Optometry and Vision Science

LM-17

a.y. 2026/27

OPTICS AND OPTOMETRY
RESEARCH CENTER
UNIVERSITY OF MILANO BICOCCA

OUTLINE

- Overview
- E-learning
- LAB
- Courses
- Admission

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120 cfu (ECTS)

60 cfu exams + 12 cfu student's choice + 48 cfu

(10 exams) (2 exams)

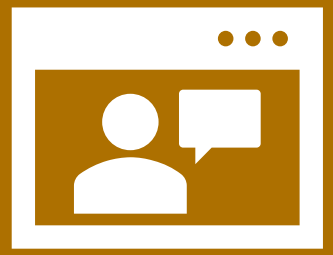
- full-time: 2 years
- part-time: 4 years

English & Blended

NO limited number, but INTERVIEW

Blended Modality

Lessons IN-PERSON



Video-recorded

e-tivities DISTANCE

synchronous or asynchronous e-tivity

LAB IN-PERSON

concentrated periods

YEAR	ECTS	STRUCTURE		
1	6	5 mandatory exams	Optometric Investigative Techniques – I	I sem
	6		History and Techniques of Contemporary Optometry	
	6		Visual Ergonomics	
	6		Physics of Vision	
	6		Mathematical Computational Methods for Optics	
	6	I mandatory exam	Psychometrics and Quantitative Methods	II sem
	6+6	2 exams to be selected in a list of 5 courses	Optometric Investigative Techniques – II Optometry and Low Vision Specialty Contact Lenses Adaptive Optics Materials Spectroscopy and Microscopy	
	12	12 cfu student's choice	Elective courses	
	3	Additional language skills		
2	6	I mandatory exam	Optical Properties of Materials	
	6	I exam to be selected in a list of 3 courses	Introduction to digital imaging and computer visiom Virtual and Augmented Reality Visual Neurosciences	
	45	Stage + final exam		

YEAR	ECTS	STRUCTURE PART-TIME		
1	6	**2 mandatory exams**	Optometric Investigative Techniques – I	I sem
	6		Visual Ergonomics	
	6	**1 mandatory exam**	Psychometrics and Quantitative Methods	II sem
	6+6	**2 exams to be selected in a list of 5 courses**	Optometric Investigative Techniques – Ii Optometry and Low Vision Specialty Contact Lenses Adaptive Optics Materials Spectroscopy and Microscopy	
2	6	**3 mandatory exams**	Physics of Vision	I sem
	6		Mathematical and Computational Methods for Optics	
	6		History and Techniques of Contemporary Optometry	
	12	**12 cfu student's choice**	Elective courses	II sem
	3	**Additional language skills**		
3	6	**I mandatory exam**	Optical Properties of Materials	
4	6	**I exam to be selected in a list of 3 courses**	Introduction to digital imaging and computer visiom Virtual and Augmented Reality Visual Neurosciences	
3-4	45	**Stage + final exam**		

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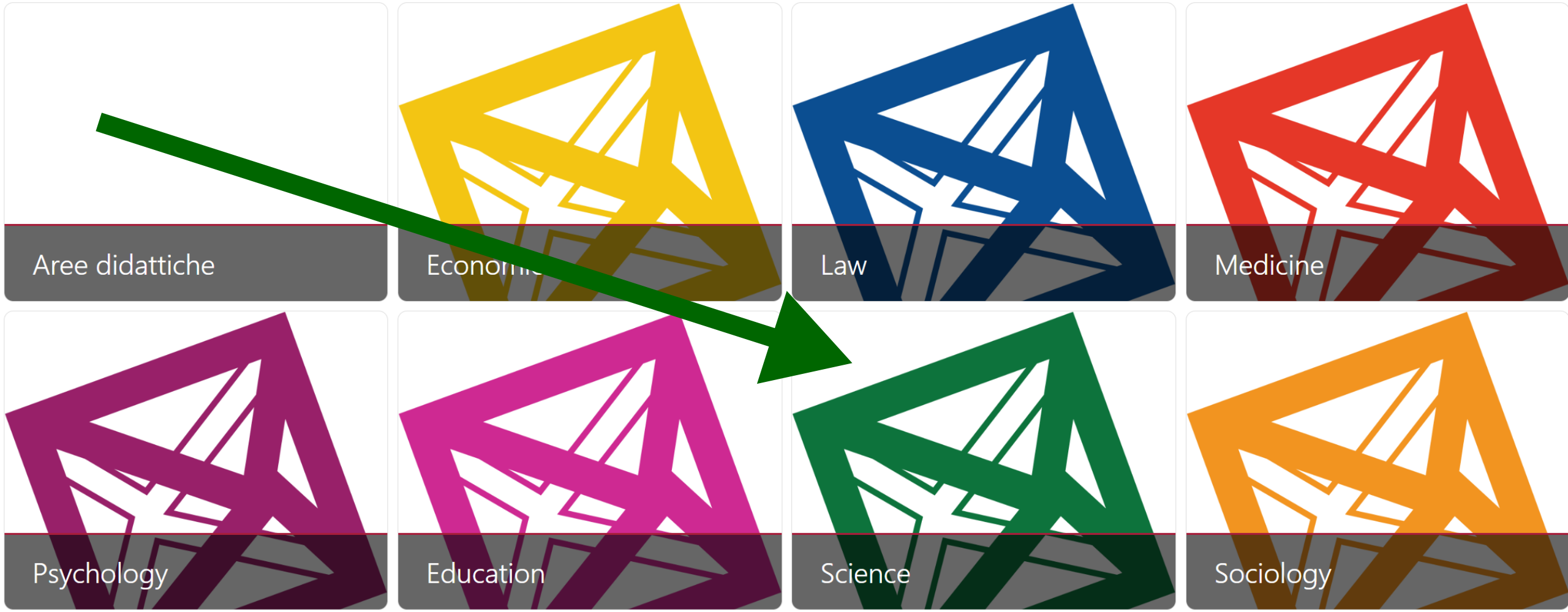
Home https://elearning.unimib.it English (en) Log in

