائم حزب البعث	
NTU204			2	-	2	Professional behaviour	اخلاقيات مهنة	
21.7%	النسبة		10	1	9		مجموع وحدات الجامعة	
MTCD201			2	-	2	Medical psychology	علم النفس الطبي	متطلبات الكلية
MTCD202			3	2	2	Metabolism	الايض الغذائي	
MTCD203			3	2	2	Biostatistics	احصاء حيوي	
MTCD204			مستوفي				التدريب الصيفي	
17.4%	النسبة		8	4	6		مجموع وحدات الكلية	
OPT201			3	3	2	Physiology of the eye and vision	فسلجة العين والرؤية	متطلبات القسم التخصصية
OPT202			3	3	2	Physiology of the retina eye	فسلجة شبكية العين	
OPT203			3	3	2	Optical devices and tools	أجهزة وأدوات بصرية	
OPT204			3	3	2	Advanced Optical Equipment	الاجهزة البصرية المتقدمة	
OPT205			4	3	3	Ocular health	صحة عينية	
OPT206			4	3	3	Eye problems	مشاكل العين	
OPT207			3	3	2	Refractive	الانكسار	
OPT208			2	-	2	pharmacology	علم الادوية	
OPT209			3	2	2	Laser in ophthalmology	الليزر في طب العيون	
60.9%	النسبة		28	23	20		مجموع وحدات القسم العلمي	
			46			مجموع وحدات المستوى الثاني		

الخطة الدراسية للعام (2024-2023)								
القسم : تقنيات البصريات			الكلية التقنية الطبية الدور			الجامعة التقنية الشمالية		
المستوى الثالث								
الرمز	الممهد ان وجد	الفصل الدراسي	عدد الوحدات	عدد الساعات العملية	عدد الساعات النظرية	اسم المقرر		نوع المتطلب
						باللغة الانكليزية	باللغة العربية	
NTU300			2	-	2	English Language	اللغة الإنكليزية	المتطلبات الجامعية (المتطلبات المعرفية)
5.7%	النسبة		2	0	2		مجموع وحدات الجامعة	
MTCD301			2	2	1	computer applications	تطبيقات الحاسوب	متطلبات الكلية
MTCD302			2	-	2	Safety in laboratories	الامان في المختبرات	
MTCD303			2	-	2	Medical research methods	طرق البحث الطبي	
MTCD304			مستوفي				التدريب الصيغي	
17.1%	النسبة		6	2	5		مجموع وحدات الكلية	المجموع
OPT301			3	3	2	Eye problems in internal diseases	مشاكل العين بالامراض الباطنية	متطلبات القسم التخصصية
OPT302			3	3	2	Eye problems in nervous diseases	مشاكل العين بالامراض العصبية	
OPT303			3	3	2	Prescription glasses	النظارات الطبية	
OPT304			3	3	2	Glasses Problems	مشاكل النظارات	
OPT305			3	3	2	Squint	الحول	
OPT306			3	3	2	Squint Problems	مشاكل الحول	
OPT307			4	4	2	Refractive Errors	أخطاء الانكسار	
OPT308			3	3	2	Optical Testing Devices	اجهزة فحص البصر	
OPT309			2	2	1	Treatment of ocular diseases by laser	علاج امراض العين بالليزر	
77.1%	النسبة		27	27	17		مجموع وحدات القسم العلمي	
			35			مجموع وحدات المستوى الثالث		

الخطة الدراسية للعام (2024-2023)								
القسم : تقنيات البصريات			الكلية التقنية الطبية الدور			الجامعة التقنية الشمالية		
المستوى الرابع								
الرمز	الممهد ان وجد	الفصل الدراسي	عدد الوحدات	عدد الساعات العملية	عدد الساعات النظرية	اسم المقرر		نوع المتطلب
						باللغة الانكليزية	باللغة العربية	
NTU401			2	-	2	English Language 4	اللغة الإنكليزية 4	المتطلبات الجامعية (المتطلبات المعرفية)
NTU400			2	-	2	Scientific research methodology	منهجية البحث العلمي	
10.3%	النسبة		4	0	4		مجموع وحدات الجامعة	
								متطلبات الكلية
MTCD402	يتم اختيار مادة واحدة		2	-	2	Preventive and social medicine	الطب الوقائي والاجتماعي	
MTCD403				-	2	Serology and Vaccines	علم الدم والامصال	
MTCD404			4	-	-	Graduation Project	مشروع بحث التخرج	
15.4%	النسبة		6	0	4		مجموع وحدات الكلية	
OPT401			3	3	2	Eye Diseases	امراض العين	متطلبات القسم التخصصية
OPT402			3	3	2	Diseases Retina	امراض شبكية العين	
OPT403			3	3	2	Squint Diagnosis	تشخيص الحول	
OPT404			3	3	2	Squint Treatment	علاج الحول	
OPT405			3	3	2	Glasses and contact lenses	نظارات وعدسات لاصقة	
OPT406			3	3	2	kind alternatives	بدائل عينية	
OPT407			3	3	2	Eye Prosthesis	العين الاصطناعية	
OPT408			3	3	2	Pediatric ophthalmology	طب عيون الأطفال	
OPT409			3	3	2	Eye rays and sonar	اشعة وسونار العين	
OPT410			2	4	-	Workshop of optical Technique	ورشة التقنيات البصرية	
74%	النسبة		29	31	18		مجموع وحدات القسم العلمي	
			39			مجموع وحدات المستوى الرابع		

