Animal Sciences/Dairy Science/Nutritional Sciences 311
Spring 2015 MWF at 12:05

Dr. Lou Armentano (learment@wisc.edu, 263-3490, 952B An. Sci.) and
Dr. Tom Crenshaw (tdcrensh@wisc.edu, 263-4423, 1156B An. Sci)
Chapters refer to recomended Text by David Tisch

Week	Date	Day	(**Armentano Lectures**)
1	1/21	W	Course Introduction, Overview of Digestive Physiology Chapter 2 plus assigned links
1	1/23	F	Anatomy and Physiology of Digestive System
2	1/26	M	Liver Function
2	1/28	W	Fermentation strategies
2	1/30	F	Quiz. Overview of feed analysis and digestibility measurements (Chapter 3 and 4)
3	2/2	M	Chemistry of carbohydrates (ch 6)
3	2/4	W	Digestion and metabolism of carbohydrates Fermentation
3	2/6	F	Quiz. Gluconeogenesis
4	2/9	M	Lipid chemistry and fatty acid nomenclature (Ch 8)
4	2/11	W	Digestion and metabolism of lipids
4	2/13	F	Quiz.Fat synthesis and transport
5	2/16	M	Lipid section wrap-up, Protein introduction
5	2/18	W	Protein digestion, absorption and metabolism (Ch 9)
5	2/20	F	Quiz.Amino acid balance and requirements, Measuring and describing protein quality
6	2/23	M	Protein quality continued, Ruminant Protein Metabolism
6	2/25	W	Ruminant Protein Metabolism continued
6	2/27	F	Quiz. Overview of energy systems (Ch 5, review Ch 4)
7	3/2	M	Energetics, Maintenance and productive energy
7	3/4	W	Energetics continued
Evening midterm exam Wed Mar 4 7:15 pm Room to be announced (NOT in 212)			
7	3/6	F	Quiz. Energetics
8	3/9	M	Energetics and Thermoregulation
8	3/11	W	Feed Intake

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Week	Date	Day	(**Crenshaw lectures**)
8	3/13	F	Quiz. Water - the "*most essential*" nutrient (**Crenshaw Lectures begin**) (Ch 11)
9	3/16	M	Electrolytes - Na, K and Cl (Ch 9)
9	3/18	W	Na, K, and Cl - additional roles Salt, and Mg
9	3/20	F	Quiz. Ca, P, Vitamin D, and K (Ch 9 and 10)
10	3/23	M	continue- Ca, P, Vitamin D and K
10	3/25	W	continue Ca, P, Vitamin D and K
10	3/27	F	Quiz. Vitamin A (Ch 10)
11	**Spring Break**		
12	4/6	M	Biotin, Mn and Cu (Ch 10)
12	4/8	W	Fe, Zn and Cu
12	4/10	F	Quiz. Continue Fe, Zn and Cu
13	4/13	M	Vitamin E and Se (Ch 9 and 10)
13	4/15	W	continue Vitamin E and Se
Evening Exam Wed 4/15 7:15 pm room to be announced (NOT 212)			
13	4/17	F	Quiz. Niacin & Riboflavin (Ch 10)
14	4/20	M	continue Niacin & Riboflavin
14	4/22	W	Thiamin, B_6 (Ch 10)
14	4/24	F	Quiz. Pantothenic Acid (Ch 10)
15	4/27	M	B vitamins and requirements
15	4/29	W	Folacin & Choline (Ch 10)
15	5/1	F	Quiz. B_{12} & Cobalt (Ch 9 and 10)
16	5/4	M	I & thyroid function
16	5/6	W	Nutraceuticals and Functional foods
16	5/8	F	Review session.

Final exam will be Friday May 15 2015 10:05 am to 12:05 pm. Room to be announced.

Animal Science, Dairy Science, Nutritional Sciences 311

Comparative Animal Nutrition

Course Information for Spring 2015

Recommended Text: **Animal Feeds, Feeding and Nutrition, and Ration Evaluation; by David Tisch**

Course Instructors:
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Dr. Armentano's area of research and greatest expertise is in Dairy Cattle Nutrition and Dr. Crenshaw's is in Swine Nutrition. However this course will not be taught in a species by species manner. Differences among species will serve to highlight the different strategies that have arisen both from an evolutionary biology standpoint and from human intervention in management and genetics. The first section of the course will focus on carbohydrates, fats, protein and energy nutrition across species and will be taught by Dr. Armentano. These are the major 'weight' portion of feeds. The second half of the course will cover the major minerals and vitamins for all species and will be taught by Dr. Crenshaw.

We will use a learn@UW web site to assist in this course. You can access it under the UW home page from the MY UW Madison section. Lecture notes that are in PowerPoint format will not be copied and distributed in class but will be posted in advance so you can make copies and review them prior to lecture. The best strategy is to do assigned/suggested readings and review posted lecture outline notes BEFORE the lecture they will be covered in, then go back to them for clarification and review. PowerPoint outlines are intended as a study guide but taking class notes is an important form of active learning and helps you assimilate and understand the material. PowerPoints and lectures are not meant to be identical; they are meant to be complementary. They cover the same material but in different ways. Integrating these two sources of information, the text material and other links and information provided is how you learn. DO NOT expect them to be identical. Order of lectures and PowerPoints are not always identical, so taking notes on a blank sheet of paper is probably the best approach. If you cannot make the link between PowerPoints and on board notes, please ask. They differ on purpose.

