# Professional Master's Degree

## Optical Technologies and Clinical Optometry

tech technological university

tech technological university

# Professional Master's Degree

## Optical Technologies and Clinical Optometry

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/in/medicine/professional-master-degree/master-optical-technologies-clinical-optometry**

# Index

01

# Introduction

This Professional Master's Degree is a comprehensive update and expansion of the optometrist's knowledge and skills. Each module focuses on topics of immediate clinical application, always focused from a practical point of view, so it will prepare the student to apply for most jobs in optometry and ophthalmology.

*The latest advances in the field of optical technologies and clinical optometry compiled in a highly efficient Professional Master's Degree that will optimize your efforts with the best results"*

Continuous specialization in the latest optometric technologies and treatments is essential in professional updating, preparing to take on jobs that are increasingly integrated into the healthcare system, both public and private.

The Professional Master's Degree in Optical Technologies and Clinical Optometry covers the main fields of action of the optometrist, always in the most up-to-date manner and with a high-level faculty. The syllabus has been designed from the perspective and experience of experts highly specialized in their module, and immersed in the clinical world, which has led to know the current and future challenges.

This Professional Master's Degree has been clearly and forcefully directed to the clinical field, preparing the student to develop in this field with extensive theoretical knowledge. Thus, you will learn how to make special adaptations of contact lenses, know the preoperative tests for cataract surgery, the basics of biostatistics especially aimed at research in optics and optometry, in-depth understanding of the treatment of low vision from clinical practice, pediatric optometry, introduce you to vision therapy with a practical and interdisciplinary approach, the latest advances in instrumentation and treatment of amblyopia, and other interesting and useful fields of optometric performance.

The student will have 13 modules, each of them structured in 10 topics. Each topic consists of a theoretical introduction, explanations by the professor, activities, etc. In such a way that learning becomes an enjoyable journey to high-level knowledge in Optical Instrumentation and Clinical Optometry.

In conclusion, this Professional Master's Degree provides the professional with the theoretical and clinical knowledge necessary to address any of the specialties of Optics and Optometry, as well as opening the door to clinical research.

This **Professional Master's Degree in Optical Technologies and Clinical Optometry** contains the most complete and up-to-date program on the market. The most important features include:

- More than 100 clinical cases presented by experts in the different specialities
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- The most frequent new developments in Optical Technologies and Clinical Optometry
- The presentation of hands-on workshops about procedures, diagnostic and therapeutic techniques
- An algorithm-based interactive learning system for decision-making in the clinical situations presented throughout the course
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection work
- Content that is accessible from any fixed or portable device with an Internet connection

*This Professional Master's Degree in Optical Technologies and Clinical Optometry will help you keep up to date in order to provide complete and quality care to patients"*

*This Professional Master's Degree is the best investment you can make when choosing a refresher program to update your existing knowledge of Optical Technologies and Clinical Optometry "*

*All the methodology necessary for the optometrist to achieve academic excellence, in a specific and concrete Professional Master's Degree.*

*We have the best educational material, an innovative methodology and a 100% online program, which will facilitate your study.*

The faculty includes professionals from the field of Optical Technologies and Clinical Optometry, who bring their experience to this program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide an immersive training experience designed to train for real-life situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise throughout the program. For this purpose, the specialist will be assisted by an innovative, interactive video system created by renowned and experienced experts in treating pediatric emergencies.

02

# Objectives

This Professional Master's Degree is oriented towards effectively updating the knowledge of the optometrist, in order to provide quality care based on the latest scientific evidence that guarantees patient safety.

*If you are looking for success in your profession, we can help you achieve it. We offer you the most complete program on Optical Technologies and Clinical Optometry"*

## General Objectives

- Advise patients from their position in the optical centers about the different procedures and their indications
- Analyze research data in the field of vision sciences
- Learn the binocular vision anomalies that, from a clinical evidence point of view, can be treated by vision therapy
- Manage the different visual therapy techniques in accommodative, oculomotor and perceptual dysfunctions, from a multidisciplinary point of view
- Acquire the necessary knowledge to evaluate clinical cases, detect potential aberrations present, study whether they are within the normal range, and propose treatment
- Know the type of visual examination required by an amblyopic patient and the most advanced techniques in their treatment, updating their educational background in order to apply it directly in their daily clinical practice
- Learn the most advanced techniques in the examination and treatment of low vision, updating new concepts, as well as techniques to apply directly in their professional clinical practice
- Know the most important definitions, mechanisms of action and routes of administration of drugs at the ocular level
- Learn all the anesthetic drugs, those that modify pupil size and act on accommodation
- Know in detail the technical characteristics, indications for use and limitations of different devices specifically designed for ocular analysis
- Learn the instruments for measuring tear quality and quantity, characterization of the cornea and sclera, measurement of the anterior chamber and the iridocorneal angle, etc. So that the professional who completes this program will know the latest instruments for measuring ocular structures
- Acquire the necessary knowledge to assess the ocular structure and visual development of the child, as well as the procedures based on clinical guidelines and current evidence
- Assess and diagnose visual anomalies, as well as plan a strategy for prevention, evaluation and intervention appropriate to the age and condition of each patient
- Cope with the fitting of all types of contact lenses

*Acquire the necessary knowledge to offer quality practice, providing your patients with expert and effective care”*



## Specific Objectives

### Module 1. Optometric Procedures in Corneal, Intraocular and Cataract Refractive Surgery

- In-depth understanding of ocular optics and how to act on it to adjust refraction by modifying corneal power
- In-depth understanding of ocular optics and how to act on it to modify refraction with intraocular lenses
- Handle the excimer laser and ablation profiles according to the refraction being treated
- Study the different techniques of corneal refractive surgery
- Describe the preoperative tests necessary for surgical indication in corneal refractive surgery
- Manage the role of the optometrist in the preoperative, intraoperative and postoperative process in corneal refractive surgery
- Delve into the postoperative medical treatment in corneal refractive surgery
- Know in depth the normal evolution and complications in corneal refractive surgery
- Study the techniques of intraocular refractive surgery
- Describe phakic lenses, their indications and necessary preoperative testing
- Describe pseudophakic eyes lenses, their indications and necessary preoperative testing
- Specialize in the surgical procedure of clear lens and cataract surgery
- Apply the different formulas for calculating the pseudophakic intraocular lens in normal eyes.
- Deepen in the special procedures for calculating the pseudophakic intraocular lens in eyes that have previously undergone corneal refractive surgery
- Describe the main complications that can occur in intraocular refractive surgery

### Module 2. Biostatistics for Optics and Optometry Research

- Define the concepts of statistics, biostatistics and epidemiology
- Understand the need to know biostatistics for a clinician
- Know how to apply the appropriate graphic representation to the type of data resulting from a clinical study
- Deepen in the procedures of parametric and non-parametric analysis of the data resulting from an investigation
- Know how to perform simple, multiple and logistic regression analysis
- In-depth knowledge of the procedures for the comparison of clinical instrumentation

### Module 3. Vision Therapy in Clinical Practice

- Interpret the different variables involved in a complete medical history
- Acquire criteria and procedures according to age, reason for visit and prognosis
- Consolidate the necessary bases, procedures and materials
- Understand in depth the results obtained after the assessment
- Consolidate the necessary bases, procedures and materials
- Know, integrate and establish consultation protocols according to optometric diagnosis
- Deepen in the visual alterations that can occur in an acquired brain injury
- Interpret results, appropriate patient selection and intervention plan using vision therapy
- Specialize in what visual skills are involved in a grassroots and/or elite athlete
- Learning to establish consultation protocols
- Lay the foundations for evidence-based vision therapy intervention and interdisciplinary work
- Learn to develop a professional communication exercise with other professionals

### Module 4. Metrics and Measurements of Visual Quality

- In-depth knowledge of the principles of aberrometry
- Present the concept of a perfect optical system
- Know that it is impossible to obtain an eye without aberrations
- Manage the classification of optical aberrations
- Describe the distribution of aberrations present in the normal eye
- In-depth knowledge of the main metrics used to evaluate visual quality
- Know the ocular optical surfaces susceptible to aberrations
- Differentiate between external and internal ocular aberrations
- Specialize in the aberrations present in corneal ocular pathology
- In-depth knowledge of the types of aberrations induced by corneal and intraocular refractive surgery
- Describe the instruments for the measurement of aberrations
- Present treatment strategies for ocular aberrations

