CEDAR CREST COLLEGE - NUTRITION PROGRAM

COURSE PLAN: - Fall 2009

COURSE NO:	NTR 300
COURSE TITLE:	Advanced Nutrition & Metabolism I
COURSE DESCRIPTION:	An intensive study of functions, digestion/absorption, interrelationships and cellular metabolism of macronutrients, determination of nutrient requirements and assessment of nutritional status, fluid balance and acid/base balance during health, disease and exercise. Topics of current research are explored.
CREDITS:	3
CLOCK HOURS/WEEK	3 hours total, 3 hours didactic
INSTRUCTOR:	Barbara M. Carlson, MA, RD, CDE Phone : 610-606-4666 – extension 4487 Email : bcarlson@cedarcrest.edu
PREREQUISITES:	NTR 210 - Principles of Human Nutrition CHE 217 - Nutritional Biochemistry BIO 117/118 or 217/218 Human Anatomy & Physiology I, II

COURSE OBJECTIVES:

1. The student will have a basic knowledge of:
   A. Exercise physiology
      - Define exercise physiology terms.
      - Explain how nutrition impacts exercise and muscular status.
   B. Evolving methods of assessing health status
      - Discuss newer methods of assessing health status.
2. The student will have a working knowledge of:
   A. Public speaking
      - Gain experience in public speaking.
   B. Nutrient metabolism.
      - Explain how macronutrients are metabolized in the body.
   C. Fluid and electrolyte requirements.
      - Discuss how the body maintains electrolyte and acid-base balance despite alterations in food/fluid intake.
   D. Pharmacology: Nutrient-nutrient and drug-nutrient interaction.
   E. Influence of age, growth, and normal development on nutrition requirements.
      - Identify how nutrient requirements for macronutrients change during the lifespan.
   F. Nutrition and metabolism.
      - Describe (review) the major metabolic pathways for macronutrients.
      - Discuss the absorption, transport, storage, and metabolism of macronutrients.
3. The student will demonstrate the ability to present an educational session for a group.
   A. Use current information technologies.

B. Interpret laboratory parameters relating to nutrition.
C. Interpret current research.
D. Calculate and interpret nutrient composition of foods.
E. Collect pertinent information for comprehensive nutrition assessments.
F. Determine nutrient requirements across the lifespan.
G. Measure, calculate, and interpret body composition data.

REQUIRED TEXT:

Advanced Nutrition and Human Metabolism (5th ed.) by James L. Groff and Sareen S. Gropper. Wadsworth Publishing, 2009.

http://newton.nap.edu/books/0309085373/html/ Required reading can be viewed online at this web address. Access if free to all data on this web site. Should you desire hard copies, or downloaded copies they can be purchased directly from the web site.

Access to the American Dietetic Association website: Evidence Analysis Library. You must be an ADA member (student). The use of the ADA Evidence Based Analysis Library is required to complete the assignments in this class.

EVALUATION:
Assessment of the student's progress is an ongoing process and involves the student as well as the instructor. The stated course objectives serve as the basis for evaluation. All assignments are due on the date scheduled. NO EXCEPTIONS. Total points and assignments may change at the discretion of the instructor.

Quizzes: 4 at 50 points each	200 points
3 Concept maps: 25 points each	75 points
Midterm:	100 points
Final:	125 points
Two Research Question Papers: 100 points each	200
TOTAL	700 points

Attend class and be on time for class! Please be courteous, late arrivals significantly disrupt class. A late arrival interferes with thought processes and concentration.
I will allow ONLY ONE late arrival and ONE absence without an MD note without the arrival or absence affecting your grade. BUT after that: If you are late more than two times, or absent more than twice without a doctor's note, your final numerical grade percentage will be lowered by 2 points. Each additional absence or late arrival after three will cause your final grade to lower by two additional points. Example: final percentage 95%. Three absences or late arrivals would lower grade to 93%. Four = 91%, Five = 89% etc.

700 Points total

Points for percentage ≥ points noted	Percentage	Grade
651	93	A
630 – 650	90-92	A-
609 – 629	87-89	B+
581 – 608	83-86	B
560 – 580	80-82	B-
539 – 559	77-79	C+
511 – 538	73-76	C
490 – 510	70-72	C-
469 – 489	67-69	D+
441 – 468	63-66	D
420 – 440	60-62	D-
<419	<60%	F

TEACHING METHODS:

1. Lecture/teacher-centered discussion
2. Student-centered discussion
3. Concept mapping
4. Student presentations
5. Reading in textbooks, reference books, periodicals, newspapers, journals, Internet
6. Assignments involving researching, organizing information, and writing

WORK EXPECTED OF THE STUDENT:

