

## **Course Description**

This course provides an overview of the metabolism vitamins and minerals. The course will cover functions, metabolism, sources, and current recommendations for use of vitamins and minerals, with an emphasis on their impact on human health and disease. In addition to learning these topics, this class is designed to provide students with practical experiences that will promote communication and assessment skills through weekly discussions and debates on vitamins and minerals, an attribute critical to succeeding in dietetics and nutrition.

## **Credits/ Modes of Instruction/ Course Platform**

3 Credit Canvas Course

## **Prerequisites**

All pre-requisite science courses

## **Course Director / Instructor(s)**

Tracey Smith, PhD, RD. The preferred method of contact for the professor is through course email (or [Tracey2810@yahoo.com](mailto:Tracey2810@yahoo.com) in an emergency).

## **Program Office**

Emily Peters

**Phone:** 973-972-4778

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## **Course Goals and Objectives:**

### **Goals**

The course focus is the study of vitamins and minerals with specific emphasis on the nutritional and health significance of these nutrients. The course provides an understanding of the sources of vitamins and minerals in the diet; how vitamins and minerals get incorporated into the human body; the function and mechanism of action of select vitamins and minerals in the human body; the metabolism and excretion of vitamins and minerals; interactions of vitamins and minerals with other nutrients and medications; vitamin and mineral roles in metabolism; current recommendations for use of vitamins and minerals; and vitamin and mineral deficiency and toxicity.

### **Objectives**

Upon course completion students will be able to:

- gain knowledge of the requirements for vitamins and minerals.
- describe the digestion, absorption, transport and storage of vitamins and minerals.
- describe the functions and mechanisms of action of vitamins and minerals.
- recognize the interactions of vitamins and minerals with other nutrients.

- describe the metabolism and excretion of vitamins and minerals.
- recognize the basic roles of vitamins and minerals in macronutrient metabolism.
- describe the sources and nutritional significance of vitamins and minerals needed for general health.
- recognize the assessment of nutriture, where applicable
- describe the role of vitamins and minerals in disease prevention.
- read vitamin and mineral related research and discuss topics of importance to public health, food and nutrition found in everyday news media.

**THIS COURSE WILL CONTRIBUTE TO THE ATTAINMENT OF THE FOLLOWING KNOWLEDGE AND COMPETENCIES TO MEET THE FOLLOWING OUTCOMES:**

<b>Competency Number</b>	<b>Competency Name</b>	
<b>KRDN 1.1 and KRDN 1.2</b>	<p>The curriculum must reflect the scientific basis of the dietetics profession and must include research methodology, interpretation of research literature and integration of research principles into evidence based practice.</p> <p>KRDN 1.1 Demonstrate how to locate, interpret, evaluate and use professional literature to make ethical, evidence-based practice decisions.</p> <p>KRDN 1.2 Use current information technologies to locate and apply evidence-based guidelines and protocols.</p>	
<b>KRD 2.1</b>	The curriculum must include opportunities to develop a variety of communication skills sufficient for entry into pre-professional practice.	
<b>KRD 5.2</b>	The physical and biological science foundation of the dietetics profession must be evident in the curriculum. Course content must include organic chemistry, biochemistry, physiology, genetics, microbiology, pharmacology, statistics, nutrient metabolism and nutrition across the lifespan.	
<b>Competency Number</b>	<b>Competency Name</b>	<b>Activities that contribute to attainment of competency</b>
<b>CRDN 3.8</b>	Deliver respectful, science-based answers to client questions concerning emerging trends.	Weekly discussion with pointed assigned questions.
<b>CRDN 4.4</b>	Use current informatics technology to develop, store, retrieve and disseminate information and data.	Vitamin and Mineral Papers

**Course Requirements and Grade Determination**

<b>Requirements</b>	<b>Weight</b>
<b>Weekly Discussion Assignments</b>	<b>20%</b>
<b>Mid-Term Exam</b>	<b>25%</b>
<b>Paper Submissions (2) @ 15% each</b>	<b>30%</b>
<b><u>Comprehensive Final Exam</u></b>	<b>25%</b>