			156			مجموع الوحدات الكلي لجميع المستويات		

Curriculum skills chart

Please tick the boxes corresponding to the individual learning outcomes from the program being assessed

Learning outcomes required from the programme

Transferable general and qualifying skills other skills related to) employability and (personal development				Emotional and value goals				Skills objectives of the programme				Cognitive objectives				Basic Or optional	Course Name	Course Code	Year/level
D4	D3	D2	D1	C4	C3	C2	C1	B4	B3	B2	B1	A4	A3	A2	A1				
A			Kh	Kh		s	n	Kh	K		n		n		K	Basic	human rights		The first stage
T		n		T		T			s		n				n	Basic	English		
T		A				A		n			Kh		K		n	Basic	Microscopic revival		The second phase
K		Kh		n									A	K	n	Basic	calculator		
	n					Kh		T			s			K	n	Basic	medical terminology		third level
	A			n				A			K			A	n	Basic	General chemistry		
M	n							Kh			K			Kh	n	Basic	Tissue		The fourth stage
M													K	Kh	n	assistant	Human physiology		

**/K/ Book N/ Theoretical T/ Report S/ Seminar M/ Project P
Practical**

Course Description: Refractive Errors

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether the student has made the most of the learning opportunities available. It must be linked to the programme description.

Northern Technical University/Health and Medical Technology/The role	• Educational institution
TechniquesOptics	• Scientific Department / Center
refractive errorsOPT207/	• Course Name/Code
In-person lectures	• Available attendance forms
2024-2023	• Chapter/Year
Theoretical 2 hours +3 hours of work.	• Number of study hours (total)
	• Date this description was prepared
• Course objectives	
Course objective for the course Refractive Errors	
The course on refractive errors aims to achieve the following objectives:	
1. Understanding the basic concepts: Introduce students to the concepts of refraction and how it affects light.	
2. Error Analysis: Teach students how to identify and analyze errors resulting from refraction in various applications.	
3. Practical applications: Developing students' skills in applying theoretical concepts to practical cases in fields such as optics, engineering, and physics.	

4. Developing critical thinking: Enhancing students' critical thinking by studying and analyzing real-life cases.

5. Modern techniques: Introduction to modern techniques used in measuring and analyzing refractive errors.

- Course outcomes, teaching, learning and assessment methods**

A.Cognitive objectives

Explaining the phenomena of refraction and its effect on light- Use measuring instruments to determine errors resulting from refraction. - Analyze data and provide solutions to problems related to refraction. - Apply the acquired knowledge in advanced fields of study or in the job market.

B. Course specific skill objectives.

Conduct practical experiments and analyze their data systematically.- Providing innovative solutions to refractive errors in practical applications. - Collaborating with colleagues in research projects and exchanging knowledge.

Teaching and learning methods

In-person education

Evaluation methods

Daily tests, midterm exams - final exams, weekly reports withinThe material,Seminars within the study materials,Discussions and conversations during the lesson.

G.Emotional and value goals.

G1– Developing and enhancing the thinking skill according to the student's ability and moving him to a higher level of thinking.

A2– The student should interact during the lecture.

A3– The student should listen carefully to the practical explanation in the laboratory.

Teaching and learning methods

((Theoretical lectures / discussion and dialogue / practical lectures / field visits / discussion groups / laboratories / office activities / solving examples / graduation project / summer training).

- Evaluation methods**

Daily, semester and final tests, weekly reports Patient seminars and clinical follow-up reports with practical discussions. Practical lesson in the hospital..

D.General and transferable skills (other skills related to employability and personal development).

D1.Collaboration and teamwork skills.

D2.Typing skills on the computer.

D3.English communication skills.

D4.Skills of enduring work performance and solving problems.

D5.Conversation skills On the Internet

Course structure

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Light		2 theoretical + 3 practical	the first
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Mirror and lens		2 theoretical + 3 practical	the second
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Visual Acuity (AV)		2 theoretical + 3 practical	the third
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Trial case		2 theoretical + 3 practical	Fourth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Retinoscope (Introduction, types of movement)		2 theoretical + 3 practical	Fifth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Retinoscope		2 theoretical + 3 practical	Sixth

Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Refractive error (Define and types of RE)		2 theoretical + 3 practical	Seventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Myopia (Sign and Symptoms)		2 theoretical + 3 practical	The eighth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Myopia		2 theoretical + 3 practical	Ninth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Hypermetropia (sign & symptoms)		2 theoretical + 3 practical	tenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Hypermetropia		2 theoretical + 3 practical	eleventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Astigmatism		2 theoretical + 3 practical	twelfth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Astigmatism (sign & symptoms)		2 theoretical + 3 practical	thirteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Astigmatism		2 theoretical + 3 practical	fourteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Revision		2 theoretical + 3 practical	fifteenth

• Infrastructure

	Presence of classrooms
	and G and specialized laboratories
	The presence of qualified cadres

- **Curriculum development plan**

The course is updated periodically to add materials that are in line with modern scientific developments..

