

Mississippi State University
College of Agriculture and Life Sciences
Department of Food Science, Nutrition, and Health Promotion
Course Syllabus (Campus 5 – Distance)
Spring Semester

I. Title: FNH 4293/6293 Vitamins, Minerals and Supplements

Credit: 3 hours

Time of Class: T.B.A.

Classroom: Room 100, Herzer

Office Hours: WebCT Chat (3:15-4:15PM M/Wed or as determined by instructor after consultation with students).

Instructor: Dr. Zee Haque

Office Room Number: 203 Herzer

Office Phone: 662-325-3200

E-Mail Haque@ra.msstate.edu

II. Catalog Description: FNH 4293/6293 Vitamins, Minerals and Supplements. (3 credits).

Prerequisite: CH 2503 or equivalent with instructor's consent). Three hour web-based distance instruction via WebCT or Blackboard. Advanced human nutrition and metabolism of regulatory micronutrients.

III. Objectives:

This course is designed to aid the student in understanding the biochemical scope, potency and interplay of regulatory micronutrients in human metabolism. Specific objectives will be to discuss:

1. Food sources and availability in common supplements
2. Digestion, absorption, transport, and storage
3. Food components, ingredients, supplements, antagonistic substances and “anti-nutritional factors” that interfere with or enhance absorption and/or bioavailability.
4. Effect of processing and handling.
5. Functions and mechanisms of action
6. Interactions with other nutrients
7. Metabolism and excretion
8. Adequate Intakes and/or RDA
9. Recommended Dietary Allowances
10. Toxicity
11. Assessment of Nutriture

IV. Required Text (see page 6-7 for additional materials):

Advanced Nutrition and Human Metabolism. Gropper, S.S., Smith, J.L. and Groff, J.L. 2005. 4th Ed Thomson Wadsworth . 0-534-55986-7

V. Reference Textbook:

1. The vitamins: Fundamental Aspects in Nutrition and Health. 3rd Ed. Gerald F. Combs, Jr. 2008. Elsevier. Academic Press. New York, NY. 978-0-12-183493-7

2. The Biochemistry of Human Nutrition. Gropper, S.S. 2nd Ed. Thomson Wadsworth. 0-534-51543

VI. Web-resources:

1. [SPRINGER-DATABASE](http://www.springerlink.com/home/main.mpx) – (<http://www.springerlink.com/home/main.mpx>)

Search the entire Springer database for original scientific refereed articles.
(MSU site license -Must use a MSU computer on campus with internet access).

2. **[IBIDS-DATABASE](http://grande.nal.usda.gov/ibids/index.php)** -<http://grande.nal.usda.gov/ibids/index.php>
International Bibliographic Information on Dietary Supplements (IBIDS) (Original papers)
3. **[VITAMINS](http://www.nlm.nih.gov/medlineplus/vitamins.html)** (<http://www.nlm.nih.gov/medlineplus/vitamins.html>)
A service of the [U.S. National Library of Medicine](#) and the [National Institutes of Health](#) ,
8600 Rockville Pike, Bethesda, MD 20894. Access data: May 4, 2007.
4. **[DIETARY SUPPLEMENTS](http://www.nlm.nih.gov/medlineplus/dietarysupplements.html)**
(<http://www.nlm.nih.gov/medlineplus/dietarysupplements.html>)
A service of the [U.S. National Library of Medicine](#) and the [National Institutes of Health](#) ,
8600 Rockville Pike, Bethesda, MD 20894. Access data: May 4, 2007.
5. **[ANTIOXIDANTS](http://www.nlm.nih.gov/medlineplus/antioxidants.html)** (<http://www.nlm.nih.gov/medlineplus/antioxidants.html>)
A service of the [U.S. National Library of Medicine](#) and the [National Institutes of Health](#) ,
8600 Rockville Pike, Bethesda, MD 20894. Access data: May 4, 2007.
6. **[SUPPLEMENTS](http://www.cfsan.fda.gov/~dms/fdsupp.html)** (<http://www.cfsan.fda.gov/~dms/fdsupp.html>)
FDA Guide to Dietary Supplements. Regulatory aspects. [FDA Consumer magazine](#). Access
data: May 4, 2007.
7. **[SUPPLEMENTS-OVERVIEW](http://vm.cfsan.fda.gov/~dms/supplmnt.html)** (<http://vm.cfsan.fda.gov/~dms/supplmnt.html>)
Center of Food Safety and Applied Nutrition. USFDA. Access data: May 4, 2007.
8. **[HERBAL SUPPLEMENTS](http://nccam.nih.gov/health/supplements.htm)** (<http://nccam.nih.gov/health/supplements.htm>)
National Center for NCCAM, National Institutes of Health, 9000 Rockville Pike, Bethesda,
Maryland 20892 USA. Access date: May 4, 2007.
9. **[HERBAL SUPPLEMENTS](http://www.mayoclinic.com/health/drug-information/HerbIndex/range=H_G-L)** (http://www.mayoclinic.com/health/drug-information/HerbIndex/range=H_G-L)
Mayo Clinic Database. Mayo Foundation for Medical Education and Research. Access date
May 4, 2007.
10. **[DIET PILLS](http://www.mayoclinic.com/health/weight-loss/HQ01160)** (<http://www.mayoclinic.com/health/weight-loss/HQ01160>)
Mayo Clinic Database. Mayo Foundation for Medical Education and Research. Access date
May 4, 2007.
11. **[ANABOLIC STEROIDS](http://rphr.endojournals.org/cgi/content/full/57/1/411)** (<http://rphr.endojournals.org/cgi/content/full/57/1/411>)
Review article. *Recent Progress in Hormone Research* 57:411-434 (2002)(pdf file available with instructor
and on WebCT). Access date Aug 84, 2007.
12. **[ANABOLIC STEROIDS](http://en.wikipedia.org/wiki/Anabolic_steroid)** (http://en.wikipedia.org/wiki/Anabolic_steroid)
13. **[ANABOLIC ANDROGENIC STEROIDS](http://www.medscape.com/viewarticle/533461)** <http://www.medscape.com/viewarticle/533461>
Anabolic Androgenic Steroids: A Survey of 500 Users.
14. **[WIKIPEDIA](http://en.wikipedia.org/wiki/%25s)** (<http://en.wikipedia.org/wiki/%25s>)
Quick search-Free web-based information source and glossary.

