

PHYSIOLOGY OF THE EYE (VS 122)

FALL SEMESTER B, 2008 SYLLABUS OF THE COURSE

PURPOSE: This course has been designed to provide students with the current understanding of the field of ocular physiology. This course, although distinct from the general physiology, emphasizes how the ocular physiology is unique and at the same time similar to physiology of non-ocular tissues. Although this course is designed from the point of view of contemporary understanding of different concepts of ocular physiology, an extensive prior understanding of general physiology is not required. The materials covered in this course will lead to understanding of extensive current concepts regarding interdependence of the physiology of different ocular tissues, and the importance of research utilizing animal models in the evolution of the current understanding of the human ocular physiology.

FORMAT: Each week, there will be four lectures (one hour each) and one laboratory experiment (an hour and half).

LECTURES AND LABOATORY EXPERIMENTS: The lectures will cover topics on tears and lacrimal glands, eyelids, cornea, lens, accommodation and presbyopia, ocular circulation, aqueous humor formation and drainage, intraocular pressure, vitreous and retina. A list of the topics covered in the lectures and laboratories is enclosed on separate sheets.

EXAMINATIONS AND GRADING: There will be a weekly quiz that will be worth 10% of the total final grade. Attendance in laboratory and performing successful practical will be worth 5% of the total grade. Two mid-term examinations will be worth 85% of the total final grade. First mid-term examination will be given in the middle and the second at the end of the Fall Semester B.

READING REFERENCES: See enclosed references on page 4 in the Course Schedule. The majority of materials that will be provided as handouts are taken from these references.

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COURSE SCHEDULE

FALL SEMESTER B, 2008

Course Master and Instructor: Dr. Om P. Srivastava, Worrell Bldg., Rm. 638

Phone No.: 975-7630

E-mail: Srivasta@uab.edu

LECTURE	DAY	DATE	TIME	INSTRUCTOR
1. TEARS AND LACRIMAL APPARATUS: Function, properties, and production	MON	Oct 20	1:00	Srivastava
2. Tear proteins arising from lacrimal gland	TUE	Oct 21	1:00	Srivastava
3. Signal transduction and activation of lacrimal gland	WED	Oct 22	1:00	Srivastava
4. Water and electrolyte secretion and fluid modifications in tears	WED	Oct 22	2:00	Srivastava
5. CORNEA: Structure, physical characteristics and transparency of cornea	FRI	Oct 24	1:00	Srivastava
6. Corneal epithelium, endothelium and stroma: Structures and roles in corneal transparency	MON	Oct 27	1:00	Srivastava
7. Metabolism and nutrition of cornea	TUE	Oct 28	1:00	Srivastava
8. Stromal physiology	WED	Oct 29	1:00	Srivastava
9. Corneal wound healing	WED	Oct 29	1:00	Srivastava
10. EYELIDS: Structure, normal closure of eyelids and blink dynamics	FRI	Oct 31	1:00	Srivastava
11. Reflex and spontaneous blinking	MON	Nov 3	1:00	Srivastava
12. LENS: Composition and function of the lens	TUE	Nov 4	1:00	Srivastava
13. Lens proteins, factors affecting size and solubility of lens proteins	WED	Nov 5	1:00	Srivastava
14. Metabolism of lens	WED	Nov 5	2:00	Srivastava
15. Theories of lens transparency	FRI	Nov 7	1:00	Srivastava
16. Aging changes and oxidative insult	MON	Nov 10	1:00	Srivastava
17. Cataractogenesis	TUE	Nov 11	1:00	Srivastava

