



**College of Food and Agricultural Sciences**  
Department of Food Sciences and Nutrition

**Curriculum**  
**For Bachelor of Agricultural Sciences in Food Sciences and**  
**Human Nutrition Program**

2012

## **B.Sc. Program in Food Sciences and Human Nutrition**

The department of Food science and Nutrition has developed along with the first scientific advances in the field of food science and nutrition and in response to the need of the development in the kingdom of Saudi Arabia. The department was established in 1385H, and named as department of Food Industries. In 1401H, the department became independent department, awarding B.Sc. in Food Science. The name of the department was changed to the department of Food Science which included all the fields of food sciences and technology. In 1410H, the department has launched a new program of study that qualifies students to work in the field of food and nutritional sciences. In the same year a joint master degree program was established (with the female program in nutrition and home economic) which offer M.Sc. degree in human nutrition. Program offering M.Sc. Degree in Food science was established in 1413 H. In 1417H, the department name was changed to department of Food Science and Nutrition to reflect all the fields in the department. Students consequently awarded B.Sc. degree in food science and nutrition. In 1425H, Ph.D. program in human nutrition for female student was established. In 1427H, a new program of study was developed to improve student qualification in human nutrition field.

The above review explained the development achieved in the department of food science and human nutrition along with its efforts to keep up with the scientific advances in the fields of food science and human nutrition as well as the developmental needs in the kingdom of Saudi Arabia. There is a strong relationship between health and nutritional status which is in turn affected by economic situation. The rapid development in the kingdom of Saudi Arabia has helped in the development of food and nutritional sciences in the department. The economical development in the Kingdom led to a drastic change in nutritional habits that led to many health problems in Saudi society. Despite the importance of food and nutritional studies to compact these problems, the Saudi universities are in need for the development of academic program in these two fields. Therefore, the college of Food and Agriculture Sciences, represented in the department of Food Science and Nutrition has taken this task.

### **Vision:**

To be Excellence in teaching and learning, scientific research and community service in the areas of food and human nutrition.

### **Mission:**

Effective contribution to the development of the areas of food and human nutrition and community service through the qualification of human resources, creating an environment of excellence in scientific research, deepening the knowledge and dissemination of food and nutrition awareness and providing advisory services and exchange of experiences with partners.

**Objectives of the Department:**

- 1) To attract outstanding students and qualify them highly in the areas of food and human nutrition.
- 2) Excellence in scientific research and the dissemination of nutrition awareness.
- 3) To provide national studies relating to food and human nutrition.
- 4) Diversify sources of funding for the department.
- 5) Community Service.

**Proposed program of study in Food Science major (B.Sc.):**

The program was prepared according to academic accreditation requirements by adapting courses from similar programs in international universities.

**Principles followed in the development of the program:**

1. Students have to pass preparatory year.
2. Adaption of credit hours system.
3. The courses have to meet the requirements accreditation of the Institute of Food Technologists (IFT) and Academy of Nutrition and Dietetics (AND).
4. Benchmarking of programs in food science from some accredited international universities.
5. Adaption of some courses from other departments in the college and university that are related to the discipline for student qualification.
6. Fulfill of cooperative education (internship) which is required by the academic accreditation.

**Appendix:**

Copies of IFT requirements and study plans for some international universities used as benchmarking are attached.

## Curriculum for Food Sciences and Human Nutrition Program

### First : Preparatory Year Courses (31hrs)

Code No.	Course Name	Credit hrs.
ENGL 140	English Language 1	8
MATH 140	Mathematics 1	2
CSK 140	Communication Skills	2
TEC 140	Computer Skills & Information Tech.	3
ENGL 150	English Language 2	8
MATH 150	Mathematics 2 (calculus)	3
LTS 140	Learning, Thinking and Research Skills	3
CHS 140	Health and Fitness	1
ENT 101	Entrepreneurship	1
	Total	31

### Second : University Requirements (8 hrs)

Code No.	Course Name	Credit hrs
IC 101	Introduction to Islamic Culture	2
IC 102	Islam and Community Structure	2
IC 103	Economic System in Islam	2
IC 104	Principles of Political System in Islam	2
	Total	8