***Disclaimer:** External sites are not necessarily endorsed by the instructor nor by Mississippi State University. Content validity/authenticity are the sole responsibility of the content owners/publishers.*

VII. Instructional Objectives:

To provide a variety of learning experiences and teaching strategies that:

1. Encourage students to take responsibility for their own learning by identifying their personal learning objectives for Human Nutrition.
2. Promote participation by all students.
3. Take into account individual learning needs.
4. Provide basic nutrition content appropriate to all individuals represented in the class.
5. Respect and support the individuals represented in the class in their personal study of nutrition.
6. Promote a climate conducive to learning and one, which encourages students to question and expand learning beyond the classroom environment.
7. Foster a spirit of cooperation, collaboration, and a lifelong love of learning.
8. Provide individualized instruction for groups and individuals.
9. Provide opportunities for individuals to show initiative in class work that will lead to the development of problem solving and critical thinking skills.

VIII. Class Design:

This is an advanced nutrition course that requires the student to integrate biochemistry, physiology, and chemistry into theoretical and applied nutrition concepts with emphasis on micronutrients. The course requires the student to read original research articles, to think critically, and apply basic nutrition concepts to contemporary issues and controversies. The class typically has bachelor, master, and doctoral level students and is designed to have content and activities that challenge everyone. Everything you need to know about human nutrition is not presented in this course.

IX. Policies

a. Attendance:

You are expected to attend all web-based discussions and chats related to this Campus 5 related academic endeavor, hereinafter referred to as “class”, unless prevented by circumstances beyond your control. Excused absences will be allowed only for illness (doctor verified in writing), authorized MSU activity (arrangements must be made prior to the absence), death in the family or Act of God. Missing class due to work conflicts is not an acceptable excuse. Regardless of the cause of the absence, the student is responsible for materials and notes covered or assigned during the absence via the internet and to arrange discussion/chat periods and makeup tests as needed.. Regardless of the reason for the absence, assignments are expected to be submitted on time.

b. Extra Credit:

The University allows instructors to develop policy related to giving extra credit in a course. The instructor of this course may provide extra credit up to one letter grade based on class participation and contribution.

c. Assignments:

Assignments are to be turned on the due date and time. Submissions via the internet are only valid when so acknowledged by email. The date/time log at the instructor’s end will be considered final and assignments that are received late will be penalized as decided by the instructor.

d. Drop Policy:

Students may: (1) add through the 5th class day; (2) drop through the 10th class day; (3) withdraw the 11th to the 30th class day and receive a “w” on their transcript. There will be no withdrawals from individual courses after the 30th class day of the semester.