Grades:
Grades will be based as follows once a final numerical score is obtained:
>90% = A, >84% AB, >78% B, >72% BC, > 66 C, >60 D, below 60 F
These cutoffs may be lowered somewhat but will not be raised (therefore any change will be in your favor). No one can 'bust the curve'. It is theoretically possible for everyone to get an A or everyone to get a C, although not at all likely.
Final grade = 20% of 10 best "in class" quizzes + 20% exam 1 + 20% exam 2 + 40% Final exam.
We do not assign letter grades to individual exams and quizzes. Exam and Quiz statistics, as well as your own grades, are available at Learn@UW. It pays to check your quiz grades so keep the quizzes when I return them to you in case a grade gets entered incorrectly.

There are two types of quizzes:
Graded Quizzes ("in class" or "take home"): Your quiz grade counts for 20% of your final grade.
Quizzes are valued at 10 pts each.
Scheduled Friday Quizzes will generally cover recent lecture material or ask you to integrate new material with older material. Expect one every friday unless informed otherwise. Arrive in class ON TIME. Quizzes will start precisely at the bell and will end at a reasonable time to enable lecture to begin. **If you arrive late you will not have adequate time to take the quiz**.
Quiz questions and answers are posted immediately after the class in which they are given, graded quizzes will be returned before the next exam.
Additional 'pop' quizzes may be given on any Monday or Wednesday. One or more assignments may be considered a take home open book graded quiz and must represent each student's own work.
Quizzes (especially pop quizzes) may cover new material that has not been covered in lecture but was specifically assigned as important material to review prior to any given class. In general Friday quizzes will test material covered in previous lectures with emphasis on the most recent 3 lectures.

MAKE SURE TO READ THIS:
Your quiz grade will be based on **your 10 best quizzes**. This means that more quizzes and pop quizzes can only help you out. **A missed quiz is a zero**, there will be more than 10 quizzes (usually at least 15) so if you miss a quiz **for whatever reason**, you will then be able to drop that 0. Just don't miss too many and be prepared for the ones you are here for. **There are NO makeup quizzes** even if you have a VERY GOOD reason to be elsewhere (**so don't ask!**). This system basically requires you to be here for each friday quiz to maximize your grade, but allows for some individual misses without us having to grant special dispensation. If your current plan for this class is to miss more than a few Fridays, you should develop a new plan. These rules apply to everyone.

Material above refers to in class Quizzes. Examples of old quizzes (with keys) are found under "content" on learn@UW.

The other kind of 'optional' quiz Is available on line under quizzes in learn@uw. Active learning and feedback are important for the learning process. *On learn@uw is a section labeled "Quizzes". These Online quizzes are not used for your grade determination but are extremely useful in student self-assessment.* If you can get a 100% on the online quiz, you should certainly be well prepared for the corresponding in class quiz. I really advise you to take these quizzes. Go over the lecture material and readings and web resources, take the quiz, then re-examine the material you did not get the first time. In the quizzes I avoid true-false questions so that in fact when you get something wrong the best way to learn it is to go back to the original materials and see where you went wrong the first time.

Two intermediate **Evening** exams: = 20% each of final grade (40% total)
Do not miss the exams. **Exam room will be announced in class.** If you know of a conflict discuss it with the instructors **now**

Final Exam = 40% of grade
(includes 20% on last third of course plus 20% comprehensive for entire course)
Final exam will be Friday May 15 2015 10:05 am to 12:05 pm. Exam room will be announced in class. Only if you have 3 exams within a 24 hr period will we consider a schedule modification for the final. According to UW policy you cannot have any specifically conflicting scheduled university event for that time period.

Pre-requisites:
The preferred pre-requisite for this course is a course that covers the basic biochemistry of animals (BmolChem 314 or one of the 500 level Biochemistry courses, Biochemistry 201 or any course named Biochemistry at any level). Prior knowledge of the role of glycolysis, gluconeogenesis, beta-oxidation, the krebs-TCA cycle and the electron transport chain, protein structure, and the role of enzymes is assumed. Some natural science students who intend to take Biochem 501 or a more advanced biochemistry may not exactly meet these requirements. In that case students that have completed organic chemistry and have been exposed to some cell biology and are co-registered in an advanced biochemistry course should be reasonably well prepared but may have to read ahead in their biochemistry texts at certain points. If you do not meet these requirements you should talk to the instructors. Nutrient metabolism will be discussed in the context of these pathways but without detailed depiction of the step by step reaction of these pathways. Knowledge of the existence, function and purpose of these pathways is essential. Chemical formula of the starting compounds, key branching intermediates and final products, and key co-factors (vitamins) will be reviewed in this course and integrated with nutritional metabolism. Reviewing pertinent sections of your biochemistry notes and textbook during 311 will be useful.
This course is intended as a bridge between basic sciences in general and applied nutrition for any particular species. Think of it as a basic introductory nutrition course taught at a pretty high level of background. 313 is a companion course that covers the basics of ration formulation calculations. It is also general and introductory but is more oriented to skills needed in quantitative formulation of animal rations. There are two sections of this one credit course available Tuesday (an am and pm section).

Armentano's availability:

I don't keep schedule office hours for this course because students don't use them, but I am very willing to meet with any student almost any time.
Questions posted by email are appreciated (and force you to focus your question) but you can always schedule a meeting with me by email. This seems to work better than fixed office hours. I should almost always be able to schedule a meeting within a few days of receiving a request (by email, in class, or by phone). I am also almost always available right after lecture. When emailing for a meeting please provide your available times over the next few days. General meetings to discuss issues you are having with the course (how to study, problems with lectures etc.) are encouraged as needed.

Please review the class rules before consulting me. Do not ask to be excused for a quiz, the policies stated are clear, fair, and we adhere to them.

On request, I will be glad to schedule a (as in one per exam) review session prior to an exam but at such a review I will answer specific questions that you ask me, I will not simply rehash a lecture I have already given.

Feel free t