NUTR 365: Nutritional Physiology of Vitamins and Minerals

Spring 2019 – Tues/Thurs 12:45-2:00pm KLCT 123

Instructor: Dr. Erin Giles, PhD
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E-mail Correspondence: To ensure that your email doesn't get filtered into spam, send emails through the eCampus OR specify 'NFSC 365' in the subject line of your email.

Course Description: Fundamental nutritional significance of fat-soluble and water-soluble vitamins and minerals to human metabolism, cell biology and physiology. Micronutrients will be grouped by metabolic function or biochemical and physiological actions. Important dietary sources, absorption, storage, metabolism, biochemistry, deficiency and toxicity of individual nutrients in this context and basis of DRIs.

Prerequisites: NUTR/NFSC 203 and 301; junior or senior classification.

Recommended Texts:

1. *Present Knowledge in Nutrition.* 10th ed. Ed: Erdman JW, Macdonald IA, Zeisel SH. International Life Sciences Institute. Wiley-Blackwell. 2012. DOI: 10.1002/9781119946045
   Free online access through TAMU library; Chapters 11-38.
2. *Advanced Nutrition and Human Metabolism;* Gropper, Smith & Groff; 7th Edition; Cengage Learning. ***Section III.*** *Copies available through the TAMU Libraries.*
3. *Understanding Nutrition,* Whitney and Rolfes. *This is the same text used in NUTR 203; it has basic tables of vitamins & minerals that you may find useful.*

Additional Readings (required): will be posted on eCampus or accessed through the Texas A&M University Libraries.

Handouts and other Course Materials: Course materials prepared for this class are not to be distributed to those outside of this class. They are considered to be copyrighted.

Learning Outcomes: By the end of the class, successful students will be able to:

1. Define the relevant (bio)chemical properties of essential vitamins and minerals related to stability, biological activity and nutritional significance;
2. Explain the fundamental mechanisms of absorption, transport, and storage or cellular localization of specific vitamins and minerals;
3. List and explain the functional role(s) performed by specific vitamins and minerals in cellular metabolism and tissue function;
4. Identify important food sources of essential vitamins and minerals;
5. Explain and diagram significant biochemical or physiological processes for which multiple vitamins and minerals are mechanistically essential;
6. Describe the metabolic/physiologic/nutritional consequences and related basic mechanisms of inadequate and/or excessive amounts of specific vitamins and minerals and how these relate fundamentally to the derivation of DRIs.

Grading: Grades may be changed only when a point calculation error has occurred. *There will be no extra credit projects or assignments*.

Grading Assessment

Exam 1	15 %
Exam 2	15 %
Assignment 1	15 %
Assignment 2	15 %
Class Participation & Small Assignments	10 %
Final Exam (cumulative)	30 %
TOTAL	**100 %**

A: 90-100%; **B:** 80-89.9%; **C:** 70-79.9%; **D:** 60-69.9%; **F:** < 60%.

Assignments: Details of assignments will be given in class and/or posted on eCampus. Assignments are due at the beginning of class on the scheduled due date. Assignments turned in after class will be considered late. Any assignment turned in after class on the due date will be deducted 5% of the maximum points of that assignment. Other late assignments will be deducted 10% of the maximum points for each day past the due date the assignment is turned in unless you have a University authorized excuse. No assignment will be accepted 7 days beyond the due date.

Exams: Exams will be given during scheduled class time. Tentative dates of exams are provided in this syllabus; however, if it becomes necessary to change the date of an exam I will give you adequate notice of this date change by announcing the change during class and via email.

Each Regular and Final Exam will be a combination of short-answer, fill-in the blank, short-essay and/or multiple-choice questions.

Attendance: In the past, students that regularly attend class and take good notes have done far better on exams than those who do not attend class. The University attendance policy can be found at: http://student-rules.tamu.edu/rule07. Please refer to Section 7.3 for a list of excused absences, as well as http://studentactivities.tamu.edu/online/sponsauth for a list of University sponsored and authorized activities. Please review all of rule 7 on attendance as it provides a thorough description of the procedure one must follow in the event an excused absence. Review this information, as it is your responsibility to comply with these rules. Documentation is required to verify all excused absences prior to making up exams, for exemption from participation point deductions, or to avoid point deductions on late assignments.

If you are absent from class on a day that an assignment is handed out, it is your responsibility to obtain a copy of that assignment from me, whether the absence is excuse or unexcused.

