New York City College of Technology
of the City University of New York

Vision Care Technology
Professor Robert J. Russo
Spring 2013

VCT1201 – Ophthalmic Materials II (2 hrs. per week)
Course Outline and Reading Assignment

Text: Optical Formulas Tutorial 2nd edition by Stoner, Perkins and Ferguson
Systems for Ophthalmic Dispensing, 3rd edition, by Brooks and Borish
Essentials of Ophthalmic Lens Finishing, 2nd edition by Brooks

Week 1-2 – Course introduction, distribution of reading assignment, grading and college policies.

Grading: Two class examinations = 33% of final grade
Final examination = 33% of final grade.
Laboratory = 33% of final grade (70% final grade required in lab)

Makeup examinations will be given with a documented excuse or at the discretion of the instructor.

Attendance and Lateness Policy: Standard college policy (Please refer to college catalog for further details.)

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Office Hours for all full-time and part-time faculty are posted on the department bulletin board in front of P-312

New York City College of Technology Policy on Academic Integrity
Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog.
**Topic: Review of VCT1101**

Reading Assignment: Metric System (Optical Formulas p. 8-9 and Systems p. 263)
Basic Anatomy of the Eye
Refractive Errors (Optical Formulas p. 69)
Basics of Light (Optical Formulas p. 24 and Systems p. 273)
Refractive Index (Optical Formulas p. 27)
Snell’s Law (Optical Formulas p. 29 and Systems p. 276)
Dispersion Abbe’ Value (Optical Formulas p. 36 and Systems p. 404)
Characteristics of Plus and Minus Lenses, Hyperopia, Myopia (Optical Formulas, p. 43 and Systems p. 279-283)
Categories of Astigmatism (Optical Formulas p. 69)
Diopter and Focal Length (Optical Formulas p. 45 and Systems p. 282)
Types of Lenses (Optical Formulas p. 47 and Systems p. 287)
Radius of Curvature (Optical Formulas p. 48 and Systems p. 312)
Nominal Lens Power (Optical Formulas p. 50 and Systems p. 292 and p. 311)
Lens Maker’s Equation (Optical Formulas p. 51 and Systems p. 283)
Sphere/Cylinders and Compound Lenses (Optical Formulas p. 52 and Systems pgs. 305-307)
Lens Meridians, Toric Lenses, Optical Cross (Optical Formulas p.53 – 57)
Plus and Minus Cylinder Lenses (Optical Formulas p. 57 – 60)
Transposition (Optical Formulas p. 62 and Systems p. 299)
Curves (Notes and Systems p. 416)
Power of Cylinder in Oblique Meridians (Optical Formulas p. 75 and Systems pgs. 288-290)
Frame Measurements (Systems Chapter 2)
MBS for Single Vision Lenses (Systems pgs. 82-83)
Lensometer Readings (Systems pgs. 92-96)
Standard Alignment (Ch. 8 Systems and pgs. 138-152 for plastic frames)

**Week 3 – Topic: Use of Prisms, Dispersion of Light by a Prism, Image Displacement, Prism Power, Adverse and Relieving Prism, Patient Reaction to Excessive Prism, Prentice Formula**

Reading Assignment: Section IV, Optical Formulas, pgs. 93
Section IV, Prism Power, pgs 94-96
Optical Formulas, Excessive or Unwanted Prism, pg. 107-108
Optical Formulas, Prentice Formula, pg. 99 – 102
Systems, pgs 349-356, Ophthalmic Prism
Systems, pgs 376-380, Prentice Formula

**Week 4 - Test 1**

**Week 5-6 - Topic: Determining Overall Prismatic Effects,**
Horizontal Prism, Prism Situations – cancelling and compounding situations,
Vertical Imbalance and Prismatic Effect
Reading Assignment: Optical Formulas, pgs. 102 - 106
Optical Formulas, pg. 111-112

Week 7-8 – Topic: Verifying Prism with the Lensometer, Prescriber’s vs. Laboratory Reference, Prism Direction and Prism Axis, ANSI Standards for Prism and Vertical Imbalance, and Splitting Prism

Reading Assignment: Optical Formulas, ANSI Standards, pg. 103-104
Optical Formulas, Prescriber’s vs. Laboratory reference, pg.123
Optical Formulas, Splitting Prism, pg.107
Systems, pgs. 593-596, Verifying Prism in a Lensometer
Systems, pgs. 356-362, Prescriber’s vs. Laboratory Reference
Systems, pg. 362, Splitting Prism

Week 9 – Test II

Week 10 – 12 – Topic Bifocals and Multifocals

Reading Assignment: Section V – Optical Formulas, Segment Height and Drop, pgs. 140-143.

