PLNU forward

Department of Sociology, Social Work and Family Sciences

NUT 3065 – Advanced Nutrition

3 units

Fall 2019

Meeting days: Mon/Wed	**Instructor title and name:** Prof Cindy Swann, MS, RD, CDE
Meeting times: 8:00-9:15	**Phone:** 619-849-2351
Meeting location: Evans 112/113	**E-mail:** cindyswann@pointloma.edu
Final Exam: Mon, 12/16 8:00 -10:00 am	**Office location and hours:** Evans 134 Mon/Wed 12- 1 pm; Tues 9:00-10:00 am or by appt.

PLNU Mission:

To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

GOALS AND OUTCOMES:

Course Description:

Theories are integrated from physiology, biochemistry and nutrition to provide an in-depth study of nutrients and their role in human metabolism. Current research on human metabolic processes is analyzed. Laboratory applications. Three (3) semester unit credits.

Dietetic Learning Outcomes:

1. Demonstrate content knowledge of food and nutrition as well as concepts and theories of nutrition across a broad range including: lifecycle stages, cellular nutrition, disease prevention and medical therapy; food and food systems; development, modification, and evaluation of recipes, menus and food products.
2. Identify and assess scientific literature to evaluate current evidence-based research related to dietetic topics.
3. Evaluate the effects of societal, cultural, ethical and financial dynamics upon diet trends, dietary choices, and food preparation methods among families and societies.

FCS 365 Course Student Learning Outcomes:

1. Define in-depth nutrient roles.
2. Describe how macronutrients are digested and absorbed.
3. Outline major biochemical pathways.
4. Explain specific reactions for vitamins and minerals as cofactors.
5. Draw the nutrient chemical structures.

6. Distinguish the relative importance of various foods as sources of nutrients.
7. Examine recent scientific literature in referred journals.
8. Analyze reports concerning research findings on various nutrients.
9. Practice spectrophotomic procedures on measurement of various blood nutrient levels.
10. Interpret and report data in a research paper.

AND's KRDN Didactic Course Core Knowledge for the RDN in DPD Programs based on 2017 Standards:

KRDN 1.1: Demonstrate how to locate, interpret, evaluate and use professional literature to make ethical, evidence-based practice decisions.
KRDN 1.2: Use current information technologies to locate and apply evidence-based guidelines and protocols.
KRDN 1.3: Apply critical thinking skills.
KRDN 2.1: Demonstrate effective and professional oral and written communication and documentation.

COURSE CREDIT HOUR INFORMATION. In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 3 unit class delivered over 17 weeks. Specific details about how the class meets the credit hour requirement can be provided upon request.

ESSENTIAL INFORMATION:

Required Text:

Gropper, S.S., Smith, J.L. and Groff J.L. Advanced Nutrition and Human Metabolism, 7th ed. Thomson Wadsworth Publishing Co., 2018.

AND's Evidence Analysis Library:

AND has a library on-line that members can use to research topics relating to dietetics. Students will need to become AND members, if they are not already, to gain access to the library (membership runs June 1 –May 31). Students must first complete the tutorial sections to learn how to navigate through the information. Print out "proof" that you completed the tutorial to turn in for 30 points. Use the library to research topics on your research paper and oral report. You will use the EAL for your case studies next semester in MNT (FCS 415/417).

Lecture Notes:

Available on Canvas. Print out and bring to lecture class, or follow along on personal computers.

Canvas Learning Management System:

All lecture notes, chapter quizzes and most assignments are located here.

1. Please use **Chrome** as your browser.
2. Go to canvas.pointloma.edu.
3. Create a shortcut or bookmark to this site.
4. Log in with your PLNU username and password.