### Third: College Requirements:

#### Basic science Courses (16 hrs.)

Code No.	Course Name	Credit hrs.	prerequisite
BOT 102	Botany	3(2+1)	none
ZOO 103	Principles of Zoology	3(2+1)	none
CHEM 103	General Chemistry (1)	3(3+0)	none
CHEM 104	General Chemistry Lab.	1(0+1)	none
PHYS 101	General Physics - 1	4(3+1)	none
STAT 106	Bio Statistics	2(2+0)	none
	Total	16	

### Fourth: Obligatory Requirement for Specialization

#### 1- Obligatory courses of basic sciences (11 hrs.)

Code No.	Course Name	Credit hrs.	prerequisite
CHEM 108-1	Introductory Organic Chemistry	4(3+1)	none
BCH 101	General Biochemistry	4(3+1)	none
ZOO 332	General Physiology	3(2+1)	103 ZOO
	Total	11	

#### 2- Obligatory courses from College Departments and University: (14 hrs.)

Code No.	Course Name	Credit hrs.	prerequisite
PPS 201	Principles of Plant Production	3(2+1)	BOT 102
ANPR 106	Animal Production Systems	2(2+0)	none
AGEC 205	Principles of Agricultural Economics	3(3+0)	none
PLPT 211	Agricultural Microbiology	3(2+1)	none
CHS 470	Nutrition and Disease	3(3+0)	FSN 206
	Total	14	

**Department Obligatory Courses (28 hrs.):**

<b>Code No.</b>	<b>Course Name</b>	<b>Credit hrs.</b>	<b>prerequisite</b>
FSN 202	Principles of Food Science	2(2+0)	none
FSN 206	Principles of Human Nutrition	2(2+0)	BCH 101
FSN 315	Nutritional Biochemistry	3(3+0)	FSN 206
FSN 316	Food Chemistry	3(3+0)	BCH 101
FSN 317	Food Analysis	3(1+2)	FSN 316
FSN 323	Food Microbiology	4(3+1)	PLPT 211
FSN 325	Sanitation and Food Safety	2(2+0)	FSN 323
FSN 352	Food Processing and Preservation	3(2+1)	FSN 323
FSN 372	Assessment of Nutritional Status	2(1+1)	FSN 206
FSN 376	Diets Planning	2(1+1)	FSN 206
FSN 456	Quality Control and sensory Evaluation of Foods	2(1+1)	FSN 352 106 STAT
	Total	28	

**Fifth: Obligatory Courses from the dept. and other Departments**

**A-Supporting Courses for Cooperative Learning in Food Science Fields**

**Selecting 15 hrs. from the following courses: (15hrs)**

<b>Code No.</b>	<b>Course Name</b>	<b>Credit hrs.</b>	<b>prerequisite</b>
FSN 420	Food Biotechnology	2(2+0)	FSN 202 FSN 323 FSN 400
FSN 422	Food Service	2(2+0)	FSN 325 FSN 400
FSN 433	Dairy Science and Technology	4(2+2)	FSN 202 FSN 400
FSN 435	Dates Science and Technology	2(2+0)	FSN 202 FSN 400
FSN 437	Cereal Science and Technology	4(2+2)	FSN 202 FSN 400

FSN 439	Meat Science and Technology	4(2+2)	FSN 202 FSN 400
FSN 471	Development of Food Products	2(1+1)	FSN 352 FSN 400
AGEN 320	Principles of Food Process Engineering	3(2+1)	PHYS 101
	Total	23	

**B- Supporting Courses for Cooperative Learning in Human Nutrition Fields**  
**Selecting 15 hrs. from the following courses: (15hrs)**

Code No.	Course Name	Credit hrs.	prerequisite
FSN 361	Nutrition during the Life Cycle	2(2+0)	FSN 206 FSN 400
FSN 422	Food Service	2(2+0)	FSN 325 FSN 400
FSN 464	Community Nutrition	3(2+1)	FSN 206 FSN 400
FSN 465	Applied Nutrition	3(3+0)	FSN 206 FSN 400
FSN 472	Problems of Nutrition in Developing Countries	2(2+0)	FSN 206 FSN 400
FSN 477	Micronutrients	2(2+0)	FSN 315 FSN 400
FSN 481	Selected Topics in Food and Nutrition	2(2+0)	FSN 202 FSN 206 FSN 400
PA 104	Principles of public Management	3(3+0)	none
SOC 463	Medical Social Work	2(2+0)	none
	Total	21	

