OPHTHALMIC LASERS, REFRACTIVE PROCEDURES AND SURGICAL TECHNIQUES
2017
Monday 3:30-5:00 pm and Tuesday 10:00-11:30 pm
Coursemaster: Nimesh Patel
Office: Rm 2157, Tel. 3-6125
npatel@central.uh.edu

Course Description: The purpose of this course is to familiarize optometry students with ophthalmic laser instrumentation, surgical laser procedures, the management of ocular conditions with lasers and the introduction of minor surgical techniques, including operating room protocols. Types of ophthalmic lasers, laser-tissue interactions and technical considerations associated with laser surgery and pre- and post-operative considerations for ocular conditions commonly managed with lasers will be discussed. In addition, principals of refractive surgery will be discussed. Included in the course will be discussions of preoperative, procedural, postoperative and complication management of radial keratotomy, lamellar procedures and laser procedures. Special consideration will be given to anatomy, wound healing and wound healing modulators, as well as, the role of optometry in refractive surgery. In addition, minor surgical procedures will be taught. Included will be suturing techniques, various injection techniques and operating room behaviors.

Recommended Textbook:
- Borish’s Clinical Refraction Chapter 29
- Refractive Surgery Chapter 13 Basic and Clinical Science Course 2015-16.
- Ophthalmology, Yanoff and Duker, 3rd ed. 2009
- Cornea 3rd edition, volume 2, Krachmer 2010

Course objectives: The objectives below are considered essential for achieving the course goals:

1. Students will be able to explain relevant conditions for injectable medications and describe the proper use of said injectables.
2. Students will be able to discuss the proper environment for surgical preparation as well as explain advanced procedures related to ophthalmic conditions.
3. Students will be able to explain laser physics and the application of the laser to ocular and periocular structures.
4. Students will demonstrate proficiency in laser and injectable procedures in and around the eye.
TOPICS
BASICS OF LASER IN EYECARE

I. General Considerations
   A. Types of lasers
      1. Classification
         a. Ruby, Nd:YAG, CO₂, Gas (argon), Excimer, Dye and others
      2. Interactions with biological tissue
         a. absorption by ocular tissue (i.e. melanin vs hemoglobin etc.)
         b. thermal, mechanical, ionizing, photochemical effects
         c. tissue reactions
      3. Technical considerations
         a. exposure duration and spot size
      4. Laser safety

II. Clinical considerations
   A. Retinal Photocoagulation
      1. chorioretinal conditions commonly treated with lasers
   B. Anterior segment defects
      1. iris abnormalities
      2. treatment of glaucoma
      3. iridotomies
      4. trabeculoplasty
      5. capsulotomy
   C. Corneal surgery

REFRACTIVE PROCEDURES

I. Anatomy
   A. increased information on cornea at cellular level

II. Physiology
   A. Regeneration
   B. Changes in normal physiology that are induced by the procedure (acute phase)
      1. role of modulators
         a. pharmacology
         b. environmental
   C. Wound healing (chronic phase)
      1. role of modulators
         a. pharmacology
         b. environmental

III. Classification of Procedures
   A. Cornea
      1. Incisional keratotomy
         a. RK
         b. Astig. K
         c. Hexagonal K (hyperopia)
      2. Lamellar keratoplasty (LKP)
         a. epikeratoplasty
         b. automated LKP
         c. myopic keratomileusis
      3. Laser (including laser physics & tissue interactions)
a. excimer  
b. infrared (holmium)  
c. LASIK  
4. Alloplastics  
   a. polysulfone (high index)  
   b. hydrogel (same index)  
   c. intrastromal

B. Lens  
   1. Extraction  
   2. Myopic IOL (anterior chamber)  
C. Sclera  
   1. Scleral reinforcement  
D. General issues in patient selection for the above procedures

IV. Optics  
   A. magnification  
   B. image size

V. Current Procedures - RK, PRK, ALK, LASIK, LASEK, Corneaplasty, Phakic IOL  
   A. what is done for the procedures  
      1. Prospective patient consultations  
   B. patient selection  
      1. age  
      2. gender  
      3. refractive error  
      4. ocular status-topography, ocular health  
      5. systemic issues  
      6. occupation  
      7. psychological  
      8. legal  
      9. informed consent  
   C. post-op management  
      1. Comanagement issues  
   D. complications  
      1. preoperative problems  
         a. topography  
      2. optical/refractive/functional  
         a. refractive  
         b. binocular vision  
         c. functional vision  
      3. ocular health  
         a. delayed complications  
         b. systemic health issues  
      4. procedural (operative) problems

