

NC State Board of Opticians
Recommended Topics and Tasks

For Training

INTERN OPTICIANS

The following topics and tasks have been deemed as final review/wrap-up in preparation for the Licensure Exam, or for applicants licensed in other states to demonstrate working knowledge/competency before their licensure in North Carolina.

The Board understands workloads and employee schedules *sometimes* must be varied, but strongly recommends that trainers and training establishments refrain from excessive deviation of these topics and timeframes during training.

A.	Assembly: mounting lenses, checking frames.	355 hours
B.	Repair: repair or replacement of temples, frames; checking lens specifications, replacing lenses.	160 hours
C.	Fitting: measuring face, assist with frame selection, adjusting glasses and frames to the face.	375 hours
D.	Record Keeping: maintenance of records or prescriptions, sales, inventory, ordering, etc.	50 hours
E.	Contact Lenses: maintenance of records or prescriptions, sales, inventory, ordering, teaching insertion and removal, etc	100 hours
	TOTAL	1040 hours *

* Total hours shown above are based on assumption of Intern's full-time employment for 6 months, at an average of 35-40 hours/week. If a training establishment cannot maintain FT hours for a trainee, the trainee should be removed from the program until the hours can be increased.

An optician's license cannot be issued without completion of an internship.

NC State Board of Opticians

Proficiency Standards for a NC-Licensed Optician

(and necessary for preparation/successful completion of the
NC Board of Opticians Licensure Examination)

An individual who has completed training and/or formal education in opticianry should be able to demonstrate proficiency (a comprehensive “working knowledge”) in the subjects listed below. (*Note: these subject areas may be included in more than one component of the Licensure Exam.*)

- I. Ophthalmic lens surface grinding
- II. Prescription interpretation
- III. Practical Anatomy of the eye
- IV. Theory of light
- V. Edge grinding and tempering ophthalmic lenses
- VI. Ophthalmic Lenses
- VII. Measurements of the face
- VIII. Benchwork, fitting, realignment of frames to face, final quality inspection of eyewear
- IX. Contact Lenses

I. Ophthalmic Lens Surface grinding

The applicant must demonstrate a workable knowledge of all phases of an ophthalmic surfacing laboratory by:

- A. making proper lens/blank selection
- B. determining layout, thickness, prism compensation, blocking techniques, etc
- C. fining/polishing techniques
- D. inspecting lenses for blemishes, readiness for edging process, etc.

II. Prescription Interpretation

The applicant shall:

- A. understand the theory and application of lens forms; single vision, bifocals, trifocals, variable focus, low vision aids and segment compensation in anisometropia, i.e. Compensated bifocal segments, prism control, bicentric or slab off
- B. demonstrate a workable knowledge of basic frame materials and their properties
- C. demonstrate a knowledge of all frame types: saddle, keyhole, rimless mounting, combination, metal tension mount, rim mount including sub-normal visual aids
- D. have a workable vocabulary of ophthalmic terminology
- E. be able to perform and compute the following values:
 - 1. Positional effective power
 - 2. Back vertex power
 - 3. Prismatic calculations:
 - a. prism for decentration
 - b. image jump
 - c. thickness difference
 - d. prism away from optical center
 - 4. Lens/edge, center/thickness
 - 5. Flat transposition
 - 6. Toric transposition
 - 7. Cylindrical power in oblique meridians
 - 8. Incorporation of “adds” and “distant” prescriptions to create reading prescriptions
 - 9. Bicentric treatment of anisometropia.

III. Practical Anatomy of the Eye

The applicant shall demonstrate a practical knowledge of the basic anatomy of the eye and its relation to the process of sight.

IV. Theory of Light

The applicant shall demonstrate a knowledge of the theory of light and its laws with application to ophthalmic lens prescriptions.

- A. Reflections and Refractions
- B. Aberrations
 - 1. spherical
 - 2. chromatic
 - 3. marginal or oblique
 - 4. curvature of field
 - 5. distortion
- C. Spectacle magnification
- D. Effects of pantoscopic tilt upon eyeglass prescriptions.

V. Edge Grinding and Tempering Ophthalmic Lenses

The applicant shall be able to:

- A. neutralize all ophthalmic lenses in the focimeter and record in proper prescription form
- B. perform computation of centration
- C. perform computation of lens size required to obtain desired decentration
- D. perform computation of size to edge grind
- E. use the "boxing method*" of frame and lens measurement
- F. establish datum line with reference to cylinder axis
- G. establish segment placement for inset, height and total reading inset
- H. apply prism calculation when prescribed by a doctor
- I. determine the effective diameter of frame for edging purposes
- J. block up and process lens for edge grinding.
 - 1. The applicant shall be able to block a lens using the following methods:
 - a. Alloy blocking with sprayed surface
 - b. Suction blocking
 - c. Pressure blocking
 - d. Adhesive blocking.
 - 2. The applicant shall be capable of evaluating, truing and resizing of edger.
 - 3. The applicant shall be able to maintain the edging equipment i.e. lubricate machine and cleaning of unit and care of recycle apparatus.
- K. determine the edge design - hideabevel, bevel centering, forward center, rimless design
- L. inspect lenses for chips, uniformity, shape, axis, slippage, scratches and fractures, water marks, flakes and waves
- M. successfully temper lenses.
 - 1. The applicant will need to perform the following tasks when heat treating a lens:
 - a. accurately measure the lens according to manufacturer's recommendations
 - b. set the correct temperature for heat treating unit
 - c. inspect heat treated lens for scratched lens or other defects such as clamp warpage
 - d. drop ball test the lens according to Food and Drug Administration regulations
 - e. final inspection of lenses and recording of procedure.
 - 2. The applicant will need to perform the following tasks when chemically hardening a lens:
 - a. completely clean lens
 - b. set temperature of chemical
 - c. record time of immersion
 - d. removal and clean up of lenses
 - e. drop ball test according to Food and Drug Administration regulations
 - f. final inspection of lens and recording of procedure.

