Course Description
Ophthalmic Medical Technology Training Program
(OMTTP)

Core Curriculum Requirements

SEMESTER 1, YEAR 1

1.1 Program Orientation
1.2 General Anatomy and Physiology
1.3 Ocular Anatomy and Physiology
1.4 Office Management
1.5 Optics and Optical Instruments
1.6 Vision Testing Methods
1.8 Survival Course
1.9 Standard First Aid and CPR
1.10 Ophthalmic Equipment Maintenance
1.11 Ocular Motility - Basic
1.12 Ophthalmic Patient Services - Basic
1.13 Medical Terminology
1.14 Travel Clinic - #1
2.1 Clinical Optics and Refractometry
2.2 Ophthalmic Patient Services - Advanced
2.4 Tonometry and Tonography
2.5 Systemic Diseases and the Eye
2.6 Pharmacology - Basic
2.8 Ocular Diseases and Disorders
2.10 The Visual Pathway
2.11 Visual Fields - Basic

SEMESTER 2, YEAR 1

1.3 Ocular Anatomy and Physiology
(continued)
1.5 Optics and Optical Instruments
(continued)
1.11 Ocular Motility - Basic
(continued)
1.12 Ophthalmic Patient Services - Basic
(continued)
2.1 Clinical Optics and Refractometry (continued)
2.2 Ophthalmic Patient Services - Advanced
(continued)
2.3 Glaucoma
2.4 Tonometry and Tonography
(continued)
2.5 Systemic Diseases and the Eye
(continued)
2.6 Pharmacology - Basic
(continued)
2.7 Contact Lenses - Basic
SEMESTER 1, YEAR 2

1.3 Ocular Anatomy and Physiology (continued)
1.12 Ophthalmic Patient Services - Basic (continued)
2.1 Clinical Optics and Refractometry (continued)
2.2 Ophthalmic Patient Services - Advanced (continued)
2.3 Glaucoma (continued)
2.9 Ocular Motility - Advanced (continued)
3.1 Surgical Assisting (continued)
3.2 Embryology
3.3 Advanced First Aid 3.4 Contact Lenses - Advanced
3.5 Visual Fields - Advanced
3.6 Ocular Diseases and Disorders
3.7 Ophthalmic Clinical Photography
3.8 Travel Clinic - # 3
4.1 Lasers in Ophthalmology (continued)
4.2 Ultrasonography and Diagnostic Imaging (continued)
4.3 Ocular Prosthesis
4.4 Microbiology
4.6 Electrodiagnostic Tests (ERG, EOG, VER)

SEMESTER 2, YEAR 2

1.7 Elements of a Full Exam
1.10 Ophthalmic Equipment Maintenance (continued)
1.12 Ophthalmic Patient Services - Basic (continued)
1.13 Medical Terminology (continued)
2.8 Ocular Diseases and Disorders (continued)
2.9 Ocular Motility - Advanced  
(continued) 
3.5 Visual Fields - Advanced  
(continued) 
3.7 Ophthalmic Clinical Photography  
(continued) 
3.9 Ophthalmic Pharmacology - Advanced  
(continued) 
4.1 Lasers in Ophthalmology  
(continued) 
4.2 Ultrasonography and Diagnostic Imaging  
(continued) 
4.3 Ocular Prosthesis  
(continued) 
4.4 Microbiology  
(Continued) 
4.5 Visual Aids and Subnormal Vision  
(continued) 
4.6 Electrodiagnostic Tests (ERG, EOG, VER)  
(continued) 
4.7 Ocular Diseases and Disorders 
4.8 Travel Clinic - #4
1.1 Program Orientation

Introduction to the Ophthalmic Medical Technology Training Program. Includes discussion of the dynamics of patient and health professional interactions, student conduct (professional manner in the working environment), responsibilities, STHA Policies (incident reports, GNWT guidelines), Patient confidentiality and identifying the roles of ophthalmic medical personnel and allied health personnel and describe the relationship of each to the ophthalmologist.