**Total 100%**

**Requirements for Completion**  
**Weekly Discussion Topics**

Two to three students will post the main reply to a weekly, assigned discussion topic. Each student will post on an important nutrition/metabolic/medical component of the vitamin or mineral and a hot topic - i.e., what's trending - truth or fiction. These topics may or may not coordinate with your selected vitamin or mineral. The discussion material will be posted every **Tuesday morning (at the latest)**. Those students assigned to the week will have until **Friday at Noon EST** to post their response and the rest of the class must respond to the initial post by **Sunday at 11:59 EST** to allow for discussion before the week ends on **Monday evening**. Students are expected to participate in all weekly discussion forums, which will be graded according to criteria in the "Evaluation Criteria" section below and weekly grades will comprise 20% of your final grade.

**Vitamin/Mineral Paper:**

Each student will write two short papers. One paper on a vitamin, and one on a mineral. This will be a short paper (~4 pages in length) that describes the vitamin or mineral assigned or selected: structure, function in the body (to include role(s) in macronutrient metabolism), assay (i.e., assessment of nutriture), interactions with other drugs and nutrients and application to health and disease. Please use the aforementioned headings to help organize your paper. Finally, the paper should include a paragraph for the lay public that you might post on a blog, Facebook page, or on-line news program. Your job for the lay paragraph is to provide the facts - and make it interesting! Assignments will be made by student request in the designated Canvas discussion forum (order they are posted via date/time stamp on thread).

Each paper must be typed using 12 pt type (Times New Roman font) and submitted as a word doc. You should be familiar with APA format and use it in writing your review. References must be from peer-reviewed journals (not websites) in the scientific literature (not popular magazines). However, if you are dispelling a myth, you may reference a popular magazine. References should be recent (within the past 15 years). You may use no more than 15 references to support your review of the subject. Each paper is to be submitted via the Canvas assignment "drop-box". It is recommended you use the tool Turnitin prior to submitting your paper, to ensure the paper is original, and written in your own words.

**Special Course Enrollment Requirements**

Students are required to have access to internet and basic computer skills. Computer requirements can be found at:

[http://shp.rutgers.edu/tech4sure/student\\_services.htm](http://shp.rutgers.edu/tech4sure/student_services.htm)

## Evaluation and Feedback and Grading

### Evaluation/Assessment Methods / Description of Assignments

**Discussion Forum:** The purpose of the discussion forum is to share experiences with fellow students and to learn from one another. If the student fails to report in the weekly discussion boards, points will be deducted from their weekly participation grade. Discussion questions will be posted each week inside the week's course shell. Each week, 2-3 students will be assigned to post ONE original, comprehensive thread in response to the discussion question. You should cite at least one peer-reviewed reference (e.g., a journal article) in your response. Other students are responsible for replying TWICE during the discussion week with posts that contribute to the conversation ("thank you" and "I agree" will not count; more are always encouraged!). The original threads need to be posted by **noon on Friday** (Eastern Standard Time), and replies to the threads should be posted by

**11:59 PM on Sunday** (Eastern Standard Time). These deadlines allow for continued back-and-forth on Mondays before the new course week begins on Tuesdays.

The forums will be monitored and graded by the teaching assistant and the instructor. The content of your posts will be graded on (a) timely participation; (b) length of participation; and (c) quality of participation. You will receive 10 percentage points for the one week in which you generate the main reply and 1 percentage point for your responses during the other ten weeks (total = 20% of your final grade).

- (a) Timeliness is self-explanatory – please post by the deadline above. Zero credit for late posts, no exceptions.
- (b) The length of your original thread posted by Friday should be at least **250 words**. Your replies posted by Sunday should be at least **100 words**. If you want to post shorter replies (in addition to your 100-word post) that would be wonderful, but not mandatory.
- (c) The quality (e.g., accuracy) portion of your discussion post will come from your synthesis of the lecture, weekly readings, and your own personal reflections. You are welcome to talk about personal experiences as long as it does not violate any individual's privacy. Also be aware that the forums are technically a public space (even though they are only seen by your classmates), so please use discretion. **Please respond to any follow-up questions posed to you by the teaching assistant, instructor or your fellow students. These follow-up responses will contribute to the quality portion of your discussion thread.**

### Standard discussion forum guidelines:

- Only provide quality postings; thank you's are implied and should not be posted.