### Module 5. Latest Advances in the Management of Amblyopia

- Know in depth the types and characteristics of amblyopia
- Know in depth the visual alterations that occur in the different types of amblyopia
- Learn the visual examination protocol to be performed for the detection and follow-up of amblyopia
- Know in depth the treatment protocol to be followed with scientific basis
- Broaden the participant's professional projection, being able to evaluate, diagnose and treat patients with amblyopia, who are currently neglected at times by optometrists

### Module 6. Low Vision and Geriatric Optometry

- In-depth knowledge of the types of conditions that cause mild, medium and severe visual impairment
- In-depth knowledge of the visual alterations that occur in the different types of pathologies and non-ocular conditions that affect the visual system
- Learn the visual examination protocol to be performed for the detection and follow-up of the patient with low vision. Know the techniques of the TR applied to patients
- In-depth knowledge of the new protocols for examination, treatment and action in a multidisciplinary manner
- Broaden professional projection, be able to evaluate, diagnose and treat patients with low vision, who are currently neglected to a great extent by optometrists, since it is still a "young" discipline, unknown to society and a great part of eye care professionals

### Module 7. Ophthalmic Pharmacology

- In-depth understanding of the mechanism of action of ocular drugs
- Identify the adverse reactions caused by this type of drugs
- Delve deeper into the groups of drugs used in the treatment of infectious ocular pathologies and antifungal drugs
- Describe anti-inflammatory drugs, both steroidal and nonsteroidal
- Accurate knowledge of the antigiogenic drugs for the treatment of AMD
- Know in depth the use and effects of botulinum toxin in the eye
- Describe the different types of ocular lubricants

### Module 8. Latest Advances in Optical and Optometric Instrumentation

- Become familiar with the methods and instrumentation necessary for the characterization of the ocular lacrimal layer
- Describe the instruments used to measure optical parameters and corneal morphology
- Know precisely the instruments necessary for the characterization of the sclera
- Describe the techniques and instruments for measuring the irido-corneal angle
- Introduce the instruments for intraocular pressure measurement
- Deepen in the instruments used for the evaluation of the visual field
- Describe the instrumentation used for optic nerve evaluation

### Module 9. Pediatric Optometry

- Consolidate optometric goals in the pediatric population
- Delve into the evolutionary scale of children
- Know and relate the neurophysiological basis of vision to the different visual skills
- In-depth knowledge of the clinical guidelines related to the pediatric population
- Specialize in the prevalence in the pediatric population and relate it to clinical practice
- Learn how to interact with pediatric patients
- Strengthen procedures in a pediatric setting
- Learn how to make medical histories according to age and reason for the visit
- Interpret a clinical history and establish a pre-diagnosis
- Learn how to perform assessment according to age and condition of the patient
- Learn how to establish pediatric optometric diagnoses
- Learn how to create different models of referral reports and interprofessional communication

### Module 10. Advanced Contactology

- Detailed knowledge of the ocular surface and tears, as this is the medium through which the contact lenses will be fitted
- In-depth knowledge of the different topographic maps and their clinical application in contactology
- Become familiar with the use of the biomicroscope for the study of ocular health prior to fitting a contact lens and subsequent evaluation of the fitting
- Deepen and learn how to fit rigid gas permeable contact lenses in regular corneas
- Learn how to fit, not "put in", soft contact lenses. Many of the adaptations currently being made are not optimal. The contact lens specialist will learn how to make fittings as personalized as possible
- Become familiar with all possible solutions for irregular corneal adaptations and know the criteria to choose the best alternative
- Handle the basics of orthokeratology and the adaptation of this type of lenses
- Learn how to assess fitting and monitoring
- Learn the main aspects that make for a different orthokeratology adaptation in high myopia, astigmatism and hyperopia
- Learn how to use the tools currently available to control the progression of myopia
- Master the fitting of multifocal lenses and know how to improve and optimize a fitting by means of defocus curves and lens power profiles
- Solve the most frequent complications found in contact lens fittings

### Module 11. Light and Optics

- Know the nature of light
- Learn to apply Snell's Law
- Learn the concepts of focal and power of a lens or optical system



- Describe the fundamentals of some optical instruments, specifically the telescope and the microscope
- Describe the eye as an optical system
- Introduce the main concepts of aberrometry of optical systems

**Module 12. Visual Anomalies and Measurement Methods**

- Know the ocular anatomy
- Describe the ocular optical structures and their measurement
- Know the methods and metrics of visual acuity measurement
- Describe spherical and cylindrical ametropia
- Know the metrics of visual quality measurement
- Present the objective and subjective methods of ocular refraction
- Introduce ultrasonic and optical ocular biometry
- Learn how to use the vector notation of ocular refraction

**Module 13. Vision Correction Alternatives**

- Present the optical principles of vision correction in the different corrective alternatives
- Describe the optical properties of corrective lenses
- Understand the most important aspects of contact lens correction
- Describe LASIK and PRK surgery, its indications, procedures and complications
- Describe intraocular surgery using phakic lenses, its indications, procedures and complications
- Describe pseudophakic intraocular lens surgery, its indications, procedures and complications

03

# Skills

After passing the assessments of the Professional Master's Degree in Optical Technologies and Clinical Optometry, the optometrist will have acquired the professional skills necessary for up-to-date quality care based on the latest scientific evidence.

*This refresher program will generate a sense of confidence when practising medicine, which will help you grow both personally and professionally”*

## General Skill

- Apply the theoretical and clinical knowledge learned in this program, to address any of the specialties of optics and optometry, as well as open the door to clinical research

*Take advantage of the opportunity and take the step to get up to date on the latest developments in the management of Optical Technologies and Clinical Optometry"*

## Specific Skills

- Perform ocular biometry and intraocular lens calculation for clear lens and cataract surgery
- Understand the difference between intuitive response and response based on data analysis
- Establish an optometric diagnosis
- Differentiate between the different types of optical aberrations.
- Present the results of the latest studies on amblyopia.
- Present the latest advances in low vision aids, examination techniques, and patient and family support
- Recognize the properties of drugs used in the treatment and diagnosis of ocular pathology.
- Describe ocular biometry and its use in Optometry
- Consolidate knowledge of the visual pathway and its development
- Identify ocular conditions that make it inadvisable to use contact lenses or find the best alternative to that condition

04

# Course Management

The program includes in its teaching staff reference experts in Optical Technologies and Clinical Optometry, who pour into this training the experience of their work. Additionally, other recognized experts participate in its design and preparation, completing the program in an interdisciplinary manner.

*Leading professionals in the field have come together to teach you the latest advances in Optical Technologies and Clinical Optometry"*

## Management

### Dr. Calvache Anaya, José Antonio

- Optometrist at Clínica Baviera in Palma de Mallorca
- Doctor in Optometry and Vision Sciences
- Postgraduate Diploma in Statistics Applied to Health Sciences

## Professors

### Dr. Berbegal García, Vicente

- Contactologist and responsible for training in the team of optometrists of Teixido opticians in Reus, Tarragona, specialists in special contact lenses adaptations.
- Graduate in Optics and Optometry from the University of Alicante
- Master's Degree in Optometry and Vision Therapy, offered by the International Optometry Center

### Dr. De Lamo Requena, Mercedes

- Technical Director of IVOP "Institut Valencià d`Optometría".
- Diploma in Optics- Optometry from the University of Valencia

### Dr. Escutia Puig, María Oreto

- Optometrist. La Ribera University Hospital Ministry of Health. Valencia
- Diploma in Optics and Optometry. University of Valencia

### Dr. Fernádez-Baca, Macarena

- Doctor of Optometry. University of Houston College of Optometry. Texas, USA
- Diploma in Optics. Complutense University of Madrid

**Dr. Just Martínez, María José**

- Community Pharmacist at Aquamarina Pharmacy Alicante
- Technical director Private optician in Valencia
- Doctor of Pharmacy. University of Valencia
- Diploma in Optics and Optometry University of Valencia
- Postgraduate Diploma in Pharmacotherapeutic Monitoring - University of Granada
- Diploma in Health

**Dr. Pérez Cambrodí, Rafael**

- Doctor in Optometry and Vision Sciences. PhD. University of Valencia
- Director of the Optometry Unit of Hospital Internacional Medimar.

**Dr. Roca Fernández Villar, Ricardo**

- Optometrist Optician. RCO Retiplus, Acesight , Orcam My Eye electronic glasses for visual impairment.
- Specialist in Low Vision in the Ophthalmology Service of Quirón Málaga.

