

TEXAS CHRISTIAN UNIVERSITY
KINE 60653: EXERCISE METABOLISM AND ENDOCRINOLOGY
Course Syllabus
Spring 2003

INSTRUCTOR: Darryn Willoughby, Ph.D., FACSM, FASEP, EPC, CSCS, CNS

OFFICE LOCATION & HOURS:

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Monday-Friday: 10:00 am to 12:00 am, * **Other hours by appointment**

CLASS TIME, DURATION, AND LOCATION:

Wednesday, 6:00 pm to 8:40 pm. Rickel Building, Room 042.

TEXTS:

Houston, M. (1995). *Biochemistry Primer for Exercise Science*, Human Kinetics Publishing. (HS)

Brooks, G., Fahey, T., White, T., and Baldwin, K. (2000). *Exercise Physiology: Human Bioenergetics and its Applications* (3rd ed.). Mayfield Publishing. (BR)

COURSE DESCRIPTION:

This course provides students with an understanding of various concepts of cellular metabolism in response to acute and chronic exercise. Emphasis will be placed on biochemical, molecular, and endocrinological mechanisms regulating human metabolism.

COURSE OBJECTIVES:

At the end of the semester the student should understand:

1. biochemical principles associated with energy production such as carbohydrate, fat, and protein metabolism.
2. principles associated with enzyme kinetics such as V_{max} , K_m , allosteric regulation, and Δg (change in free energy).
3. role of endocrine hormones in exercise metabolism such as testosterone, insulin, glucagon, epinephrine, etc.
4. molecular principles involved in regulating gene expression such as: 1) the helix-loop-helix DNA binding proteins, 2) transcription and mRNA processing, 3) translation and protein synthesis, and 4) post-translational modification of proteins.

EVALUATION:

Exam 1: 25%
Exam 2: 25%
Exam 3: 25%
Research Paper: 15%
Research Article Summaries/Homework: 10%

ACADEMIC CONDUCT POLICY

Students should familiarize themselves with the Academic Conduct Policy in the University Calendar/Student Handbook.

DISABILITY POLICY

Texas Christian University complies with American with Disabilities Act and with Section 504 of the Rehabilitation Act of 1973 regarding students with disabilities. The full policy is available in the University Calendar/Student Handbook.

Each eligible student is responsible for presenting a letter to the instructor from the Coordinator of Academic Services for Students with Disabilities **no later than two calendar weeks following the first day of classes for the academic term.**

COURSE OUTLINE:

DATE	CHAPTERS
01-15 Course Introduction; Overview of Molecular Biology	Handouts
01-22 DNA Replication and Gene Expression	HS 3; Handouts
01-09 Transcription and mRNA Processing	HS 4; Handouts
02-05 Translation and Protein Synthesis	HS 5; Handouts
02-12 EXAM 1	
02-19 Bioenergetics and Enzyme Kinetics	HS 2,6; BR 2,3
02-26 Anaerobic Energy: Phosphagen Metabolism	HS 6
03-05 Carbohydrate Metabolism and Glycolysis	HS 7,11,12; BR 3,5
03-12 Glucose Oxidation and the Krebs Cycle	HS 9,11,12; BR 5,6
03-19 Oxidative Phosphorylation	HS 8; BR 6
03-26 EXAM 2	
04-02 Lipid Metabolism	HS 10; BR 7
04-09 Protein Metabolism	HS 1,13; BR 8
04-16 Hormonal Regulation of Metabolism	BR 9
04-23 Hormonal Regulation of Metabolism	BR 9
04-30 Intracellular Signaling Systems	Handouts
05-07 EXAM 3	

***Note: For textbook readings, the codes are as follows: HS=Houston's Biochemistry Primer for Exercise Science Textbook; BR=Brooks' Exercise Physiology Textbook**

*** Dr. Willoughby reserves the right to modify the syllabus, either by changing information discussed throughout the semester and/or changing exam dates.**