Week 13 – 14 – Sag of a Lens

Reading Assignment: Optical Formulas, pg. 149
Systems, pgs 323-332, Sag of a Lens

Week 15 - Final Examination
New York City College of Technology of the City University of New York Vision Care Technology Professor Robert J. Russo

VCT1201L – Ophthalmic Materials II Laboratory (3 hrs. per week)
Course Outline and Reading Assignment

Text: Optical Formulas Tutorial 2nd edition by Stoner, Perkins and Ferguson
Systems for Ophthalmic Dispensing, 3rd edition, by Brooks and Borish
Essentials of Ophthalmic Lens Finishing, 2nd edition by Brooks

Week 1 Course introduction, distribution of reading assignment, grading and college policies, Distribution of Department Safety Document

Grading: Laboratory = 33% of final grade (70% final grade required in lab)

Makeup examinations will be given with a documented excuse or at the discretion of the instructor.

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Topic: Introduction to VCT1201L laboratory:

Students will be given a copy of the department’s laboratory safety handout and will be required to sign the safety handout form.
• Safety requirements, lab coat requirements with department arm patch, safety eyeglasses, student name tag requirements
• Location and importance of MSDS sheets and OSHA requirements for edger waste removal
• Location of First Aid kit, eyewash station and use, demonstration of red shut off switches, Security phone number
• Students will receive a copy of the department’s laboratory safety handout procedures Fire exits and emergency evacuation procedures
• Students will be given a laboratory work procedure including seating assignments and job trays

**Topic: Processing a finished single vision lens prescription in a plastic frame**

• Review of Lensometry to determine sphere power, cylinder power, the axis of the cylinder and the location of optical center. In addition, a review of the parts of the lensometer will be discussed.
• Review laboratory layout and edging procedures including completing laboratory job ticket
• Review laboratory grading procedures in relation to ANSI Z80.1 standards. In addition, students will be made aware of the ANSI Z80.1 standards as it relates to unwanted horizontal or vertical prism tolerances in finished fabricated eyeglasses.
• Layout and edge single vision lens prescription in plastic frame based on pupillary measurements, frame measurements and decentration.
• Complete job ticket based on instructor’s specifications
• Introduction to new equipment and patternless edger
• Instructor will evaluate lens job for prescription verification, PD accuracy, standard bench alignment, bevel and safety bevel accuracy design

**Reading Assignment:**
- Department lensometer Handout
- Department Safety Handout System for Ophthalmic Dispensing, 3rd edition, lensometer basics, pgs. 92-96,
- Ch. 4, Centration of Single Vision Lenses, Essential of Ophthalmic Lens Finishing, 2nd edition
- Ch. 7, Blocking of Lenses, Essentials of Ophthalmic Lens Finishing, 2nd edition
- Chapter 10, Hand Edging, Essentials of Ophthalmic Lens Finishing, 2nd edition
- Chapter 9, Deblocking, Essentials of Ophthalmic Lens Finishing, 2nd edition
- Chapter 12, Lens Insertion and Standard Alignment, Essentials of Ophthalmic Lens Finishing, 2nd edition
Week 2 – Topic: Processing a finished single vision lens prescription in a metal frame

- Layout and edge single vision lens prescription in metal frame
- Review parts of metal frame, including Datum line, “A” measurement, “B” measurement, “GC Geometric Center, “DBL” Distance between lenses.
- Demonstrate inserting lenses into metal frame mounting
- Review basic bench alignment for metal frames
- Instructor will evaluate lens job for prescription verification, PD accuracy, standard bench alignment, bevel and safety bevel accuracy design.

Week 3- 4 – Topic: Processing single vision lenses into metal frames for “One Sight Eye Project”

- Students will be given single vision lens prescriptions to be edged into metal frames based on the prescription needs of the “One Sight Eye Project”
- The instructor and college laboratory technician will evaluate lens job prescriptions for PD accuracy, standard bench alignment, bevel and safety bevel accuracy design. Once these specifications are verified, each frame will be marked, inserted into a plastic bag and processed for shipping to the “One Sight Eye Project” center.