05

# Structure and Content

The structure of the contents has been designed by a team of professionals knowledgeable about the implications of specialization in medical practice in Optical Technologies and Clinical Optometry, aware of the current relevance of the program to be able to treat pediatric patients with urgent pathology, and committed to quality teaching through new educational technologies.

*This Professional Master's Degree in Optical Technologies and Clinical Optometry will help you keep up to date in order to provide complete and quality care to patients"*

## **Module 1.** Optometric Procedures in Corneal, Intraocular and Cataract Refractive Surgery

1.1. Physical Basis of Refractive Change in the Corneal Plane
- 1.1.1. Solution of the Theoretical Eye
  - 1.1.1.1. Theoretical Emeropic Eye
  - 1.1.1.2. Theoretical Emeropic Eye
- 1.1.2. Change in Refraction as a Function of Change in ACD
- 1.1.3. Change in Refraction as a Function of Change in Corneal Power

1.2. Corneal Refractive Surgery Techniques
- 1.2.1. Corneal Anatomy and Physiology
- 1.2.2. Optical Foundation
- 1.2.3. LASIK
- 1.2.4. PRK
- 1.2.5. LASEK
- 1.2.6. SMILE
- 1.2.7. PRESBILASIK
- 1.2.8. Retreatments

1.3. Types of Laser
- 1.3.1. The Excimer Laser
- 1.3.2. Ablation Profiles
- 1.3.3. Optometrist in the Laser Refractive Surgery Operating Room
- 1.3.4. Surgery Scheduling and Safety Protocols
- 1.3.5. Creation of a Nomogram

1.4. Preoperative Testing for Corneal Refractive Surgery
- 1.4.1. Corneal Topography and Tomography
  - 1.4.1.1. Normal Corneal Topography
  - 1.4.1.2. Corneal Astigmatism vs. Refractive: Application of Javal's Rule
  - 1.4.1.3. Pathological Topographies
  - 1.4.1.4. Suspicious Topographies
- 1.4.2. Pachymetry
  - 1.4.2.1. Normal Values, Limits and Fine Pachymetries
  - 1.4.2.2. Limitations of Surgery Due to Pachymetry
- 1.4.3. Refraction:
  - 1.4.3.1. Visual Acuity
  - 1.4.3.2. Subjective Refraction vs. Objective Refraction
  - 1.4.3.3. Cycloplegic Refraction
  - 1.4.3.4. Surgical Indication
- 1.4.4. Test Verification
  - 1.4.4.1. Preoperative Briefing

1.5. Postoperative Period and Complications in Corneal Refractive Surgery
- 1.5.1. Intra-Operative
  - 1.5.1.1. Correction of Programming Errors by Vectors of Dioptric Powers
  - 1.5.1.2. Incomplete Lenticule
  - 1.5.1.3. Complete Lenticule
  - 1.5.1.4. Loss of Epithelium
- 1.5.2. Postoperative
  - 1.5.2.1. Flap Dislocation
  - 1.5.2.2. Keratitis Sicca
  - 1.5.2.3. Infections
  - 1.5.2.4. Epithelial Growth at the Interphase
  - 1.5.2.5. Interphase Fluid Syndrome
  - 1.5.2.6. Cortico-Dependent Increase in Intraocular Pressure
  - 1.5.2.7. Toxic Anterior Segment Syndrome (TASS)
  - 1.5.2.8. Loss of Visual Quality

1.6. Physical Basis of Refractive Change Induced by Intraocular Lenses
- 1.6.1. Solution of the Theoretical Eye
  - 1.6.1.1. Phakic Lenses
  - 1.6.1.2. Pseudophakic Lenses in Clear Lens and Cataracts

1.7. Preoperative Testing for Intraocular Surgery
- 1.7.1. Phakic Lenses
- 1.7.2. Lens Surgery

1.8. Ocular Biometry and Intraocular Lens Calculation
- 1.8.1. Calculation Formula for Pseudophakic Intraocular Lenses
- 1.8.2. Calculation Formula for Phakic Intraocular Lenses
- 1.8.3. Ultrasonic and Optical Ocular Biometry
- 1.8.4. Intraocular Lens Power Calculation Formulas
- 1.8.5. Calculation in Eyes Undergoing Corneal Laser Refractive
  - 1.8.5.1. Haigis Method
  - 1.8.5.2. Shammas' Method
  - 1.8.5.3. Barrett True-K

1.9. Types of Intraocular Lens
- 1.9.1. Monofocal
- 1.9.2. Multifocal
- 1.9.3. O-rings
- 1.9.4. Accommodating

1.10. Postoperative Period and Complications in Intraocular Refractive Surgery
- 1.10.1. Intra-Operative
- 1.10.2. Early Preoperatives
- 1.10.3. Late Preoperatives

## **Module 2.** Biostatistics for Optics and Optometry Research

2.1. Concept of Biostatistics and Epidemiology
- 2.1.1. Definition of Statistics and Biostatistics
- 2.1.2. Clinical Research
- 2.1.3. Evidence Levels
- 2.1.4. Evidence-Based Optics and Optometry

2.2. A Visual Acuity Measurement Experiment
- 2.2.1. The Teacher's Doubt
- 2.2.2. Random Error and Systematic Error
- 2.2.3. Answering a Question from Intuition or from Science
- 2.2.4. Point or Interval Estimation
- 2.2.5. The Confidence Interval: Concept and Utility
- 2.2.6. The Hypothesis Contrast: Concept and Utility

2.3. Descriptive Statistics
- 2.3.1. Types of Variables
- 2.3.2. Measures of Central Tendency
- 2.3.3. Measures of Dispersion
- 2.3.4. Graphical Representation of Research Project Results
- 2.3.5. Use of Software
- 2.3.6. Examples Applied to Optics and Optometry

2.4. Probability Distributions
- 2.4.1. Concept of Probability
- 2.4.2. Concept of Probability Distribution
- 2.4.3. Binomial Distribution
- 2.4.4. Normal Distribution
- 2.4.5. Concept of Normality and Homoscedasticity
  - 2.4.5.1. Typified Normal Distribution
- 2.4.6. Use of Software
- 2.4.7. Examples Applied to Optics and Optometry

2.5. Confidence Intervals
- 2.5.1. Point or Interval Estimation
- 2.5.2. The 95% Confidence Interval
- 2.5.3. Sample Size Estimation
- 2.5.4. Estimation of an Average
- 2.5.5. Estimation of a Proportion
- 2.5.6. Confidence Interval for a Difference in Means
- 2.5.7. Confidence Interval for a Difference in Proportions
- 2.5.8. Use of Software
- 2.5.9. Examples Applied to Optics and Optometry

2.6. Hypothesis Contrast
- 2.6.1. The P-Value
- 2.6.2. Critical Analysis of P-Value
- 2.6.3. Normality Test
  - 2.6.3.1. Kolmoronov-Smirnov
  - 2.6.3.2. Shapiro-Wilk's Test

2.6.4. Homoscedasticity Test
2.6.5. Use of Software
2.6.6. Examples Applied to Optics and Optometry
2.7. Test for the Comparison of Two Samples and Two Proportions
2.7.1. Parametric and Non-Parametric Tests
2.7.2. *Student*'s T-Test
2.7.3. Welch's Test
2.7.4. Wilcoxon's Test
2.7.5. Mann-Whitney's Test
2.7.6. Confidence Interval for the Difference of Means
2.7.7. Use of Software
2.7.8. Examples Applied to Optics and Optometry
2.8. Test for the Comparison of More than Two Samples or Proportions
2.8.1. ANOVA
2.8.2. Kruskal-Wallis
2.8.3. Post-Hoc Analysis
2.8.4. Use of Software
2.8.5. Examples Applied to Optics and Optometry
2.9. Regression Analysis
2.9.1. Simple Linear
2.9.2. Multiple Linear
2.9.3. Logistics
2.9.4. Use of Software
2.9.5. Examples Applied to Optics and Optometry
2.10. Comparison and Concordance Analysis Between Measurement Methods
2.10.1. Difference Between Concordance and Correlation
2.10.2. Bland-Altman's Graphic Method
2.10.3. Use of Software
2.10.4. Examples Applied to Optics and Optometry

## **Module 3.** Vision Therapy in Clinical Practice

3.1. Medical History
- 3.1.1. Patient's Clinical History
- 3.1.2. Triad: Patient, Family and Optometrist

3.2. Assessment of Sensory and Accommodative Function
- 3.2.1. Sensory Function: Suppression and Stereopsis
- 3.2.2. Accommodative Dysfunctions
- 3.2.3 Necessary Equipment