Course description for the subject: Physiology of the Eye and Vision

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether the student has made the most of the learning opportunities available. It must be linked to the programme description.

Northern Technical University/Health and Medical Technology/The role	<ul style="list-style-type: none"> • Educational institution
TechniquesOptics	<ul style="list-style-type: none"> • Scientific Department / Center
Physiology of the eye and visionOPT201	<ul style="list-style-type: none"> • Course Name/Code
In-person lectures	<ul style="list-style-type: none"> • Available attendance forms
2024-2023	<ul style="list-style-type: none"> • Chapter/Year
Theoretical 2 hours +3 hours of work.	<ul style="list-style-type: none"> • Number of study hours (total)
	<ul style="list-style-type: none"> • Date this description was prepared
<ul style="list-style-type: none"> • Course objectives 	
<p>### Course objective for the course Physiology of the Eye</p> <ol style="list-style-type: none"> 1. Understand the anatomy of the eye: Identify the different parts of the eye and their functions. 2. Teaching the mechanisms of vision: studying how the eye processes light and converts it into nerve signals. 3. Explore physiological processes: Understand how the retina, macula, and rod and cone cells work. 4. Study lighting and adaptation: Understand how the eye adapts to different levels of lighting. 5. Vision Disorders Analysis: Identify some common disorders and how they affect vision. 	
<ul style="list-style-type: none"> • Course outcomes, teaching, learning and assessment methods 	
<p>A.Cognitive objectives Get to know:-</p> <ol style="list-style-type: none"> 1. Anatomical structure of the eye 2. Mechanism of eye action 3. The concept of vision 4. Visual physiology 5. Factors affecting vision 6. Visual disturbances 7. Eye-brain interaction 	

B. Course specific skill objectives.

1. ****Application of visual inspection techniques****
2. ****Visual Data Analysis****
3. ****Interpretation of clinical results****
4. ****Use of specialized medical devices****
5. ****Developing scientific research skills****
6. ****Perform simple physiological experiments****
7. ****Communicate effectively with patients about vision problems****

Teaching and learning methods

In-person education

Evaluation methods

Daily tests, midterm exams - final exams, weekly reports within The material, Seminars within the study materials, Discussions and conversations during the lesson.

G. Emotional and value goals.

G1– Developing and enhancing the thinking skill according to the student's ability and moving him to a higher level of thinking.

A2– The student should interact during the lecture.

A3– The student should listen carefully to the practical explanation in the laboratory.

Teaching and learning methods

((Theoretical lectures / discussion and dialogue / practical lectures / field visits / discussion groups / laboratories / office activities / solving examples / graduation project / summer training)).

• Evaluation methods

Daily, semester and final tests, weekly reports Patient seminars and clinical follow-up reports with practical discussions. Practical lesson in the hospital..

D. General and transferable skills (other skills related to employability and personal development).

D1. Collaboration and teamwork skills.

D2. Typing skills on the computer.

D3.English communication skills.

D4.Skills of enduring work performance and solving problems.

D5.Conversation skillsOn the Internet

Course structure

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Visual acuity		2 theoretical + 3 practical	the first
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Visual acuity cont.		2 theoretical + 3 practical	the second
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Binocular vision, benefits of having 2 eyes		2 theoretical + 3 practical	the third
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Optics and refraction of the image of the eye		2 theoretical + 3 practical	Fourth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Optics and refraction cont.the aging eye		2 theoretical + 3 practical	Fifth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Pupillary reflex		2 theoretical + 3 practical	Sixth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Eye movements, types & coordinated movements		2 theoretical + 3 practical	Seventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Eye movements, types & coordinated movements		2 theoretical + 3 practical	The eighth

Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Cornea and sclera, anatomy		2 theoretical + 3 practical	Ninth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Cornea and Seclera, cont. corneal transparency, responses to wounding		2 theoretical + 3 practical	tenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Cornea cont. wounding healing corneal nutrition vit.A& cornea		2 theoretical + 3 practical	eleventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	I'm bored		2 theoretical + 3 practical	twelfth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Aqueous humor and IO P		2 theoretical + 3 practical	thirteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments			2 theoretical + 3 practical	fourteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	The lens		2 theoretical + 3 practical	fifteenth

• Infrastructure

	Presence of classrooms
	andGAnd specialized laboratories
	The presence of qualified cadres

• Curriculum development plan

The course is updated periodically to add materials that are in line with modern scientific developments.

Course Description: Optical Devices

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether the student has made the most of the learning opportunities available. It must be linked to the programme description.

