## Department of Science Grande Prairie Regional College

## Biochemistry 3100

**Bioenergetics and Metabolism** 

## Course Outline 2006-2007

Instructor

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Course Description:	Designed to enable rigorous study of the molecular mechanisms in bioenergetics and metabolism. It covers: the principles of bioenergetics; the reactions and pathways of carbohydrate, lipid, and nitrogen metabolism, and their regulation; oxidative phosphorylation and photophosphorylation; carbohydrate biosynthesis in plants; the integration and hormonal regulation of mammalian metabolism.
Pre-requisites:	BC 2000, CH 1020 and CH 2630
Notes:	<ol> <li>Students with grades of less than B- in pre-requisite courses require consent of the department.</li> <li>This course may not be taken for credit if credit has already been obtained in BC 2030 or BC 2050.</li> </ol>
Transferability:	Biochemistry 310 – University of Alberta
Text-book:	Lehninger Principles of Biochemistry (4 <sup>th</sup> edition) David Nelson & Michael Cox W.H. Freeman and Co. (2005)
Requirements:	Since participation in lectures and completion of assignments are essential to achieving success in this course, regular attendance at classes is highly recommended. Those who chose not to attend must assume whatever risks are involved. In this regard, your attention is directed to the Academic Guidelines of Grande Prairie Regional College.
Evaluation:	Mid-term Exam I30%Mid-term Exam II30%Final Exam40%
	Mid-term Exam I will test knowledge of material covered in the first third of the course. Mid-term Exam II will test knowledge of material covered since the first mid- term exam. The Final Exam will be cumulative and test knowledge of the entire course.

Hours       Topic       Readings         1       - general introduction of metabolism - overall purposes - catabolism / anabolism - general properties - in balance / dynamic steady state - bioencregetically separate - pathways       27-28, 481-488         - overall purposes - catabolism / anabolism - general properties - in balance / dynamic steady state - pathways       -         - pathways       - catabolism / ear equilibrium reactions - far from equilibrium / near equilibrium reactions - pasible regulation / control         - major pathways in humans - possible regulation / control       892-893         - major pathways in humans - integration       892-893         - bioenergetics - ATP and phosphoryl-group transfers - color reactions in biology - coenzymes and water soluble vitamins       489-517         1       - principles of metabolic regulation       571-575         3       Glycolysis and Gluconeogenesis - glycolysis       532-533 - feeder pathways for glycolysis and aerobic conditions - gluconeogensis       533-537 - fates of priviate under anaerobic and aerobic conditions - gluconeogensis       543-549 - coordinated regulation of glycolysis and gluconeogenesis         1       Pentose phosphate pathway       549-555       1         1       Pentose phosphate pathway       543-549 - coordinated regulation of glycogen synthesis and breakdown       583-591         1       Pentose phosphate pathway - coordinated regulation of glycogen synthesis and breakdown       583-591 <t< th=""><th colspan="6">BC 3100 – Topic Outline &amp; Required Readings</th></t<>	BC 3100 – Topic Outline & Required Readings					
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