3.3. Vergence and Oculomotor Function Assessment
- 3.3.1. Vergenital Dysfunctions
- 3.3.2. Oculomotor Dysfunctions
- 3.3.3. Necessary Equipment

3.4. Assessment of Visual Information Processing
- 3.4.1. Relationship Between Vision and Learning
- 3.4.2. Visuospatial Skills
- 3.4.3. Visual Analysis Skills
- 3.4.4. Visuomotor Integration Skills

3.5. Visual Therapy in Non-Strabismic Dysfunctions
- 3.5.1. Intervention in Accommodative Dysfunctions
- 3.5.2. Intervention in Binocular Dysfunctions
- 3.5.3. Intervention in Oculomotor Dysfunctions

3.6. Visual Therapy in Amblyopia and Strabismus
- 3.6.1. Types of Amblyopia Intervention
- 3.6.2. Interventions in Strabismus

3.7. Visual Therapy in Brain Damage with Visual Impairment
- 3.7.1. Classification of Brain Injuries
- 3.7.2. Visual Problems after Acquired Brain Injury
- 3.7.3. Eye Test
- 3.7.4. Prognosis and Intervention Plan

3.8. Vision Therapy in Sports and Other Professions
- 3.8.1. Sport Vision
- 3.8.2. Visual Skills According to Sports Discipline
- 3.8.3. Techniques and Procedures for the Selection and Training of Athletes
- 3.8.4. Vision Therapy in Other Professions

3.9. Vision Therapy in Comorbidity with Neurodevelopmental Disorders, Low Vision, People With Disabilities and Functional Diversity
- 3.9.1. Visual Examination in Neurodevelopmental Disorders
- 3.9.2. Intervention Protocols According to Current Evidence and Clinical Guidelines
- 3.9.3. Visual Therapy in Patients With Low Vision
- 3.9.4. Triad: Student, Family and School

3.10. Transdisciplinary Practice in Vision Therapy
- 3.10.1. Optometric Report Templates
- 3.10.2. Communication With the Family
- 3.10.3. Communication With the Patient
- 3.10.4. Communication With Healthcare Professionals
- 3.10.5. Communication With the school
- 3.10.6. Visual Intervention in the Classroom

## **Module 4.** Metrics and Measurements of Visual Quality

4.1. Principles of Aberrometry
- 4.1.1. Wavefront
  - 4.1.1.1. Perfect Wavefront
  - 4.1.1.2. Aberrated Wavefront
- 4.1.2. Perfect Optical System and Diffraction
  - 4.1.2.1. Diffraction Rings
- 4.1.3. Classification of Optical Aberrations
  - 4.1.3.1. High Order
  - 4.1.3.2. Low Order
- 4.1.4. Decomposition Into Zernike Polynomials
  - 4.1.4.1. Zernike Coefficients
  - 4.1.4.2. Normal Values

4.2. Clinically Significant Optical Aberrations
- 4.2.1. Spherical Aberration
  - 4.2.1.1. Optical Foundation
  - 4.2.1.2. Positive Spherical Aberration
  - 4.2.1.3. Negative Spherical Aberration
  - 4.2.1.4. Normal Values
- 4.2.2. Coma.
  - 4.2.2.1. Normal Values

4.3. Metrics for the Measurement of Visual Quality
- 4.3.1. Zernike Coefficients
- 4.3.2. Strehl's Ratio
- 4.3.3. CSF and MTF
- 4.3.4. RMS

4.4. External Ocular Aberrations
- 4.4.1. Corneal Geometry
- 4.4.2. Asphericity
  - 4.4.2.1. Asphericity Coefficients
  - 4.4.2.2. Aspherical and Spherical Aberration
- 4.4.3. Normal Distribution of Corneal Aberrations
  - 4.4.3.1. Normal Eye Asphericity
  - 4.4.3.2. Normal Eye Coma

4.5. Internal Ocular Aberrations
- 4.5.1. Lens
- 4.5.2. Methods

4.6. Aberrations in the Irregular Cornea
- 4.6.1. Keratoconus
- 4.6.2. Corneal Ectasia

4.7. Induced Aberrometric Changes on the Cornea
- 4.7.1. Orthokeratology
  - 4.7.1.1. Focused Treatment Case
  - 4.7.1.2. Off-Center Treatment Case
- 4.7.2. Aberrometric Changes Induced by Corneal Refractive Surgery
  - 4.7.2.1. Myopia Surgery
  - 4.7.2.2. Hyperopia Surgery
  - 4.7.2.3. Off-Center Ablations

4.8. Aberrometric Changes Induced by Crystalline Lens Surgery and Intraocular Lens Implantation
- 4.8.1. Intraocular Lens Aberrations
- 4.8.2. Asphericity and Aberrations in the Pseudophakic Eye

4.9. Instruments for Measuring Visual Quality
- 4.9.1. Surveyors
- 4.9.2. Hartman-Shack Aberrometry

4.10. Compensation of Ocular Aberrations
- 4.10.1. Contact Lenses
- 4.10.2. Corneal Topography Guided Laser Ablation

## **Module 5.** Latest Advances in the Management of Amblyopia

5.1. General Information
- 5.1.1. Visual Acuity Development
- 5.1.2. Critical Periods vs. Plasticity

5.2. Definition

5.3. Types of Amblyopia
- 5.3.1. Refractive Amblyopia
- 5.3.2. Strabismic Amblyopia
- 5.3.3. Deprivation Amblyopia
- 5.3.4. Combined Amblyopia

5.4. Visual Alterations
- 5.4.1. Visual acuity
- 5.4.2. Contrast Sensitivity
- 5.4.3. Accommodation System
- 5.4.4. Ocular Motility:
- 5.4.5. Spatial Localization (Spatial Uncertainty and Distortions)
- 5.4.6. Stacking Effect
- 5.4.7. Suppression and Stereopsis
- 5.4.8. Reading Performance
- 5.4.9. Visuomotor Tasks
- 5.4.10. Neurological Activity and Pupillary Reaction
- 5.4.11. Anatomical Changes

5.5. Visual acuity
- 5.5.1. Contrast Sensitivity
- 5.5.2. Accommodation System

5.5.3. Ocular Motility:
5.5.4. Spatial Localization (Spatial Uncertainty and Distortions)
5.5.5. Stacking Effect
5.5.6. Suppression and Stereopsis
5.5.7. Reading Performance
5.5.8. Visuomotor Tasks
5.5.9. Neurological Activity and Pupillary Reaction
5.5.10. Anatomical Changes
5.6. Inclusion and Exclusion Evaluation and Diagnosis
5.6.1. Visual Acuity Evaluation
5.6.2. Refractive Status Evaluation
5.6.3. Binocular System Evaluation
5.6.4. Accommodating System Evaluation
5.6.5. Ocular Motility Assessment
5.6.6. Ocular Health Evaluation
5.7. Treatment with Refractive Status Correction Latest Studies
5.7.1. Optical Correction to Prescribe
5.7.2. Time Required for Effect
5.7.3. Effectiveness
5.8. Treatment with Occlusion and Pharmacological Penalty Latest Studies
5.8.1. Occlusion
5.8.1.1. Types of Occlusion
5.8.1.2. Occlusion Time
5.8.1.3. Effectiveness
5.8.2. Pharmacological Penalty
5.8.2.1. Atropine Dosage
5.8.2.2. Effectiveness
5.8.2.3. Comparison of Treatment with Occlusion vs Pharmacological Penalty
5.8.2.4. Treatment Compliance
5.8.2.5. Treatment Regression
5.8.3. Vision Therapy Treatment Latest Studies
5.8.3.1. Advantages and Disadvantages
5.8.3.2. Monocular Activities
5.8.3.3. Near and Far Vision Activities
5.8.3.4. Antisuppressive Techniques and Binocular Therapy
5.8.4. Other Current and Future Treatments
5.8.4.1. Medical Treatment
5.8.4.2. Acupuncture
5.8.4.3. Other Future Treatments
5.8.5. Comprehensive Management of the Amblyopia Patient
5.8.5.1. Action Protocol
5.8.5.2. Follow-Up Evaluation
5.8.5.3. Check-up Calendar