Northern Technical University/Health and Medical Technology/The role	<ul style="list-style-type: none">• Educational institution
TechniquesOptics	<ul style="list-style-type: none">• Scientific Department / Center
Optical devices /OPT204	<ul style="list-style-type: none">• Course Name/Code
In-person lectures	<ul style="list-style-type: none">• Available attendance forms
2024-2023	<ul style="list-style-type: none">• Chapter/Year

theoretical 2 hour + 4 My working hours.	<ul style="list-style-type: none"> Number of study hours (total)
	<ul style="list-style-type: none"> Date this description was prepared
<ul style="list-style-type: none"> Course objectives 	
<p>1. Understanding the physical fundamentals of optical devices: This course aims to provide students with a comprehensive understanding of the physical principles that control the operation of optical devices, such as refraction, reflection, and lenses.</p> <p>2. Applications of optical devices in everyday life: Aims to explore how optical devices are used in a variety of applications, including photography, microscopes, and lenses used in glasses.</p> <p>3. Optical Device Analysis and Design: Aims to develop students' skills in optical device analysis and design, including the use of specialized software and simulation to understand and improve optical performance.</p>	
<ul style="list-style-type: none"> Course outcomes, teaching, learning and assessment methods 	
<p>A. Cognitive objectives</p> <p>Get to know: -</p> <ol style="list-style-type: none"> 1. Explain the basic physical principles of optical devices. 2. Identify the types of optical devices and their different uses. 3. Analyze the influence of various factors on the performance of optical devices. 	
<p>B. Course specific skill objectives.</p> <ol style="list-style-type: none"> 1. Application of visual inspection techniques 2. Visual data analysis 3. Interpretation of clinical results 4. Use of specialized medical devices 5. Develop scientific research skills 6. Perform simple physiological experiments. 	
Teaching and learning methods	
In-person education	
Evaluation methods	
Daily tests, midterm exams - final exams, weekly reports within The material, Seminars within the study materials, Discussions and conversations during the lesson.	
<p>G. Emotional and value goals.</p> <p>G1– Developing and enhancing the thinking skill according to the student's ability and moving him to a higher level of thinking.</p> <p>A2– The student should interact during the lecture.</p>	

A3– The student should listen carefully to the practical explanation in the laboratory.

Teaching and learning methods

((Theoretical lectures / discussion and dialogue / practical lectures / field visits / discussion groups / laboratories / office activities / solving examples / graduation project / summer training).

• Evaluation methods

Daily, semester and final tests, weekly reports Patient seminars and clinical follow-up reports with practical discussions. Practical lesson in the hospital.

D.General and transferable skills (other skills related to employability and personal development).

D1.Collaboration and teamwork skills.

D2.Typing skills on the computer.

D3.English communication skills.

D4.Skills of enduring work performance and solving problems.

D5.Conversation skills On the Internet

Course structure

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Introduction and general information		2 theory +4practical	the first
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	General consideration for maintaining ophthalmic instruments and ophthalmic instruments decontamination		2theory +4practical	the second
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Ophthalmic instruments decontamination: (cleaning,		2 theory +4practical	the third

		Disinfection, inspection, packaging, sterilization, transport)			
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	risk of transmission of infection in devices used in clinic Tonometry, diagnostic contact lenses, contact lenses		2 theory +4practical	Fourth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Risk of transmission of infection in devices used in clinic Tonometry, diagnostic contact lenses, contact lenses		2 theory +4practical	Fifth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Test charts and trial case and frame		2 theory +4practical	Sixth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Test charts and trial case and frame		2 theory +4practical 1	Seventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Retinoscope		2 theory +4practical 1	The eighth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Auto refractometer		2 theory +4practical 1	Ninth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Auto refractometer		2 theory +4practical 1	tenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Test charts and trial case and frame		2 theory +4practical 1	eleventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Test charts and trial case and frame		2 theory +4practical 1	twelfth

Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Tonometer types, contact and non-contact		2 theory +4practical	thirteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Tonometer types, contact and non-contact		2 theory +4practical	fourteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Revision		2 theory +4practical	fifteenth

• Infrastructure

	Presence of classrooms
	GA and specialized laboratories
	The presence of qualified cadres

• Curriculum development plan

The course is updated periodically to add materials that are in line with modern scientific developments..

Course Description: Eye Health

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether the student has made the most of the learning opportunities available. It must be linked to the programme description.