e. Academic Misconduct:

Policies and procedures for handling Academic Misconduct (honesty) found at <http://www.msstate.edu/web/security.html>. University policies relating to students and student records will be followed in this course. There will be no warnings. Sanctions will occur on the first offense.

f. Special Needs:

It is the responsibility of any student who has special needs (Section 504 of the Rehabilitation Act and the Americans with Disabilities Act (ADA) to inform the instructor of this class as soon as possible. The student must self-identify concerning disability documentation that is as recent as within last three (3) years and request necessary accommodations. Students should be registered with Support Services and have a letter verifying disability that has been documented.

g. Time limitations:

All students will adhere to the time limitations placed on all activities.

i. Extra Credit:

The University allows instructors to develop policy related to giving extra credit in a course. The instructor of this may provide extra credit up to 10% of total points based (amounting to one letter grade) on class participation and contribution.

j. Quiz/Exam Days:

Students will report in writing to the instructor that he/she is prepared to take the test prior to the activity. Though exams are “open-book”, it is required that all relevant rules of conduct related to academic honesty, per university policy, is adhered to. Contrary evidence may result in relevant action per university disciplinary policy. Instructor may require the use of “lock-down” browsers available through university, if site-license is available, or through individual purchase by the student.

k. University Policies:

Please refer to the student handbook for a complete discussion of your rights and responsibilities as a student at MSU . All discussions concerning grades and progress in the course should be conducted in the instructor’s office by appointment or via secured emails as possible.

The University contacts students with official information via a University-assigned Internet address. It is the student’s responsibility to regularly check his/her official University e-mail address regularly for deadlines, fees, etc. Class-related information will be sent to students via the official University email address.

X. Methods of Instruction: Instructional methods on the web will include power-point presentations and relevant audio-visual material as needed.

XI. Grading and Evaluation:

The percentages of the total points acquired by the student will be translated to a letter grade based on the following scale:

1. Grading Scale: A= 90-100

- B= 80-89
- C= 70-79
- D= 60-69
- F= 60 or less

2. Distribution of Points:

	<u>Undergraduate</u> <u>Points</u>	<u>Graduate</u> <u>Points</u>
(i) 30 quizzes (1 per part) (10 points ea)	300	300
(ii) Final Exam	100	100
(iv) Controversies in nutrition (Term paper for <i>graduate</i> enrollees only)	---	100
(v) Presentation (two for graduate credit)	100	200
(vi) Class participation (discussion/chat)	100	100
TOTAL	600	800

3. Student presentation (item v above)

All campus 5 students will be assigned (via WebCT) a topic of current nutritional interest. Student may change the topic within the first seven days of classes. The students will research and build on the seed material provided and submit a detailed power point presentation with relevant text to instructor on the designated day. The student must submit a copy of the presentation before the designated deadline. The instructor will evaluate the presentation based on the:

- (i) Content of the presentation.
- (ii) Effort the student makes to further add to the provided seed material.
- (iii) Student's response to questions via discussion and chat activity.

4. Additional requirement for graduate credit (6000 enrollees)

Student will make two presentations and submit a term paper related to either of the presentations. The student will choose the second topic.

Sequence of students' activity:

- (i) Do a literature search (Medline is a good place to begin) and select a topic. Points to consider;
 - a. What is unique about the topic?
 - b. Is this a timely issue?
 - c. Does this issue merit being presented to the class?
- (ii) Discuss the topic with the instructor.
- (iii) Write the paper providing arguments to support the controversial issues. What conclusion can you make about the issue?
- (iv) Submit electronically during the finals week or as instructed.

XII. Tentative course outline (weeks and hrs reflect relative importance):

This course is designed to aid the student in understanding the biochemical scope, potency and interplay of regulatory micronutrients in human metabolism. Specific objectives will be to discuss the following for each of the micronutrients to be studied:

- I. Food sources and availability in common supplements
- II. Digestion, absorption, transport, and storage
- III. Food components, ingredients, supplements, antagonistic substances and "anti-nutritional factors" that interfere with or enhance absorption and/or bioavailability.
- IV. Effect of processing and handling.