Restrain from sending "thank you" messages in the threaded discussions; your appreciation is implied.

- The discussion forum is a medium to debate the issues; candid comments are welcome, but inflammatory comments are not. Please be respectful and courteous to each other. We can "agree to disagree."
- Provide succinct/concise responses with references.
- Be open-minded to other opinions and viewpoints.
- Please recognize that your participation is graded according to the types of interactions you have on the Discussion Forum.
- Feel free to share articles, information that may be helpful for your classmates and colleagues as long as they are not copyright protected.

Referencing and use of outside sources as part of your discussion are encouraged. This can include data from scholarly articles (**at least one citation to a peer-reviewed reference is required in each original response**), links to webpages, mass media articles, images, videos, etc., as long as posting does not violate copyright. If you have questions about outside sources, please ask!

If you are not familiar with searching the peer-reviewed literature, I encourage you to take advantage of the resources on the Rutgers Library website (<http://www.libraries.rutgers.edu/>).

When you reference an outside source, please make sure to use the proper citation. For the sake of consistency we will use APA formatting for this class. If you need help with APA formatting there are several excellent sources on the internet. Here is the link directly to the APA guidelines: <http://apastyle.org/learn/tutorials/basics-tutorial.aspx>. **You do not need to provide a citation for information you use from the lectures or the textbook readings.**

The instructor and teaching assistant will track the quality and quantity of each student's Canvas activity in the course. Students will receive a participation grade for each weekly posting based on this chart:

Discussion/assignment was completed ON TIME (i.e., student posted the main reply on time or the TWO replies on time), with appropriate length, excellent detail, accuracy, and submitted on time. Student contribution to the discussion forum, provides comments to other students, encourages discussion and participation.	Full Credit: (10 points for main reply; 1 point for other weeks).
Discussion/assignment was completed ON Time (i.e., student posted the main reply on time or the TWO replies on time); however, length and/or quality is subpar (e.g., too short, lack of detail, inaccurate or does not respond to instructors or fellow students).	B (5 points for main reply; 0.5 points for other weeks).

Discussion/assignment was NOT completed ON TIME. Again, the original threads need to be posted by 11:59 PM every Thursday (Eastern Standard Time), and replies to the threads should be posted by 11:59 PM on Sunday (Eastern Standard Time).	Zero Credit: (0 points for main reply; 0 points for other weeks).
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**Exams:**

You may use your notes and course materials during the exams; however, you will not have time to look up the answer to every question! The Mid Term and Final Exam are similar to the Registration Examination for Dietitians, in that you will not have the options of progressing or returning to the multiple choice questions asked. You must answer each question before progressing to the next question. In addition, you will have only one attempt to complete it. The mid-term and final exams will be open for an entire week and will close Monday at 11:59 PM (Eastern Standard Time). You are expected to work alone on these exams. The exams will time out at 11:59 PM (Eastern Standard Time), so give yourself enough time to complete the exam by then! If you open the exam at 11:30 PM, you will only have 29 minutes to take it. No make-up exams will be given, as you have plenty of time to complete them!

**Feedback on Progress**

The instructor will contact students via email who are not meeting course expectations at midpoint and recommend remediation and academic support services accordingly. The student will conduct anonymous course/ instructor evaluation at the end of the course.

Unsatisfactory Performance/Progress: Students will be notified via email concerning their progress if their grade is unsatisfactory. Additional assistance will be offered via email and telephone if requested by the student.

The SHP grading policy is available at: <https://apps.shp.rutgers.edu/projects/shrpweb-cf/policies/PDFs/3.0%20GRADING%20SYSTEM%20POLICY.pdf>

Note: there is no rounding per the grading policy.

