

**SPM 435 EXERCISE METABOLISM
SYLLABUS
FALL 2000**

INSTRUCTOR

Michael Godard, Ph.D.

220 Costello Complex

Department of Sports Medicine

Tel: 780-4698

E-mail: mgodard@usm.maine.edu

Office Hours: Monday, Wednesday and Friday 9:55 a.m. – 10:55 a.m.

OR By appointment

MEETING TIMES AND LOCATION

Monday, Wednesday and Friday 9:00 a.m. – 9:50 a.m. BAIL 108

TEXBOOK

Required – *Exercise Metabolism*. M. Hargreaves, 1995.

Recommended – *Any Biochemistry Textbook*

COURSE OBJECTIVES

An intensive study of the biochemical regulatory mechanisms of energy production and expenditure involved in cellular metabolism. Emphasis will be placed on carbohydrates, protein, and lipid metabolism and the acute and chronic effects that exercise and physical activity have on these systems.

Prerequisites: SPM 431 or Instructor Permission.

COURSE OBJECTIVES

The course will provide basic information facilitating increased student competency to understand and be able to discuss the following:

1. Metabolism: Basic concepts and design; including, structural basis of the high phosphoryl transfer potential of ATP, creatine phosphate, NADH and FADH₂ in the oxidation of fuel molecules, coenzymes (water soluble vitamins), and fat-soluble vitamins.
2. Glycolysis; including rest and exercise.
3. Citric Acid Cycle; including rest and exercise
4. Oxidative Phosphorylation; including, rest and exercise
5. Pentose phosphate pathway and gluconeogenesis
6. Carbohydrates; including structure and function and glycogen metabolism
7. Proteins; including structure and function and amino acid degradation
8. Lipids; including structure and function and fatty acid metabolism

STUDENT EVALUATION

There will be a total of 500 points possible in this course. The points are as follows:

Exam 1	100 points
Exam 2	100 points
Exam 3	100 points
Exam 4	100 points
<i>(Final Comprehensive Exam)</i>	
Quizzes	100 points

There will be 10 quizzes worth 10 points each. Unless by consent of the instructor, missed quizzes and exams cannot be made-up. Final grades for the course will be based upon the following scale:

92.5% and above = **A**; 90.0 to 90.4 = **A-**; 87.5 to 89.9 = **B+**; 82.5 to 87.4 = **B**; 80.0 to 82.4 = **B-**; 77.5 to 79.9 = **C+**; 72.5 to 77.4 = **C**; 70.0 to 72.4 = **C-**; 67.5 to 69.9 = **D+**; 62.5 to 67.4 = **D**; 60.0 to 62.4 = **D-**; 59.9 and below = **F**

ATTENDANCE

It is expected that each student will attend every class. Under that assumption, if a class is missed it is the student's responsibility to contact another individual in the class for all materials covered on that particular day. **Exams and quizzes cannot be "made-up"**. All exams and quizzes will be taken at the scheduled time – **NO EXCEPTIONS!** Any student who misses an exam will receive a score of **"0"** unless undue circumstances prevents the student from attending the scheduled time.

SPECIAL STUDENT NEEDS

If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share with me, please make an appointment with me as soon as possible.

LECTURE AND EXAM SCHEDULE

Unit 1: Metabolism: Basic concepts and design

Class Notes - structural basis of the high phosphoryl transfer potential of ATP

Class Notes - creatine phosphate

Class Notes - NADH and FADH₂ in the oxidation of fuel molecules

Class Notes - coenzymes (water soluble vitamins)

Class Notes - fat-soluble vitamins.

EXAM 1 – 100 points (Friday, September 29th)

Unit 2: Glycolysis and the Citric Acid Cycle

Chapter 1 and Class Notes – Glycolysis and metabolism during high-intensity exercise

Chapter 2, 3, 6 and Class Notes – Citric Acid Cycle, skeletal muscle carbohydrate and hepatic metabolism during exercise, and metabolic adaptations to endurance training

EXAM 2 – 100 points (Friday, October 27th)

Unit 3: Oxidative Phosphorylation, Pentose phosphate pathway, and Carbohydrate Metabolism

Chapter 3, 6 and Class Notes – Electron transport system and gluconeogenesis

Chapter 2, 3, 6 and Class Notes – Glycogen metabolism

EXAM 3 – 100 points (Friday, November 17th)

Unit 4: Protein and Lipid Metabolism, and Muscle Fatigue

Chapter 3, 5, 6 and Class Notes - Amino acid degradation and Citric Acid Cycle

Chapter 3, 4, 6 and Class Notes – Fatty acid metabolism

Chapter 7 and Class Notes – Metabolic muscle fatigue with intense exercise

EXAM 4 (Comprehensive Final) – 100 points