

521-204 Biochemistry and the Eye

Credit Points:	12.50
Level:	2 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 1, - Taught on campus. Three one hour lectures per week and one 1 hour tutorial per week.
Time Commitment:	Contact Hours: 48 Total Time Commitment: 120 hours
Prerequisites:	Level 1 Biology and chemistry are required for entry into studies for the Bachelor of Optometry.
Corequisites:	Please ask the Department of Optometry and Vision Science if not co-enrolled in the following subjects: Anatomy& Histology of the Eye Human Visual Functions Applied Statistics for Optometrists Enrollment may be approved for students who might not otherwise qualify at the discretion of the Head of the Department of Optometry and Vision Sciences.
Recommended Background Knowledge:	Students must either be undertaking the Bachelor of Optometry or enrolled in the specified co-requisite subjects.
Non Allowed Subjects:	None
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Assoc Prof Graham Parslow, Dr Andrew Ian Jobling
Subject Overview:	This course covers the chemical structures and functions of body constituents, core metabolic and regulatory processes, particularly in relation to the eye and other tissues which have a major influence on the function and maintenance of the eye. The first part of this subject covers general biochemistry while the second segment deals with specific interactions in the eye. You will be introduced to the biochemical basis of diseases of the eye, the role of experimentation in the development of biochemical knowledge and the clinical relevance of ocular biochemistry and molecular biology. Major topics are the structure, function and metabolism of proteins, carbohydrates, lipids, mucopolysaccharides and nucleic acids; the specialised functions of proteins, lipids and proteoglycans, bioenergetics, ion transport, DNA replication, the genetic code, messenger RNA, protein synthesis at ribosomes; the function, composition and production of tears and aqueous humour; the extracellular matrix of the cornea, sclera and vitreous humour; the ion channel mechanisms of the retina, lens, cornea and ciliary body and the visual cycle in the retina from the genetic components of the photopigments to the biochemistry of the phototransduction cascade and retinal metabolism.
Objectives:	By the end of the subject the student should understand: <ul style="list-style-type: none"> # the metabolic functions of a cell as the basic unit of life; # the molecular basis for information storage and transmission from DNA to protein, including a basic understanding of genomics; # the chemical nature of amino acids and their role in determining the folding and function of proteins; # the chemistry and structure of lipids and carbohydrates as components of cell membranes;

	<ul style="list-style-type: none"> # the complete breakdown of glucose (glycolysis, TCA cycle and oxidative phosphorylation) as the mechanism that supplies the macromolecules and the energy needed for cells to carry out their functions; # the importance of ion movement and metabolism on the structure and function of the cornea, ciliary epithelium, lens and retina; # the genetic and biochemical components of photopigments, the retinoid (chromophore recycling) pathway and the phototransduction cascade; # the underlying biochemical basis for specific visual disorders.
Assessment:	One 3 our written exam held in the end of semester examination period (80%)Two 1 hour multiple choice examinations during semester (each 10%)
Prescribed Texts:	Nelson and Cox, Lehninger Principles of Biochemistry, 5th edn., 2008
Recommended Texts:	Students will be directed to specific reference materials from various text book chapters and research articles during the second part of the subject.
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	<p>On completion of this subject, students should have developed the following generic skills</p> <ul style="list-style-type: none"> # think critically and organize and expand knowledge from a consideration of the lecture material; # learn to adopt new ideas, from participation in the lecture program; # plan effective work schedules and grow confident in the synthesis of knowledge.
Notes:	<p>This subject is only available to students enrolled in the Bachelor of Optometry course.</p> <p>Students undertaking this subject will be expected to regularly access an internet-enabled computer to access material mounted on the Learning Management System.</p>
Related Course(s):	Bachelor of Optometry