## **Module 6.** Low Vision and Geriatric optometry

6.1. Low Vision, Definition and Current Classifications
6.1.1. Definition, New Terms and Concepts
6.1.2. What Is a Low Vision Test?
6.1.3. Functional Vision
6.1.4. New Concept of Fragile Vision
6.1.5. Different Classifications, a Single Protocol?
6.1.6. Statistics Related to Visual Impairment of all Types
6.1.7. Concepts and Terminology
6.1.8. Low Vision Statistics
6.1.9. Low Vision Decalogue
6.2. Ocular Pathologies and Other Conditions Causing Low Vision
6.2.1. Degenerative and Non-Degenerative Pathologies
6.2.2. Classification of These Pathologies According to Their Condition
6.2.3. Physiopathogenesis
6.2.4. Risk Factors
6.2.5. Current Evolution of These Pathologies, Epidemiology
6.2.6. Adjustment Process to Visual Impairment
6.2.7. Low Vision in Children and Infants

6.3. Anamnesis in Low Vision and Multidisciplinary Intervention
- 6.3.1. Preliminary Considerations
- 6.3.2. Guidelines for Interaction With People With Low Vision
- 6.3.3. Role of the Patient's Family And/or Companions
- 6.3.4. How to Communicate the Information?
- 6.3.5. Accompanying the Person With Low Vision
- 6.3.6. Patient Selection, Success or Failure, Outcome Prognoses

6.4. Clinical Intervention Protocol for Low Vision Individuals or Who Suffer Moderate to Severe Visual Loss
- 6.4.1. WHO Diagram
- 6.4.2. Individuals Eligible for Low Vision Adaptive Aids and Visual Rehabilitation
- 6.4.3. Improved Intervention for People With Low Vision, Fragile Vision, or Neurological Injuries
- 6.4.4. Tips for Professionals to Help Patients and Family Members
- 6.4.5. Interdisciplinary Referral Protocol
- 6.4.6. Interaction With People With Visual Impairment
- 6.4.7. Same Conditions, Different Solutions

6.5. Low Vision Consultation Material
- 6.5.1. Attitude and Aptitude
- 6.5.2. Equipment in Low Vision and Geriatrics
- 6.5.3. Tests Required for Evaluation
- 6.5.4. Which Commercial Products Are Useful?
- 6.5.5. Organizing a Low Vision Consultation
- 6.5.6. Patient and Family Support Reports

6.6. Low Vision and Geriatric Vision Patient Examination
- 6.6.1. Core Values for the Care of Low Vision and Geriatric Patients
- 6.6.2. *Dunning-Kruger* Syndrome in the Professional
- 6.6.3. Refraction of the Patient With Low Vision
- 6.6.4. Distant Vision
- 6.6.5. Near Vision
- 6.6.6. What Does the Patient Want?

6.7. Visual and Non-Visual Aids in Visual Limitation, Low Vision and Geriatrics
- 6.7.1. Optical Aids, Classification
- 6.7.2. Non-Optical Aids Environment in Patients with Low Vision
- 6.7.3. Electronic Aids, Classification and Utilities
- 6.7.4. Latest Technologies and Artificial Intelligence for Low Vision
- 6.7.5. How to Create Positive Circumstances

6.8. Light, Its Importance and Basic Concepts Needed for Low Vision
- 6.8.1. Notions of Light Spectrum
- 6.8.2. Basic Concepts
- 6.8.3. Adaptation to Light and Darkness in Low Vision
- 6.8.4. Glare, a Fundamental Factor in Low Vision and Geriatrics
- 6.8.5. Variable of Objects Influencing Vision
- 6.8.6. Selective Filters: Not Everything Goes

6.9. Training in Low Vision Patient Support, Accompaniment and Follow-Up
- 6.9.1. Optimal Choice in Patient Aids
- 6.9.2. Clear and Documented Information About Prescribed Aids
- 6.9.3. Guidelines for Training Aids
- 6.9.4. Specific Training in Distance, Medium and Near Vision
- 6.9.5. Expectations and Perceptions
- 6.9.6. Multidisciplinary Follow-Up and Intervention, Training
- 6.9.7. Concepts of TR, and Patient Orientation

6.10. Geriatric Optometry Aging and Vision Problems
- 6.10.1. Pillars of Geriatrics
- 6.10.2. Aging and Visual Impairment
- 6.10.3. Significant Physical Changes
- 6.10.4. Assessment of Personal Autonomy
- 6.10.5. Most Relevant Neuropsychological Characteristics
- 6.10.6. Optometric Examination in Geriatric Patients
- 6.10.7. Appropriate Corrections in Geriatric Patients
- 6.10.8. Welfare Support



## **Module 7.** Pharmacology of Ophthalmic Use

7.1. General Principles of Pharmacology
- 7.1.1. Drug Concept
- 7.1.2. Drug Action Mechanisms

7.2. Pharmacokinetics
- 7.2.1. Routes of Drug Administration
- 7.2.2. ADME Process: Absorption, Distribution, Metabolism, and Excretion of Drugs
- 7.2.3. Adverse Reactions of Drugs Administered by General and Topical Ocular Administration

7.3. Anesthetic Drugs in Ophthalmology
- 7.3.1. Pharmacological Effects of Anesthetics Applied at the Ocular Level
- 7.3.2. Use of Anesthetics in Ophthalmology
- 7.3.3. Adverse Reactions

7.4. Drugs That Modify the Diameter of the Pupil
- 7.4.1. Pharmacological Effects of Mydriatics, Miotics and Cycloplegics Applied at the Ocular Level
- 7.4.2. Use of Drugs in Ophthalmology
- 7.4.3. Adverse Reactions

7.5. Ocular Hypotensive Drugs
- 7.5.1. Glaucoma Pathology
- 7.5.2. Drug Action Mechanisms
- 7.5.3. Adverse Reactions

7.6. Anti-Infective Drugs
- 7.6.1. Antibiotic Drugs
- 7.6.2. Antiviral Drugs
- 7.6.3. Antifungal Drugs

7.7. Non-Steroidal Anti-Inflammatory Drugs
- 7.7.1. NSAID Drugs
- 7.7.2. Steroid Anti-Inflammatory Drugs
- 7.7.3. Antihistamine Drugs

7.8. Antiangiogenic Drugs
- 7.8.1. Pathology of AMD
- 7.8.2. Mechanism of Action of Antiangiogenic Drugs

7.9. Botulinum toxin
- 7.9.1. Botulinum Toxin Mechanism of Action
- 7.9.2. Use of Botulinum Toxin in Strabismus

7.10. Drugs Used in the Diagnosis of Ocular Surface Disorders Artificial Tears and Ocular Moisturizers
- 7.10.1. Ocular Dyes
- 7.10.2. Artificial Tears and Ocular Moisturizers

## **Module 8.** Latest Advances in Optical and Optometric Instrumentation

8.1. Characterization of the Tear
- 8.1.1. Characterization of the Meibomian Glands: Indications for Intense Pulsed Light (IPL) Treatment
- 8.1.2. Qualitative and Quantitative Techniques
- 8.1.3. Assessment of Tear Patterns

8.2. Characterization of the Cornea
- 8.2.1. Corneal Topography: Placido Systems and Scheimpflug Photography
- 8.2.2. Optical Coherence Tomography (OCT) of the Anterior Segment
- 8.2.3. Endothelial Microscopy
- 8.2.4. Corneal Biomechanics

8.3. Characterization of the Sclera: Scleral Topography

8.4. Evaluation of the Anterior Chamber and Iridocorneal Angle
- 8.4.1. Classic Techniques
- 8.4.2. Anterior Segment OCT
- 8.4.3. Gonioscopy
- 8.4.4. Ultrasonic Biomicroscopy (UBM)

8.5. Tonometry
- 8.5.1. Techniques
- 8.5.2. Instruments

8.6. Evaluation of the Crystalline Lens
- 8.6.1. Techniques
- 8.6.2. Instruments

8.7. Evaluation of the Optic Nerve, Retina (Vascular Tree, Parenchyma and Macular Area) and Choroid
- 8.7.1. Ophthalmoscopy
- 8.7.2. Posterior Segment OCT
- 8.7.3. Retinography
- 8.7.4. Other techniques

8.8. Visual Field Evaluation
- 8.8.1. Computerized Campimetry

8.9. Systems for Assessing Visual Quality and Light Scattering

8.10. Ocular Biometry
- 8.10.1. Uses in Optometry
- 8.10.2. Ultrasound biometry
- 8.10.3. Optical Biometrics

## **Module 9.** Pediatric Optometry

9.1. Introduction
- 9.1.1. Optometric Goals in the Pediatric Population
- 9.1.2. Developmental Scale of the Child in the First Years of Life