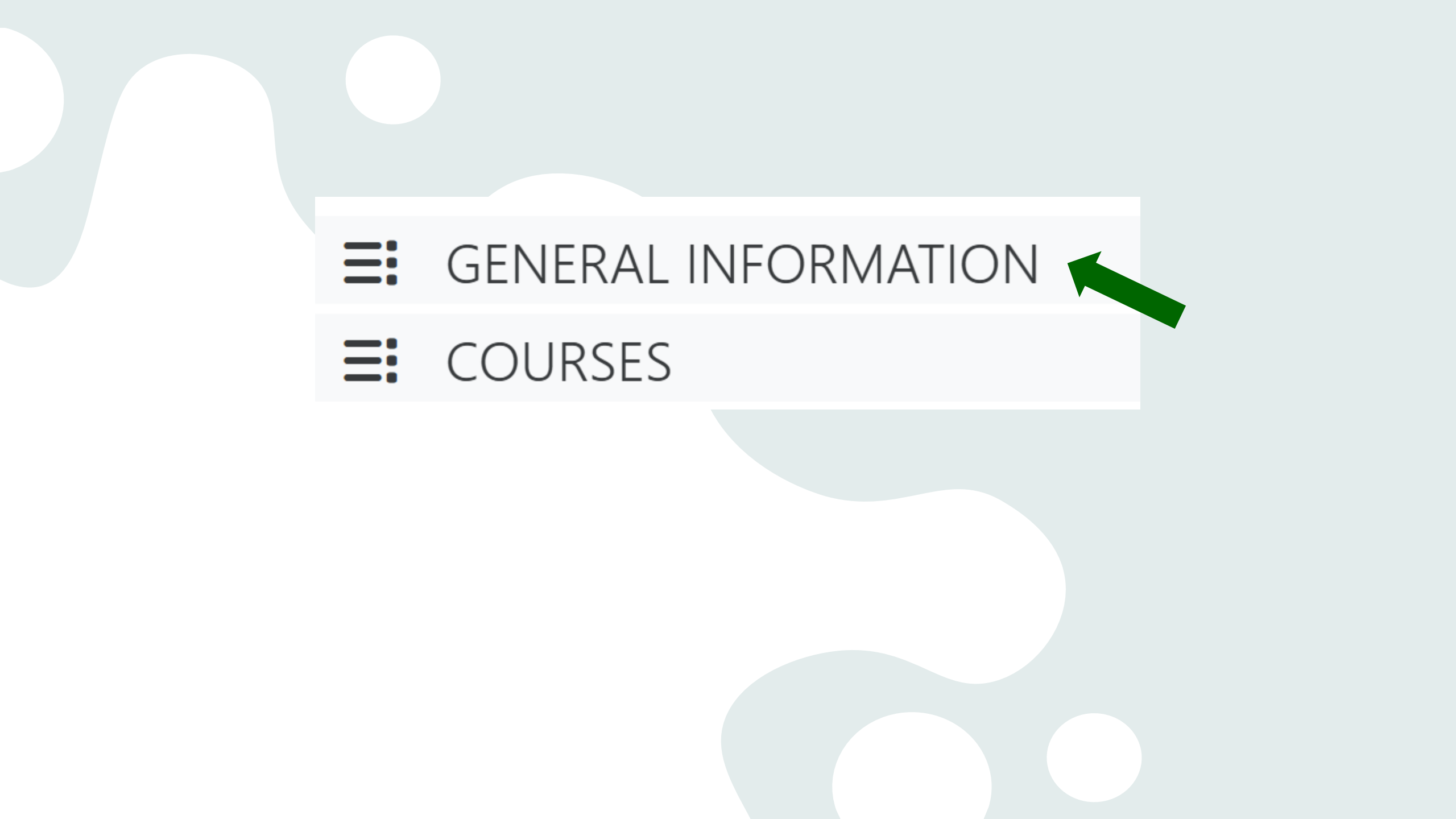
Online teaching



Science

- BACHELOR DEGREE
- MASTER DEGREE 
- TEACHING COORDINATION COUNCILS, COMMITTEES AND OTHER EDUCATIONAL BODIES
- PROJECT "REFRESHING MATHS"
- ERASMUS

- ARTIFICIAL INTELLIGENCE FOR SCIENCE AND TECHNOLOGY [F9102Q]
- ASTROFISICA E FISICA DELLO SPAZIO [F5801Q]
- ASTROPHYSICS AND SPACE PHYSICS [F5802Q]
- BIOLOGIA [F0601Q]
- BIOTECNOLOGIE INDUSTRIALI [F0802Q]
- DATA SCIENCE [F9101Q]
- DATA SCIENCE [FDS01Q]
- ECONOMICS AND TECHNOLOGIES FOR SUSTAINABILITY [F7603Q]
- FISICA [F1701Q]
- INFORMATICA [F1801Q]
- MARINE SCIENCES [F7502Q]
- MATEMATICA [F4001Q]
- MATERIALS SCIENCE [F5302Q]
- MATERIALS SCIENCE AND NANOTECHNOLOGY [FSM01Q]
- OPTOMETRY AND VISION SCIENCE [F1702Q]
- SCIENZA DEI MATERIALI [F5301Q]
- SCIENZE E TECNOLOGIE CHIMICHE [F5401Q]
- SCIENZE E TECNOLOGIE GEOLOGICHE [F7401Q]
- SCIENZE E TECNOLOGIE PER L'AMBIENTE E IL TERRITORIO [F7501Q]
- TEORIA E TECNOLOGIA DELLA COMUNICAZIONE [F9201P]


GENERAL INFORMATION
COURSES

General Information

GENERAL INFORMATION

COURSES

Announcements
CDS-F1702Q-NEWS

Course Overview, Regulations, Planned Courses
CDS-F1702Q-INFO

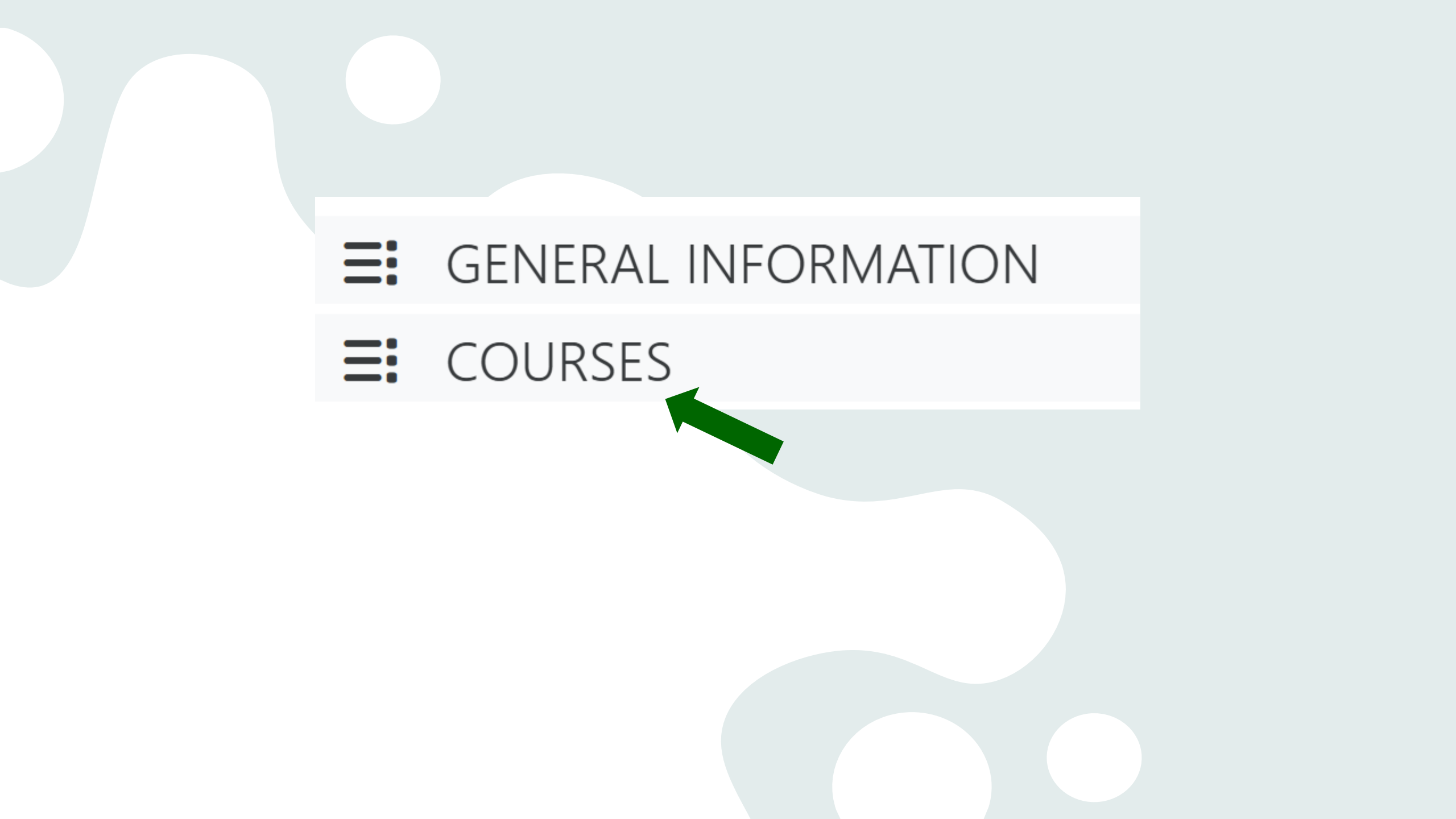
Orienteering for Future Students and Admission Procedures
CDS-F1702Q-SOS

Teaching Plan (Full-Time, Part-Time)
CDS-F1702Q-OFFDID

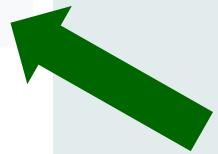
Academic Calendar, Timetable, Exam Sessions
CDS-F1702Q-CALENDAR

