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1. (Course Overview)

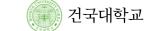
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	Nutritional Biochemistry is a fundamental course in nutritional sciences. Students will be expected to be familiar with the material covered in an Introductory Nutrition. It will serve as a foundation for the material explored in this course. NUTRITIONAL BIOCHEMISTRY IS A FLIPPED LEARNING COURSE.								
	Basic Nutrition, Biology, Chemistry								
	Nutritional Biochemistry will cover topics related to cells, body fluid, proteins, carbohydrates, lipids, nucleic acids,enzymes and vitamins. By the end of the course, students will be able to have an understanding of the biochemical and physiological mechanisms involved in macronutrients as well as vitamins.								
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	Additional support will be provided for physically challenged students.								

(Course Schedule)

2.

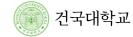
		Introduction, Cells
1		Understand the basic unit of living organism
	03/09~03/13	Introduction to the course. Discuss about the facts of life (on-line)
		Cells (off-line) Lecture and Discussion
		Chap1
		Importance of water for life
		Understand the properties of water
2	03/16~03/20	Properties of water, pH, buffer, role of body fluid (on-line)
		Water & body fluid discussion (off-line) Lecture and discussion
		Chap1
		Amino acids and peptides
		Understand amino acids and proteins
		Understand properties of amino acids and peptides (on-line)
3	03/23~03/27	Unerstand the protein primary, secondary, tertiary and queaternary strucutres. Protein classification (off-line)
		Lecture and discussion
		Chap 2
		Metabolism of amino acids and proteinds
		Understand metabolism amd catabolism of amino acids
4	03/30~04/03	Absorption and digestion of proteins (on-line) Catabolism of amino acids and urea cycle (off-line)
		Lecture and discussion
		Chap 3
		Enzyme properties
		Understand basic properties of enzymes
5	04/06~04/10	Basic concept of enzyme action (on-line) Enzyme kinetics and regulation (off-line)
		Lecture and discussion
		Chap 3
		Fatty acids, Lipids
		Understand basic structures and properties of fatty acids and lipids
6	04/13~04/17	Structure, chemistry and biological functions of lipids, energy storage, membrane, emulsification (on-line) Fatty acid and lipid metabolism, beta-oxidation, lipogenesis (off-line)
		Lecture and discussion
		Chap 8

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7		Fate of Acetyl-CoA
		Understand the fate of Acetyl-CoA
	04/20~04/24	Fate of Acetyl-CoA (on-line) Review: Cells ~ Acetyl-CoA (off-line)
		Lecture and discussion
		Chap 9
		Mid-Term Exam (35%)
		April 20, Monday, 11:00 am -12:00 pm (noon)
8	04/27~05/01	
		Carbohydrates and Glycolysis
		Understand carbonydtares and metabolism of carbohydrates
9	05/04~05/08	Carbohydrates (monosaccharides, disaccharides, polysaccharides) (on-line) Metabolism of carbohydrates, Glycolysis (off-line)
		Lecture and discussion
		Chap 4
		Fate of pyruvate, Glycogenesis, Glycogenolysis, Gluconeogenesis
		Understand the fate of pyruvate and other metabolism of carbohydrates
10	05/11~05/15	Fate of carbohydrates (on-line) Glycogenesis, Glycogenolysis, Gluconeogenesis (off-line)
		Lecture and discussion
		Chap 6
		TCA cycle, Electron transport, Oxidative phosphorylation
		Understand TCA cycle, Electron transport, Oxidative phosphorylation
11	05/18~05/22	TCA cycle, Electron transport, Oxidative phosphorylation (on-line) Q/A session for TCA cycle, Electron transport, Oxidative phosphorylation (off-line)
		Lecture and discussion
		Chap 11
		Biochemical energy production
		Understand biochemical energy production
12	05/25~05/29	Biochemical energy production (on-line) Q/A session for biochemical energy production (off-line)
		Lecture and discussion
		Chap 11



13	06/01~06/05	Nucleotides, Nucleic acids and protein synthesis
		Undertand Nucleotides, Nucleic acids and protein synthesis
		Nucleotides and nucleic acids (on-line) Protein synthesis (off-line)
		Lecture and discussion
		Lecture note
		Water-soluble vitamins
		Understand basic concepts of water-soluble vitamins
14	06/08~06/12	Structures, metabolisms and functions of ascorbic acid, thiamin (on-line) Structures, metabolisms and functions of riboflavin, niacin, pyridoxine, cobalamin, folate (off-line)
		Lecture and discussion
		Lecture note
		Fat-soluble vitamins
	06/15~06/19	Understand basic concept of fat-soluble vitamins
15		Structures, metabolisms and functions of Vitamin A (on-line) Structures, metabolisms and functions of Vitamin D, E, & K (off-line)
		Lecture & Discussion
		Lecture notes
	06/22~06/26	Final Exam (35%)
		June 15th, Monday, 11:00 am - 12:00 pm, noon
16		

	Bioenergetics	Poster				
	Nutritional Biochemistry is a Flipped learning course. In this flipped classroom students are encouraged to engage with lectures via on-line to prepare for an active learning experience in the classroon.					
	Students' performance evaluation - Attendance 15% - Homework 15% - Mid-term exam 35% - Final exam 35%					