- V. Functions and mechanisms of action
- VI. Interactions with other nutrients
- VII. Metabolism and excretion
- VIII. Adequate Intakes and/or Recommended Dietary Allowances
- IX. Toxicity
- X. Assessment of Nutriture

In addition to the above mentioned specific objectives, major nutritional deficiency diseases, toxicities and supplements will include but not be limited to the following:

- A. The Water-Soluble Vitamins (Weeks 1-2)
 - 1. Vitamin C (Ascorbic Acid): Scurvy (1 hr)
 - 2. Thiamin (Vitamin B₁): Beriberi (1 hr)
 - 3. Riboflavin (Vitamin B₂): Ariboflavinosis (1 hr)
 - 4. Niacin (Vitamin B₃): Pellagra (1 hr)
 - 5. Pantothenic Acid: Deficiency symptoms (1 hr)
 - 6. Biotin: Deficiency symptoms (1 hr)
 - 7. Folic Acid: Deficiency: Megaloblastic, Macrocytic Anemia (1 hr)
 - 8. Vitamin B₁₂ (Cobalamin): Megaloblastic, Macrocytic Anemia (1 hr)
 - 9. Vitamin B₆: Deficiency symptoms (1 hr)
 - 10. **Perspective Genetics and Nutrition: Human Folate Needs and Chronic Disease Risk.** (1hr)
- B. The fat soluble vitamins (Weeks 3-4):
 - 1. Vitamin A and Carotenoids (2 hrs):
 - a. Deficiency symptoms
 - b. Toxicity: Hypervitaminosis A
 - 2. Vitamin D (2 hr):
 - a. Deficiency: Rickets and Osteomalacia
 - 3. Vitamin E (1 hr)
 - a. Deficiency symptoms
 - 4. Vitamin K (1 hr)
 - a. Deficiency symptoms
 - 5. Perspective The Antioxidant Nutrients, Reactive Species, and Disease (1 hr)
- C. Macrominerals (Week 5):
 - 1. Calcium: Osteomalacia, osteoporosis(interplay with vitamin D and PTH)(1 hr)
 - 2. Phosphorus: Refeeding syndrome, hypophosphatemic rickets (1/2 hr)
 - 3. Magnesium: Neuromuscular hyperexcitability, tetany (1/2 hr)
 - 4. Chloride: Hypokalemia, acidosis (1 hr)
 - 5. Potassium: mental apathy, cardiac arrhythmias (1/2 hr)
 - 6. Sodium: Anorexia, muscular atrophy (1/2 hr)
 - 7. **Perspective Macrominerals and Hypertension** (1/2 hr)
 - 8. **Perspective Osteoporosis and Diet** (1/2 hr)
- D. Microminerals (Trace)(Week 6):
 - 1. Iron (1 1/4 hr):
 - a. Deficiency symptoms with and without anemia
 - b. Toxicity: Hemochromatosis (genetic)
 - 2. Zinc: Emphasis on latest findings on its influence on immune response and wellbeing (1/4 hr).
 - a. Deficiency symptoms
 - 3. Copper (1/4 hr):

- a. Deficiency symptoms.
 - b. Toxicity: Wilson's disease (genetic).
4. Selenium (1/4 hr):
 - a. Deficiency symptoms. Keshan and Kashin-Beck's disease
 - b. Toxicity: Selenosis
 5. Chromium (1/4 hr):
 - a. Deficiency symptoms: Syndrome X
 - b. Toxicity symptoms
 6. Iodine: Emphasis on its relationship to "basal metabolic rate" (1/4 hr)
 - a. Deficiency symptoms: Goiter, cretinism
 7. Manganese (1/4 hr):
 - a. Deficiency symptoms: General
 - b. Toxicity symptoms: Parkinsonism-like, memory loss.
 8. Molybdenum (1/4 hr):
 - a. Deficiency symptoms: In the presence of antagonistic substances (Sulfate, copper, tungstate)
 - b. Toxicity symptoms: Uric acid levels, goiter.
 9. Fluoride (1/4 hr):
 - a. Deficiency symptoms: Animal studies
 - b. Toxicity symptoms: Fluorosis
 10. **Perspective Nutrient-Drug Interactions**(1 hr)
- E. Weight loss supplements: (weeks 7-8)(Total 4 hrs)
1. Hoodia: An effective appetite suppressant?
 2. Bitter orange weight loss supplements: Do they work?
 3. Protein shakes: Do they increase weight loss?
 4. Vitamin B-12 injections for weight loss: Do they work?
 5. Alli weight-loss pill: Does it work?
 6. Do dairy calcium work
- F. Anabolic (bodybuilding) steroids (week 9-10)(total 4 hrs)
- G. Herbal supplements (week 11)(total 1 hrs)
- H. Other supplements (week 11)(total 1 hrs)
- I. Student presentations (Weeks 12-13)(Student presentations may be integrated with the lectures).