Internships and Final Exam
CDS-F1702Q-STAGE

Outgoing orientation
CDS-F1702Q-OUT


GENERAL INFORMATION
COURSES

Optometric Investigative Techniques - I 2425-1-F1702Q001	ECTS: 6	SYLLABUS
Optometric Investigative Techniques - II 2425-1-F1702Q007	ECTS: 6	SYLLABUS
Optometry and Low Vision 2425-1-F1702Q008	ECTS: 6	SYLLABUS
Physics of Vision 2425-1-F1702Q004	ECTS: 6	SYLLABUS
Specialty Contact Lenses 2425-1-F1702Q009	ECTS: 6	SYLLABUS
Visual Ergonomics 2425-1-F1702Q003	ECTS: 6	SYLLABUS



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LAB (**dates to be confirmed**)

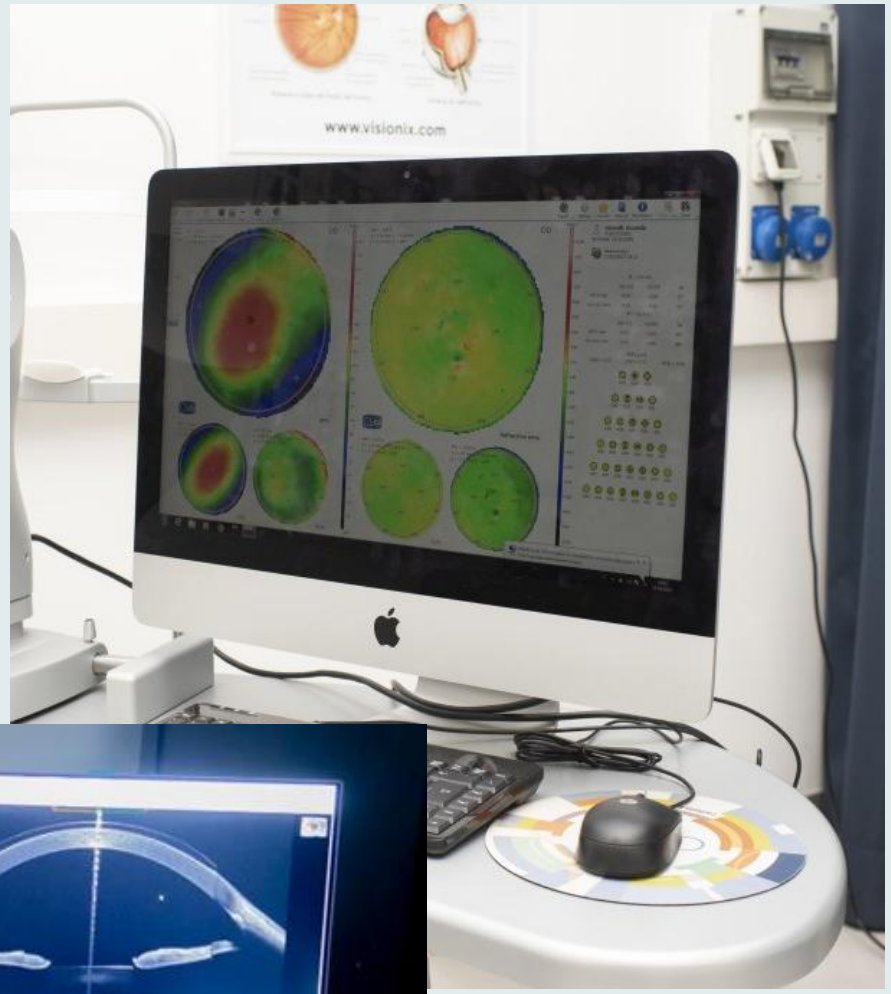
TURNO A

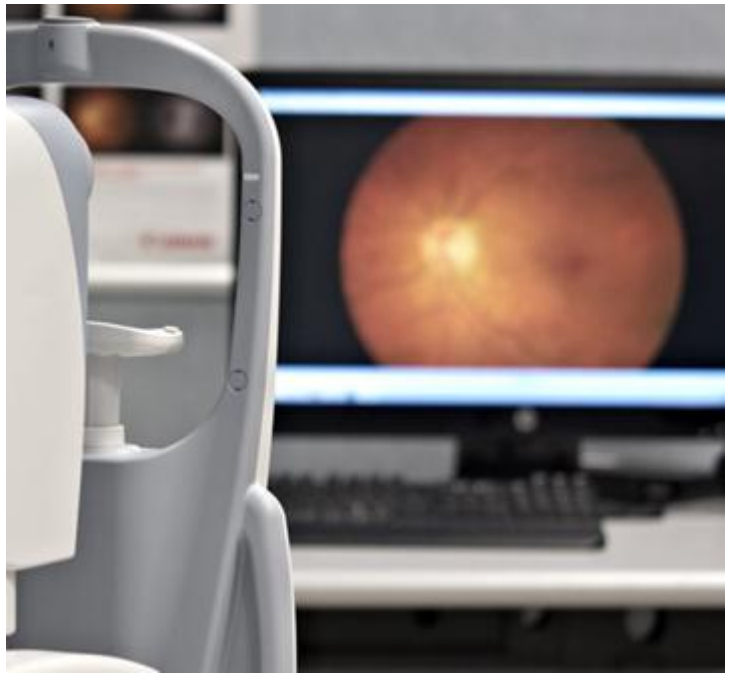
1 SEM	2 SEM
November 9, 2026	April 12, 2027
November 10, 2026	April 13, 2027
November 11, 2026	April 14, 2027
	April 15, 2027
	April 16, 2027

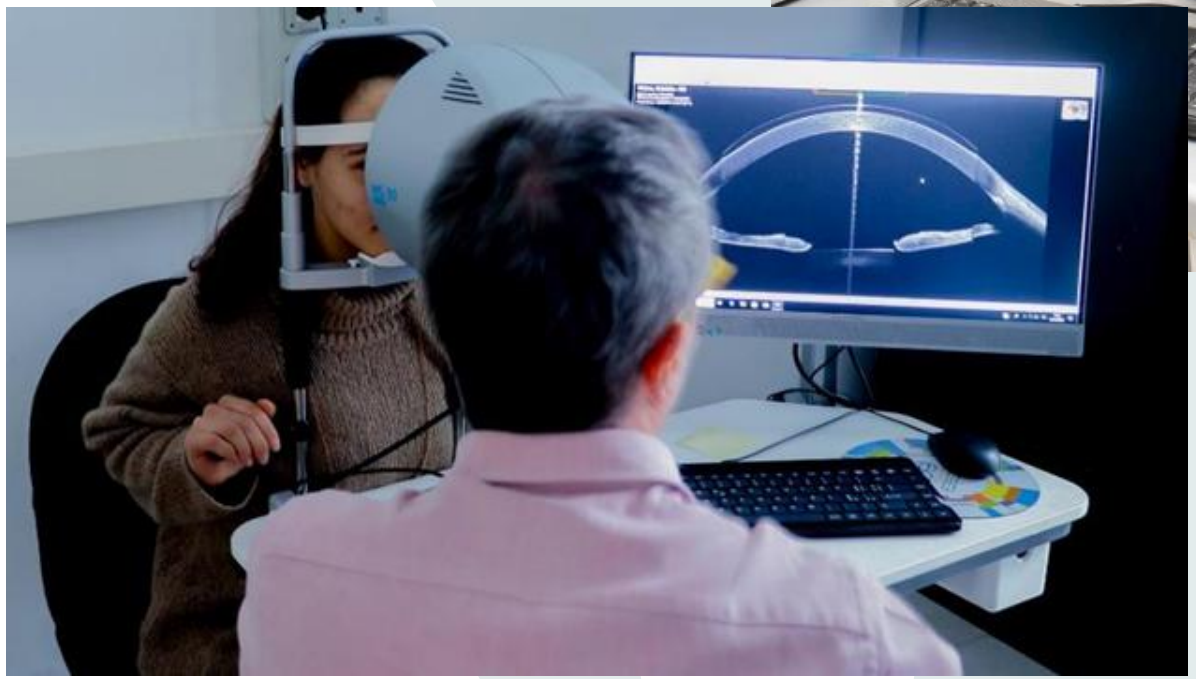
TURNO B

1 SEM	2 SEM
January 11, 2027	April 26, 2027
January 12, 2027	April 27, 2027
January 13, 2027	April 28, 2027
	April 29, 2027
	April 30, 2027

- Advanced instrumentation available at the COMiB research center in optics and optometry
- Instruments specifically provided for the Master Degree by companies