1.2 General Anatomy and Physiology

Introduction of body systems and their function in homeostasis. Gain knowledge of all major body systems including cardiovascular, respiratory, endocrine, and nervous systems and the physiology of these systems in order to draw relationship between disease processes in major body systems and their effects on the ocular system.

1.3 Ocular Anatomy and Physiology

Relates structure and function of the human visual system. Anatomy and Physiology of the globe, orbit and ocular adnexa are covered. Basis for infection and inflammation are covered and the difference between the two. Normal microbial flora and common ocular pathogens are discussed. Ocular terminology is expanded. Special emphasis on the relationship between the cranial nerves and their effect on the visual system.

1.4 Office Management

Demonstrates and discusses how a medical office operates. Patient confidentiality, medical legal issues, patient scheduling, and the relationship the Stanton clinic has with the different levels of government is discussed.

1.5 Optics and Ophthalmic Instruments

Introduction to the basic properties of light and how refractive media affects it. Presents the optical principles of the human visual system from both the theoretical and practical standpoints, including the recording of the prescription of a pair of spectacles and the transposition of that prescription. This section explores loose lenses, prisms, Geneva lens clock, lensometry (spherical, cylindrical, prism, multifocal, induced multifocal prism, aphakic lenses or any combination) and ophthalmic dispensing.
1.6 Vision Testing Methods

Describes what visual acuity is and accurately record distance acuity, near acuity, low vision, pinhole and stereopsis in children and adults. The student learns instruction of Snellen acuities, illiterate charts, Sheridan Gardiner, millimeter sweets, and other visual acuity test methods in use of appropriate vision testing procedures for patients who are malingering, have nystagmus or in preverbal children and illiterate adults.

1.7 Elements of a Full Exam

Introduction to the essential tests and skills required to complete a routine visual exam. Includes uncorrected visual acuity, best corrected visual acuity, pupil examination (neurological and pharmalogical reactions), external examination, slit lamp techniques including anterior chamber depth, Intra-ocular pressure, and direct and indirect ophthalmoscopy.

1.8 Survival Course

This is a course delivered through Inukshuk Ventures and gives students knowledge and the best chance to survive a winter travel accident. Due to the extensive arctic travel that is required by graduates this course has been incorporated into the program.

1.9 Standard First Aid and CPR

This section is a course delivered through St. John Ambulance and gives student the skills to understand and help those in need of basic first aid and cardio-pulmonary resuscitation.

1.10 Ophthalmic Equipment Maintenance

Discuss basic maintenance and repair of the following standard ophthalmic equipment: Ophthalmosopes (Indirect and Direct), Retinoscope, Lensometer, Automated and Manual perimeters, Tangent Screen, Phoropter, Slit lamp, U/S, Keratometer, loose lens, tonometer, muscle light, projectors, special instruments, surgical instruments

1.11 Ocular Motility – Basic

This module describes how the human visual system uses both eyes for vision. The student shall describe all extraocular muscle actions; describe the location and innervations of all extraocular muscles; describe the principles of ductions and versions, head tilt, vergences, Risley prisms, diplopia and fusion; describe binocular function including Hering’s law, Sherrington’s law, AC/A ratio, fusional amplitudes, stereopsis,
convergence and divergence, Horopter, Panum’s area, normal retinal correspondence and abnormal retinal correspondence. Described are the principles underlying phorias/tropias, horizontal deviations, vertical deviations, paralytic deviations and pseudostrabismus.