**SHP Grading Policy**

Grade	Undergraduate Scale	Graduate Scale	Quality Points
A	93.0-100	93.0-100	4.0
A-	90.0-92.9	90.0-92.9	3.7
B+	87.0-89.9	87.0-89.9	3.3
B	83.0-86.9	83.0-86.9	3.0
B-	80.0-82.9	80.0-82.9	2.7
C+	77.0-79.9	77.0-79.9	2.3
C	73.0-76.9	73.0-76.9	2.0
C-	70.0-72.9	70.0-72.9	1.7
D+	67.0-69.9	67.0-69.9	1.3
D	63.0-66.9	63.0-66.9	1.0
F	<63	<63	0.0

## Minimum Level of Performance

The minimum level of satisfactory performance in this course is an 80% or better. To receive an 80% or better, students must first complete ALL course requirements specified above, including meeting the minimum attendance expectation. Based on the evaluations methods previously described, each requirement then is assigned a numeric score on a 0-100 point scale. The final letter grade is based on the weighted average of all requirements, as specified previously.

## General Learning Resources

### Required Textbook(s)

Gropper S. Smith J.: Advanced Nutrition and Human Metabolism 6<sup>th</sup> (2012) or 7<sup>th</sup> edition (2017)

### Other Required Learning Resources

Available through Rutgers Online Library Resources- Free e Resources

Ross C.A.: Modern Nutrition in Health and Disease, 11th ed., 2014

### Recommended or Supplemental Learning Resources

These will be added to the course platform as needed.

## Course Units/Schedule

This schedule is a plan only, subject to change by the instructor as deemed necessary to achieve the course goals. Whenever possible, you will be notified in advance of any changes, especially those affecting course requirements or grading.

Please consult the Calendar icon in Moodle for updates. Review the weekly Lessons for lecture materials and updates on journal articles, weblinks, etc. Discussion assignments will be posted weekly in Moodle.

Date	Topical Outline	Learning Resources	Activities / Assignments
Week 1: Sept 3-9	<b>Fat Soluble Vitamins: Vitamin A Vitamin D</b>	Gropper: pp 371-400 Ross: Chapter 17, 18	<b>Discussion Forum Topic on Canvas Topic Selection for Vitamin and Mineral Papers via Forums by Sept 12<sup>th</sup> at Noon EST</b>

<b>Week 2:</b> Sept 10-16	<b>Fat Soluble Vitamins: Vitamin E Vitamin K</b>	Gropper: pp 400-414 Ross: Chapter 19, 20	<b>Discussion Forum Topic on Canvas</b>
<b>Week 3:</b> Sept 17-23	<b>Water Soluble Vitamins: Vitamin C and antioxidants</b>	Gropper: pp 310-318, 414-416 Ross: Chapter 29	<b>Discussion Forum Topic on Canvas</b>
<b>Week 4:</b> Sept 24-30	<b>Water Soluble Vitamins: Niacin, Riboflavin, Thiamin</b>	Gropper: pp 319-334 and 360-365 Ross: Chapter 21-23	<b>Discussion Forum Topic on Canvas</b>
<b>Week 5:</b> Oct 1-7	<b>Water Soluble Vitamins: Biotin, Pantothenic Acid, Folate</b>	Gropper: pp 334-359; 366-369 Ross: Chapters 25, 26, 28	<b>Discussion Forum Topic on Canvas</b>
<b>Week 6:</b> Oct 8-14	<b>Water Soluble Vitamins: Vitamin B12 and B6</b>	Gropper: pp 354-365 Ross: Chapters 24, 27	<b>Discussion Forum Topic on Canvas</b> <b>Vitamin Paper Due Oct 14th Noon EST</b>
<b>Week 7:</b> Oct 15-21	<b>Mid-term Exam</b>	All topics covered through week of 10/14/19	<b>Tuesday Oct 8<sup>th</sup>-Monday Oct 14<sup>th</sup> 11:59 EST</b>
<b>Week 8:</b> Oct 22-28	<b>Macrominerals: Calcium, Phosphorus, Magnesium</b>	Gropper: pp 425-450 Ross Chapters: 7-9	<b>Discussion Forum Topic on Canvas</b>
<b>Week 9:</b> Oct 29- Nov 4	<b>Electrolytes: Sodium, potassium, chloride</b>	Gropper: pp 462-480 Ross Chapters: pp 109-119	<b>Discussion Forum Topic on Canvas</b>



