SEMESTER AT SEA COURSE SYLLABUS

Voyage: Spring 2014
Discipline: Biology
BIOL 1559-503 and 504: Nutrition Around the World
Division: Lower
Faculty Name: Reginald H. Garrett

COURSE DESCRIPTION

Study of the science of human nutrition provides a relevant and fascinating way to familiarize students with fundamental biological principles that will be useful to them in their daily lives. Examining nutrition around the world allows a glimpse into the various roles that food plays in our health, welfare, culture, and social interactions. Topics to be considered include: The chemical composition of the body; the molecular structure and function of the different kinds of nutrients required by humans; the metabolic processes that transform food into energy and the chemical building blocks for the creation and renewal of cellular structures; and the basic scientific principles of energy balance that determine weight gain or weight loss, as governed by diet and exercise. With this foundation in hand, the course will address local solutions to nutritional needs, such as the principal food sources consumed by peoples around the world, cultural influences on food choices, food sufficiency, and the relationship between proper nutrition and health maintenance. As we circle the globe, we will sample the food and participate in the food culture of the countries we visit.

COURSE OBJECTIVES

Nutrition around the World is addressed to students who wish to understand the principles of nutrition so that they can make informed decisions about relationship between food they eat and their prospects for good health. Further, by exploring nutrition around the world, students can appreciate the many different healthful ways by which human nutritional requirements might be met. The course aims to deliver the science of nutrition in light of the biology and chemistry that forms the basis of our understanding of nutrition. Also, the course is intended for non-science majors seeking to fulfill their natural science requirement, as well as science majors with an interest in nutrition.

Nutrition around the World
Syllabus
Lecture*
01 Introduction; Food Choices, Dietary Reference Intakes
02 Diet Planning Guides; Food Labels
03 Digestion, Absorption, and Transport of Nutrients
04 Carbohydrates; Digestion and Absorption of Carbohydrates
05 Fats (lipids); Digestion and Absorption of Lipids
06 Quiz 1 - 50 points
07 Proteins; Digestion and Absorption of Proteins
08 Metabolism: Chemical Reactions in the Body
09 Energy from Carbohydrates & Fats
11 Energy from Proteins: Protein Metabolism
12 Alcohol & Nutrition; Energy Balance
13 Quiz 2 - 50 points
14 Energy In, Energy Out, Body Weight; Weight Management
15 Obesity and its Causes; Underweight and Anorexa
16 Vitamins; Water
17 Major Minerals and Trace Elements
18 Fitness; Energy Systems of Physical Activity
19 Quiz 3 – 50 points
20 Diet and Health: Cardiovascular Diseases and Cancer
21 Diet and Health: Diabetes; Nutrition Support in Wasting Diseases
22 Consumer Concerns: Food-Borne Illnesses
23 Food Biotechnology
24 Hunger and the Environment
Apr 22 Final Exam - 50 points
*As we travel, we will incorporate relevant aspects of the foods and nutrition habits found in the various countries we visit.

Field Laboratory
Due to the large size of the LENS course, the class will be divided into two groups. Each group will survey a food market in one of our Chinese ports-of-call. The goal of the survey will be to understand how the common nutritional needs (energy from carbohydrate, fat and/or protein, minerals, vitamins) are met by people shopping at the market through the purchases they might make. Students will be expected to note the items available, how these items contribute to nutrition (or not), how much they cost, and how satisfaction of nutritional requirements can be achieved by making informed choices. After the market visit, we will return to the ship to hear on-board lectures from prominent Chinese scientists regarding biological research relevant to nutrition.

Group 1 - February 6, the first morning in Shanghai: Group 1 will be bused to New Zhenning Lu Wet Market, a large, traditional Chinese food market. The group will stroll through the market, surveying the foods available, and noting the nutrition these foods provide and their cost. Group 1 will then return to the ship to

hear a lecture and presentations from Professor Liping Zhao, the Director of the Laboratory of Nutritional Systems Biology, Shanghai Jiao Tong University. Professor Zhao is a leading researcher in the influence of the human gut microbiome (the totality of all micro-organisms in the human gut) in human health and nutrition. Attendance is mandatory.

Group 2- February 11, the last day in Homng Kong. Group 2 will visit Wanchai Street Market, on Hong Kong Island, on the last morning in Hong Kong, surveying the foods available, and noting the nutrition these foods provide and their cost. Group 2 will then return to the ship to hear a lecture and presentations by Dr. Samuel S-M Sun, Research Professor of Biology and Director of the State Key Lab of Agrobiotechnology, The Chinese University of Hong Kong, and his colleagues. Professor Sun is a leading authority on the application of agricultural biotechnology to improve food nutrition and health. Attendance is mandatory.

The purpose of the field laboratory experience is to train students to think about strategies for meeting their nutritional needs through sound nutritional practices. As we travel beyond China, students will be required to survey the local food, including personal tours of local food markets in seven of the countries we visit: Hawaii (U.S.), China, Vietnam, Burma (Myanmar), India, South Africa, and Ghana. For each of these ports, students are given a hypothetical budget to plan a meal for a family of four; the budget is set to be appropriate to the median per capita income in the country. On the first day of class after each port, the students respond in class to a 10-question survey of their budget results. The field laboratory assessment will be based on a 1,000-word *Nutritional Culture and Experience* paper in which the student provides an overall survey of their seven budgets and a comparative analysis of meal plans from two of the countries visited. The students are required to submit the data for their 7 meal plans as an Appendix to their paper.

Evaluation
Quizzes: 3, each worth 50 points
Final examination: 50 points
Field Laboratory: 50 points
TOTAL: 250 points
Each quiz and the final exam will be 50 multiple-choice questions.
The field laboratory portion of the course will be evaluated based on the 1,000-word *Nutritional Culture and Experience* paper written by the student.

Textbook
Sizer, F., and Whitney, E., *Nutrition: Concepts and Controversies.* 12th ed., 2011. Cengage/Wadsworth publishers.
ISBN: 978-0-538-73494-3
Cost: $150.00

HONOR CODE

Semester at Sea students enroll in an academic program administered by the University of Virginia, and thus bind themselves to the University's honor code. The code prohibits all acts of lying, cheating, and stealing. Please consult the Voyager's Handbook for further explanation of what constitutes an honor offense. Each written assignment for this course must be pledged by the student as follows: "On my honor as a student, I pledge that I have neither given nor received aid on this assignment." The pledge must be signed, or, in the case of an electronic file, signed "[signed]."