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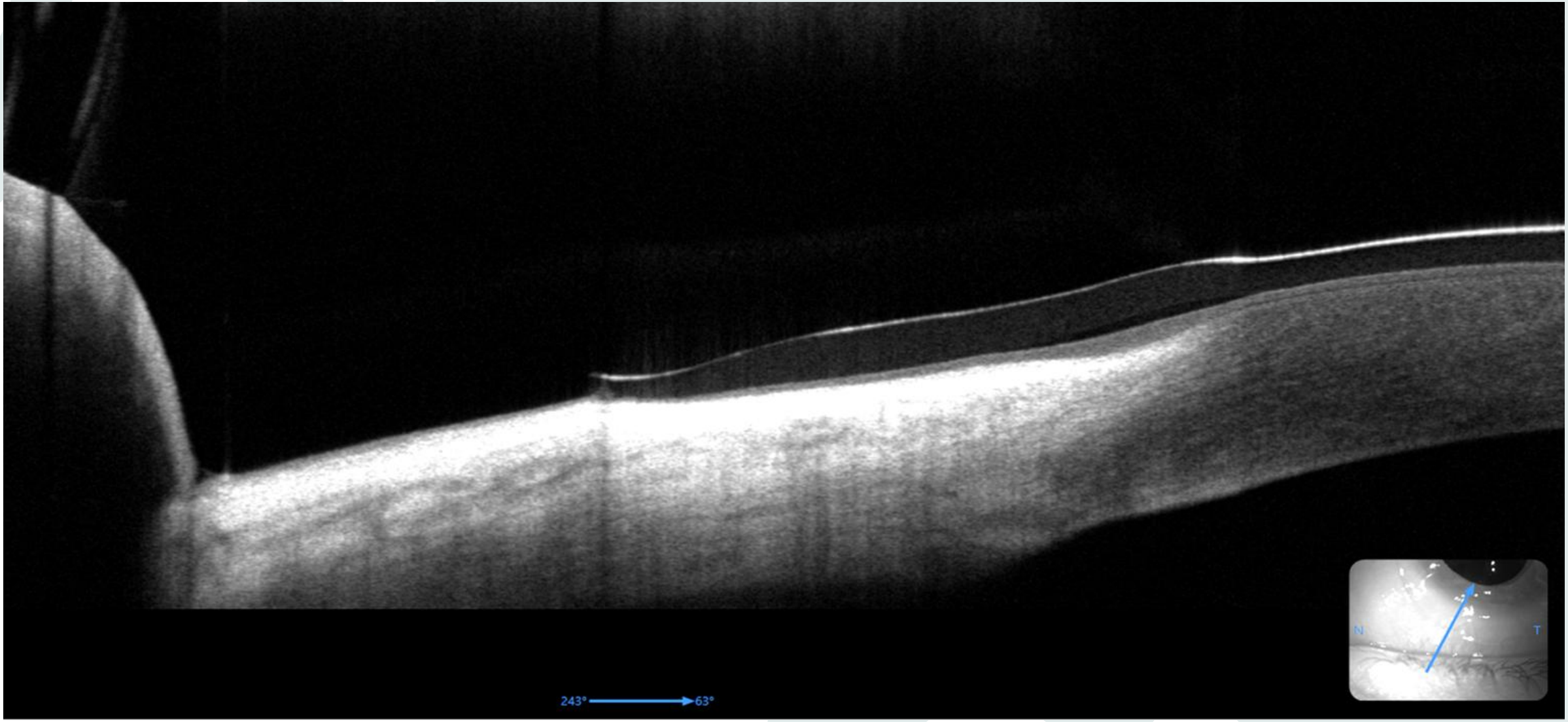
243°
63°
N
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