1.12 Ophthalmic Patient Services - Basic

This is a broad section which incorporates many facets of dealing with patients and their complaints. From eliciting a complete ocular history, which includes: recording the chief complaint including onset, symptoms and duration; recording past ocular history including any previous ocular surgery, non-surgical treatments, strabismus, contact lens wear, refractive history, etc; recording medical history including diabetes, hypertension, arthritis and other systemic conditions; record birth history and general development; record family history including systemic and ocular conditions; medications including systemic and ocular; record allergies to systemic medications, topical medications and environmental sources; record drug reactions. Discussion of the indications and proper use of ocular dressings and shields

Description and care of spectacles; discuss basic principles (interpupillary distance, multifocals, bifocals, frames, proper fitting, adjustment and repair, lens material and safety lenses)

d this section covers all left over items that make up the day to day tasks required by the Ophthalmic Technologist.

1.13 Medical Terminology

Development and demonstrate a knowledge of medical terms; converse using appropriate medical terminology and language for use in the clinical setting. Much of this section is independent study with frequent quizzing by chief instructor and other instructors/technicians.

1.14 Travel Clinic I

The students travel to a smaller Northern community and assist with travel clinic. Demonstrates what is expected of technicians and technologists working in the Stanton Eye Clinic. Packing and preparing for a trip is learned. Understanding cultural differences and the logistics of remote health care is demonstrated and discussed. Students are expected to perform tests under supervision of a technician or technologist.
2.1 Clinical Optics and Refractometry

Discussion on the fundamental principles of optics (i.e geometric, clinical and physiologic). This module teaches students how to accurately find a prescription of lenses which allow a person to achieve their best vision. The students learn the principles that govern retinoscopy; demonstrate the general principles governing refractometry and their relation to fogging, astigmatic dials, cross cylinder, duochrome test, accommodation and cycloplegic vs manifest. The student should be able to demonstrate the stenopeic slit and use of automated refractors. The proper technique for retinoscopy (objective method) and refinement (subjective method) is discussed and learned by students. Discussion of advanced optics including simple lens system, compound lens system, plane mirrors, curved mirrors, accommodative range, accommodative amplitude, presbyopia, induced prism, safety lenses, schematic eye, conoid of sturm; discuss principles of bicentric grinding (slab off).

2.2 Ophthalmic Patient Services - Advanced

This section builds from 1.12. Discuss cause, effect and treatment of refractive errors including spectacles, contact lenses, surgical refractive procedures and presbyopia. Also the manufacture and administration of these devices. Discussion of colour vision defects (acquired, congenital, monochromatism, dichromatism and anomalous trichromatism)

2.3 Glaucoma

Describes and classifies the different glaucomas, including signs and symptoms and treatment of each. The mechanism of the disease is discussed in detail. Description and treatment of Primary Open Angle Glaucoma, Acute Angle Closure glaucoma, secondary glaucomas and the mechanism behind each type is explained. Treatment modalities are also covered in this section. A large portion of this module is taught by the Medical Director.

2.4 Tonometry and Tonography

Discussion of the three types of tonometry (indentation, applanation and non-contact). Including the principles; advantages and disadvantages; recognize where each method is appropriate; errors; cleaning and sterilization techniques; list complications and errors; the effects of scleral rigidity; the factors altering intraocular pressure (e.g eyelid squeezing, heartbeat, breath holding and tight collar) demonstrates methods for measuring intraocular pressure. Tonography is discussed but not demonstrated.
2.5  **Systemic Disease and the Eye**

Introduction to various systemic diseases and their effects on the eye and adnexa. Special emphasis will be placed on Diabetes Mellitus, hypertension, cancer, infectious diseases, artherosclerosis, Thyroid disorders, Multiple Sclerosis, Myasthenia Gravis, blood dyscrasias, and others. As the program progresses, even into the second, third and fourth semesters, less common system disorders such as phakomatoses and autoimmune disorders are introduced. More common disorders are expanded upon. The majority of this module is taught by the Medical Director.

2.6  **Pharmacology I**

This section describes drug effects on human tissues. Advantages, disadvantages and complications of various types of drug deliveries (drops, ointment, injections, sustained release), compliance among patients, classification of certain drugs, and obstacles to getting drugs to their target sites is learned in this section. Proper technique for handling and instilling drugs is demonstrated. An introduction to diagnostic and common ophthalmic drugs is included.

