

King Saud University
College of Science
Biochemistry Department

Course title and code: Biochemistry of Nutrition (BCH 445)

Credit hours: 3 (2 + 1)

Objectives:

Main objective of this course is to study elements of nutrition – Macronutrients, micronutrients with special emphasis on biochemical fundamentals of nutrition. The course aims to study the roles of carbohydrates, fats, proteins, vitamins and minerals in health and disease conditions related to metabolism of these nutrients. This course also aims to study nutrition and energy requirements of different age groups, special nutrition during different physiological conditions like pregnancy, lactation and some metabolism related diseases, calorie contents of foods, energy expenditure, concepts of BMR, BMI, obesity, electrolyte balance and related conditions like malnutrition

Reference Books:

- Advanced nutrition and metabolism by Jack L smith
- Food biochemistry and food processing by Benjamin K Simpson

Topics	Contact hours
Introduction to nutrition, types of sources of nutrition, energy yielding, body building and protective group of foods, identifying nutritional status of a nation, nutritional intervention by governments – fortification of foods, regulatory government authorities	2
Biochemical and physiological role of carbohydrates – classification of carbohydrates, caloric value, sources, functions, digestion, absorption storage and malnutrition	2
Biochemical and physiological role of fats – classification, calorie value, sources, essential fatty acids, animal vs plant fats, saturated vs unsaturated fats, main functions, storage in relation to obesity, digestion and malnutrition	4
Biochemical and physiological role of proteins – classification of amino acids, essential vs non-essential, classification of proteins in view of nutrition – complete proteins, incomplete proteins, animal vs plant sources, protein quality determination and indexes (Biological value, net protein utilization, protein efficiency ratio, amino acid scores...) digestion, functions, storage and malnutrition	4

Energy – determination of calorie content of foods, units – calorie, joules, energy requirements of different age groups and different socio-economic groups, Body mass index (BMI), Basal metabolic rate (BMR) relation to calories, factors effecting BMR, calorie deficiency and excess calories-body response, obesity.	4
Micronutrients – vitamins- classification, water soluble, fat soluble, role in maintaining health and offering protection from diseases,	2
Micronutrients – minerals – major minerals like calcium, phosphorus, magnesium Trace elements – like zinc, copper, cobalt, role in metabolism, sources and associated diseases and iron, role and functions in human body, major nutritional sources,	2
Electrolytes – sodium, chloride, potassium, role in water balance, water toxicity,	2
Nutritional requirements of special conditions like Diabetes, Kidney failure, obesity and diet planning for these conditions. Diet planning for special physiological conditions like pregnancy and lactation	4

Assessment Tasks for Students during the Semester

Assessment task	Week due	Marks
1st continuous assessment	5	10
2nd continuous assessment	10	15
Assignment and quizzes	Along the semester	5
Practical	Along the semester	30
Final exam	At end of the semester	40