COURSE REQUIREMENTS AND STANDARDS:

Course Grading Criteria:

13 Chapter quizzes @ 10 pts. each	130 (LO# 1)
4 Term Exams @ 100 pts. each	400 (LO# 1)
Written Research Study	100 (LO# 1,2,3)
EAL Tutorial	30 (LO3# ,2,3,)

1 Oral Presentation @ 50 pts. each	50 (LO# 1,2,3)
5 Laboratory Reports @ 15 pts. each	75 (LO# 1)
Diet and Activity Study	100 (LO# 1,2,3)
Blood Glucose Journal	30 (LO# 1)
Final Exam	100 (LO# 1)
Review Questions/Discussions on Canvas	varying points
TOTAL POINTS	~ 1015 points

Attention FCS Students: You are required to turn in a portfolio project as a senior. Keep any and all graded work you want to showcase.

Grade Distribution:

GRADE	PERCENTAGE RANGE	GRADE	PERCENTAGE RANGE
A	≥ 93%	C	73-76%
A-	90-92%	C-	70-72%
B+	87-89%	D+	67-69%
B	83-86%	D	63-66%
B-	80-82%	D-	60-62%
C+	77-79%	F	≤ 59%

Projects:

Diet Activity Report

See Canvas for full directions on this project. You will record your dietary intake, and every minute of activity for three consecutive days. Your diet will be analyzed by hand and compared to the DRIs, MyPlate guidelines, and US Dietary Guidelines. Your activities will be calculated using the appropriate MET. Summary reports will be written for each method used, and your comparison of energy intake vs output. A conclusion will state goals on how your daily diet and activities should be adapted to better meet the guidelines.

Laboratory Experiment Report Format

A written report will be required to turn in following each lab experiment performed. The report will consist of the following six parts:

1. Objective: what did you measure? What was the point of the experiment?
2. Principle: how did the experiment happen? What reacted to produce a compound that could be measured?
3. Procedure: Step by step directions in how to measure the compound.
4. Raw Data: all readings from the spectrophotometer and all calculations must be shown here.
5. Final Data: What results did you obtain? What was the standard (known value) you were to obtain?
6. Discussion/Conclusion: Were your results accurate? If not, what were some potential sources of errors? Were your results precise? If not, what sources of error may have altered your results?
7. We will do five (5) lab experiments during class. A lab report will be due the next class period after the lab. Each report is worth 15 pts.

Oral Presentations

Each student will choose one vitamin or one mineral to teach to the class. A 10 minute presentation will be prepared and presented that will include the nutrient's functions, active form, food sources, RDA values, deficiency/toxicity symptoms, and method of assessment. Additionally, a journal article on this nutrient will be presented. A variety of presentation methods may be utilized, but should include a visual presentation, as well as a handout to be used as a study guide.

Research Report Guidelines

The purpose of this assignment is to conduct a research project in its entirety. Each student will be responsible for collecting data, and writing their own paper. The project will consist of several parts.

1. In class, we will practice conducting laboratory experiments on test "blood" reagents. Then you will choose one test kit to use for your research report (ex. cholesterol, triglycerides, glucose, albumin, iron)
2. Sign up with me for an appointment with the Wellness Center for a blood draw. This will be your "pre-diet" test vial. (I will bring in a sign-up sheet to the class for appointments.)
3. Change your diet to attempt to result in a change in this blood value. Write out how your diet will change, and give a sample. For example, add an egg to your diet every day to see if your blood cholesterol level changes; or eliminate red meat in your diet for two weeks to see if it affects your iron status. Follow your diet for two weeks. Keep a journal of what you ate.
4. After at least two weeks, sign up with me for a second appointment with the Wellness Center for a blood draw. This will be your "post-diet" test vial.
5. Run the lab experiment on your pre- and post-diet blood vials (see syllabus for assigned date).
6. Write a research paper. A research report consists of 6 parts:

    A. Introduction: Students decide their own hypothesis. For instance, you may want to report on the assumption that increasing your saturated fat levels will raise your blood cholesterol values. The introduction generally has a few paragraphs describing the basic components of the nutrients. For example, what are saturated fats and where are they found, how do they affect blood cholesterol, etc. Next, conduct a literature review and outline what studies have been done on this topic in the past, summarizing what has been found. A literature review/introduction section should be ~5 pages (double spaced). Finish the section by stating the hypothesis of this research project.

