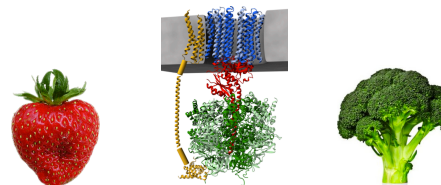


CHEMISTRY 105 PERSPECTIVES IN NUTRITION



DR. JANIS E. LOCHNER, OLIN CENTER 223, EXT. 7538, (lochner@lclark.edu)
OFFICE HOURS: M,F 12:00 -1:30 PM AND T 1:00 - 2:00 PM

TEXT: THE SCIENCE OF NUTRITION 3RD ED. (2013), JANICE L. THOMPSON, MELINDA M. MANORE. LINDA A. VAUGHAN (ISBN 978-0321832009)

LECTURE: 7:00 P.M. - 8:30 P.M. MONDAY AND WEDNESDAY, HOWARD HALL 102

LABORATORY: OLIN CENTER 215

CLASS WEB SITE: <https://sites.google.com/a/lclark.edu/lochner/teaching/chem105>

PERSPECTIVES IN NUTRITION FOCUSES ON THE FUNDAMENTAL BASIS OF OUR NUTRITIONAL NEEDS AND EXPLORES THE CONNECTION BETWEEN DIET AND DISEASE. THE COURSE BEGINS WITH AN INTRODUCTION TO THE ENERGY-YIELDING NUTRIENTS: CARBOHYDRATES, FATS AND PROTEINS. THE CELLULAR METABOLIC REACTIONS THAT HARNESS ENERGY FROM THESE NUTRIENTS ARE THEN STUDIED WITH SPECIAL EMPHASIS ON THE VITAMINS THAT AID IN THESE ENERGY-YIELDING REACTIONS. THE PHYSIOLOGICAL ROLES PLAYED BY MICRONUTRIENTS ARE DELINEATED TO FACILITATE AN UNDERSTANDING OF HOW UNDER OR OVERCONSUMPTION OF SPECIFIC NUTRIENTS GIVES RISE TO SELECT NUTRITIONAL DISORDERS.

WE WILL BE EXPLORING THE BASIC TENETS OF NUTRITION BY DRAWING ON READINGS IN THE THOMPSON TEXT AND TARGETED SUPPLEMENTAL READINGS. THE APPROPRIATE READINGS SHOULD BE COMPLETED PRIOR TO COMING TO CLASS. YOUR LABORATORY WORK IN NUTRITION HAS BEEN DESIGNED SO THAT YOU CAN EXPERIMENTALLY EXPLORE SEVERAL DIFFERENT QUESTIONS OF NUTRITIONAL RELEVANCE. ADDITIONALLY, THREE GUEST LECTURERS WILL CONTRIBUTE TO THE CLASSROOM DIALOG AND GUIDE US IN MORE FOCUSED EXPLORATIONS OF A FEW SELECT ISSUES.

DURING THE SEMESTER, YOU WILL HAVE THE OPPORTUNITY TO WORK IN A SMALL TEAM AND RESEARCH THE EFFORTS AND ACCOMPLISHMENTS OF AN ORGANIZATION THAT IS FOCUSED ON ADDRESSING A SPECIFIC NUTRITIONAL ISSUE. YOUR ANALYSIS WILL BE SHARED ORALLY IN CLASS. ADDITIONALLY, YOU WILL WORK IN A SMALL TEAM TO IDENTIFY A NUTRITIONAL INITIATIVE THAT MERITS FUNDING AND DEVELOP A PITCH DECK PRESENTATION TARGETED AT SECURING FUNDING FOR THIS INITIATIVE. GOOD LUCK IN YOUR STUDY OF NUTRITION! I LOOK FORWARD TO WORKING WITH YOU.

STUDENT LEARNING OBJECTIVES

1. ACQUIRE A DETAILED UNDERSTANDING OF THE FUNDAMENTAL BASIS OF HUMAN NUTRITIONAL NEEDS INCLUDING THE KEY ELEMENTS OF METABOLISM AND THE SPECIFIC PHYSIOLOGICAL ROLES OF MICRONUTRIENTS.
2. DEVELOP A MECHANISTIC UNDERSTANDING OF HOW DIET INFLUENCES HEALTH AND DISEASE
3. GAIN FACILITY WITH A RANGE OF CONTEMPORARY LABORATORY TECHNIQUES USED TO EXPLORE NUTRITIONALLY RELATED QUESTIONS AND ANALYZE AND INTERPRET DATA COLLECTED FROM THESE STUDIES
4. WORK IN SMALL TEAMS TO EVALUATE AND COMMUNICATE ADVANCES AND KEY INITIATIVES THAT ARE TARGETED AT ADDRESSING SELECT NUTRITIONAL CONCERNS

COURSE EVALUATION AND GRADING

YOUR GRADE IN THE COURSE WILL BE BASED ON THE FOLLOWING:

TWO MIDTERM EXAMS GIVEN DURING THE SEMESTER (40%)

FINAL EXAM (15%)

CLASS PRESENTATION / ORGANIZATION FOCUSED ON NUTRITIONAL ISSUES (10%)

PITCH DECK PRESENTATION (15%)

LABORATORY WORK (20%).

A MAKE-UP EXAM WILL BE GIVEN ONLY IF YOU NOTIFY ME OF YOUR PENDING ABSENCE PRIOR TO THE EXAM, AND I FIND YOUR REASON SUITABLE TO JUSTIFY MISSING THE EXAM.