1. Students are expected to have read the assignment prior to class and to actively participate in class discussions. Students are responsible for reading assigned journal articles and should be prepared to discuss the articles in class.
2. Students are responsible for all terms defined in the textbook.
3. Written assignments must be word-processed and completed on 8-1/2" x 11" paper. Spelling, punctuation and grammar will constitute part of the grade for the assignment. One-inch margins and double-spacing is required. Indent for paragraphs. Use the American Dietetics Association guidelines for authors.
4. Class attendance is expected. If you must miss a class, a phone call is expected.
5. **Assignments are due on the date indicated. NO EXCEPTIONS.**
6. You must be present for the midterm and final tests. Quizzes will be online and will be open only for the designated time. They are NOT open book. I will provide guidelines for topics on the exam. However, this is an upper division course, at some point in your career you need to understand all the material covered. You won't have a study guide before you see a client.
7. A physician note is required to make up an exam. Quizzes are open for four days. They will only be reopened in case of documented emergency or serious illness.

"Your obligations for this course include attendance at the final exam, on the day and time scheduled by the Registrar's Office. You should not make travel arrangements until the final exam schedule is published; if you must make plans early, you should schedule your travel after the last final exam day."

CLASSROOM PROTOCOL

Appropriate classroom behavior is implicit in the Cedar Crest honor Code. Such behavior is defined and guided by complete protection for the rights of all students and faculty to a courteous, respectful classroom environment. That environment is free from distractions such as late arrivals, early departures, inappropriate conversations and any other behaviors that might disrupt instruction and/or compromise students' access to their Cedar Crest College education. Turn off your cells phones prior to entering the classroom. **Lap top computers ARE NOT ALLOWED!**

Honor Code: The Cedar Crest Honor Code will prevail at all times. Please verify on each test and assignment that the work done is your own with your SIGNATURE. You are not to consult with ANY OTHER STUDENTS when you are given take-home tests, projects, and assignments. PLAGIARISM or any other form of academic dishonesty will result in no points on the paper/exam on which you plagiarized or cheated. In addition, such an act may result in failing the entire course. Please refer to your customs book for a complete explanation of the Cedar Crest Honor Code.

EVIDENCE BASED EVALUATION OF RESEARCH

Objectives: Critically evaluate a scientific original research study related to macronutrient for its validity and application to clinical practice. The guidelines we will use for the course follow the Institute for Clinical Systems Improvement (ICSI) Methodology adopted by the American Dietetic Association. See the ADA Evidence Guide for more information. Two short papers are required in this class. The paper must use Evidence Based Research guidelines and the ADA guidelines for authors.

Criteria:

- Papers are to be **no more than 6 pages in len**gth without bibliography.
- Arial Font of 12, with 1 inch margins, double spaced.
- A minimum of **5 peer reviewed articles** must be used to document research, facts and assertions. Only one article may be a review article. A copy of each article must accompany your paper.
- Research articles must be published after 2000.
- Paper and Bibliography must use the format of the American Dietetic Association
- Charts and Graphs may be used, but do not count as a page.
- Textbooks may be used as the source of metabolism review, but they will not count as a peer reviewed article.

The topics and due dates for the papers are as follows:

Topic: Answer each of the following questions based on current research.	Required areas of discussion	Due Date
Fructose: What is the current understanding of fructose impact on metabolism and health? USE EVIDENCE BASED, PEER REVIEWED RESEARCH.	• Explain the metabolic pathway for fructose absorption and metabolism • How are **excess** Fructose calories metabolized by the human body? • What are the benefits and risks of fructose as a carbohydrate source? ○ Is there any metabolic difference proven for	9/24/2009 At class meeting

Points: 50 The following rubric will be used to grade your paper 20 – use of Peer reviewed, validated literature. 10 – use of ADA format 20 – cohesive, well written information 5 accurate grammar and spelling 10 clarity of comments and arguments 5 ability to apply literature to question	▪ fructose as a component of sucrose vs ▪ fructose in High fructose corn syrup ▪ vs fructose from fruit or honey? **You may choose ONE of the following:** • How does Fructose affect lipid levels? • How does Fructose affect insulin levels and blood glucose • Does Fructose consumption contribute to any other disease states and how?	
Lipids: What is the current understanding of Omega three fatty acids and their contribution to health and disease?	You must answer the following questions: 1. Which fatty acids are considered Omega 3 fatty acids. 2. What is required for absorption of Omega 3 fatty acids. 3. How are they metabolized? 4. How do they impact metabolism of other lipids. 5. What amount is considered adequate or good? 6. Is there an amount that is considered excessive. 7. Positive benefits of Omega 3 fatty acids. 8. Negative impacts of Omega 3 fatty acids.	