*On January 1, 1962, the Optical Manufacturers Association adopted frame and lens measurements.

VI. Ophthalmic Lenses

The applicant shall be able to:

- A. identify lens forms including single vision, bifocals, trifocals, variable focus and low vision aids
- B. identify lens materials, i.e. hard resin, polycarbonate, trivex, high index plastic, or glass
- C. identify absorption lenses, their purposes, individual characteristics and practical usage, as well as cosmetic tints, polarizing lenses and photochromatic lenses and lens coatings.

VII. Benchwork

- A. The applicant shall be able to perform, as follows, all benchwork procedures necessary prior to dispensing:
 1. insert lenses into zyl frames
 2. inset lenses into metal frames
 3. mount, drill, notch lenses, groove
 4. assemble all frames and put into standard alignment checking:
 - a. cutting line positions
 - b. lens positions as seen from the side
 - c. lens positions as seen from the top
 - d. positions of the open temples
 - e. positions of the closed temples
 5. demonstrate the ability to utilize ophthalmic lens standard to inspect completed eyeglasses
 6. demonstrate a working knowledge of the ophthalmic frame reference books
 7. verify the optical accuracy of completed eyeglasses
 8. verify the mechanical quality of completed eyeglasses
 9. replace and repair temples
 10. replace nose pads on frames
 11. solder metal frames
 12. install hinges on frames.

VIII. Measurements of The Face

The applicant shall be able to:

- A. take accurate monocular and binocular pupillary distances, both near and distant
- B. take accurate facial bridge measurements
- C. determine accurate frame size (eye size) to fit facial features
- D. take accurate temple lengths
- E. take facial abnormalities into consideration
- F. fit a pair of eyeglasses properly noting that the following criteria are met:
 1. lens planes remain identical
 2. lens vertex distances are equal
 3. the pantoscopic angle is correct and as required
 4. the proper amount of bend of temple is executed if skull temples are used
 5. the proper amount of pressure is applied if library temples are used
 6. the correct amount of nose pad contact and pressure is applied
 7. checking hinge screws
- G. realign a frame to attain proper fit and execute the following:
 1. necessary repairs to frames
 2. necessary bending of frame to ensure correct fit
 - a. correct positioning of bend
 - b. avoiding stress on frame and lenses
 3. nose pad angling
 4. screw tightening
- H. perform a quality inspection on a pair of eyeglasses
 1. Inspection of frame
 - a. color
 - b. bridge
 - c. eyesize
 - d. temple length and style
 - e. alignment
 - f. eyewires
 - (1) rolled
 - (2) bead marks

- (3) burnt
- (4) file marks, scratches, cracks
- (5) faulty soldering
- 2. Inspection of lenses
 - a. correct prescription
 - (1) base curve
 - (2) lens form (+ and/or – cylinder)
 - (3) tint
 - (4) lens style
 - (a) single vision
 - (b) multifocal
 - (c) variable focus
 - (d) low vision
 - (5) location of optical center in reference to the pupil
 - (6) refractive material of lenses.

IX. Contacts Lenses

The applicant shall be able to demonstrate, show knowledge of, and/or understand the reasoning for, the following tasks:

- A. Conduct a patient's prefit evaluation
 - 1. Interview patient and record case history
 - 2. Observe, evaluate and record:
 - a. lid and pupil considerations
 - b. blink rate and type
 - c. tear film evaluation
 - d. corneal evaluation and sensitivity
- B. Recommend proper lens for patient wear
 - 1. Determine/select lens type
 - a. Rigid
 - b. Gas Permeable
 - c. Soft
 - d. Toric
 - e. Multifocal
 - 2. Demonstrate knowledge of each lens type's materials, and conduct patient education regarding selected lenses' advantages
 - 3. Educate patient on modifications of lens parameters that may be necessary
- C. Demonstrate proper/effective use of equipment
 - 1. Keratometer
 - 2. Radiuscope
 - 3. Lensometer
 - 4. Diameter Gauge (V-gauge)
 - 5. Thickness Gauge
- D. Educate patient regarding lens insertion & removal technique, lens hygiene & care, and follow-up evaluation
 - 1. Perform I&R instruction, observe and coach patient regarding technique
 - 2. Observe and evaluate lens centration and movement
 - 3. Demonstrate cleaning/disinfecting regimes for selected contact lens types
 - 4. Inform patient of statutorily-required release form, and follow-up evaluation by the prescribing physician for the approval of the fit & Rx release
 - 5. Recognize indicators of non-compliance with lens care and wearing schedule.