HONOR CODE GUIDELINES

YOU ARE ENCOURAGED TO WORK AND STUDY COOPERATIVELY WITH YOUR CLASSMATES. HOWEVER, WORK ON EXAMS MUST BE YOUR OWN WORK. VIOLATION OF LEWIS & CLARK'S ACADEMIC INTEGRITY POLICY WILL BE TAKEN SERIOUSLY. PLEASE READ THE GUIDELINES PROVIDED IN THE STUDENT HANDBOOK (PATHFINDER) CONCERNING ACADEMIC HONESTY AND THE HONOR CODE. THE ACADEMIC HONESTY AND HONOR CODE APPLIES TO ALL MATERIAL IN THIS CLASS.

SCHEDULE OF LECTURES AND EXAMS

DATE	LECTURE TOPIC AND ADDITIONAL READINGS	TEXT
9/4	THE SCIENCE OF NUTRITION: TOOLS AND PREMISES THE CONCEPT OF METABOLIC ENERGY, ESSENTIAL NUTRIENTS	CH. 1
9/9	HUNGER AND CHEMICAL DIGESTION	CH. 3
9/11	CARBOHYDRATES: SIMPLE AND COMPLEX	CH. 4
9/16	HIGH FRUCTOSE CORN SYRUP ARTIFICIAL SWEETENERS READING NESTLE – WHAT TO EAT READING POLLAN – THE OMNIVORE'S DILEMMA	
9/18	CARBOHYDRATE STORAGE: DIABETES AND INSULIN RESISTANCE	
9/23	FIBER AND PHYTOCHEMICALS READING WILLETT – EAT, DRINK AND BE HEALTHY	CH. 10.5
9/25	DIETARY FAT: UNSATURATED, POLYUNSATURATED, OMEGA 3 AND OMEGA 6 FATTY ACIDS. TRANS FATTY ACIDS READING – QUEEN OF FAT	CH. 5
9/30	CHOLESTEROL AND ATHEROSCLEROSIS LDL RECEPTORS AND GENETIC PREDISPOSITION TO HEART DISEASE	
10/2	EXAM I – CARBOHYDRATES & FATS	
10/7	AMINO ACIDS AND PROTEIN STRUCTURE ESSENTIAL AMINO ACIDS, PROTEIN QUALITY VEGETARIAN RESOURCE GROUP	CH. 6
10/9	PROTEIN ENERGY MALNUTRITION THE HUNGER PROJECT NUTRISET, PLUMPY NUT AND FAMINE RELIEF	
10/14	CELLULAR ENERGY METABOLISM THE WORLD'S SMALLEST MOLECULAR MOTOR AND ATP SYNTHESIS	CH. 7, 7.5
10/16	PROTEIN METABOLISM AND GLUCONEOGENESIS STORING FUELS: BUILDING FATTY ACIDS, GLYCOGEN SYNTHESIS	
10/21	ENERGY YIELDING VITAMINS	CH. 8
10/23	THE FAT CELL: LANGUAGE, LIFE AND LONGINGS GUEST LECTURE: DR. KEITH LOWENSTEIN CENTER FOR HUMAN HOLISTICS	
10/28	GLOBAL REGULATION OF ENERGY METABOLISM THE EDIBLE SCHOOLYARD PROJECT FOOD CORPS	
10/30	ORPHAN NUTRITION GUEST LECTURE: BRITA JOHNSON OPERATIONS DIRECTOR SPOON FOUNDATION	
11/4	SPORTS NUTRITION CARBOHYDRATE LOADING, PROTEIN AND EXERCISE	CH. 14
11/6	EXAM II – PROTEINS, CELLULAR METABOLISM AND B VITAMINS	
11/11	GROUP WORK ON PITCH DECK PRESENTATIONS	
11/13	ANTIOXIDANT NUTRIENTS METABOLIC ROLES OF VITAMIN C	CH. 10
11/18	NUTRIENTS INVOLVED IN BLOOD HEALTH AND IMMUNITY IRON DEFICIENCY ANEMIA PROJECT HEALTHY CHILDREN / MICRONUTRIENT SPRINKLES	CH. 12
11/20	LEAD POISONING PREVENTION GUEST LECTURE: PERRY CABOT, PROGRAM DIRECTOR ENVIRONMENTAL HEALTH MULTNOMAH COUNTY	
11/25	PITCH DECK PRESENTATIONS	
11/27	VITAMIN A AND VISION VITAMIN ANGELS HELEN KELLER INTERNATIONAL	
12/2	FLUID AND ELECTROLYTE BALANCE SODIUM AND HYPERTENSION	CH. 9
12/4	VITAMIN D AND BONE HEALTH CALCIUM AND OSTEOPOROSIS	CH. 11
12/9	FOOD ADDITIVES CENTER FOR SCIENCE IN THE PUBLIC INTEREST	CH. 15
12/11	BIOTECHNOLOGY AND GENETIC MODIFICATION OF FOODS (GMOs) THE GOLDEN RICE INITIATIVE BIOCASSAVA PLUS REVIEW - RECAPITULATION OF CENTRAL THEMES	

12/17	FINAL EXAM (6:00-9:00 P.M.)	
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TEXTS USED FOR ADDITIONAL READINGS FOR PERSPECTIVES IN NUTRITION:

1. ALLPORT, S. (2006) THE QUEEN OF FATS, BERKELEY, UNIVERSITY OF CALIFORNIA PRESS.
2. NESTLE, M. (2006) WHAT TO EAT, NEW YORK, FARRAR, STRAUS AND GIROUX.
3. POLLAN, M. (2006). THE OMNIVORE'S DILEMMA A NATURAL HISTORY OF FOUR MEALS, NEW YORK, PENGUIN PRESS
4. WILLETT, W. C. (2001). EAT, DRINK AND BE HEALTHY: THE HARVARD MEDICAL SCHOOL GUIDE TO HEALTHY EATING. NEW YORK, SIMON AND SCHUSTER.