



Vision Care (VC) I

COURSE SYLLABUS

Curriculum Outline



Grades: 9-10

Prerequisite(s): None

Course Description

Description: Scholars will be introduced to the anatomy of the human eye and sight (vision). From there they will study the various causes of poor vision health. Once they have a good understanding of the eye and vision issues they will learn the role that healthcare plays in helping correct these issues. In this course, they will work hands-on with the tools required to make eyeglasses for vision correction. Learning to use the various machines used to manufacture prescription eyewear. Throughout the course, they will complete various projects to help them gain knowledge of what an optician is and the roles they play in the healthcare workforce. The final project in this class will be manufacturing a corrective pair of glasses from a doctor's prescription.

Course Units/Skills & Knowledge

This course is broken into four units as follows:

UNIT 1: Ocular Structure and Lenses
UNIT 2: Lensometry
UNIT 3: Mini-Clinical Unit
UNIT 4: Layout and Lens Finishing

SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE
Unit 1 Ocular Structure and Lenses		Unit 2 Lensometry		Unit 3 Mini-clinical unit			Unit 4 Layout and Lens finishing		

Grading

20% - Career Readiness

30% - Classwork

50% - Performance Tasks/Assessments

UNIT 1: OCULAR STRUCTURE AND LENSES

UNIT 1 UNDERSTANDINGS:

1. Various structures of the ocular system contribute to the generation of images for vision to occur
2. Changes to one component of the ocular system can change the organism's ability to generate images
3. Different lens shapes affect light and can be used to correct specific vision issues

Knowledge	Skills
<p>Scholars will know...</p> <ul style="list-style-type: none"> • The biological causes of and corrections for myopia, hyperopia, and astigmatism • That the vision center of the brain integrates information from how the cornea, crystalline lens, retina, pupil, and iris work together to generate images for the vision center of the brain • Lenses correct vision imperfections by focusing incoming light appropriately on the retina. • How spherical and cylindrical lenses refract light and correct vision imperfections 	<p>Scholars will be skilled at...</p> <ul style="list-style-type: none"> • Integrate understanding of major biological components that are required for eyes to function and how light and images reach the brain through the eyes in order to help others understand their vision needs • Analyze an individual's prescription and explain how glasses serve to correct that person's vision • Recognize that every individual is different and has different prescriptions to correct ocular issues, and s/he will need different types of glasses to correct vision to help a student see the board • Analyze, synthesize, and integrate technical knowledge, skills, and understandings in a constantly evolving world to be a literate consumer of electronics and optics • Using convex and concave lenses to refract light • Using mm's to measure sizes and distances • Manipulating parts of a model eye to create vision • Understanding how the pupil regulates light entrance to the eye

PERFORMANCE TASK: *How will students demonstrate their understanding (meaning-making and transfer) through a complex performance task?)*

Performance Task focused on Transfer:

A student-created poster that includes information on what emmetropia, hyperopia, and myopia are; how light passes through each of these eyes and where it reaches within the eye; and the type of lens that will best affect these eyes and how the lens affects light to correct vision.

Goal: Students will create a poster to teach others how lenses affect light to correct for visual deficiencies.

Role: Educating optician to help a patient understand how their glasses will help their vision

Audience: A patient, about to get a new pair of glasses, who needs to understand how the glasses will help their vision

Situation: The scholar will use their notes and the work with the model eye and the lenses to make a poster to show how the lenses will help the patient to see.

Product: Poster with images of light and lenses and information that describes how the glasses affect vision

UNIT 2: LENSOMETRY

UNIT 2 UNDERSTANDINGS:

1. Lensometers are machines used by opticians for the layout and fabrication of prescription eyeglasses
2. Astigmatic lenses and spherical lenses, 2 types of lenses used to correct ocular issues, have similarities and differences
3. People wear glasses to correct vision imperfections and that specific information can be used to provide information about their prescription

Knowledge	Skills
<p>Scholars will know...</p> <ul style="list-style-type: none"> • How to read the power drum of a lensometer • The difference between spherical and astigmatic lenses • The thin lines in the reticle of the lensometer indicate the spherical power of the lens, and the thick lines indicate the cylindrical portion of the lens • Power drums are always turned in a minus direction, and the difference between the powers where the spherical lines come in, compared to when the cylindrical lines come in, shows the cylindrical power of a lens 	<p>Scholars will be skilled at...</p> <ul style="list-style-type: none"> • Correctly read the spherical and cylindrical powers of lenses using the lensometer • Spot and dot the optical centers of spherical and astigmatic lenses to prepare them for manufacturing into prescription eyewear • Understand why calibration of machinery is important • Reading the lensometer to determine astigmatic lens power • Reading the lensometer to determine spherical lens power • Reading the lensometer to determine the power of a finished pair of glasses • Using a cylinder axis wheel to find the axis of lenses

PERFORMANCE TASK: *How will students demonstrate their understanding (meaning-making and transfer) through a complex performance task?)*

Performance Task focused on Transfer:

Scholars will determine the power of a pair of glasses and match them to a patient who has lost them.