2.7  **Contact Lenses – Basic**

Introduction to contact lenses and parameters for fitting. Describe principles of oxygen permeability as it relates to contact lenses. Discuss the uses, advantages and disadvantages of rigid gas permeable lenses, hard contact lenses, soft contact lenses, toric lenses, bifocal lenses, aphakic lenses, extended wear lenses, truncated lenses, bandage lenses and disposable lenses.

2.8  **Ocular Diseases and Disorders**

Description of the Ocular Disease process. Discussion of cause, effect and treatment of ocular infections including bacterial, viral and fungal; discuss cause, effect and treatment of ocular emergencies including corneal abrasions, foreign bodies, chemical injuries, blunt trauma, penetrating trauma, red eyes and flashes/floaters; discuss cause, effect and treatment of common eye disorders including glaucoma, external eye disease, strabismus, dry eye, age related macular degeneration and uveitis; discuss cause, effect and treatment of systemic conditions that can effect the eyes including AIDS and other autoimmune disorders, diabetes, hypertension, artherosclerosis, thyroid disease, pituitary disorders and brain tumors; This section is taught entirely by the Medical Director.
2.9 Ocular Motility - Advanced

Continuation of 1.11 Further investigation into strabismus especially childhood strabismus. Classification of strabismus, including treatment of the condition and its sequelae is expanded, including the principles, causes and treatment of amblyopia; detection and classification of amblyopia. Student should be able to identify advanced types of strabismus (i.e. convergence insufficiency/accommodative insufficiency, divergence excess/divergence insufficiency, dissociated vertical deviations and syndromes/systemic manifestations).

2.10 The Visual Pathway

Explanation of the visual pathway and the anatomy of the visual system as it is related to the visual field; description of ways to evaluate abnormalities of this pathway. Identification of neurological disorders via Visual Field, pupils, and certain other tests is learned by students.

2.11 Visual Fields - Basic

Discuss and demonstrate various methods for evaluation of the visual field. Static and Kinetic methods of testing will be compared. Describe the principles of the binocular field of vision; identifying the errors inherent to visual field testing such as machine calibration, stimulus selection, calculation of correcting lens, patient error and perimetrist error. Automated, Goldmann, Tangent Screen, Confrontation, and Amsler Grid are learned. Benefits and drawbacks of each instrument are discussed as well.

2.12 Travel Clinic II

The students travel to a smaller Northern community and assist with travel clinic. Packing and preparation for the trip is the responsibility of the student. The student is expected to perform more testing under the supervision of the technician or technologist.

3.1 Surgical Assisting

Discussion of aseptic technique and sterile fields is covered in the classroom. Assisting in minor office procedures in the clinic is expected in addition to scrubbing in for operating room procedures at the hospital. Patient instruction on pre and post-operative care is also covered. The majority of this module is taught by Operating Room nurses at the hospital.
3.2 Embryology

Discussion of general embryology and evolution of the eye from developmental stages in utero. This section also includes disorders of the eye, which can alter normal development as well as diseases that may cause congenital defects.

3.3 Advanced First Aid

This course is offered if scheduling and budget restrictions allow. This course is offered through St. John Ambulance and gives students knowledge in how to deal with varied general medical emergencies. This course is beneficial as students and techs often travel to small communities in small aircraft and may be looked to for leadership in an emergency.

3.4 Contact Lenses – Advanced

Continuation of 2.7. Further discussion and demonstration of fitting soft and rigid contact lenses. Medical indications for contact lenses, complications from contact lens wear, and special fittings are covered. Instructing patients on the insertion, removal, wearing regime and care of the contact lenses.

3.5 Visual Fields – Advanced

Description of appropriate tests for various ocular diseases (neurologic, optic nerve, retinal and non-organic); the student shall describe types and causes of major visual field defects and the etiology and description of less common defects such as toxic, steep vs sloping margins, absolute vs relative, nasal step, scotoma and altitudinal. Skills are developed in the use of the non-automated Visual Field testing techniques. Proper documentation of findings, detection of artifactual field loss, basic interpretation, recording and printing results of visual field tests and custom testing are all covered in this section.