**C: Cooperative Learning**  
**FSN 400 (Cooperative Learning 12hrs)**

**Distribution of courses for food sciences and Human Nutrition B.Sc program  
(Male & Female Students)**

Code No	3rd level	Credit hrs
202 FSN	Principles of Food Science	2 (2+0)
101 IC	Introduction to Islamic Culture	2 (2+0)
101 PHYS	General Physics (1)	4 (3+1)
101 BCH	General Biochemistry	4 (3+1)
102 BOT	Botany	3 (2+1)
106 STAT	Bio Statistics	2 (2+0)
205 AGECE	Principles of Agricultural Economics	3 (3+0)
	<b>Total</b>	<b>20</b>

Code No	4th level	Credit hr
206 FSN	Principles of Human Nutrition	2 (2+0)
316 FSN	Food Chemistry	3 (3+0)
103 ZOO	Principles of Zoology	3 (2+1)
103 CHEM	General Chemistry (1)	3 (3+0)
104 CHEM	General Chemistry Lab	1 (0+1)
211 PLPT	Agricultural Microbiology	3 (2+1)
332 ZOO	General Physiology	3 (2+1)
	<b>Total</b>	<b>18</b>

Code No	5th level	Credit hrs
315 FSN	Nutritional Biochemistry	3(3+0)
317 FSN	Food Analysis	3 (1+2)
323 FSN	Food Microbiology	4 (3+1)
102 IC	Islam and Community Structure	2(2+0)
106 ANPR	Animal Production Systems	2(2+0)
108-1 CHEM	Introductory Organic Chemistry	4 (3+1)
	<b>Total</b>	<b>18</b>

Code No	6th level	Credit hrs
325 FSN	Sanitation and Food Safety	2(2+0)
352 FSN	Food Processing and Preservation	3(2+1)
372 FSN	Assessment of Nutritional Status	2(1+1)
376 FSN	Diets Planning	2(1+1)
456 FSN	Quality Control and sensory Evaluation of Foods	2(1+1)
103 IC	Economic System in Islam	2 (2+0)
201 PPS	Principles of Plant Production	3(2+1)
470 CHS	Nutrition and Disease	3(3+0)
	<b>Total</b>	<b>19</b>

Code No	7th level	Credit hrs
400 FSN	Cooperative Learning	12
	<b>Total</b>	<b>12</b>

Code No	8th level	Credit hrs
104 IC	Principles of Political System in Islam	2(2+0)
Supporting Courses for Cooperative Learning in Food Science Fields Choose 15 credit hrs		
420 FSN	Food Biotechnology	2(2+0)
422 FSN	Food Service	2(2+0)
433 FSN	Dairy Science and Technology	4(2+2)
435 FSN	Dates Science and Technology	2(2+0)
437 FSN	Cereal Science and Technology	4(2+2)
439 FSN	Meat Science and Technology	4(2+2)
471 FSN	Development of Food Products	2(1+1)
320 AGEN	Principles of Food Process Engineering	3(2+1)
	<b>Total</b>	<b>17</b>

Code No	8th level	Credit hrs
104 IC	Principles of Political System in Islam	2(2+0)
Supporting Courses for Cooperative Learning in Human Nutrition Fields Choose 15 credit hrs		
361 FSN	Nutrition during the Life Cycle	2(2+0)
422 FSN	Food Service	2(2+0)
464 FSN	Community Nutrition	3(2+1)
465 FSN	Applied Nutrition	3(3+0)
472 FSN	Problems of Nutrition in Developing Countries	2(2+0)
477 FSN	Micronutrients	2(2+0)
481 FSN	Selected Topics in Food and Nutrition	2(2+0)
104 PA	Principle of General Administration	3(3+0)
463 SOC	Medical Social Work	2(2+0)
	<b>Total</b>	<b>17</b>



# Curriculum for Food Science and Human Nutrition Program

## Courses contents

### **FSN 202: Principles of Food Sciences** **2(2+0)**

Overview of food –Nutritional status in the Kingdom and worldwide – Food Groups ( milk- meat, legumes and eggs – vegetables – fruits – cereals and bread products ) – Physical, chemical and microbial spoilage of foods – introduction to food preservation – Food commodities ( milk and dairy products, vegetables and fruits, cereals, meats, lipids and sugars).