    B. Methods and Materials: in this section, report exactly how the research was conducted and the materials used. The methods section should be so clear, and complete, that I could repeat your exact study. Examples are a description of the subject(s), the environment, the diet followed, how the blood was drawn and prepared, and the laboratory equipment used. Think of this section as a recipe, **except the text is written in paragraph form** (do not list materials).

    C. Results: generally, this is a summary of the data shown in concise graphs or tables with verbal text describing in paragraph form the contents of each graph or table. The raw data and any calculations done will be housed in the appendices. In this section, just report the facts. Write in the third person, past tense, with no opinion given, or discussion made. This will be a very brief section since you are just reporting the pre and post blood values, and the statistics of how compliant you were with your diet changes.

    D. Discussion: this section should complete a full circle from your hypothesis and introduction material. Here you will compare or contrast your results to the literature reported, evaluate your procedures and techniques used, and summarize your findings. Finish with a brief conclusion.

    E. Reference page: Follow the *Journal of Nutrition* format for referencing all articles used in your paper. Within the body of the paper, you may use the number system, or author/year system when referencing.

F. Appendices: all raw data used, such as diet log, raw data from the lab experiments, etc.

DAILY SCHEDULE:

Tentative Lecture Schedule

Date	Lecture Topic	Chp Readings	Assignment Due
Wed, 9/04	Course Intro; Cell Review	1,2	
Mon, 9/09	Digestive System		Quiz 1/**Introduce Self**
Wed, 9/11	Energy/Start Carbohydrates	2,3	Quiz 2
Mon, 9/16	Glucose Lab (Satter Hall, rm 120)		
Wed, 9/18	Carbohydrates	3	Quiz 3/**Glucose lab report**
Mon, 9/23	Fiber	4	Quiz 4/**Glycolysis discussion**
Wed, 9/25	**Exam 1**		
Mon, 9/30	Lipids	5	Quiz 5
Wed, 10/2	Triglyceride / Cholesterol Lab (Satter Hall, rm 120)		
Mon, 10/07	Lipids	5	**Trig and Chol lab reports**
Wed, 10/09	Lipids / Protein	6	Quiz 6
Mon, 10/14	Protein	6	
Wed, 10/16	Protein/Body Composition	6,8	
Mon, 10/21	Albumin/Body Comp Lab (Satter Hall, rm 120)		
Wed, 10/23	**EXAM 2**		
Mon, 10/28	Energy Balance	8	Quiz 8/**Albumin lab report**
Wed, 10/30	Metabolism	7	Quiz 7/**Body Comp report**
Mon, 11/04	Metabolism	7	**Diet/Activity** report
Wed, 11/06	**Oral Reports on Vitamins**	9,10	Quiz 9, Quiz 10
Mon, 11/11	**Oral Reports on Vitamins**		
	Finish Vitamins/Review	9,10	
Wed, 11/13	**EXAM 3**		
Mon, 11/18	Macrominerals	11	Quiz 11
Wed, 11/20	Pre- and Post-diet labs (Satter Hall, rm 120)		
Mon, 11/25	Fluid & Electrolyte Balance	14	Quiz 12/ **Blood Glucose Journal**
Wed, 11/27	HOLIDAY		
Mon, 12/02	Microminerals	12	Quiz 13
Wed, 12/04	**EXAM 4**		

Mon, 12/09	Supplements/Paper Due	**Research Paper**
Wed, 12/11	Final Review	**EAL Tutorial**
Mon, 12/16	**FINAL EXAM**	**8:00-10:00 am**

POLICIES AND PROCEDURES:

Department Policies And Procedures:

Note: Failure to abide by the rules will negatively affect your grade.