Make-up for Regular Exams: Make-up exams will be given only in the event of a University authorized absence. If you must be absent on the day of an exam, please notify me prior to that exam, if feasible, or by the end of the second working day after the absence. Appropriate documentation must be submitted to me to confirm this absence (i.e. signed doctor's note); a make-up exam will be scheduled after I have verified the documentation.

eCampus: Announcements, lecture notes, additional readings, and grades will be posted on eCampus. You are responsible for monitoring eCampus for announcements that may affect the class schedule, lecture notes, or any other information related to this class. Your grades will also be posted on eCampus. You must contact me within 1 week after an assignment has been returned if you do not have a grade for that particular assignment posted in eCampus.

Google Drive: A group drive will be used for collaborative work throughout the semester as this is sometimes easier to use for sharing files and preparing presentation files as a team. Be sure to provide Dr. Giles with your preferred email address to access the class drive at the beginning of the semester.

Classroom Etiquette: Behavior must be respectful at all times. You are expected to silence your phones and do not text during class. If your computer is open, it is expected that you are using it to take notes (and not to surf the net or post on social media).

Americans with Disabilities Act (ADA): The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

Academic Integrity:
Aggie Honor Code: "An Aggie does not lie, cheat, or steal or tolerate those who do."

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System.

For additional information please visit: http://aggiehonor.tamu.edu

To make this environment comfortable for everyone, please remember that there are many students with different experiences and needs in one room. This class does not tolerate remarks that are sexist, racist, homophobic, or otherwise ridicule people.

Tips for Success:

1. Read the syllabus for this course, and check the course website on eCampus regularly.
2. Read the respective readings and review the lecture outline BEFORE each class lecture.
3. Go to class, pay attention, ask questions, and participate in class discussions and activities.
4. Come to class prepared to answer questions both verbally and in writing. You will be called upon to answer questions in class.
5. Rather than cramming before an exam, daily review and study lecture notes and learning objectives for each chapter. Consider reviewing notes and concepts with a study partner or group.
6. Preparation for exams: Study in advance for each exam. Study the notes from each lecture using the learning objectives as a guide. Test your comprehension using pop quizzes and practice questions.
7. Assess your performance based on your comprehension of quiz questions and exam grades. If you are struggling with the material OR your grade is lower than you think you are *capable* of *earning*, immediately seek help from the Instructor. Do not wait. The sooner you seek help, the more likely you are to improve your final grade for the course AND the more you will learn

Tentative Class Schedule – NFSC 365 – Spring 2019

Schedule Changes Will Be Announced in Class

Week 1: Jan 15, 17
Overview of Vitamins & Minerals and Basics of Water-Soluble Vitamins

Week 2: Jan 22, 24
Continue with Basics of Water Soluble → Fat Soluble Vitamins → Minerals

Week 3: Jan 29, 31
Digestion and Absorption, Post-Absorption Distribution and Cellular Transport of Micronutrients

Week 4: Feb 5, 7
Basics of Renal Physiology of Transport and Urinary Excretion of Vitamins and Minerals
Principal Action: Regulation of Fluid/Electrolyte Balance and Blood Pressure

Week 5: Feb 12, **Lecture: Fluid/Electrolyte Balance and Blood Pressure**
Feb 14: **Exam #1**

Thursday, February 14 – Exam #1

Week 6: Feb 19, 21
Principal Action: Erythropoiesis (Red Cell Production) → Principal Action: Coagulation (Blood Clotting)

Week 7: Feb 26, 28
Principal Action: Single Carbon Metabolism and Principal Action: Regulation of Gene Expression

Thursday, February 28 – Assignment #1 Due

Week 8: Mar 5, 7
Vitamins and Minerals and Energetics
Oxidant Minerals and (Pro-)Antioxidant Vitamins and Minerals

March 11-15 - Spring Break

Week 9: Mar 19, 21
Membrane Potential and Action Potential, e.g., neuronal firing, skeletal/ cardiac/ smooth muscle contraction

Week 10: Mar 26, 28
Roles of Vitamins and Minerals in Brain Function

Thursday, March 28th – Exam #2

Week 11: Apr 2, 4
Biology of Bone and Connective Tissues

Week 12: Apr 9, 11
Hormone Regulation and Cell Signaling, *e.g.,* Ca, P, Cr, Zn, I, Se

Week 13: Apr 16, 18 Lecture
In Class Presentations (Assignment #2)

Week 14: Apr 23, 25
Principal Action: Hormone Regulation and Cell Signaling – *continued*

*** FINAL Exam: Cumulative – Tuesday May 7, 8:00 AM – 10:00 AM ***