Prerequisite:	None
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### **FSN 206: Principles of Human Nutrition** **2(2+0)**

Introduction to the science of nutrition – Nutrients ( carbohydrate, proteins, lipids, vitamins, minerals and water) – Functions, sources and body needs of nutrients – balanced diet – Digestion, absorption and metabolism of macronutrients – food energy and its determination and estimation of body energy needs – Malnutrition diseases.

Prerequisite:	BCH 101
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### **FSN 315: Nutritional Biochemistry** **3 (3+0)**

Metabolisms of carbohydrates, lipids and protein – Integration and regulation of metabolism – Roles of vitamins in metabolism (B1, B2, niacin, B6 and pantothenic acid) – Metabolism of vitamins and minerals.

Prerequisite:	FSN 206
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### **FSN 316: Food Chemistry** **3 (3+0)**

Physical, chemical and functional properties of water, carbohydrates, proteins and lipids in foods – The roles of enzymes and food additives in foods – chemical changes and integrations among principle components of foods during handling and production processes – Physical, chemical and stability of vitamins and pigments – Chemical reactions in food such as browning reactions and lipid oxidation.

Prerequisite:	BCH 101
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### **FSN 317: Food Analysis** **3 (1+2)**

Principle methods of chemical and physical analysis of food composition. Methods of sampling and handling of samples for analysis – preparation of standard solutions – Preparation of buffer solutions – Method of titration - Determination of moisture, ash, fat, fibers, protein and sugars – Spectrophotometry and chromatography and their applications in foods analysis.

Prerequisite:	FSN 316
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### **FSN 323: Food Microbiology** **4(3+1)**

Important microbial groups (bacteria, molds and yeasts) in food – Factors affecting the microbial activities in food – Microbial spoilage of food and its indicators – Controlling microorganisms in food – Microbiology of different food products – Pathogens and food borne diseases.

Prerequisite:	PLPT 211
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**FSN 325: Sanitation and Food Safety** **2(2+0)**

Health hazards associated with food- food safety elements (law and regulations, inspection, surveillance, investigation, recall and tracing....) - food safety systems (good manufacturing practices, standard operating procedure, hazard analysis and Critical control points...) - water safety in food premises – solid and liquid waste treatment - inspection planning - cleaning and sanitation - pest control in food premises - inspection and skills of writing reports.

Prerequisite:	FSN 323
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**FSN 352: Food Preservation and Processing** **3(2+1)**

Technologies of preservation and processing and the relationship between them – Preparation of animal and plant raw materials for the methods of preservations (refrigeration, freezing, thermal processing) and processing preservation (canning, pickling, salting, smoking, concentration) and methods of processing (modified processing, extraction, drying) and nontraditional methods of processing (food irradiation) – Development of new products – traditional and innovative packaging systems (smart packaging).

Prerequisite:	FSN 323
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**FSN 361: Nutrition During Life Cycle** **2(2+0)**

Nutrition during pregnancy – Nutrition during lactation – Nutrition of infants – Nutrition of preschool children – Nutrition of school children – Nutrition of adolescents – Nutrition of adults – Nutrition of the elderly.

Prerequisite:	FSN 206 + FSN 400
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**FSN 372: Assessment of Nutritional Status** **2(1+1)**

Introduction to nutritional assessment – Anthropometric methods – Biochemical methods – Clinical methods - dietary intake methods –assessment of body composition – assessment of vitamins status – assessment of minerals status – assessment of macronutrients status.

Prerequisite:	FSN 206
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**FSN 376: Diets Planning** **2(1+1)**

Dietary standards –Food composition tables and their use –Adequate diet – Use of food exchange system and food groups for planning adequate diet – Estimation of human energy requirements – methods of evaluating diet and nutritional status – Diet planning applications.

Prerequisite:	FSN 206
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**FSN 400: Cooperative Learning** **12(0+12)**

The student shall work continually for 27 weeks at a food establishment which he selected with the approval of the department. The student will be evaluated by the training supervisor and the academic advisor on the bases of his abidance to the training program and schedule and the reports he submit during training and on the final training report presentation and discussion.

Prerequisite:	To finish 102 Credit hrs.
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**FSN 420: Food Biotechnology** **2(2+0)**

Overview of biotechnology and its historical development – Principles and procedures of biotechnology and its applications in food processing – Industrial fermentations – Types of bioreactor – Use food processing wastes in production of materials of economic value – Enzymes and food processing – New topics in foods biotechnology.