Northern Technical University/Health and Medical Technology/The role	• Educational institution
TechniquesOptics	• Scientific Department / Center
Eye healthOPT205	• Course Name/Code
In-person lectures	• Available attendance forms
2024-2023	• Chapter/Year
theoretical3hour + 3My working hours.	• Number of study hours (total)
	• Date this description was prepared
• Course objectives	
<ol style="list-style-type: none">1. Understand the basics of eye health: Learn about the importance of eye health and its impact on quality of life.2. Identify eye diseases: Identify common eye diseases, such as cataracts, glaucoma, and eye infections.3. Teaching prevention methods: Learn about methods of preventing eye diseases, including regular check-ups and a healthy lifestyle.4. Develop practical skills: acquire skills in eye examination and vision assessment.5. Raising community awareness: enhancing awareness about the importance of eye health in the community and appropriate awareness methods.	
• Course outcomes, teaching, learning and assessment methods	

A.Cognitive objectives

- 1. Knowledge of eye anatomy: Understanding the anatomical structure of the eye, its parts and functions.**
- 2. Understanding the functions of the eye: Learn how the eye works in the process of vision.**
- 3. Recognizing eye diseases: Knowing the causes, symptoms, and causative factors of common eye diseases.**
- 4. Knowledge of examination methods: Learn about the different methods of eye examination, including clinical examinations and modern techniques.**
- 5. Understanding the impact of environmental factors: Know how environmental factors and lifestyle affect eye health.**
- 6. Knowledge of treatment and prevention: Learn about the different treatment options for eye diseases and ways to prevent them.**
- 7. Understand the importance of regular checkups: Realize the importance of regular checkups for early detection of eye problems.**

B. Course specific skill objectives.

- Develop clinical examination skills and acquire the ability to perform basic eye examinations.**
- Use medical equipment and learn how to use tools and devices used to diagnose eye problems.**
- Apply treatment techniques and acquire the skills necessary to apply basic treatments such as using eye drops correctly.**

Teaching and learning methods

In-person education

Evaluation methods

Daily tests, midterm exams - final exams, weekly reports withinThe material,Seminars within the study materials,Discussions and conversations during the lesson.

G.Emotional and value goals.

G1– Developing and enhancing the thinking skill according to the student's ability and moving him to a higher level of thinking.

A2– The student should interact during the lecture.

A3– The student should listen carefully to the practical explanation in the laboratory.

Teaching and learning methods

((Theoretical lectures / discussion and dialogue / practical lectures / field visits / discussion groups / laboratories / office activities / solving examples / graduation project / summer training)).

• **Evaluation methods**

Daily, semester and final tests, weekly reports Patient seminars and clinical follow-up reports with practical discussions. Practical lesson in the hospital..

D.General and transferable skills (other skills related to employability and personal development).

D1.Collaboration and teamwork skills.

D2.Typing skills on the computer.

D3.English communication skills.

D4.Skills of enduring work performance and solving problems.

D5.Conversation skills On the Internet

Course structure

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Introduction: review of anatomy & physiology of the eye		3 theoretical + 3 practical	the first
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Introduction: history & examination of the eye		3 theoretical + 3 practical	the second
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Introduction: certain ophthalmic terms.(terminology)		3 theoretical + 3 practical	the third
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Primary eye care		3 theoretical + 3 practical	Fourth
Reports, oral and written	whiteboard, powerpoint slides,	Primary eye care		3 theoretical	Fifth

theoretical exams	hands-on experiments			+ 3 practical	
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Screening procedures in ophthalmology		3 theoretical + 3 practical	Sixth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Screening procedures in ophthalmology		3 theoretical + 3 practical	Seventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	School eye screening programs		3 theoretical + 3 practical	The eighth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Concept of community ophthalmology sticky eye, watery eye		3 theoretical + 3 practical	Ninth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Concept of community ophthalmology flashes of light, floating object		3 theoretical + 3 practical	tenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	in visual field Concept of community ophthalmology long term glaucoma monitoring		3 theoretical + 3 practical	eleventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	The epidemiology of blindness (general principles)		3 theoretical + 3 practical	twelfth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	The epidemiology of blindness (disease specific strategy)		3 theoretical + 3 practical	thirteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	The right to sight (vision 2020)		3 theoretical + 3 practical	fourteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Revision		3 theoretical + 3 practical	fifteenth

• Infrastructure

	Presence of classrooms
	GA and specialized laboratories
	The presence of qualified cadres

- **Curriculum development plan**

The course is updated periodically to add materials that are in line with modern scientific developments..

Course Description: Biostatistics

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether the student has made the most of the learning opportunities available. It must be linked to the programme description.

Northern Technical University/Health and Medical Technology/The role	• Educational institution
TechniquesOptics	• Scientific Department / Center
Vital statistics /MTCD203	• Course Name/Code
In-person lectures	• Available attendance forms
2024-2023	• Chapter/Year
theoretical2hour + 2My working hours.	• Number of study hours (total)
	• Date this description was prepared
• Course objectives	
<ul style="list-style-type: none">- Understand the basic concepts of biostatistics and their applications in health fields.- Identify the types of statistical data and methods of collecting and analyzing them.- Knowledge of statistical methods used in the analysis of biological and medical data.- Understand the concepts of probability and their importance in biostatistics.	
• Course outcomes, teaching, learning and assessment methods	
A.Cognitive objectives <ul style="list-style-type: none">- Enhancing the ability to make decisions based on statistical data.- Developing critical thinking skills when evaluating statistical studies and research.- Encourage teamwork and cooperation in statistical research projects.- Promote adherence to ethical standards in data collection and analysis.	