<b>Week 10:</b> Nov 5-11	<b>Microminerals: Iron, zinc</b>	Gropper: pp 481-510 Ross Chapters: 10, 11	<b>Discussion Forum Topic on Canvas</b>
<b>Week 11:</b> Nov 12-18	<b>Microminerals: Copper, selenium, chromium</b>	Gropper: pp 510-530 Ross Chapters: 12, 14 & pp 251-252	<b>Discussion Forum Topic on Canvas</b>
<b>Week 12:</b> Nov 19-25	<b>Microminerals: Iodine, Manganese, Molybdenum</b>	Gropper: pp 530-542 Ross Chapters: 13, 15 & pp 252-254	<b>Discussion Forum Topic on Canvas</b>
<b>Week 13:</b> Nov 26-Dec 2	<b>Nonessential trace and ultratrace minerals</b>	Gropper: pp 547-559 Ross Chapter: 16	<b>Discussion Forum Topic on Canvas</b> <b>Mineral Paper Monday Dec 1<sup>st</sup> Noon EST</b>
<b>Week 14:</b> Dec 3-9	<b>Final Exam</b>	Cumulative	<b>Tuesday Dec 3rd - Monday Dec 9th 11:59 EST</b>

### **Course Evaluations:**

Students have the opportunity to evaluate the entire course upon its completion. Student feedback is very important, as it will be used to improve this course and the educational experience. All responses are kept CONFIDENTIAL. The evaluation is conducted as a survey and will be available to you later on in the semester.

### **SCHOOL AND PROGRAM POLICIES**

Please refer to the SHP Student Handbook at <https://shp.rutgers.edu/wp-content/uploads/Student-Handbook.pdf>.

Please refer to the SHP Grading Policy, available at: <https://apps.shp.rutgers.edu/projects/shrpweb-cf/policies/PDFs/3.0%20GRADING%20SYSTEM%20POLICY.pdf>

### **Faculty/Student Honor Code and Academic Integrity**

The Faculty/Student Honor Code is posted on the SHP website within the online SHP Student Handbook. The faculty of RBHS-School of Health Professions believe that students must observe and support high standards of honesty and integrity in all aspects of education, practice, and research. For this reason, all matriculated and non-matriculated students in this course are expected to abide by the School's Faculty/Student Honor Code and accept responsibility to help ensure that

these standards are maintained by reporting violations of the Honor Code observed in others. All violations will be considered with gravest concern and may be punishable with sanctions as severe as suspension or dismissal.

### **Professional Behavior**

Students are expected to conform to established standards and civil, social, and professional behavior. Violations will be considered with the gravest concern and may be punishable with sanctions as severe as suspension or dismissal. Please consult the Code of Student Behavior in the Student Handbook for prohibited actions <https://shp.rutgers.edu/wp-content/uploads/Student-Handbook.pdf> as well as Zoom Etiquette posted in class.

### **Attendance**

Students are expected to attend all classes whether in-person or web-based. Students are expected to adhere to the stated attendance and participation policies for each course and for the specific program in which they are enrolled. For distance-based learning platforms, students are expected to attend and participate in scheduled online chats and/or discussion boards as well as “live” meetings or in-person sessions, as indicated by the course faculty.

Students are responsible for all material covered in classes. Absent students are responsible for obtaining all material covered in missed sessions. Students should be cognizant of this if absences occur during the semester and should consider planning vacations/time away in-between semesters as course faculty may not release course content early or may not allow late submission of work or retake of exams. When illness or other special circumstances prevent attendance, students should inform their course faculty/director in advance or as early as possible and may be asked to provide appropriate documentation.