9.2. Development of the Visual System
- 9.2.1. The Visual Pathway: Retina-Lateral Geniculate Body-Visual Cortex
- 9.2.2. Other Routes, Structures and Conexions

9.3. Epidemiology and Clinical Guidelines
- 9.3.1. Preliminary Considerations
- 9.3.2. Prevalence of Refractive Errors, Amblyopia, and Strabismus
- 9.3.3. Other Prevalences

9.4. Cabinet Design and Optometrist's Aptitude
- 9.4.1. The Optometrist and the Child
- 9.4.2. Pediatric Practice Design
- 9.4.3. Inclusion From Diversity

9.5. Medical History in the Pediatric Population
- 9.5.1. Anamnesis From 0 to 3 Years Old
- 9.5.2. Anamnesis From 3 to 7 Years Old
- 9.5.3. Anamnesis From 7 to 18 Years Old

9.6. Visual Acuity, Refractive Status and Contrast Sensitivity in the Pediatric Population
- 9.6.1. Development of Visual Acuity in Pediatric Population
- 9.6.2. Refraction and Its Evolution in the Pediatric Population
- 9.6.3. Contrast Sensitivity in Pediatric Population

9.7. Accommodation and Oculomotor Function in the Pediatric Population
- 9.7.1. Accommodation in Pediatric Population
- 9.7.2. Function in Pediatric Population

9.8. Binocular Function and Perceptual Assessment
- 9.8.1. Binocular Function
- 9.8.2. Perceptual Assessment and Other Skills

9.9. Detection of Pathological Alterations in the Pediatric Population
- 9.9.1. Detection of Alterations in the Anterior Pole
- 9.9.2. Detection of Posterior Pole Alterations

9.10. Transdisciplinary Involvement of the Optometrist in Vision Therapy
- 9.10.1. Communication With Other Health Care Providers
- 9.10.2. Communication With Educational Professionals

## **Module 10.** Advanced Contactology

10.1. Cornea and Ocular Surface
- 10.1.1. Cornea
- 10.1.2. Tears
- 10.1.3. Lens-To-Eye Relationship

10.2. Corneal Topography
- 10.2.1. Introduction and Principles
- 10.2.2. Placid Disk-Based and Elevation-Based Topographies
- 10.2.3. Types of Maps and Their Application

10.3. Biomicroscopy
- 10.3.1. Introduction
- 10.3.2. Techniques and Uses
- 10.3.3. Photography and Image Capture

10.4. Fitting of Contact Lenses in Regular Cornea
- 10.4.1. When Is a Cornea Regular?
- 10.4.2. RGP Lenses
  - 10.4.2.1. Materials
  - 10.4.2.2. Designs
- 10.4.3. Custom Fitting of Soft Lenses
  - 10.4.3.1. Introduction
  - 10.4.3.2. Concept of Sagitta
  - 10.4.3.3. Importance of Sagittal Height in Soft Lenses

10.5. Fitting of Contact Lenses in Irregular Cornea
- 10.5.1. Definition of Irregular Cornea
- 10.5.2. Corneal Lenses
- 10.5.3. Scleral Lenses
- 10.5.4. Other Possible Solutions

10.6. Principles of Orthokeratology
- 10.6.1. History
- 10.6.2. Treatment Mechanisms
- 10.6.3. Lens Design
- 10.6.4. Evaluation of the Fluorogram
- 10.6.5. Topography Evaluation

10.7. Advanced Orthokeratology
- 10.7.1. Myopia
- 10.7.2. Astigmatism
- 10.7.3. Hyperopia

10.8. Myopia Control with Contact Lenses
- 10.8.1. Introduction to Myopia
- 10.8.2. Orthokeratology
- 10.8.3. Multifocal Soft Lenses
- 10.8.4. Combined Treatments With Atropine

10.9. Fitting of Multifocal Lenses for Presbyopia
- 10.9.1. Blur Curve and Power Profiles
- 10.9.2. RGP Lenses
- 10.9.3. Soft Lenses

10.10. Complications in Contactology
- 10.10.1. Complications Arising From Adaptation
- 10.10.2. Complications Unrelated to the Adaptation

## **Module 11.** Light and Optics

11.1. Nature of Light
- 11.1.1. Waves and Corpuscles
- 11.1.2. The Wave Front
  - 11.1.2.1. Waves and Rays
- 11.1.3. Principles of Photometry
- 11.1.4. Luminous Flux
- 11.1.5. Luminous Intensity
- 11.1.6. Luminance

11.2. Paraxial Optics
- 11.2.1. Paraxial Environment
- 11.2.2. Definitions
- 11.2.3. Refraction and Reflection
- 11.2.4. Snell's Law

11.3. Meniscus, Lenses and Ray Tracing
- 11.3.1. Diopter Definition
- 11.3.2. Spherical Meniscus
  - 11.3.2.1. Focal and Power of a Spherical Meniscus
- 11.3.3. Thin Lenses
  - 11.3.3.1. Focal and Power of a Lens
  - 11.3.3.2. Spherical Lenses
  - 11.3.3.3. Aspherical Lenses
  - 11.3.3.4. Toric or Astigmatic Lenses
  - 11.3.3.5. Spherotoric Lenses
- 11.3.4. Ray Tracing
- 11.3.5. Diaphragms

11.4. Optical Systems
- 11.4.1. Thick Lens
  - 11.4.1.1. Optical Coupling of the Two Surfaces
  - 11.4.1.2. Main and Nodal Planes
  - 11.4.1.3. Focal and Power of the Lens
- 11.4.2. Two-Lens System
  - 11.4.2.1. Optical Coupling of the Two Lenses
  - 11.4.2.2. Main and Nodal Planes
  - 11.4.2.3. Focal and System Power

11.5. Optical Instruments
- 11.5.1. Telescope
  - 11.5.1.1. Newton
  - 11.5.1.2. Galileo
  - 11.5.1.3. Increases
- 11.5.2. Microscope
  - 11.5.2.1. Increases
- 11.5.3. The Eye as an "Optical Instrument"

11.6. Optical Aberrations I
- 11.6.1. The Perfect Wavefront vs. The Real Wavefront
- 11.6.2. Analysis of the Quality of an Optical System
  - 11.6.2.1. Diffraction
  - 11.6.2.2. Diffraction Limitation to the Perfect System
  - 11.6.2.3. Modulation Transfer Function (MTF)
  - 11.6.2.4. Point Spread Function (PSF)
  - 11.6.2.5. Strehl Ratio

11.7. Optical Aberrations II
- 11.7.1. Spherical Aberration
  - 11.7.1.1. Spherical Aberration Asphericity
- 11.7.2. Coma.
- 11.7.3. Zernike Polynomials
  - 11.7.3.1. Low and High Order Aberrations
  - 11.7.3.2. RMS
- 11.7.4. Seidel Aberrations
- 11.7.5. Clinical Aberrations

## **Module 12.** Visual Anomalies and Measurement Methods

12.1. Ocular Anatomy
- 12.1.1. The Eyeball
- 12.1.2. The Cornea
- 12.1.3. The Crystalline Lens
- 12.1.4. The Retina
- 12.1.5. Optic Nerve
- 12.1.6. Visual Pathway

12.2. The Ocular Optical System I
- 12.2.1. Cornea
  - 12.2.1.1. Simplified Keratometry: SimK
  - 12.2.1.2. Total Corneal Power
- 12.2.2. Lens
  - 12.2.2.1. Power
- 12.2.3. Corneal-Crystalline Coupling
  - 12.2.3.1. Principal and Nodal Planes of the Eye
  - 12.2.3.2. Focal and Eye Power

12.3. The Ocular Optical System II
- 12.3.1. Diaphragms and Pupils of the Eye
  - 12.3.1.1. Aperture Diaphragm
  - 12.3.1.2. Entrance and Exit Pupils
  - 12.3.1.3. Accommodation
  - 12.3.2. Remote and Proximity Points

12.4. Measurements of Visual Quality
- 12.4.1. Visual Acuity
  - 12.4.1.1. Visual Acuity Measurement Metrics
  - 12.4.1.1. Optotypes
- 12.4.2. Contrast Vision
- 12.4.3. Aberrometry
  - 12.4.3.1. Corneal Aberrometry
  - 12.4.3.2. Hartman-Shack Aberrometry

