

# Southwest University

## Graduate Course Syllabus

### Course Unit: School of Food Science

Course No.	1108320052		Course		Modern Nutrition						
Course category (√)	Compulsory courses () Elective courses ( √ )	Credit hour	2	Total class hours	40	Lecture hours	40	Discus sion Hours	0	Experi ment hours	0
Lecturer	Zhou Caiqiong	Job title Degree	Professor On-the-job Ph.D		Specialties		Food Nutrition Chemistry; Healthy food				
Range of application by majors: Food science and engineering; food quality and safety											
Prerequisites: Organic Chemistry; Basic Biochemistry; Food Chemistry; Food Nutrition											
Teaching objectives and requirements:  This course focuses on emerging issues in energy physiology, macronutrients, micronutrients, nutrition and life cycle, physiology and pathophysiology, nutrition and chronic diseases and nutrition research. the students could learn the latest developments in nutrition research and the future research direction of nutrition through this course.											
Teaching methods and test methods (it should be conducive to cultivate graduates' innovative thinking and innovation ability):  Teaching methods: adopt the classroom teaching and classroom discussion. Examination Method: Literature Review. The students should understand the latest advances in food nutrition research or nutrition future research direction by guiding students to access information.											

### Course content and course hours allocation

### **Chapter 1 Macro-Nutrient and Energy (9 hours)**

Carbohydrates: intake and metabolism, glycemic index, resistant starch and dietary fiber etc..

Lipids: Absorption and transport of lipids and adjustment of lipid uptake in disease control. The influence of dietary lipid on serum lipids and lipoproteins.

Protein and amino acids: amino acid nutrition and metabolic classification; protein and amino acid absorption, amino acid catabolism and so on.

Energy metabolism: energy needs, energy balance, energy imbalance and energy intake regulation.

### **Chapter 2 Micronutrients and Water (11 hours)**

Fat-soluble vitamins: Vitamin A and carotenoids, vitamin D and vitamin E.

Water-soluble vitamins: Vitamin C and B vitamins

Minerals and trace elements: magnesium, sodium, chlorine and potassium; iron, zinc, iodine, selenium, chromium and copper and other trace elements.

Water and electrolyte balance: water and electrolyte requirements, insufficient water and excess water.

### **Chapter 3 Nutrition and Life Cycle (3 hours)**

Pregnancy and lactation: maternal physiological changes during pregnancy, metabolic metabolism and recommended intake during pregnancy, the diseases related to pregnancy and nutrition.

Nutritional needs of infants: required intake amount and recommended intake amount; breast milk, milk and infant formula powder.

Adolescent nutrition: adolescent growth and nutritional needs, nutritional evaluation and nutrition-related special problems, adverse diet behavior and eating disorders.

Aging: nutrition and longevity, nutritional and functional decline

### **Chapter 4 Special Nutrition (4 hours)**

The relationship between the environment and the body; the relationship between stress adaptation and nutrition.

Sports Nutrition: Aerobic exercise and resistance movement. Athlete's nutrition metabolism and needs.

Plateau nutrition: plateau climate characteristics and the impact on the human body, adapt to hypoxia of the human body and plateau nutrition.

Radiation Nutritional Issues: Effects of radiation on nutrient metabolism, and nutritional support under radiation conditions

### **Chapter 5 Physiology and Pathophysiology (4 hours)**

The effects of alcohol on health and nutrition: the metabolism of ethanol, the nutritional assessment of alcoholic disease patients, and the effect of ethanol on nutrient metabolism.

Self-taught part: Nutritional regulation of immune response; Food allergy; Gastrointestinal disease; Nutrition and liver and kidney disease; malnutrition and renal function and kidney disease

### **Chapter 6 Nutrition and Chronic Diseases (6 hours)**

Obesity: classification and pathogenesis, obesity and overweight effects on health, overweight and obesity treatment and prevention.

Nutrition and Hypertension: Alcohol, Obesity, Sodium, Potassium, Calcium, Magnesium, Lipids and Other Factors.

Atherosclerotic cardiovascular disease: CVD risk factors affected by dietary, dietary composition effect on CVD risk, and new risk factors for CVD.

Diabetes: the main factors and classification of the epidemic, dietary and dietary composition of diabetes.

Osteoporosis: Physiology of Calcium and Vitamin D; Protein and Vitamin K.

Nutrition and Cancer: Chemical-induced cancer mechanisms, dietary patterns and carcinogenesis, and carcinogenic substances in the diet.

### **Chapter 7 Ingredients and Dietary Recommendations (1 hours)**

Food composition: food ingredients data products and food ingredients data status; maintenance and improvement of food composition database.

Evaluation of Dietary Intake: Evaluation method of Dietary, Evaluation of Special Food Ingredients and Dietary Supplements, Evaluation of Intake in Special Cases and Evaluation of Special Population.

Dietary recommendations: Nutritional demand amount and recommended amounts, food diversity and nutritional needs, dietary diversification, food fortification and supplements, food-based dietary guidelines.

Strategies of changing dietary and movement behavior: behavioral strategies and changes in diet behavior, change movement.

### **Chapter 8 Emerging Problems in Modern Nutrition (2 hours)**

Foodborne disease and food safety: pathogenic factors and disease types, different risks of food production.

Food Bioengineering Technology: Nutritional Considerations, Food Genetically Modified.

Safety Evaluation of Bioengineering Food.

Functional Food Concepts and Safety Issues.

Human Genome and Nutrition: Genomics Nutrition, Dietary and Gene Interactions, Nutritional Pathophysiology and Gene Polymorphism, Nutrient Requirement and Gene Polymorphism.

### **The Catalog for main reference book (periodicals):**

S.N.	Author	Books and Periodicals' name	Press
1	B.A.Bowman	Modern nutrition	Chemical Industry Press, 2004
2	Yu Zhishen Gu Jingfan	Special Nutrition	Science Press, 1991
3	Zheng Jianxian	Functional food	Light Industry Press, 1999
4	Wen Zhimei Chen Jun Shi Yi	Modern nutrition	People's Health Press, 1998
5	Chen Renchun	Modern Clinical Nutrition	People's Medical Press, 1999

Review Comments of School (Institute, Center):

Signature

(Date)

Review Comments of Student Committee:

Signature

(Date)

Review Comments of Graduate School

Signature

(Date)