3.6 Ocular Diseases and Disorders

Continuation of 2.8. Further description of the ocular disease process. Signs and symptoms of various diseases are taught. Treatment of various conditions is expanded from 2.8. This section is taught entirely by the medical director.

3.7 Ophthalmic Clinical Photography

The student will demonstrate the basic elements of photography. Student will prepare and instruct the patient for ophthalmic photographic procedures; describe the theory
behind external and fundus photography; demonstrate film processing. Explanation of the fundamentals of photography and imaging directed toward uses in ophthalmology. Description and discussion of the various types of ocular photographs and images including Fundus, (including Fluorescein Angiography) Slit Lamp, External, Specular Microscopy, CT, MRI, X-Ray. Principles of fluorescein angiography including filters (exciter/barrier), sodium fluorescein administration, photographic technique and sequencing and fluorescence will be discussed.

3.8 Travel Clinic III

The students travel to a smaller Northern community and assist with travel clinic. Packing and preparation for the trip is the responsibility of the student. The student is expected to perform more than 70% of the testing under the supervision of the technician or technologist.

3.9 Ophthalmic Pharmacology -- Advanced

Continuation of 2.6; Further discussion of drug effects on human tissues. Emphasis is placed on the types, strengths, actions and complications of topical anesthetics, mydriatics and cycloplegics, epinephrine, beta-blockers, miotics, steroids, antibiotics, carbonic anhydrase inhibitors, prostaglandins, vasoconstrictors, antihistamines, osmotic agents, nonsteroidal anti-inflammatories, etc.. Systemic drugs and their effects on the eye are also discussed.

4.1 LASERS in Ophthalmology

Description and discussion of LASERs used in ophthalmology (Nd-YAG, Argon, Excimer, CO2, holmium, and Xenon LASERS.) Students will follow LASER safety guidelines according to STHA policy.

4.2 Ultrasonography and Diagnostic Imaging

Explanation of the fundamentals of ultrasonography and diagnostic imaging and their use in ophthalmology. Description and discussion of the A-scan and B-scan ultrasound; discussion of differences in IOL calculations, as well as theory behind MRI and CT imaging will be covered. A day long visit to the diagnostic imaging department of the hospital will demonstrate function of the CT scanner.
4.3 Ocular Prosthesis

This section is taught by an Ocularist in Edmonton. During training students spend two weeks in Edmonton taking in experience in efferent areas not available in Yellowknife. On average students will spend a full day with the Ocularist learning about the creation, fitting, and care of ocular prostheses.

4.4 Microbiology

Organisms are identified according to their microscopic appearance. Specimen collection and identification, as well as categories of common ocular pathogens are covered. Staining techniques (Gram, Giemsa) are learned. Microbial resistance and proper use of antibiotics is discussed. A portion of this module is taught by Laboratory Technologists at the hospital.

4.5 Visual Aids and Subnormal Vision

Discusses low vision and legal blindness. Visual aids to assist the visually impaired are demonstrated. Methods to measure vision in the visually impaired are demonstrated. Understanding the needs of the visually impaired individual is emphasized.

4.6 Electrodiagnostic Tests (ERG, EOG, VER)

Discussion and description of electrodiagnostic testing devices and their use in ophthalmology. EOG, ERG, and VER are covered in this module. Students have the opportunity to gain experience with this equipment during a two-week learning session at the University of Alberta in Edmonton, Canada.

4.7 Ocular Diseases and Disorders

Continuation of 2.8 and 3.6.

4.8 Travel Clinic IV

The students travel to a smaller Northern community and assist with travel clinic. Packing and preparation for the trip is the responsibility of the student. The student is expected to perform almost all of the testing under the supervision of the technician or technologist.