12.5. Spherical and Cylindrical Ametropias
- 12.5.1. Myopia
  - 12.5.1.1. Definition
  - 12.5.1.2. Types
- 12.5.2. Hyperopia
  - 12.5.2.1. Definition
  - 12.5.2.2. Types
- 12.5.3. Astigmatism
  - 12.5.3.1. Definition
  - 12.5.3.2. Strurm Interval
  - 12.5.3.3. Types
  - 12.5.3.4. Regular
  - 12.5.3.5. Irregular
- 12.5.4. Presbyopia
  - 12.5.4.1. Definition
- 12.5.5. Evolution with Age
- 12.5.6. Distribution of Ametropia in the Population

12.6. Ocular Refraction
- 12.6.1. Objective Methods of Refraction
  - 12.6.1.1. Autorrefractometry
  - 12.6.1.2. Retinoscopy
- 12.6.2. Subjective Refraction
- 12.6.3. Cycloplegic Refraction

12.7. Topography and Keratometry
- 12.7.1. The Keratometer
- 12.7.2. Corneal Topography
  - 12.7.2.1. Topographic Maps
  - 12.7.2.2. Tomography
  - 12.7.2.3. Applications

12.8. Ocular Biometry
- 12.8.1. Ultrasound Biometry
- 12.8.2. Optical Biometrics
- 12.8.3. Applications

12.9. Vector Notation of Refraction
- 12.9.1. Vector of Cylindrical Powers
- 12.9.2. Applications
  - 12.9.2.1. Contactology
  - 12.9.2.2. Refractive Surgery

12.10. Binocular Vision
- 12.10.1. Accommodation and Convergence
- 12.10.2. Heterophoria and Strabismus
- 12.10.3. Fusion and Stereopsis
- 12.10.4. Binocular Vision Examination Methods

## **Module 13.** Vision Correction Alternatives

13.1. Principle of Ocular Correction
- 13.1.1. Correction in Glasses
- 13.1.2. Correction in Contact Lenses
- 13.1.3. Correction by Modification of Corneal Power
- 13.1.4. Intraocular Options
  - 13.1.4.1. Phakic Lenses
  - 13.1.4.2. Pseudophakic Lenses

13.2. Optical Technology
- 13.2.1. Types of Optical Glass
- 13.2.2. Refractive Index
- 13.2.3. Abbe Number
- 13.2.4. Spherical Lenses
- 13.2.5. Aspherical Lenses
- 13.2.6. Astigmatic Lenses
  - 13.2.6.1. Cylindrical Lenses
  - 13.2.6.2. Spherocylindrical Lenses
  - 13.2.6.3. Transposition

13.3. Contactology
- 13.3.1. Types of Contact Lenses
  - 13.3.1.1. Adaptation Study
- 13.3.2. Nocturnal Orthokeratology
- 13.3.3. Complications



13.4. Laser Corneal Refractive Surgery I
- 13.4.1. Principle of Correction
- 13.4.2. Preoperative Tests
- 13.4.3. LASIK
  - 13.4.3.1. Indications
  - 13.4.3.2. Procedure
  - 13.4.3.3. Complications

13.5. Laser Corneal Refractive Surgery II
- 13.5.1. PRK and LASEK
  - 13.5.1.1. Indications
  - 13.5.1.2. Procedure
  - 13.5.1.3. Complications

13.6. Phakic Lenses
- 13.6.1. Types
- 13.6.2. Indications
- 13.6.3. Preoperative Tests
- 13.6.4. Procedure
- 13.6.5. Complications

13.7. Pseudophakic Lenses
- 13.7.1. Ocular Biometry and Intraocular Lens Calculation
  - 13.7.1.1. Bio-Meters
  - 13.7.1.2. Calculation Formulas
  - 13.7.1.3. Types of Intraocular Lens
    - 13.7.1.3.1. Monofocal
    - 13.7.1.3.2. Multifocal
    - 13.7.1.3.3. O-Rings
  - 13.7.1.4. Online Calculation Resources
- 13.7.2. Types of Pseudophakic Intraocular Lenses

06

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

*With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.*


According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the physician's professional practice.

*Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method"*

**The effectiveness of the method is justified by four fundamental achievements:**

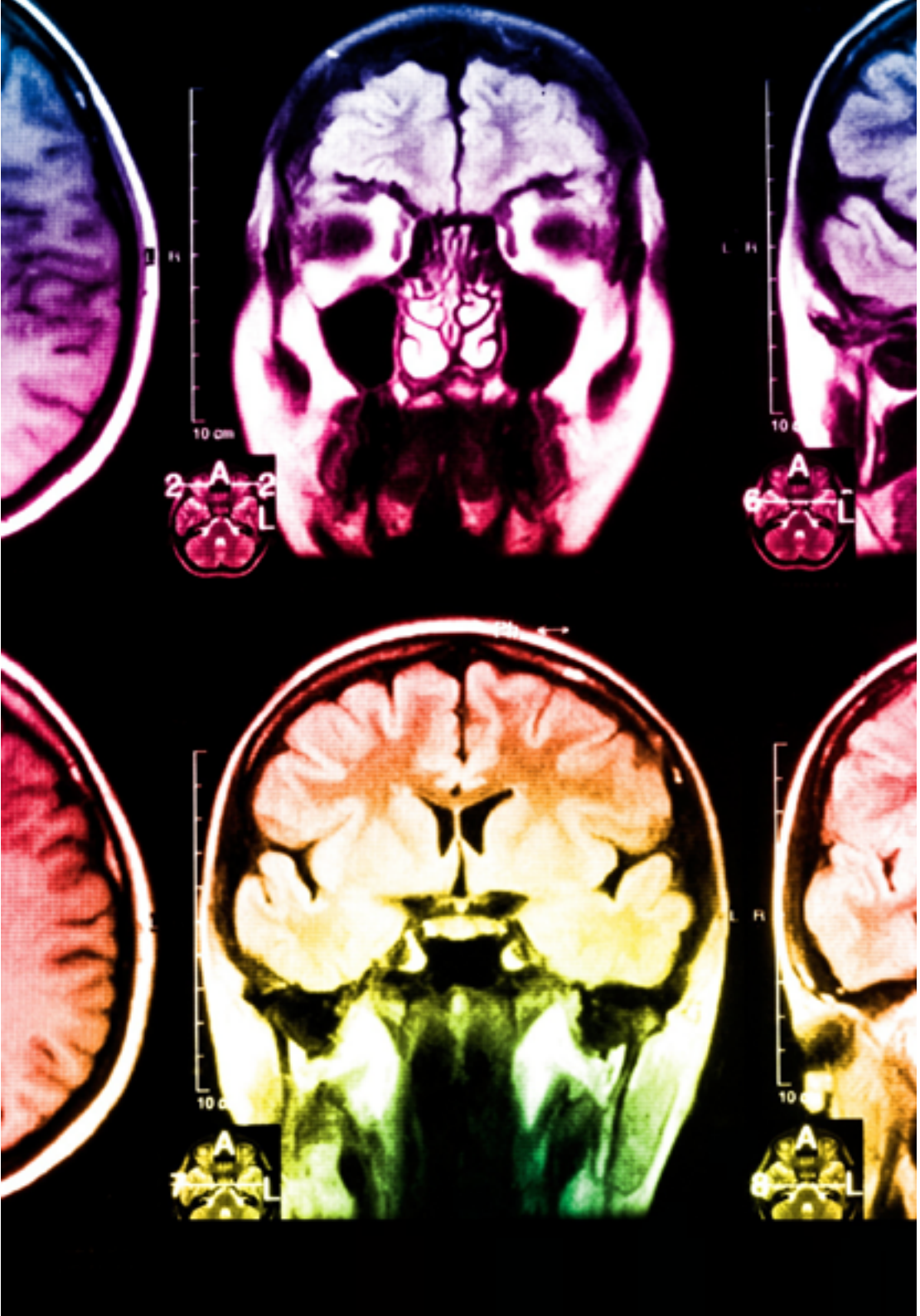
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

*Professionals will learn through real cases and by resolving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology, more than 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

*Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.*

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.

**This program offers the best educational material, prepared with professionals in mind:**

### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.