LECTURE	DAY	DATE	TIME	INSTRUCTOR
18. ACCOMMODATION AND PRESBYOPIA: Lens accommodation and presbyopia	WED	Nov 12	1:00	Srivastava
19. Pathophysiology of presbyopia I	WED	Nov 12	2:00	Srivastava
20. Pathophysiology of presbyopia II	FRI	Nov 14	1:00	Srivastava
21. MID-TERM EXAMINATION REVIEW	MON	Nov 17	1:00	Srivastava
24. FIRST MID-TERM EXAMINATION	TUE	Nov 18	1:00	Srivastava
25. OCULAR CIRCULATION: Anatomy and dynamics	WED	Nov 19	1:00	Srivastava
26. Rate of blood flow and oxygen supply	WED	Nov 19	2:00	Srivastava
27. Control of circulation, and autoregulation	FRI	Nov 21	1:00	Srivastava
28. AQUEOUS HUMOR: Aqueous humor production	MON	Nov 24	1:00	Srivastava
29. Ciliary epithelium and aqueous humor	TUE	Nov 25	1:00	Srivastava
30. INTRAOCULAR PRESSURE: Origin of IOP and factors controlling aqueous production and outflow	WED	Nov 26	1:00	Srivastava
31. Nervous system regulation of IOP, Devices to measure IOP	WED	Nov 26	1:00	Srivastava
32. RETINA: Anatomy, Composition and formation of visual pigments	MON	Dec 1	1:00	Srivastava
33. Biochemistry of sensory transduction in vertebrate photoreceptors	TU	Dec 2	1:00	Srivastava
34.. Dark current and phototransduction	WED	Dec 3	1:00	Srivastava
35. Electroretinograms	WED	Dec 3	2:00	Srivastava

LECTURE	DAY	DATE	TIME	INSTRUCTOR
36. VITREOUS: Composition, structure, development and function	FRI	Dec 5	1:00	Srivastava
37. Metabolism and aging changes in composition	MON	Dec 8	1:00	Srivastava
38. Physical characteristics, Posterior vitreous detachment	TU	Dec 9	1:00	Srivastava
39. CHOROID I	WED	Dec 10	1:00	Srivastava
40. CHOROID II	WED	Dec 10	2:00	Srivastava
<u>41. REVIEW FOR SECOND MID-TERM EXAMINATION</u>		DEC 12	2:00	Srivastava
<u>42. SECOND MID-TERM EXAMINATION</u>	Date to be announced			

READING REFERENCES:

1. 10th Edition of Adler's Physiology of the Eye, (Edited by: Paul L. Kaufman and Albert Elm) Mosby Co., St. Louis, 2003. This book is recommended for general reading.
2. The human Eye: Structure and Function, C. W. Oyster, Sinauer Associates, Inc, 1999.
3. Clinical Anatomy and Visual System, L.A. Remington, Butterworth-Heinemann, Boston, 1998
4. 5th Edition, Physiology of the Eye, Davson H., Pergamon Press, New York, 1990.
5. Physiology of the Eye: An Introduction to the Vegetative Function, Butterworth-Heinemann, Boston, 1992.
6. Textbook of Medical Physiology (Eleventh Edition), A.C. Guyton and J.E. Hall, Elsevier Saunders, Philadelphia, PA, 2006

PHYSIOLOGY OF THE EYE (VIS 122)
Laboratory Schedule, Fall Quarter, 2008

LAB 1: **Tears and lacrimal system**

Dr. Om Srivastava

Room 305
Peters Bldg.

Thursday, October 30

Groups C and D: 1:00 - 3:00 p.m.
Groups A and B: 3:00 - 5:00 p.m.

LAB 2: **Corneal endothelial pump and deturgescence**
Dr. Om Srivastava

Room 305
Peters Bldg.

Thursday, November 6

Groups A and B 1:00 – 2:30 p.m.
Groups C and D: 2:30 - 4:00 p.m.

LAB 3: **Recording of eyelid movement**
Dr. Tim Gawn

Worrell Bldg.
Rm 235

Thursday, November 13

Group C and D: 1:00 – 2:30 p.m.
Group A and B: 2:30 - 4:00 p.m.

LAB 4 **Tour of Alabama Eye Bank (Corneal Morphometry)**
Alabama Eye Bank Alan Blake/Paul Graves

500, Robert Jamison
Road
Phone: 942-2120

Thursday, November 20

Groups A and B: 1:00 - 2:30 p.m.
Groups C and D: 2:30 - 4:00 p.m

LAB 5: **Accommodation**
Dr. Sarah Alvarez and Dr. Om Srivastava

Room 305
Peters Bldg.

Thursday, December 4

Groups C and D: 1:00 - 2:30 p.m.
Groups A and B: 2:30 - 4:00 p.m.