B. Course specific skill objectives.

- Acquire skills in using statistical programs to analyze data, such as:SPSS or R.
- Develop the ability to design experiments and statistical studies correctly.
- Apply appropriate statistical methods to analyze data and extract results.
- Improving skills in interpreting statistical results and writing scientific reports.

Teaching and learning methods

In-person education

Evaluation methods

Daily tests, midterm exams - final exams, weekly reports withinThe material,Seminars within the study materials,Discussions and conversations during the lesson.

G.Emotional and value goals.

G1– Developing and enhancing the thinking skill according to the student’s ability and moving him to a higher level of thinking.

A2– The student should interact during the lecture.

A3– The student should listen carefully to the practical explanation in the laboratory.

Teaching and learning methods

((Theoretical lectures / discussion and dialogue / practical lectures / field visits / discussion groups / laboratories / office activities / solving examples / graduation project / summer training).

• Evaluation methods

Daily, semester and final tests, weekly reportsPatient seminars and clinical follow-up reports with practical discussions. Practical lesson in the hospital..

D.General and transferable skills (other skills related to employability and personal development).

D1.Collaboration and teamwork skills.

D2.Typing skills on the computer.

D3.English communication skills.

D4.Skills of enduring work performance and solving problems.

D5.Conversation skillsOn the Internet

Course structure

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Introduction Objectives Of Statistics, The Major Objectives Of Statistics,		2 theory +2practical	the first
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Classification Of Statistics, Stages Of Statistical Method in Scientific Research Sources of Data collection		2 theory +2practical	the second
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	ources of Data collection		2 theory +2practical	the third
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Samples: Introduction,		2 theory +2practical	Fourth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Types of Samples		2 theory +2practical	Fifth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Types of data: Introduction, constant data, variables, Types of variables.		2 theory +2practical	Sixth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Data display: Introduction, Display data numerically as Simple display or Raw data, Ordered		2 theory +2practical	Seventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Display or Array, Data display frequency table		2 theory +2practical	The eighth
Reports, oral and written	whiteboard, powerpoint slides,	Display data graphically		2 theory +2practical	Ninth

theoretical exams	hands-on experiments				
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Measures of central tendency		2 theory +2practical	tenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Measures of Dispersion		2 theory +2practical	eleventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Measures of Skewness		2 theory +2practical	twelfth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Kurtosis		2 theory +2practical	thirteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	General Review		2 theory +2practical	fourteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Revision		2 theory +2practical	fifteenth

• Infrastructure

	Presence of classrooms
	and G and specialized laboratories
	The presence of qualified cadres

• Curriculum development plan

The course is updated periodically to add materials that are in line with modern scientific developments..

Course Description: Pharmacology

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether the student has made the most of the learning opportunities available. It must be linked to the programme description.

Northern Technical University/Health and Medical Technology/The role	• Educational institution
TechniquesOptics	• Scientific Department / Center
PharmacologyOPT208	• Course Name/Code
In-person lectures	• Available attendance forms
2024-2023	• Chapter/Year
theoretical2hour	• Number of study hours (total)
	• Date this description was prepared
• Course objectives	
<ul style="list-style-type: none">- Promote awareness of ethical responsibility in the practice of pharmacology.- Develop communication skills with patients to explain the use of medications and methods of their administration.- Encouraging teamwork in research projects related to pharmacology.- Enhancing commitment to safety standards in the storage and use of medicines.	
• Course outcomes, teaching, learning and assessment methods	
A.Cognitive objectives <ul style="list-style-type: none">- Understand the basic concepts of pharmacology and the mechanism of action of drugs in the body.- Identify different types of medications, including therapeutic and preventive medications.- Knowing the potential side effects of medications and how to manage them.- Understand the principle of dosage and how to determine the appropriate dosage for each medication.	

B. Course specific skill objectives.

- Acquire skills to evaluate drug interactions with other drugs and with foods.
- Develop the ability to read and understand prescriptions and drug leaflets.
- Applying scientific knowledge in selecting appropriate medications for specific medical conditions.
- Improving skills in using databases and scientific sources to search for pharmaceutical information.

Teaching and learning methods

In-person education

Evaluation methods

Daily tests, midterm exams - final exams, weekly reports within The material, Seminars within the study materials, Discussions and conversations during the lesson.

G. Emotional and value goals.

G1– Developing and enhancing the thinking skill according to the student's ability and moving him to a higher level of thinking.

A2– The student should interact during the lecture.

A3– The student should listen carefully to the practical explanation in the laboratory.

Teaching and learning methods

((Theoretical lectures / discussion and dialogue / practical lectures / field visits / discussion groups / laboratories / office activities / solving examples / graduation project / summer training)).

• Evaluation methods

Daily, semester and final tests, weekly reports Patient seminars and clinical follow-up reports with practical discussions. Practical lesson in the hospital..