### Surgical Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.

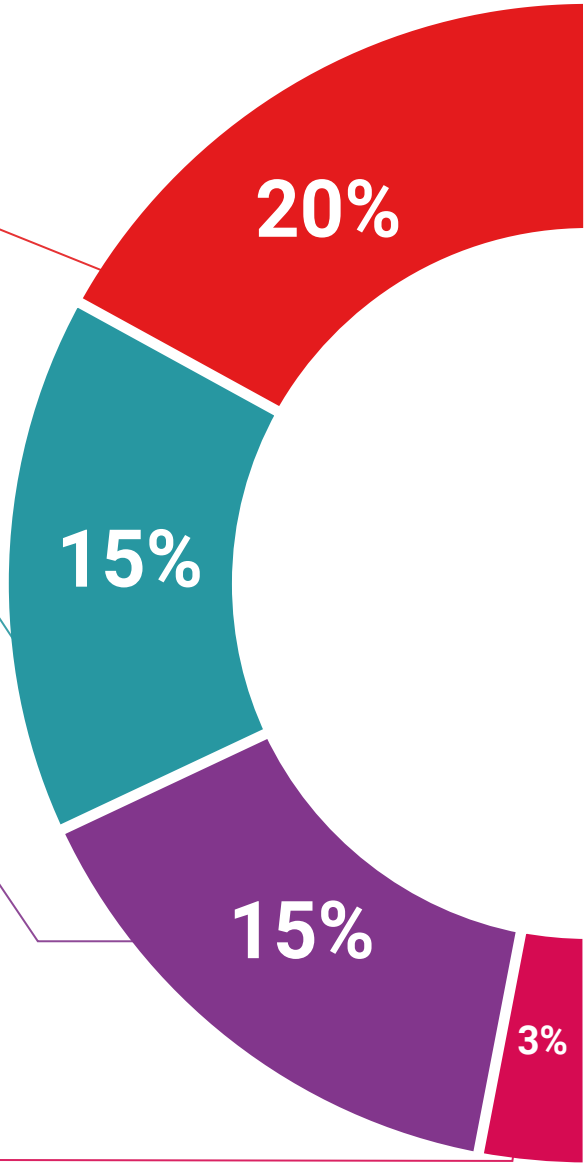
### Interactive Summaries

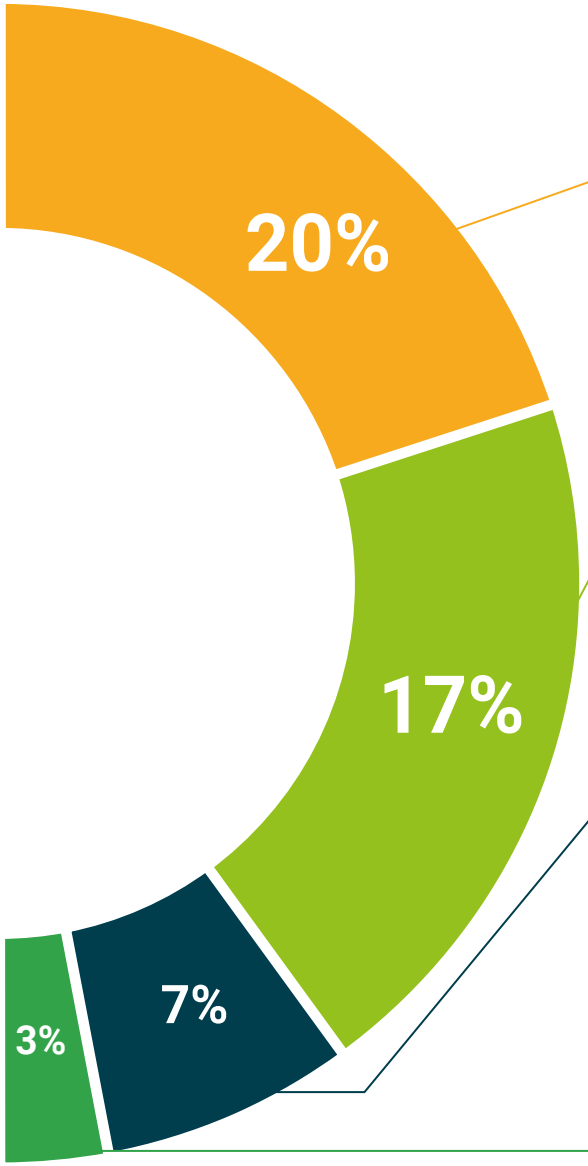
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.






### Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.

### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.

### Classes

There is scientific evidence on the usefulness of learning by observing experts. The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

### Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.

07

# Certificate

The Master's Degree in Optical Technologies and Clinical Optometry and guarantees you, in addition to the most rigorous and updated training, access to a Master's Degree issued by TECH Technological University.

*Successfully complete this program and receive your university degree without travel or laborious paperwork"*

This **Professional Master's Degree in Optical Technologies and Clinical Optometry** contains the most complete and updated scientific program on the market.

After the student has passed the assessments, they will receive their corresponding **Professional Master's Degree** issued by **TECH Technological University** via tracked delivery*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Professional Master's Degree, and meets the requirements commonly demanded by labor exchanges, competitive examinations and professional from career evaluation committees.

Title: **Professional Master's Degree in Optical Technologies and Clinical Optometry**

Official Nº of hours: **1,950 h.**


tech technological university

Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having successfully passed and accredited the following program

PROFESSIONAL MASTER'S DEGREE

in

Optical Technologies and Clinical Optometry

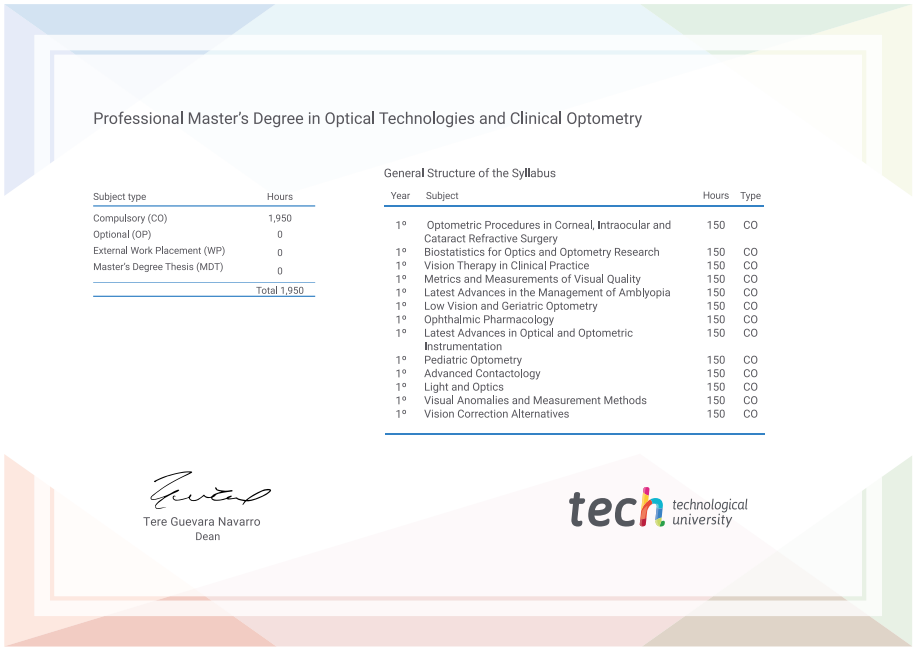
This is a qualification awarded by this University, equivalent to 1,950 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates


Professional Master's Degree in Optical Technologies and Clinical Optometry

| Subject type | Hours |
|---|---|
| Compulsory (CO) | 1,950 |
| Optional (OP) | 0 |
| External Work Placement (WP) | 0 |
| Master's Degree Thesis (MDT) | 0 |
| | Total 1,950 |

General Structure of the Syllabus

| Year | Subject | Hours | Type |
|---|---|---|---|
| 1º | Optometric Procedures in Corneal, Intraocular and Cataract Refractive Surgery | 150 | CO |
| 1º | Biostatistics for Optics and Optometry Research | 150 | CO |
| 1º | Vision Therapy in Clinical Practice | 150 | CO |
| 1º | Metrics and Measurements of Visual Quality | 150 | CO |
| 1º | Latest Advances in the Management of Amblyopia | 150 | CO |
| 1º | Low Vision and Geriatric Optometry | 150 | CO |
| 1º | Ophthalmic Pharmacology | 150 | CO |
| 1º | Latest Advances in Optical and Optometric Instrumentation | 150 | CO |
| 1º | Pediatric Optometry | 150 | CO |
| 1º | Advanced Contactology | 150 | CO |
| 1º | Light and Optics | 150 | CO |
| 1º | Visual Anomalies and Measurement Methods | 150 | CO |
| 1º | Vision Correction Alternatives | 150 | CO |

Tere Guevara Navarro
Dean

tech technological university

*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

tech technological university

# Professional Master's Degree

## Optical Technologies and Clinical Optometry

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

# Professional Master's Degree

## Optical Technologies and Clinical Optometry

tech technological university