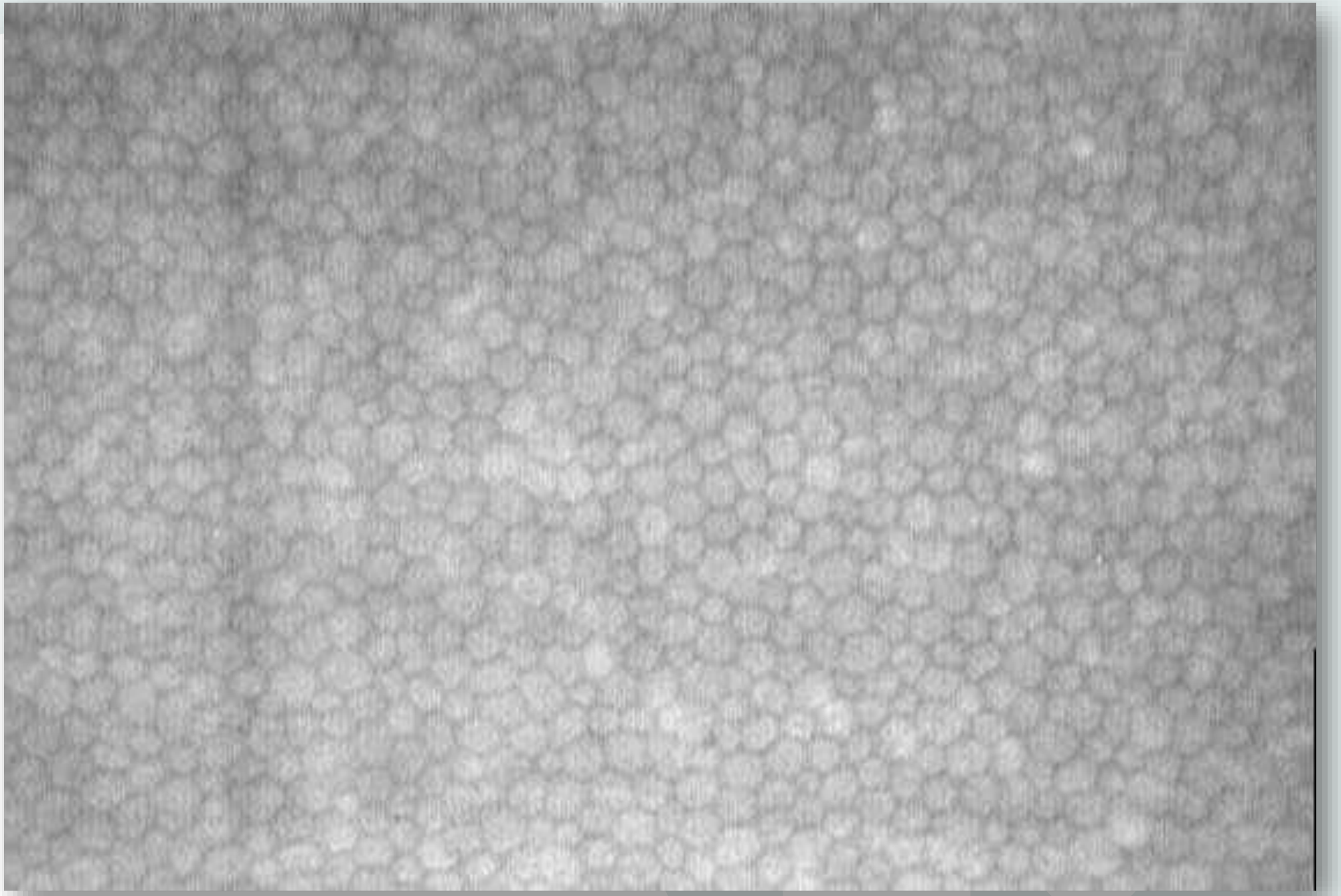
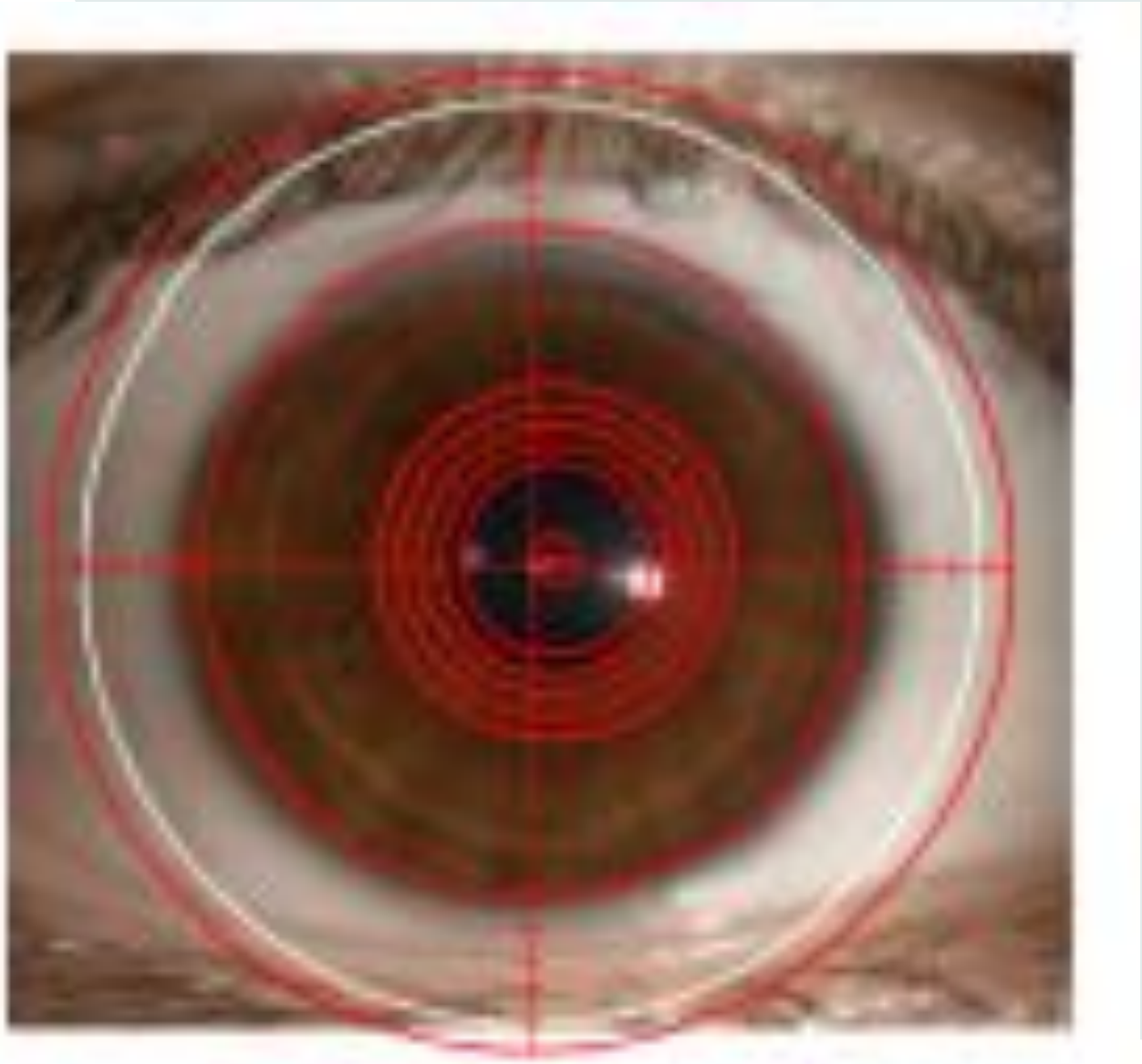
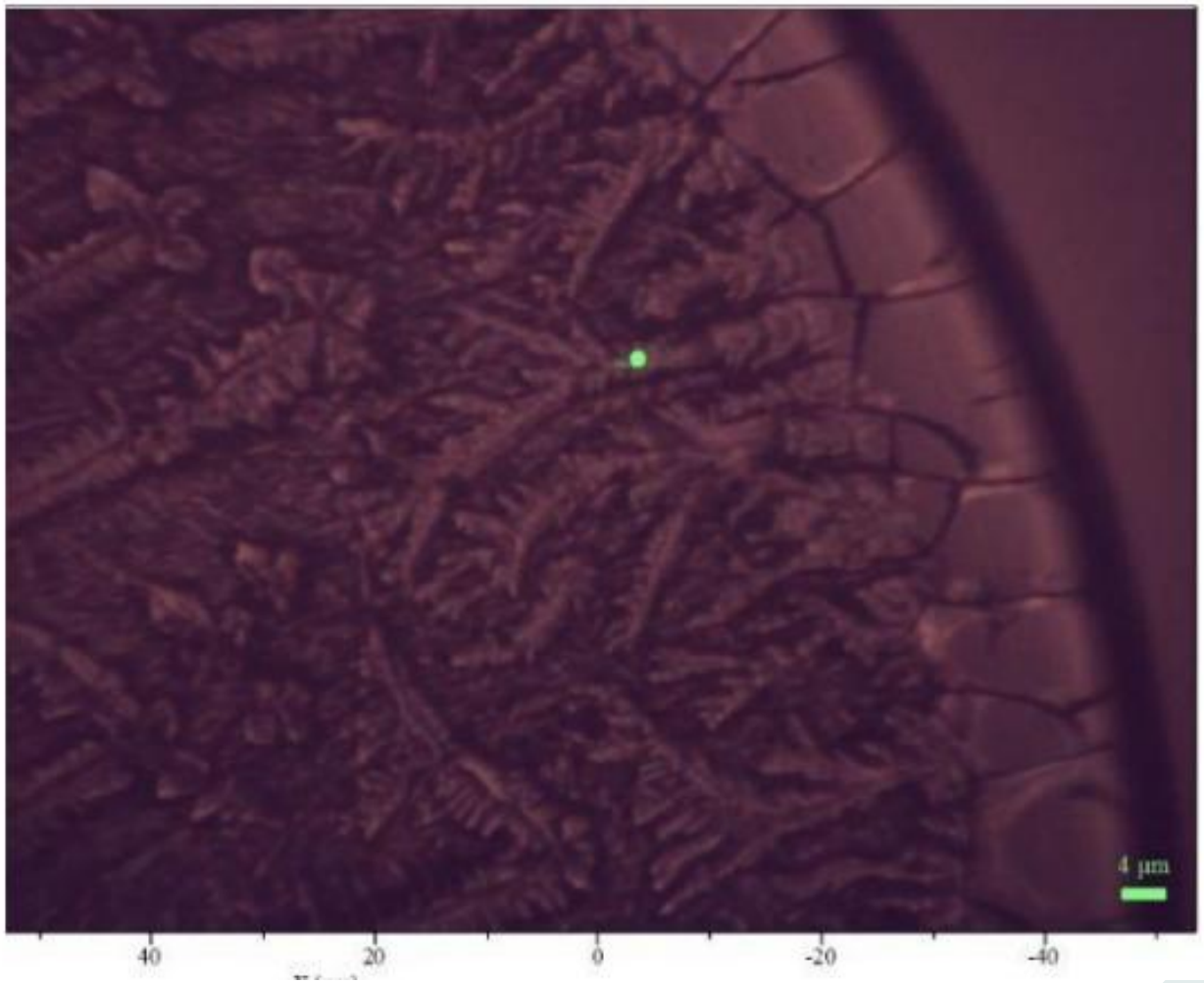
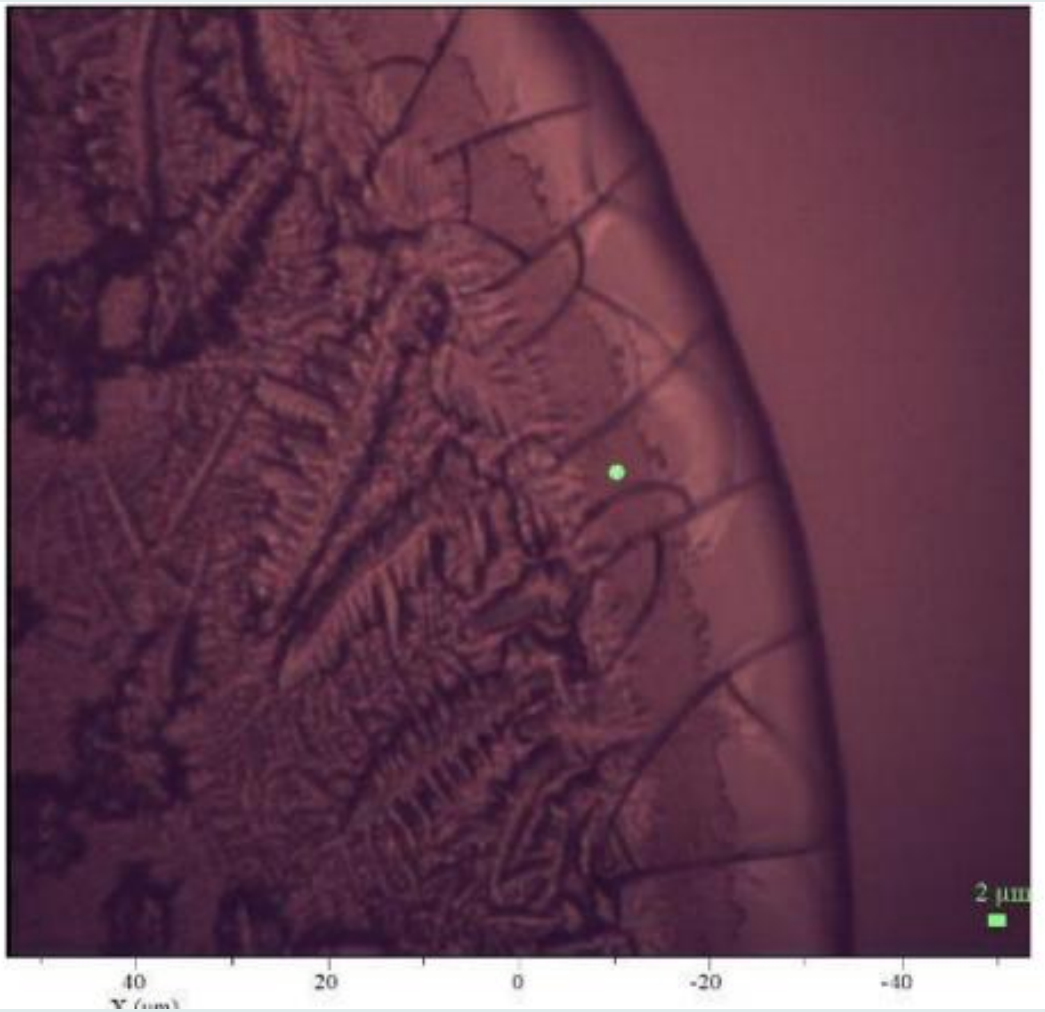