D. General and transferable skills (other skills related to employability and personal development).

D1. Collaboration and teamwork skills.

D2. Typing skills on the computer.

D3. English communication skills.

D4. Skills of enduring work performance and solving problems.

D5. Conversation skills On the Internet

Course structure

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Principles of Drug Therapy		2theoretical	the first
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Drugs Affecting the Autonomic Nervous System-I		2theoretical	the second
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Drugs Affecting the Autonomic Nervous System-II		2theoretical	the third
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Drugs Affecting the Central Nervous System		2theoretical	Fourth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Drugs Affecting the Cardiovascular System -I		2theoretical	Fifth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Drugs Affecting the Cardiovascular System - II		2theoretical	Sixth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Drugs Affecting the Endocrine System Chemotherapeutic Drugs-I		2theoretical	Seventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Chemotherapeutic Drugs -II		2theoretical	The eighth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Anti-inflammatory, Antipyretic, and Analgesic Agents		2theoretical	Ninth

Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Gastrointestinal and Antiemetic Drugs		2theoretical	tenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Drugs for Disorders of the Respiratory System		2theoretical	eleventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Anti-inflammatory, Antipyretic, and Analgesic Agents		2theoretical	twelfth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Anti-inflammatory, Antipyretic, and Analgesic Agents		2theoretical	thirteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Drugs of Abuse		2theoretical	fourteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides	Principles of Drug Therapy		2theoretical	fifteenth

• Infrastructure

	Presence of classrooms andGAnd specialized laboratories
	The presence of qualified cadres

• Curriculum development plan

The course is updated periodically to add materials that are in line with modern scientific developments..

Course Description: Laser in Ophthalmology

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether the student has made the most of the learning opportunities available. It must be linked to the programme description.

Northern Technical University/Health and Medical Technology/The role	• Educational institution
TechniquesOptics	• Scientific Department / Center
Laser in ophthalmologyOPT209	• Course Name/Code
In-person lectures	• Available attendance forms
2024-2023	• Chapter/Year
theoretical2hour + 2My working hours.	• Number of study hours (total)
	• Date this description was prepared
• Course objectives	
<ul style="list-style-type: none">- Raising awareness of the importance of using lasers to improve eye health and vision.- Develop communication skills with patients to explain laser treatment procedures and its benefits.- Encourage teamwork in medical teams to apply laser technologies effectively.- Commitment to medical practice ethics and safety when using laser techniques.	
• Course outcomes, teaching, learning and assessment methods	
A.Cognitive objectives <ul style="list-style-type: none">- Understand the basic principles of laser technology and its mechanism of action in ophthalmology.- Identify the types of lasers used in treating eye diseases, such as non-surgical lasers and surgical lasers.- Knowledge of the clinical applications of lasers in the treatment of various conditions, such as cataracts, glaucoma, and retinopathy.- Study the side effects and potential risks of using lasers in the eyes.	

B. Course specific skill objectives.

- Acquire skills to use laser devices correctly and safely.
- Developing the ability to evaluate medical conditions that require the use of laser.
- Applying laser techniques in performing various operations under medical supervision.
- Improve skills in analyzing and interpreting the results of laser treatments.

Teaching and learning methods

In-person education

Evaluation methods

Daily tests, midterm exams - final exams, weekly reports within The material, Seminars within the study materials, Discussions and conversations during the lesson.

G. Emotional and value goals.

G1– Developing and enhancing the thinking skill according to the student's ability and moving him to a higher level of thinking.

A2– The student should interact during the lecture.

A3– The student should listen carefully to the practical explanation in the laboratory.

Teaching and learning methods

((Theoretical lectures / discussion and dialogue / practical lectures / field visits / discussion groups / laboratories / office activities / solving examples / graduation project / summer training)).

• Evaluation methods

Daily, semester and final tests, weekly reports Patient seminars and clinical follow-up reports with practical discussions. Practical lesson in the hospital..

D. General and transferable skills (other skills related to employability and personal development).

D1. Collaboration and teamwork skills.

D2. Typing skills on the computer.

D3. English communication skills.

D4. Skills of enduring work performance and solving problems.

D5. Conversation skills On the Internet

Course structure

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Lasers definition characteristics applications in eye		2 theory +2practical	the first
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Laser in medicine •Advantage disadvantage		2 theory +2practical	the second
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Types of Laser in medicine Excimer lasers (LASIK) Double frequency Nd/yag laser		2 theory +2practical	the third
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Microplus laser		2 theory +2practical	Fourth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Femtosecond		2 theory +2practical	Fifth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	laser Laser Safety		2 theory +2practical	Sixth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Laser treatment for eyes (tissues and diseases)		2 theory +2practical	Seventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Laser tissue interaction		2 theory +2practical	The eighth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	laser in diagnostics (OCT)		2 theory +2practical	Ninth

Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Confocal scanning laser ophthalmoscopy (CSLO)		2 theory +2practical	tenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Laser doppler flowmetry (LDF)		2 theory +2practical	eleventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Photo Refractive Keratectomy (PRK)		2 theory +2practical	twelfth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Laser treatment for eyes (tissues and diseases)		2 theory +2practical	thirteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Retinal Laser treatment		2 theory +2practical	fourteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Revision		2 theory +2practical	fifteenth

• Infrastructure

	Presence of classrooms andGAnd specialized laboratories
	The presence of qualified cadres

• Curriculum development plan

The course is updated periodically to add materials that are in line with modern scientific developments..