VI. New developments  
   A. current FDA trials  
   B. what’s hot and what’s not  
   C. thoughts on the future

VII. Practice management  
   A. networks  
   B. other practice promotion opportunities
VIII. Ethical issues

INJECTIONS
I. Injectable basics
II. Parenteral injections
   a. Types of medication
   b. Proper technique
   c. Sites of administration
III. Ocular injections
   a. Indications for use
   b. Types of medication
   c. Proper technique
   d. Sites of administration
IV. OSHA requirements
   a. Preventing needlestick injuries
   b. Sharps containers
V. Syncope and other possible emergencies
   a. Signs and symptoms
   b. Necessary equipment and phone numbers
   c. Education of staff and ancillary personnel

SURGICAL ENVIRONMENT
I. Asepsis and aseptic technique
   a. Sterilization versus antisepsis
II. Preparing for surgery
   a. Donning gown, gloves, mask, cap etc.
III. Handling instruments in a surgical arena

SUTURING AND MINOR SURGICAL
I. Suturing techniques
II. Minor surgical
   A. Chalazion incision and curettage
   B. Lid lesion removals

ADVANCED OCULAR PROCEDURES
I. Corneal/conjunctival foreign body removal/ Debridement
II. Punctal occlusion
III. Anterior stromal puncture
IV. Epilation
V. Minor surgical procedures (ie. cutaneous horn removal)
Ophthalmic Lasers, Refractive Procedures and Surgical Techniques  
Monday 3:30-5:00 pm and Wednesday 1:00-2:30 pm  

*Lecture times and speakers are subject to change.*

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>SPEAKER</th>
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<tbody>
<tr>
<td>1/9/17</td>
<td>Introduction/Injectables/OSHA</td>
<td>Patel</td>
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<tr>
<td>1/10/17</td>
<td>Injectables/OSHA</td>
<td>Patel</td>
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<td>1/16/17</td>
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<td>1/17/17</td>
<td>Injectables/OSHA</td>
<td>Patel</td>
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<td>1/23/17</td>
<td>Laser Physics</td>
<td>Patel</td>
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<td>1/24/17</td>
<td>Laser Tissue Interaction and Safety</td>
<td>Patel</td>
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<td>1/30/17</td>
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<td>1/31/17</td>
<td>Lasers in Glaucoma/Capsulotomies</td>
<td>Patel</td>
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<td>2/6/17</td>
<td>Lasers in Glaucoma/Capsulotomies</td>
<td>Patel</td>
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<td>2/7/17</td>
<td>Photodynamic Therapy/AMD Tx</td>
<td>Ketcham</td>
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<td>2/13/17</td>
<td>Diabetic Retinopathy Treatments</td>
<td>Patel</td>
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<td>2/14/17</td>
<td>Exam 1</td>
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<td>2/20/16</td>
<td>Suturing and Wound Healing</td>
<td>Patel</td>
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<td>2/21/16</td>
<td>Surgical Environment, and tools</td>
<td>Patel</td>
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<td>2/27/16</td>
<td>RK/PRK</td>
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<td>2/28/16</td>
<td>LASIK</td>
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<tr>
<td>3/6/16</td>
<td>Intralase/Epi-LASIK</td>
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<tr>
<td>3/7/16</td>
<td>Managing patients with refractive surgery</td>
<td>R Patel</td>
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<td>3/13/16-3/17/16</td>
<td>Spring break</td>
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<td>3/20/16</td>
<td>NBEO</td>
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<td>3/27/16</td>
<td>Evaluating the lids</td>
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<td>3/28/16</td>
<td>Eyelid Lesions</td>
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<td>4/3/16</td>
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<td>4/4/16</td>
<td>Office emergencies</td>
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<td>4/10/16</td>
<td>Pharmacology, anesthesia</td>
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<td>4/11/16</td>
<td>Minor surgical procedures and techniques</td>
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Grades: Grades will be based on three examinations and attendance. Attendance and participation will constitute 10% of the total grade. Each of the three tests will be worth 30% of the total grade. The first two examinations will not be comprehensive. Examinations must be taken at the scheduled administration unless the instructor gives prior approval. Failure to take a scheduled examination will result in a zero for the examination. Students who are ill at the time of a scheduled examination must have a letter from their physician in order to make up the examination. Letter grades will be given as follows: 100-95 A, 94-90 A-, 89-87 B+, 86-83 B, 82-80 B-, 79-77 C+, 76-73 C, 72-70 C-, 69 and below F (no D’s will be given). The instructor reserves the right to assign grades based on overall class performance.