4 µm
40
20
0
-20
-40


2 µm
40
20
0
-20
-40

Academic Year 2024/25

Academic Year 2025/26

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History and Techniques of Contemporary Optometry

- 35 hs video-recorded + e-tivities
- 12 hs LAB

LECTURERS TO BE CONFIRMED

Silvia TAVAZZI
Antonio CALOSSI
Erika PONZINI
Jessica SACCANI




EVOLUTION, OPERATING PRINCIPLES, AND USE OF:

- ♣ Ocular OCT
- ♣ Ocular biometry
- ♣ Ocular aberrometry

SCIENTIFIC LITERATURE

- ♣ types of scientific articles
- ♣ search of the current literature
- ♣ citations and plagiarism detection
- ♣ new approaches based on artificial intelligence

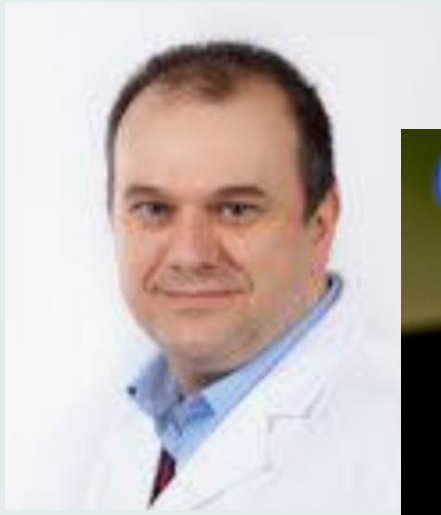
REVIEW OF THE SCIENTIFIC LITERATURE ON SPECIFIC TOPICS

Optometric Investigative Techniques – I

- 35 hs video-recorded + e-tivities
- 12 hs LAB

LECTURERS TO BE CONFIRMED

David PINERO
Alfredo DESIATO
Fabrizio ZERI
Andrea BERTELLI



Cyclopegic vs non cyclopegic refraction
Objective / Subjective Refraction
Binocularity, accommodation
Visual Psychophysics
Anterior chamber angle assessment
Tonometry
General Fundus Examination
The pupil and pupillary reflexes
Perimetry in clinical practice

Optometric Case Studies, how to write a clinical case

Visual Ergonomics

LECTURERS TO BE CONFIRMED

Jacopo PEDRINI
Francesco CARULLI
Lorenzo FERRARO
Fabrizio ZERI

- 42 hs video-recorded + e-tivities

- characterization of working environment
- assessment of visual load
- optometric management of visual ergonomics issues

- software for lighting and renderings of workspace
- measuring photometric characteristics of visual stimuli

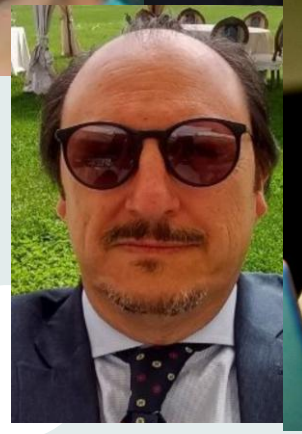
Optometric Investigative Techniques – II

- 39 hs video-recorded + e-tivities
- 12 hs LAB **LECTURERS TO BE CONFIRMED**

Nicola RUPERTO
Bruce EVANS
Assunta DI VIZIO
Fabrizio ZERI
Paolo PALUMBO
Jessica SACCANI





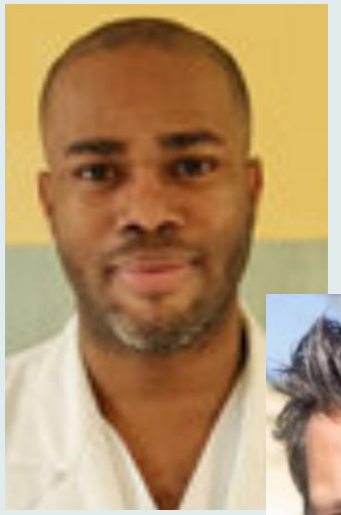



- **Principles of paediatrics**
- **Development of eye & visual system**
- **Development of binocular vision & accommodation**
- **Development of refractive errors in childhood**
- **Examination methods in children**
- **Optometric factors in learning disabilities**
- **Binocular vision anomalies in children**
- **Myopia management in children**
- **Children & contact lenses**

Optometry and Low Vision

- 39 hs video-recorded + e-tivities
- 12 hs LAB

LECTURERS TO BE CONFIRMED



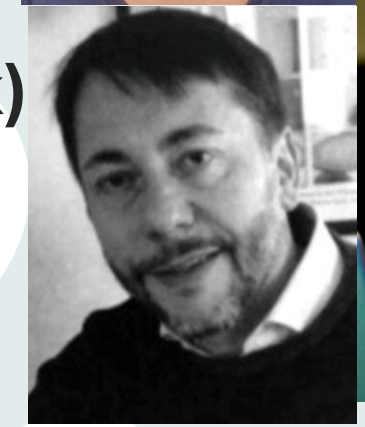
Chukwuma OKOYE
Sotiris PLAINIS
Riccardo CHELONI
Fabrizio ZERI
Javier RUIZ ALCOCER

- **Aging and geriatrics: general, ocular**
- **Aging and accommodation/pupil**
- **Presbyopia**
- **Assess vision across the elderly (psychophysics, electrophysiology)**
- **Visual impairment and low vision: epidemiology and regulations**
- **Optical and digital low vision aids**
- **Clinical cases**