### **TURNITIN**

You will be required to evaluate your final vitamin and mineral paper drafts through TURNITIN for plagiarism prior to submitting it for grading. A TURNITIN link is embedded in the course with instructions for doing so. Plagiarism is considered a serious offense. If you are unsure of what constitutes plagiarism, review the plagiarism tutorial located at <http://www.indiana.edu/~istd/>. Students who plagiarize may receive a grade of F for the assignment.

### **Publication or Submission of Coursework for a Grant or Manuscript**

If you submit a paper or a grant that was completed as part of a course at Rutgers for publication, you are expected to communicate with the course director and any other faculty reviewers of your paper or grant regarding their interest as serving as a co-author. If the faculty agrees to serve as co-author(s) then it is the student’s responsibility to obtain their review and approval of the paper prior to its submission to the publication. Non-compliance will be considered a professional behavior violation. Regardless, the student is expected to indicate that the manuscript was prepared as part of course requirements while at Rutgers School of Health Professions as part of the degree process. University affiliation for publications/abstracts/posters/presentations should be listed as “School of Health Professions’ Department of Clinical and Preventive Nutrition Sciences at Rutgers

University". Posters/presentations must be completed using the Rutgers template or logo which can be found at: <https://communications.rutgers.edu/brand-policies/visual-identity-system>

### **Suggested Writing Resources**

This course relies on the ability to communicate concepts clearly in a written format as well as follow guidelines for proper grammar and sentence structure. It is expected that all written assignments follow appropriate grammatical, spelling, and referencing rules, and are free from plagiarism. Assignments with excessive grammatical and writing errors will receive a lower grade. If you need assistance with writing, we encourage you to get a writing tutor to assist you as writing is a critical skill in graduate education and for professional communication in the nutrition and dietetics profession. The Rutgers Biomedical and Health Sciences (RBHS) Writing Center (<https://sasn.rutgers.edu/student-support/tutoring-academic-support/writing-center/satellite-writing-centers/rbhs-writing-center>) offers writing assistance to distance and local students. See the RBHS Writing Center handout posted in class for more details. There are also tutorials available at: [http://www.libraries.rutgers.edu/health\\_sciences\\_distance\\_learning/tutorials](http://www.libraries.rutgers.edu/health_sciences_distance_learning/tutorials) as well as further resources available in the Online Student Resource Center in Moodle

### **EndNote**

EndNote is a software program that works with Microsoft Word to automatically format in-text citations and end-of-paper reference lists with your chosen style (APA, AMA, etc.). EndNote can also be used as a database to gather and store citation libraries. We highly suggest that you become familiar with EndNote. Rutgers is licensed to provide download access of EndNote for Rutgers affiliated users. EndNote is a bibliographic software program used to search Internet libraries, organize references and create instant bibliographies. EndNote enables you to collect and download your references from online catalogs and databases for inclusion in presentations and papers. After downloading the program from the Rutgers Virtual Library available at <https://www.libraries.rutgers.edu/endnote> you will need to install the EndNote program. There are tutorials on how to use EndNote available at the Rutgers library as well as at <http://www.endnote.com>.

### **Program Online Examination Policy**

Students taking the Online Courses are solely responsible for having a working computer and internet connection. Computer crashes and internet connection problems are not valid excuses for failing to complete any required course work within the course time limits; this applies to finishing a quiz or examination within the allotted time as well as submitting assignments before the deadline. It is highly recommended that students make arrangements to have access to a second computer to complete their course work in case of an emergency; either at their own residence, a friend's residence, a local library or in one of the computer labs on campus.

### **Office of Disability Services (ODS)**

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://shp.rutgers.edu/disability-services/>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with

them as early in your courses as possible. To begin this process, please complete the Registration form on the Rutgers Office of Disability Services web site at: <https://webapps.rutgers.edu/student-ods/forms/registration>