Week 5 - 6 - Topic: Processing single vision lens prescriptions that includes prescribed horizontal and vertical prism in plastic and metal frames

- Students will given sample prescriptions that will require base up prism in both plus and minus lenses
- Students will be given sample prescriptions that will require base down prism in both plus and minus lenses
- Students will be given a sample prescription that will require either base up or base down prism in a compound lens
- Verifying prism with the lensometer as it relates to resultant prism in both prism direction and prism axis
- Students will be evaluated on their assessment of processing single vision lenses with prism for both horizontal and vertical prism in plastic and metal frames


Week 7-8 – Topic: Processing single vision lens prescriptions with splitting prescribed prism for both horizontal and vertical prism in plastic and metal frames

- Students will given sample prescriptions that will require splitting horizontal prism in both plus and minus lenses
• Students will be given sample prescriptions that will require splitting vertical prism in both plus and minus lenses
• Students will be given a sample prescription that will require splitting either horizontal or vertical prism or combination in a compound lens
• Verifying prism with the lensometer as it relates to resultant prism in both prism direction and prism axis
• Students will be evaluated on their assessment of processing single vision lenses with splitting prescribed prism for both horizontal and vertical prism in plastic and metal frames

Week 9 – Topic: Neutralization of prescribed prism in finished eyeglasses

• Students will be given finished eyeglasses to neutralize. Neutralization of the eyeglasses will include: prescription verification, PD, Prism neutralization as it pertains to base and direction and amount of the prism.
• Students will be evaluated on their assessment to verify prescribed prism in eyeglasses

Week 10- 12 – Topic: Processing Multifocal Lenses with Segments

• Students will be introduced to basic multifocal lenses with segments. These multifocal lenses will included but not limited to Flat tops, round segments, blended segments and executive bifocals
• Students will be introduced to distance and near PD’s, segment height, segment drop and inset utilizing both monocular and bionocular PD’s
• Students will also be introduced to ANSI standards regarding position and location of the various bifocals
• Students will be given laboratory assignments to complete various fabrication projects in both plastic and metal frames utilizing patternless edgers
• Students will be evaluated on their assessment of processing multifocal lenses in plastic and metal frames. Evaluation will include: distance and near PD accuracy, segment height, segment drop, inset and ANSI standards regarding position and location of the various bifocals


Week 13- 14 – Topic: Progressive Multifocal Lenses

• Students will be introduced to lens identification, layout and neutralization of various progressive lenses
• Students will be introduced to various progressive lens designs and the various parts of the progressive lens template that will include: Fitting mark, distance power location, prism mark, horizontal reference guide, reading power location, trade mark identifier and reading add identifier mark
• Students will be introduced to the PAL Identifier
• Students will be introduced to “The Progressive Identifier” that is a resource for identifying the various types of progressive lens designs
• Students will be introduced to the website: “The Lens Guru.com” that is a website resource for identifying the various type of progressive lens designs
• Students will be evaluated on their assessment to verify the type of progressive lens and neutralize a pair of eyeglasses with progressive lenses. Students will be expected to identify the type of progressive, manufacturer, reading add and neutralize the distance prescription

Reading Assignment: Ch. 5 – Centration of Progressive Addition Lenses, Essentials of Ophthalmic Lens Finishing, 2nd edition

Week 15 – Final Practical Exam

• Final Lab Practical - Students will be required to neutralize three pair of finished eyeglasses. The finished eyeglasses will consist of: prism neutralization, bifocal neutralization and progressive lens neutralization. For the prism neutralization, students will be expected to identify the amount and direction of the prism in the eyeglasses. In the bifocal neutralization, the student will be expected to identify the amount and direction of the prism in the eyeglasses. In the progressive lens neutralization, the student will be expected to identify the type of progressive, manufacturer, neutralize the distance and near prescription. In addition, the student will have to markup and prepare a pair of bifocal lenses for fabrication. Grading will be evaluated on the accuracy and completion of the job order sheet and the filling out of all necessary calculations in preparation for edging a complete pair of eyeglasses.

• The final grade will be determined by laboratory assignments and the final practical examination. A minimum of 70% is required in the laboratory to pass the course.