Nutrition 300
Advanced Nutrition & Metabolism
Fall 2009

DATE	TOPIC	READING ASSIGNMENTS
8/26 **Week One**	Interpretation of Research	1. Gropper, Chapter 15 2. ADA's Evidence Analysis Workshop Manual Article posted in document sharing: Please use this article for Evidence Based worksheet completion.
9/2 - Week Two QUIZ - online open 9/3/2009 through 9/07/ 2009	Nutrient Recommendations and their establishment Role in Dietary Assessment	http://newton.nap.edu/books/0309085373/html/ Chapters 1-4 in online text Evaluate assigned article according the ADA Evidence worksheets

DATE	TOPIC	READING ASSIGNMENTS
9/9 **Week Three**	Carbohydrates • Basic metabolic pathways • Identification of carbohydrates, primary and intermediary products • Energy production. ➢ Glycolysis (Embden Meyerhoff), ➢ Glycogensis, ➢ Glycogenolysis, Gluconeogenesis ➢ Cori Cycle ➢ Hormones related to carbohydrate metabolism	Chapter 3 in Gropper http://newton.nap.edu/books/0309085373/html Chapter 6 - online text Complete concept map of each pathway Due 9/16/2009 Follow handout
9/16 **Week Four**	Carbohydrates Abnormal carbohydrate metabolism. Relationships of carbohydrate to disease states: • Maximal carbohydrate disposal • Lactose Intolerance Inborn errors of metabolism • Galactosemia • Fructosemia • Glycogen storage diseases	Chapter 3 Gropper, http://newton.nap.edu/books/0309085373/html/ Chapter 6 in online text Read Assigned articles: Week four in document sharing.
9/23 **QUIZ – ONLINE OPEN 9/24 – 9/28** **WEEK 5**	Carbohydrates: cont ➢ Diabetes – primary pathways, hormones, management ➢ Fiber – relationship to metabolic control of diseases	Chapter 4 in Gropper http://newton.nap.edu/books/0309085373/html/ Chapters 7, 8, 9 in online text PAPER ONE – FRUCTOSE DUE 9/24

DATE	TOPIC	READING ASSIGNMENTS
09/30 **WEEK SIX**	*Midterm*	*Chapters15, and 2 through 4 from Gropper and nap.edu chapters 1 – 9.*
10/7 **WEEK SEVEN**	Lipids ➢ Digestion ➢ Nomenclature ➢ Chain length ➢ Medium Chain Triglycerides ➢ Trans Fatty Acids ➢ Fatty Acid Oxidation – Beta Oxidation ➢ Lipolysis o Relationship to TCA cycle ➢ Lipogenesis	Chapter 5 in Gropper http://newton.nap.edu/books/0309085373/html/ Chapters 8 and 9 from online text Reading assignments: document sharing Concept Map: Beta Oxidation, Lipolysis and Lipogenesis, Eicosanoid metabolism, Sphingolipid metabolism and Steroid metabolism
10/14 **QUIZ online** **Open 10/15 – closes 10/19** **WEEK EIGHT**	Lipids ➢ Carnitine ➢ Sphingolipids ➢ Eicosanoids ➢ Steroids ➢ Abnormal metabolism o Inborn Errors of metabolism ➢ Cardiovascular Disease o Relationship to Lipoprotein levels o Atherogenesis and inflammation o Current research ➢ Relationship to Carbohydrate metabolism	Chapter 5 Gropper, http://newton.nap.edu/books/0309085373/html/ Chapters 8 and 9 from online text

DATE	TOPIC	READING ASSIGNMENTS
10/21/2009 ADA NATIONAL MEETING DENVER WEEK FREE TO WRITE PROTEIN PAPER		
10/28 **WEEK NINE**	Proteins ➢ Digestion and absorption ➢ Amino Acid classifications ➢ Protein requirements	Chapter 6 http://newton.nap.edu/books/0309085373/html/ Chapter 10 from online text Reading assignments: document sharing
11/4 **WEEK TEN** **QUIZ ONLINE** **OPEN 11/5 CLOSES** **11/09**	Proteins ➢ Abnormal protein metabolism ➢ Inborn Errors of metabolism ➢ Protein requirements ➢ Conditions requiring restriction ➢ Conditions requiring supplementation	Gropper, Chapters 4 through 6 And nap.edu information Chapters 7,8,9,10 Paper TWO – Lipids due at class Concept Map - amino acid synthesis, Transcription, Translation, Protein anabolism, Protein catabolism (proteolysis)
11/11 **WEEK ELEVEN**	Metabolism - Body Composition and Energy Expenditure • Fluid Balance • Measurement • Assessment of energy Expenditure • Regulation: Hormonal control of energy intake and utilization	Chapter 8 and 14 - Gropper
11/19 **WEEK TWELVE**	In class presentation of written papers:	Fructose and Lipids
WEEK THIRTEEN	THANKSGIVING BREAK	
12/03 **WEEK FOURTEEN**	In class presentation of written papers:	Fructose and Lipids
FINALS	Final	LIPIDS, PROTEIN AND ENERGY

DATE	TOPIC	READING ASSIGNMENTS