Specialty Contact Lenses

- 35 hs video-recorded + e-tivities
- 12 hs LAB **LECTURERS TO BE CONFIRMED**

Shehzad NAROO
Erika PONZINI
Marino FORMENTI
Fabrizio ZERI
Davide BRAMBILLA



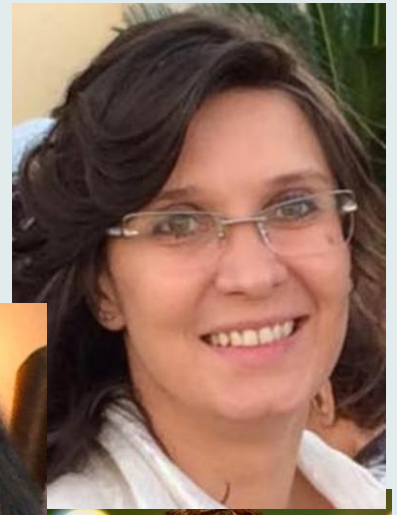
- **corneal ectasia, irregular cornea surfaces, corneal dystrophies, dry eye**
- **Corneal surgery**
- **Scleral CLs**
- **Orthokeratology**
- **CL for irregular corneas (RGP, hybrids, piggyback)**
- **Post refractive surgery and post graft CL fitting**
- **Prosthetic, cosmetic, therapeutic CLs**
- **Dry eye assessment and management**
- **Case studies**

Virtual and Augmented Reality

- VIRTUAL AND AUGMENTED REALITY TECHNOLOGIES
- VISION IN VIRTUAL AND AUGMENTED REALITY
- 42 hs video-recorded

Daniela BRIOLA
Rossana ACTIS GROSSO
Fabrizio ZERI

LECTURERS TO BE CONFIRMED



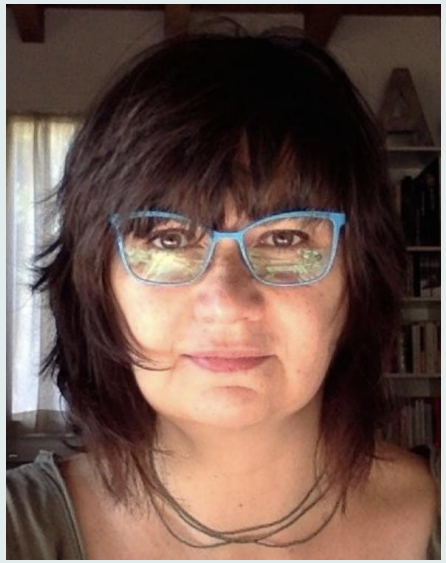
- **Hardware, software, implementation VR/AR**
- **Usability, benefits, adverse effects**
- **Output devices and vision,**
  Input devices and tracking,
  Interaction between virtual worlds
- **Optometric aspects related to the visual system during VR/AR use**

Visual Neurosciences

- 42 hs video-recorded

LECTURER TO BE CONFIRMED

Roberta DAINI



- **Cognitive neuroscience and neuropsychology**
- **How neural activity results in visual perception**
- **Visuo-perceptual disorders in brain-damaged patients**
- **Neuropsychological rehabilitation of visuo-perceptual disorders**
- **Healthy and pathological decline of brain mechanisms underlying visual perception in the older population**

Psychometrics and Quantitative Methods

- 42 hs video-recorded **LECTURER TO BE CONFIRMED**

- **Introduction to psychological measurement**
- **Direct and indirect measures**
- **Reliability and validity**
- **Statistical models and inferential statistics**
- **Multiple Regression**
- **ANOVA and General Linear Model**
- **Principal Component Analysis (PCA)**

Marco PERUGINI

Physics of Vision

LECTURERS TO BE CONFIRMED

- 42 hs video-recorded

- **Recall of electromagnetism and wave physics**
- **Color measurement**
- **Physical origin of the color of light sources**
- **Physical origin of the color of metals, materials, and molecules**
- **Physical origin of structural colors**
- **Color vision**

Roberto LORENZI
Alberto PALEARI

Mathematical and Computational Methods for Optics

- 52 hs video-recorded + e-tivities

LECTURERS TO BE CONFIRMED

Silvia PICOZZI
Lorenzo FERRARO

- **Python Programming Language**
- **Introduction to Fourier optics: mathematical tools,**
- **physical principles, and applications**
- **Combination of the previous mathematical and physical concepts for applications in optics: lenses, filters**
- **Computer-aided optical system modelling, analysis, and design**

Adaptive Optics

LECTURER TO BE CONFIRMED

Giuseppe CHIRICO

- 42 hs video-recorded + e-tivities
- **Introduction to AO**
- **AO methods for the correction of optical aberrations:**
  - deformable mirrors
  - spatial light modulators
- **Methods to describe the optical aberrations**
- **Applications of AO for vision testing**
- **Analysis of AO opthalmoscopes for retina imaging**
- **Role of AO to study accommodation**
- **High resolution AO imaging to diagnose vision defects at the scale of single photoreceptors**

Materials Spectroscopy and Microscopy

Giovanni DRERA

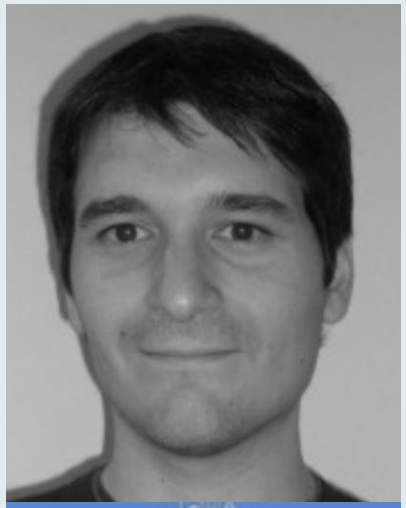
- 42 hs video-recorded + e-tivities **LECTURER TO BE CONFIRMED**
- **Light-matter interaction**
- **Data analysis: smoothing, interpolation, noise, convolution/deconvolution filters, spectra matching, curve fitting, data visualization**
- **UV-VIS, Raman, IR/FTIR, Ellipsometry, X-rays (XRD, XPS, XAS) with special focus on materials for optics, optometry, and vision science**
- **Imaging techniques (SEM, TEM, STM, AFM) with special focus on the materials for optics, optometry, and vision science**

Optical Properties of Materials

LECTURERS TO BE CONFIRMED

Davide CAMPI
Lorenzo FERRARO

- 42 hs video-recorded + e-tivities

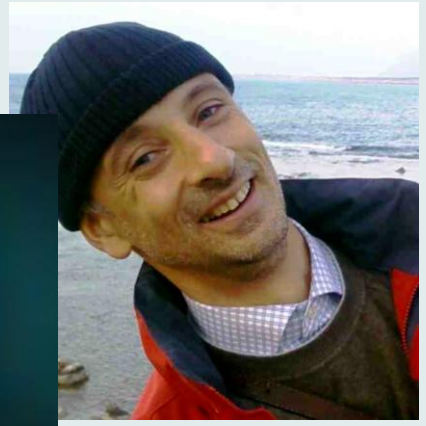


- **Propagation of electromagnetic waves in a medium, including anisotropy**
- **Light polarization states and applications**
- **Scattering mechanisms**
- **Nanostructuring effects on optical properties and optical metamaterials**
- **Applications to simple cases relevant for optics and optometry using numerical simulations (ANSYS ZEMAX OpticStudio for ray-tracing simulations)**

Introduction to Digital Imaging and Computer Vision

LECTURERS TO BE CONFIRMED

Domenico SORRENTI
Luca PRESOTTO



- 47 hs video-recorded

Image formation

A realistic pin-hole projection model

Calibration of the projection model

Image processing and enhancement

Image segmentation

Model-based vision

Point-based stereometry

Examples of applications in optics, optometry, ophthalmology

2nd year: STAGE and THESIS

Internship and thesis

experimental or computational

- University of Milano-Bicocca
- Other Universities
- abroad
- Companies or other external sites