Goal: Successfully find the powers and axis of both the right and left lens of a finished pair of glasses

Role: Fabricating optician preparing in an optical shop with 3 work trays where the glasses have been mixed up

Audience: Patients waiting for their glasses

Situation: a fabricating optician dropped 3 trays of glasses with the same frames and different prescriptions. Match the powers of lenses to the correct tray

Products: Accurately match up the glasses to the correct tray

Standards: *Eyeglass prescriptions correct to ANSI Standard Z80.1*

Success Criteria

- Accurate calibration of the lensometer
- A prescription must be set within ANSI standards (+/- 0.125 diopters of power, 0.33 prism diopters of OC, and cylindrical axis within standards)
- Correctly label the right and left lenses for manufacturing purposes

UNIT 3: MINI-CLINICAL UNIT

UNIT 3 UNDERSTANDINGS:

1. Different ocular issues cause people to see the world differently
2. Clinical skills are important to working with patients and helping them act responsibly in a clinical setting
3. Visual acuities are ways we can check patient's vision to determine their optical needs to meet their personal goals
4. Accurate pupillary distance measurements are vital to making prescription glasses for patients that meet ANSI standards
5. Work together to build an understanding of how optical professional have different skills, responsibilities, and pay based on their training

Knowledge	Skills
<p>Scholars will know...</p> <ul style="list-style-type: none">• How to take a patient's PD and why it is important.• The different ocular disorders and the types of lenses that correct for them.• Some ways to talk with a patient and act professionally when dealing with patients• How to accurately conduct a Visual Acuity Exam on a patient and what it means	<p>Scholars will be skilled at...</p> <ul style="list-style-type: none">• Implement critical thinking skills to make sense of problems and persevere in solving them• Understanding the differences between near and distance visual acuity exams and how to conduct them• Manually measuring Pupillary distance

PERFORMANCE TASK: *How will students demonstrate their understanding (meaning-making and transfer) through a complex performance task?)*

Performance Task focused on Transfer:

Scholars will work in teams to conduct visual acuity exams on patients at East for the nursing staff.

Goal: Scholars will work in teams to conduct visual acuity exams on patients at East for the nursing staff. They will conduct near and far visual acuities perform a color vision test for patients and demonstrate a rudimentary

Role: optical tech conducting a visual acuity

Audience: East High scholars in need of visual acuity exams as prescribed by NYS

Situation: School nurses or their proxies are required to conduct the visual acuity exams for students in grades 1, 3, 5, 8, and 11. Vision Care students will do this for the school nurses

Product: Accurate visual acuity exams on patients resulting in a numeric understanding of their sharpness of vision at 20 feet, near vision acuity at a distance of 14-26 inches, and color vision screenings and accurate records of the screenings.

Standards: NYS visual acuity requirements ([Link to NYS documentation](#)) ([link to referral tool](#))

Success Criteria

- Professional communication with patients
- Accurate assessment of distance vision using the ocular paddle
- Accurate assessment of near vision
- Explanation with name and issues to patient
- Appropriate next steps for the patient
- complete paperwork accurately and correctly

UNIT 4: LAYOUT AND LENS FINISHING

UNIT 4 UNDERSTANDINGS:

1. The layout of a prescription pair of glasses requires multiple pieces of information about the patient and the frames
2. The optical center of a lens is manipulated during the layout portion of prescription eyewear manufacturing
3. Precise measurements are important in the edging and manufacturing of eyeglass lenses
4. Every frame shape is different and specific steps are necessary to ensure the accurate cutting of lenses for frames
5. Issues will arise during production processes and the use of critical thinking skills to analyze the issues will allow you to solve and/or fix the issues

Knowledge	Skills
<p>Scholars will know...</p> <ul style="list-style-type: none"> ● How to trace and safely use an edger/tracer combo machine ● How to apply a hand bevel on a lens and that it is a safety feature for patients ● That cutting of lenses to shape requires multiple trials and pieces of information (size, thickness, base curve, beveling, lens material) to get accurate lens size ● That mistakes in any step will cause errors in the final product ● The math necessary to decenter a lens, how to find the FPD of a frame, and how PD plays a part in it ● What an optical center is and why it is important ● The consequences of inaccurate blocking on the final pair of glasses 	<p>Scholars will be skilled at...</p> <ul style="list-style-type: none"> ● Correctly trace and cut lenses to fit specific frames, using a variety of machines, recognizing similarities in the types of controls ● Recognize that many steps are necessary to complete a final product ● Utilizes the skills necessary to manufacture a finished pair of glasses for a patient ● Using the edger safely and correctly to edge a lens ● Hand-beveling safety edges on lenses ● Mounting lenses in frames ● Using the tools of an optician to make a pair of glasses ● Blocking lenses at the correct decentration for frames so the patient can comfortably wear their glasses and not return them ● Precisely measure and calculate lens layout dimensions to manufacture eyeglasses to fit patient needs and physical characteristics ● Implement critical thinking skills to make sense of problems and persevere in solving them ● Measuring frames for specific measurements ● Spotting and dotting the optical center of lenses ● Calculating decentration using frame and patient PD