Attendance for laboratory and lecture is mandatory. The instructor reserves the right to administer attendance quizzes in the didactic and laboratory portion of the course. A missed laboratory session will constitute a failure in the laboratory portion of the course. Tardiness to a lab session will constitute a ½ grade drop in your final lab grade for each session late.

Academic honesty and ethical behavior are requirements at the College and each student is expected to adhere to these requirements. The Academic Honesty Policy and Professional Conduct Code can be found at: http://www.opt.uh.edu/current-students/academic-resources/academic-policy-and-procedures/

Pursuant to U.S. Copyright laws, students wishing to use audio or video devices to record classroom lectures or discussions must obtain written permission from the instructor. Such recordings are to be used solely for the purposes of individual or group study with other students enrolled in this class. They may not be reproduced, shared with those not in the class, or uploaded to publicly accessible web environments. Students found in violation of this policy may be subject to disciplinary action under the University’s Code of Student Conduct.

Each student is required to complete a final class evaluation via the internet prior to receiving a grade in the course.

Whenever possible, and in accordance with 504/ADA guidelines, we will attempt to provide reasonable academic accommodations to students who request and require them. Please notify your instructor if you qualify.

NBEO Disclaimer Statement – This course is intended to prepare students in the knowledge, skills, and attributes needed of an entry-to-practice Doctor of Optometry. While this course should also help students prepare for licensing examinations such as those administered by the NBEO, nothing in this course, including the lectures and discussions, coursework, study guides, teaching notes, electronically posted information, or other materials, should be believed or understood to utilize actual confidential examination items from licensing examinations. For example, throughout this course, the instructor(s) may indicate points of emphasis for NBEO study and preparatory work. This instructional approach does not reflect knowledge of actual NBEO examination items, but represents a suggested area of focus based entirely upon the NBEO content outline/matrix. All materials in this course have been prepared in good faith to comply with the highest ethical standards of the profession.
Ophthalmic Lasers, Refractive Procedures and Surgical Techniques Laboratory

**Course description:** This 2-hour laboratory allows for hands on learning with several laser and surgical techniques. Included in the laboratory exercises will be sessions on the appropriate use of the Nd:YAG laser, the argon laser and the excimer laser. Both dry or non-living tissue exercises as well as simulations with living tissue will be offered. Also included in the laboratory will be sessions on suturing techniques, injection techniques, miscellaneous surgical procedures and proper operating room protocol. The student will be expected to be proficient in all these techniques at the conclusion of the laboratory course.

Instructors: Dr. Kimberly Lambreghts (T, Th), Dr. Krystal Schulle and Dr. Nimesh Patel (M, W)

**LABORATORY SCHEDULE**

**Week of January 9**
No Lab

**Week of January 16**
**Parenteral Injections**
Monday group will meet on Jan 23rd

**Week of January 23**
**Parenteral Injections**
Wednesday group will meet on Jan 18th

**Week of January 30**
**Ocular Injections**

**Week of February 6**
**Ocular Injections**

**Week of February 13**
**Argon Laser Applications**

**Week of February 20**
**Argon Laser Applications**

**Week of February 27**
**YAG Laser Applications**
Week of March 6
YAG Laser Applications Group B

Week of March 13 NO LABS (SPRING BREAK)
Week of March 20 NO LABS (NBEO)

Week of March 27
Surgical Environment/Suturing/minor surgical Group A

Week of April 3
Surgical Environment/Suturing/minor surgical Group B

Week of April 10
TBA

Week of April 17
TBA

Grades: Final grades will be based on quizzes, homework assignments and attendance (see above). Tardiness to lab will result in an incremental decrease in your final laboratory grade (e.g. A to A-, B+ to B etc). As part of your final grade you must also observe a LASIK, PRK or Epi-LASIK at a Surgeon of your choice.