ANSC 618
LIPIDS & LIPID METABOLISM
MW 3:00 4:15
WCBA 105

INSTRUCTOR: Stephen B. Smith
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E-mail: sbsmith@tamu.edu
Course website: http://animalscience.tamu.edu/academics/texas-am-anscnutr-618/
CLASSROOM: WCBA 105
Office hours: Drop in or by appointment

OBJECTIVES:

Upon completion of this course, the student should be able to effectively:
1. Describe the chemical nature of the various classes of lipids and lipid-derived hormones;
2. Discuss the absorption and metabolism (synthesis/degradation/modification) of fatty acids and lipids in monogastric and ruminant species;
3. Discuss the relationship between lipid metabolism and obesity;
4. Describe the relationship between lipid metabolism and cholesterol homeostasis
5. Understand lipids as hormones

Scope of the course. This is a comparative biology/biochemistry course. It will not focus solely on human lipid metabolism, nor will it focus only on rodent models or livestock species. The goal of the course is to provide the student with an understanding of the role of lipid metabolism in normal and dysfunctional growth and metabolism.

PREREQUISITE: BICH 410 or approval of instructor.

Lecture material. Lecture material for each section will be posted throughout the semester at: http://animalscience.tamu.edu/academics/texas-am-anscnutr-618/.

The lecture “handouts” will be posted at least one week in advance of their respective lecture day. You will be expected to download the lecture for its respective day of presentation and review the material before coming to class.

RECOMMENDED READING MATERIAL:
Lipid Biochemistry, 5th ed. Gurr, Harwood, and Frayn, Blackwell Science. This text provides excellent background for general lipid chemistry and lipid metabolism.

This text can be purchased from amazon.com new for about $60. You are not required to purchase the text, but it is highly recommended if you plan to do research in lipids.

ATTENDANCE: Students will be allowed University-sanctioned absences.
EXAMS:
- Midterm I* 50 points
- Midterm II 50 points
- Midterm III 50 points
- Midterm IV 50 points
- Quizzes** 40 points
- Final (40% new, 60% review) 100 points

**TOTAL**
340 points

**TOTAL FOR GRADE BASIS***
290 points

GRADING: A = 90-100%; B = 80-89%; C = 70-79%; D = 60-69%; F = 59% or lower

*There will be four midterms, each covering the material from five lectures. The final exam will cover lecture material from three classes plus material from the previous midterms.

**Twenty, two-point quizzes will be given throughout the semester. The quizzes are designed to encourage students to study ahead for class and reinforce exam material. There are no make-up quizzes, but students will not be penalized for missing quizzes due to excused absences (total quiz score will be adjusted accordingly). Excused absences include illnesses, scientific meetings in which the student is required to attend, and unavoidable laboratory research.

***Students are allowed to drop one midterm (Midterms I – IV). Students are required to take all midterms and the final, but students are allowed to miss one midterm for excused absences. Students who do not miss any midterms may drop the midterm with the lowest score. Students who miss two midterms (excused or otherwise) are required to take a midterm that includes information from both missed midterms.

AGGIE CODE OF HONOR: An Aggie does not lie, cheat, or steal, and will not tolerate those who do.

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<td>Gurr, Harwood, and Frayn.</td>
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<td>11 Fatty acid synthesis, elongation, desaturation, and hydrogenation</td>
<td>Section 3.1, 3.4, Handouts 6 &amp; 7</td>
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<td>16 Triacylglycerol synthesis</td>
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18 Lipolysis
23 B-oxidation and ketone bodies
25 Regulation of fatty acid metabolism

March
2 Midterm II (Lipid Metabolism)

SECTION III. Lipid Transport
4 Absorption of lipids from the small intestine
9 Absorption of fat-soluble vitamins
11 Lipoprotein metabolism
16-18 Spring Break
23 Lipoprotein metabolism
25 The LDL receptor; familial hypercholesterolemia
31 Midterm III (Lipid Transport and Lipoprotein Metabolism)

April
SECTION IV. Cholesterol Metabolism
1 Cholesterol synthesis
6 Dietary fat and heart disease; intervention trials and epidemiological data
8 Adipose tissue differentiation
13 Fatty acid metabolism, stearoyl-CoA desaturase, and obesity

SECTION IV. Structural Lipids/Obesity
15 Midterm IV (Cholesterol Metabolism and Obesity)
20 Lipid peroxidation
22 Prostaglandins, leukotrienes, and phosphatidyl inositols
27 Membrane lipids
29 Sphingolipids and membrane structure

May
4 Inflammation and obesity
6 Reading Day
11 FINAL EXAMINATION (10:30 a.m. – 12:30 p.m.)
13 Final grades for degree candidates
14 Commencement
18 Final grades due to the registrar

Section 3.5, Handout 7
Section 2.3, Handout 8
Sections 3.6 & 5.3, Handout 8
Section 5.1, Handout 9
Section 5.1, Handout 10
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