1. **CLASS ATTENDANCE:** Class will begin promptly. *Class attendance is essential for success in this class*. Students are expected to work efficiently and respectfully.
2. **ELECTRONICS IN CLASSROOM:** IPADS and laptops are fine for viewing and taking notes, however, there is much research proving writing notes BY HAND creates synthesis, thereby increasing your learning and promoting long-term retention. I highly recommend you try it!
3. **EMAIL:** Check PLNU email regularly for any new postings or communications from the instructor.
4. **LATE POLICY:** Due dates are enforced rigorously. 25% deducted for each day late.
5. **EXAMS:** No makeup exams or quizzes given. Emergencies processed on an individual basis.
6. **EMERGENCIES:** Everyone has them. Be responsible, communicate promptly and privately, tell the truth, don't take advantage of the instructor's goodwill. Each will be evaluated on its merits. Documentation may be requested.

FINAL EXAMINATION POLICY

Successful completion of this class requires taking the final examination **on its scheduled day**. The final examination schedule is posted on the Class Schedules site. No requests for early examinations or alternative days will be approved.

PLNU COPYRIGHT POLICY

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See Academic Policies for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. (DRC@pointloma.edu or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section

504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.
If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See Academic Policies in the Undergraduate Academic Catalog.

Course Outline
NUT 3065 Advanced Nutrition

I. Cell Review
    A. Typical Cell Components
    B. Cellular Proteins
II. Digestive System
    A. Structural Overview
    B. Coordination and Regulation
    C. The Process of Digestion
III. Energy Transformation
    A. High Energy Phosphate Bonds
    B. ATP Formation
    C. Electron Transport Chain

Section 2

I. Carbohydrates
    A. Structures
    B. Digestion
    C. Absorption, Transport, Distribution
    D. Integrated Metabolism
    E. Regulation of Metabolism
II. Dietary Fiber
    A. Definition
    B. Components
    C. Physiological and Metabolic Effects
    D. Recommended Intake

III. Lipids
- A. Structure and Function
- B. Digestion, Absorption, Transport
- C. Lipoproteins and Cardiovascular Risk
- D. Integrated Metabolism

IV. Proteins
- A. Functions
- B. Structure and Organization
- C. Amino Acid Classification
- D. Sources
- E. Digestion, Absorption
- F. Amino Acid Metabolism
- G. Organ-Specific Metabolism
- H. Protein Turnover
- I. Protein Quality/Intake

V. Interrelationship of CHO, Lipid and Protein Metabolism
- A. Central Role of Liver
- B. Feed-Fast Cycle
- C. System Integration and Homeostasis

Section 3

I. Water-Soluble Vitamins (C and all B)
- A. Sources
- B. Digestion, Absorption, Transport, Storage
- C. Functions and Mechanisms of Action
- D. Interactions with other Nutrients
- E. Metabolism and Excretion
- F. Recommended Amounts
- G. Deficiency and Toxicity
- H. Assessment of Nutriture

II. Fat-Soluble Vitamins (A,D,E,K)
- A. Sources
- B. Digestion, Absorption, Transport, Storage
- C. Functions and Mechanisms of Action
- D. Interactions with other Nutrients
- E. Metabolism and Excretion
- F. Recommended Amounts
- G. Deficiency and Toxicity
- H. Assessment of Nutriture

III. Macrominerals
- A. Sources
- B. Digestion, Abs'n, Transport, Storage
- C. Functions and Mechanisms of Action
- D. Interactions with other Nutrients
- E. Excretion
- F. Recommended Amounts
- G. Deficiency and Toxicity
- H. Assessment of Nutriture

IV. Microminerals
- A. Sources
- B. Digestion, Abs'n, Transport, Storage
- C. Functions and Mechanisms of Action
- D. Interactions with other Nutrients
- E. Excretion
- F. Recommended Amounts
- G. Deficiency and Toxicity
- H. Assessment of Nutriture

Section 4

I. Body Fluid and Electrolyte Balance
- A. Water Distribution in Body
- B. Maintenance of Fluid Balance
- C. Maintenance of Electrolyte Balance
- D. Acid-Base Balance and Buffers
- E. Respiratory Regulation of pH
- F. Renal Regulation of pH