OUTLINE

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- **Admission**

REQUIREMENT
1 out of 3
FOR
ADMISSION

bachelor

- Italian bachelor: obtained before end of 2026
- otherwise: August 2026

Classe L-30, classe 25 or suitable foreign degree

OR

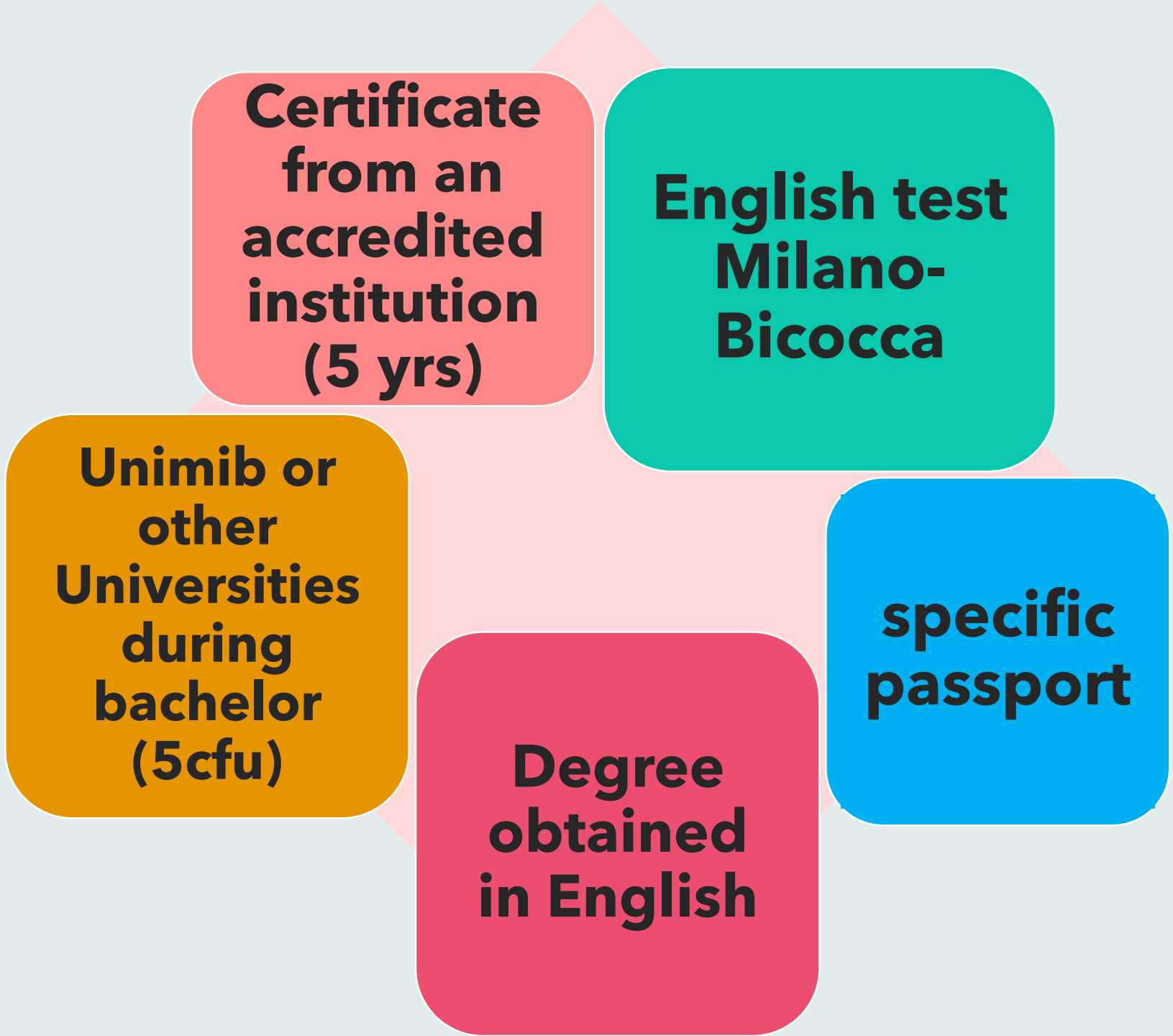
altra classe

+ 30 cfu FIS/01-FIS/03-FIS/07

REQUIREMENT
2 out of 3
FOR
ADMISSION

English B2

Italian bachelor



English test Milano-Bicocca

IN PRESENZA

1^ sessione: test dal 23 al 30 marzo 2026
(invio richiesta entro il 17 marzo 2026)

2^ sessione: test dal 22 giugno al 3 luglio 2026
(invio richiesta entro il 16 giugno 2026)

3^ sessione: test dal 2 al 7 settembre 2026
(invio richiesta entro il 26 Agosto 2026)

REQUIREMENT
2 out of 3
FOR
ADMISSION

English B2

Foreign bachelor

Degree obtained in English

specific passport

Certificate from an accredited institution (5 yrs)

REQUIREMENT
3 out of 3
FOR
ADMISSION

interview

INTERVIEW
REMOTELY
IN ENGLISH
(A ≥ 18 out of 30)

DEADLINES

deadlines are different for candidates with **foreign qualification**: **apply.unimib.it**

DEADLINES

deadlines are different for candidates with **foreign qualification**: **apply.unimib.it**

CANDIDATI IN POSSESSO DEL PRECEDENTE TITOLO DI STUDIO ITALIANO

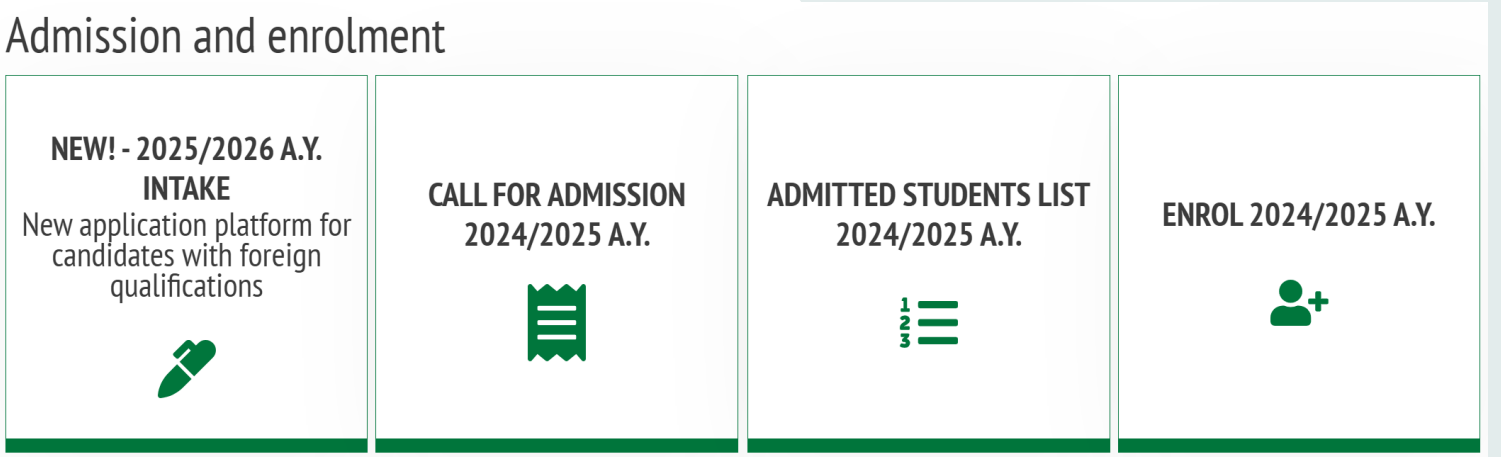
Termini di presentazione della domanda di valutazione della carriera (solo per candidati in possesso del precedente titolo di studio acquisito in Italia)	**Date di svolgimento del colloquio (solo per candidati in possesso del precedente titolo di studio acquisito in Italia)**
2 marzo - 29 maggio 2026	11 - 12 giugno 2026
8 giugno - 11 settembre 2026	24-25 settembre 2026

www.unimib.it

FUTURI STUDENTI

CORSI DI LAUREA – ISCRIZIONI

SCIENZE – LAUREA MAGISTRALE



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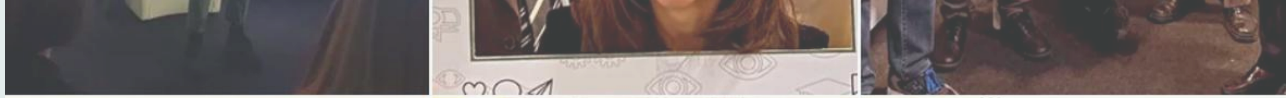

otticaeoptometriamilano

Optometry and Vision Science [F1702Q]

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silvia.tavazzi@unimib.it