Course Description

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether the student has made the most of the learning opportunities available. It must be linked to the programme description.

Northern Technical University/Health and Medical Technology/The role	<ul style="list-style-type: none"> • Educational institution
Techniques Optics	<ul style="list-style-type: none"> • Scientific Department / Center
Laser in ophthalmology OPT209	<ul style="list-style-type: none"> • Course Name/Code
In-person lectures	<ul style="list-style-type: none"> • Available attendance forms
2024-2023	<ul style="list-style-type: none"> • Chapter/Year
Theoretical 2hour + 2 My working hours.	<ul style="list-style-type: none"> • Number of study hours (total)
	<ul style="list-style-type: none"> • Date this description was prepared
<ul style="list-style-type: none"> • Course objectives 	
<ul style="list-style-type: none"> - Raising awareness of the importance of using lasers to improve eye health and vision. - Develop communication skills with patients to explain laser treatment procedures and its benefits. - Encourage teamwork in medical teams to apply laser technologies effectively. - Commitment to medical practice ethics and safety when using laser techniques. 	
<ul style="list-style-type: none"> • Course outcomes, teaching, learning and assessment methods 	
A.Cognitive objectives <ul style="list-style-type: none"> - Understand the basic principles of laser technology and its mechanism of action in ophthalmology. - Identify the types of lasers used in treating eye diseases, such as non-surgical lasers and surgical lasers. - Knowledge of the clinical applications of lasers in the treatment of various conditions, such as cataracts, glaucoma, and retinopathy. - Study the side effects and potential risks of using lasers in the eyes. 	
B. Course specific skill objectives. <ul style="list-style-type: none"> - Acquire skills to use laser devices correctly and safely. - Developing the ability to evaluate medical conditions that require the use of laser. - Applying laser techniques in performing various operations under medical supervision. - Improve skills in analyzing and interpreting the results of laser treatments. 	
Teaching and learning methods	
In-person education	
Evaluation methods	
Daily tests, midterm exams - final exams, weekly reports within The material, Seminars within the study materials, Discussions and conversations during the lesson.	

G. Emotional and value goals.

G1– Developing and enhancing the thinking skill according to the student's ability and moving him to a higher level of thinking.

A2– The student should interact during the lecture.

A3– The student should listen carefully to the practical explanation in the laboratory.

Teaching and learning methods

((Theoretical lectures / discussion and dialogue / practical lectures / field visits / discussion groups / laboratories / office activities / solving examples / graduation project / summer training).

• Evaluation methods

Daily, semester and final tests, weekly reports Patient seminars and clinical follow-up reports with practical discussions. Practical lesson in the hospital..

D.General and transferable skills (other skills related to employability and personal development).

D1.Collaboration and teamwork skills.

D2.Typing skills on the computer.

D3.English communication skills.

D4.Skills of enduring work performance and solving problems.

D5.Conversation skills On the Internet

Course structure

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Lasers definition characteristics applications in eye		2 theory +2practical	the first
Reports, oral and written	whiteboard, powerpoint slides,	Laser in medicine •Advantage disadvantage		2 theory +2practical	the second

theoretical exams	hands-on experiments				
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Types of Laser in medicine Excimer lasers (LASIK) Double frequency Nd/yag laser		2theory +2practica 1	the third
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Microplus laser		2 theory +2practica 1	Fourth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Femtosecond		2 theory +2practica 1	Fifth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	laser Laser Safety		2 theory +2practica 1	Sixth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Laser treatment for eyes (tissues and diseases)		2 theory +2practica 1	Seventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Laser tissue interaction		2 theory +2practica 1	The eighth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	laser in diagnostics (OCT)		2 theory +2practica 1	Ninth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Confocal scanning laser ophthalmoscopy (CSLO)		2 theory +2practica 1	tenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Laser doppler flowmetry (LDF)		2 theory +2practica 1	eleventh
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Photo Refractive Keratectomy (PRK)		2 theory +2practica 1	twelfth
Reports, oral and written	whiteboard, powerpoint slides,	Laser treatment for eyes (tissues and diseases)		2 theory +2practica 1	thirteenth

theoretical exams	hands-on experiments				
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Retinal Laser treatment		2 theory +2practical	fourteenth
Reports, oral and written theoretical exams	whiteboard, powerpoint slides, hands-on experiments	Revision		2 theory +2practical	fifteenth

- Infrastructure**

	Presence of classrooms
	andGAnd specialized laboratories
	The presence of qualified cadres

- Curriculum development plan**

The course is updated periodically to add materials that are in line with modern scientific developments.