Prerequisite:	FSN 202 + 323 FSN + FSN 400
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**FSN 422: Food Service** **2(2+0)**

Types and management of food service systems – Designing the food service systems and preparation of food menus and the factors affecting that – Economical and nutritional basis of food selection –Scientific and technical considerations of meal preparation and serving.

Prerequisite:	FSN 325 + FSN 400
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**FSN 433: Dairy Science and Technology** **4(2+2)**

Composition and properties of milk - Factors influencing the composition of milk - Sanitary practices in milk production - Changes in milk during storage and processing - Processing of pasteurized and long life milk - Cultures and their preparation -Processing of fermented dairy products - Processing of recombined dairy products -Processing of milk fat products, concentrated and dry milk products - Processing frozen desserts.

Prerequisite:	FSN 202 + FSN 400
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**FSN 435: Dates Science and Technology** **2(2+0)**

Kingdom production of dates – Stages of dates ripening – Nutritional components of dates – Physical and chemical properties of dates – Processing of dates (sorting, washing, grading, sterilization, package, storage, freezing and drying) – date products – date in other food products – dates by products.

Prerequisite:	FSN 202 + FSN 400
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**FSN 437: Cereal Science and Technology** **4(2+2)**

Cereal classification according to type and use – Grain storage and pre-processing- Grain dry milling – Rice and rice processing – Pasta : wheat durum products like Macaroni and spaghetti – Grain wet milling : starch , gluten and syrup – Grain flour and flour processing - Biscuit and cake production – Breakfast cereals production.

Prerequisite:	FSN 202 + FSN 400
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**FSN 439: Meat Science and Technology** **4(2+2)**

The economic and nutritional values of meat and meat products – Slaughterhouse and its importance – Meat carcasses(major cuts and chemical composition)- Structure and functions of meat muscle- postmortem changes in meat muscles- Factors affecting meat palatability- meat type identification- poultry slaughter and processing- Chemical and physical characteristics of fish – meat, poultry and fish preservation and storage- meat and fish processed products (cured meat products, sausages, smoked meat, dried meat, canned meat, canned fish, smoked fish and dried fish products)- Meat, poultry and fish by-products.

Prerequisite:	FSN 202 + FSN 400
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**FSN 456: Quality Control and sensory Evaluation of Foods** **2(1+1)**

Introduction to quality control - Quality aspects and their measurement - Food regulation in the Kingdom - Quality management systems - ISO 9000 standards - Statistical quality control methods - Sensory attributes - Purpose and applications of sensory evaluation in food - Quantitative overall and attribute difference tests - Affective tests (consumer tests) - Descriptive analysis methods.

Prerequisite:	FSN 352 + 106 STAT
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**FSN 464: Community Nutrition** **3(2+1)**

General principles in community nutrition – Designing , executing and evaluating community nutrition programs – Nutritional intervention – food information– Nutritional programs and group nutrition – Roles of local and international organizations in community nutrition.

Prerequisite:	FSN 206 + FSN 400
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**FSN 465: Applied Nutrition** **3(3+0)**

Study and evaluation of food habits - Nutrition education – Malnutrition diseases – In field nutritional Studies- Nutrition of athletes and vegetarians.

Prerequisite:	FSN 206 + FSN 400
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**FSN 471: Development of food Products** **2(1+1)**

Food ingredients function and selection. Initial stages of product development, generation of ideas to formal presentation of product concept. Implementation stage, preliminary product description, proto type development, product testing including sensory evaluation.

Prerequisite:	FSN 352 + FSN 400
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**FSN 472: Problems of Nutrition in Developing Countries** **2(2+0)**

Identification and quantitative assessment of malnutrition in developing countries – Social, political, economic, and geographic ecology of malnutrition and its impact on health – Protein –energy malnutrition – Vitamin and mineral deficiency – Intervention organizations, programs, and efforts.

Prerequisite:	FSN 206 + FSN 400
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**FSN 477: Micronutrients** **2(2+0)**

Vitamins and minerals: Food sources – Bioavailability – physiological functions – Diseases associated with deficiency of vitamins and minerals – toxicity.

Prerequisite:	FSN 315 + FSN 400
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**FSN 481: Selected Topics in Food and Nutrition** **2(2+0)**

Selected topics in the current knowledge of the different aspects of food and human nutrition from scientific periodicals in English language.

Prerequisite:	FSN 202 + FSN 206 + FSN 400
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