

Subject Description Form

Subject Code	SO3003
Subject Title	Visual Science 2
Credit Value	3
Level	3
Pre-requisite	Students are required to have attempted: Visual Science 1 (SO2003), and Ocular Anatomy and Physiology 1 (SO2005)
Objectives	<ol style="list-style-type: none"> 1. To introduce the fundamental basis of binocular vision 2. To discuss the foundations of binocular interaction/summation and development of binocular vision
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. compare and contrast the binocular vision of human and different animals b. discuss the concept of horopter and its measurement methods c. apply the horopter concept on fixation disparity and depth perception d. classify different monocular and binocular vergence eye movements e. discuss the effect and application of different entoptic phenomena f. calculate the retinal image size from different refractive errors and optical corrections g. describe the effect of different radiations to the eye and the effects of ocular aberrations on vision h. apply appropriate knowledge on clinical eye examination
Subject Synopsis/ Indicative Syllabus	<ul style="list-style-type: none"> • Sensory fusion and motor fusion • Horopter and physiological diplopia • Fixation disparity • Normal eye movement • Fusional responses and near vision complex • Depth perception and stereopsis • Retinal image size and aniseikonia • Ocular transmission and aberration • Entoptic phenomena • Binocular vision in human and other animals • Development of binocular vision • Binocular summation and interaction
Teaching/Learning Methodology	Lecture: This subject will help students understand the basic concepts of vision and visual optics.

	Tutorial: Problem-based learning case studies will be presented through small group discussion.									
Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)							
			a	b	c	d	e	f	g	h
	1. Coursework (test & lab quiz)	50	✓	✓	✓	✓	✓	✓	✓	✓
	2. Examination	50	✓	✓	✓	✓	✓	✓	✓	✓
	Total	100								
Student Study Effort Required	Class contact:									
	▪ Lecture									26 Hrs.
	▪ Laboratory									9 Hrs.
	▪ Tutorial									4 Hrs.
	Other student study effort:									
	▪ Self-study									80 Hrs.
	Total student study effort:									119 Hrs.
Reading List and References	<p><u>Prescribed Reading</u></p> <p>Steinman SB, Steinman BA, Garzia RP. Foundations of binocular vision. A clinical perspective, 2000. McGraw-Hill.</p> <p>Kaufman PL, Alm A. Adler's physiology of the eye, 10th ed. 2003. Mosby Inc.</p> <p>Hart WM. Adler's physiology of the eye, 9th ed. 1992. Mosby-Year Book Inc.</p> <p>Tunnacliffe AH. An introduction to visual optics, 4th ed. 1993. Association of British Dispensing Opticians.</p> <p>Rabbetts RB. Bennett and Rabbetts' Clinical visual optics, 4th ed. 2007. Butterworths-Heinemann.</p> <p><u>Recommended Reading</u></p> <p>Goss DA, West RW. Introduction to the optics of the eye, 2002. Butterworths-Heinemann.</p> <p>Reading RA. Binocular Vision, Foundations and Applications, 1981. Butterworths.</p>									

	Schor CM, Ciuffreda KJ. Vergence eye movements: Basic and clinical aspects. 1983. Butterworths.
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	Goss DA. Ocular accommodation, convergence, and fixation disparity, 2 nd ed. 1995. Butterworths-Heinemann.
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