PERFORMANCE TASK: *How will students demonstrate their understanding (meaning-making and transfer) through a complex performance task?)*

Performance Task focused on Transfer:

Scholars will manufacture their first pair of eyeglasses

Goal: Scholars will manufacture, from start to finish, a pair of glasses for a patient using tools and techniques learned throughout the course of the school year.

Role: Fabricating Optician in Vision Care Store

Audience: Customers of the optical store

Situation: The student is provided a prescription for a patient and must make them a pair of glasses

Product: Finished pair of glasses for a patient. They will check for the accuracy of the final product before acting as an optician and dispensing the glasses to the patient. They will use critical thinking skills to solve issues that occur during production learn how to fix them and move forward through the issue

Standards: The finished pair meets ANSI Z80.1 and is comfortable for the patient to wear

Success Criteria

- Lenses are cut to the correct shape to fit the specified frame
- Accuracy of size in cut lenses such that they fit frames without falling out of them when used
- Hand bevel has correct placement and depth such that it is not visible and the lens is not negatively compromised
- Lens prescription meets ANSI standards to the patient prescription and PD

STANDARDS

NYS CDOS - HEALTH SERVICE

[CDOS.3b.1B](#)- Apply natural sciences to health services

1C. Apply mathematics to health care:

1. Measurement
2. Ratio and proportions

1F- Apply foundation skills:

1. Problem-Solving
2. Critical Thinking
3. Research

CDOS 3b 2A. Health Care Systems: understand the current healthcare system and its impact on health

2B. Understand service delivery settings (e.g., hospital, clinic, laboratory, office, home).

2D. Identify career choices in health care

CDOS.3b.8A- Understand the scope of healthcare occupations

CDOS 3b 4A Identify and understand legal issues related to health careers:

4B. Identify and understand ethical issues related to health careers:

CDOS 3b 6A Understand medical terminology and abbreviations.

6B. Develop and practice elements of professional communication:

6C. Understand medical documentation:

6E. Develop job-seeking skills:

CDOS 3b 7A. Interpersonal Dynamics: Develop team-building skills and behaviors within the health care setting(s).

7B. Understand functions and roles within a health care team(s).

7C. Develop positive communication skills:

7F. Understand professionalism in the healthcare system:

5.2 Legal Practices

5.2.1 Apply standards for the safety, privacy, and confidentiality of health information. • HIPAA • Privileged communication

6.2 Cultural, Social, and Ethnic Diversity

6.2.2 Demonstrate respectful and empathetic treatment of all patients/clients/families.

7.1 Infection Control

7.1.2 Differentiate methods of controlling the spread and growth of pathogens.

- b. Standard precautions

7.2 Personal Safety

7.2.1 Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

7.2.3 Demonstrate and apply the use of Personal Protective Equipment (PPE)

8.1 Healthcare Teams

8.1.1 Evaluate roles and responsibilities of healthcare team members.

8.1.2 Identify characteristics of effective teams.

8.2 Team Member Participation

8.2.1 Recognize methods for building positive team relationships.

8.2.2 Analyze the attributes and attitudes of an effective leader.

8.2.3 Apply effective techniques for managing team conflict.

2.4 Evaluate why teamwork is an important part of healthcare and how it improves patient care

9.2 Healthcare Across the Lifespan

9.2.1 Discuss physical, mental, social, and behavioral development and its impact on healthcare. 9.2.2 Identify socioeconomic determinants of health and wellness.

10.1 Technical Skills- Vision Care*

10.1.1 Demonstrate procedures for measuring and recording eyesight in both normal and abnormal ranges - including but not limited to

- Nearsightedness (myopia), a condition that makes far away things look blurry.
- Farsightedness (hyperopia), a condition that makes close-up things look blurry.
- Astigmatism, which causes generally blurry vision and makes it hard to see at night.
- Presbyopia (only in middle-aged adults and older), this condition makes it hard to see things up close.

10.1.2 Obtain training on

- Lensometer
- Blocker
- Edger

11.1 Key principles, components, and practices of health information systems (HIS)

11.1.4 Examine information systems policies, procedures, and regulations as required by national, state, and local entities