

**MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATION OF
THE REPUBLIC OF UZBEKISTAN**

**URGENCH STATE UNIVERSITY
NAMED AFTER ABU RAYHAN BERUNI**

"APPROVED"
Vice-Rector for Academic Affairs
_____**S.U. Khodjaniyazov**
" ____ " _____ 2025

"BASIS OF FOOD SAFETY"

SYLLABUS

Knowledge sector:	700000 - Production technical industry
Education sector:	720000 - Production Technology
Field of study (specialty)	60720100 - Food Technology (Food Safety)

Urgench – 2025



Subject Syllabus / Module
Faculty of Chemical Technology
Field of Study
60720100 - Food Technology (Food Safety)

Name of the subject:	<i>Basis of Food Safety</i>
Subject type:	Mandatory
Subject/Module Code:	OOXA1404
Course:	2
Semester:	4
Form of study:	Full-time
Class format and allocated hours per semester:	120
Lectures	16
Practical classes	14
Laboratory classes	16
Seminar	-
Independent study	74
Number of credits:	4
Knowledge assessment form:	Exam (written)
Language of instruction:	Uzbek / Russian / English

I. Course Objective (CO)	
CO1	To explain to students the conditions and rules for receiving raw materials and further production of food products at food-producing enterprises, as well as to develop knowledge and skills in properly conducting quality control of raw materials and finished products, comprehensively studying the composition of food raw materials, semi-finished products and all additives, examining the influence of temperature changes, chemical and biological effects on products, teaching control processes (contaminants) and methods of monitoring technological, medical-toxicological and regulatory indicators that ensure product safety.

Basic knowledge necessary for mastering the science	
1.	KIMY11208 - Chemistry
2.	OOK1204 - Food Chemistry
3.	OOB1304 - Food Biochemistry
4.	OOXA13410 - Food Raw Materials and Commodity Science
5.	OOSUM2308 - General and Special Equipment of the Food Industry

Learning outcomes of the subject - formed competencies (SC)
<i>As a result of mastering the subject, the student must know:</i>

SC1	Problems and prospects of the food industry;
SC2	Interrelations between food industry enterprises;
SC3	Scientific basis of food technology;
SC4	Thermophysical properties of food products;
SC5	Components that pose a threat to human health;
SC6	Safe production technologies;
SC7	Nutritional value of food products;
SC8	Main mechanisms for optimal heat treatment of food products;
SC9	Principal diagrams of the main processes;
SC10	Basic research methods for conducting qualitative and quantitative analysis of food raw materials.
<i>As a result of mastering the subject, the student must be able to apply:</i>	
SC11	Knowledge of the fundamental schemes for the production and processing of oils, fats, flour, grains, bread, pasta, confectionery, wine, beer, spirits, meat, dairy, fish, and canned products;
SC12	Technology of fermentation production and winemaking;
SC13	General technology of grain products;
SC14	Raw materials and products of the oil and fat industry;
SC15	Technological schemes for the production of distilled fatty acids and soap;
SC16	Modern experimental methods for working with food raw materials, semi-finished products, and finished food products;
SC17	Determine the chemical qualitative and quantitative composition of the object under study;
SC18	Provide reasoned selection of testing methods for specific tasks.
<i>As a result of mastering the subject, the student must possess the following skills:</i>	
SC19	Determination and quality control of grain and grain products, vegetable oils, meat, dairy, fish and canned products;
SC20	Analyze the quality of fermentation industry products;
SC21	Determine the required quality of bread, pasta, and confectionery products;
SC22	Processing and rational utilization of food industry waste;
SC23	Theoretical foundations of the technology for producing safe inhibitors, vitamins, sugar substitutes, flavoring and coloring components;
SC24	Toxic properties and classification of chemical substances;
SC25	Basic principles of protection against radioactive substances in food and their mechanism of action on the human body;
SC26	Interrelation between biological, chemical, and physical hazards;
SC27	Basic chemical and physicochemical analysis methods for determining the properties and technological indicators of materials and finished products used.

II. TOPICS INCLUDED IN THE SUBJECT		
2.1. Lecture topics (L):		
L1	Topic 1. Scientific and practical aspects of rational nutrition. Food safety and its main assessment criteria.	2
L2	Topic 2. Biological hazards in food products. Microbiological indicators of food safety. Bacterial food intoxications. Mycotoxicoses. Foodborne infections	2
L3	Topic 3. Hazards of foreign substances from the external environment. Classification of foreign contaminants - xenobiotics.	2
L4	Topic 4. Metal contamination. Radionuclides	2
L5	Topic 5. Pesticides. Nitrates, nitrites and nitroso compounds	2
L6	Topic 6. Hazards of natural components in food products (of plant and animal origin). Genetically modified food sources	2
L7	Topic 7. Food additives. Technological processing aids. Biologically active additives	2
L8	Topic 8. Identification and adulteration of food products	2
	Total	16
2.2. Practical lesson topics (P)		
P1	Determining the average daily energy requirement for different groups of people	2
P2	Determining the energy value of food products	2
P3	Determination of the biological value of food proteins by calculating the amino acid score relative to the FAO/WHO standard scale	2
P4	Determination of the biological effectiveness of lipids in food products	2
P5	Determination of the nutritional value of food products	2
P6	Food quality control. Rheological properties of food products	2
P7	Main hazardous and harmful factors in food production	2
	Total	14
2.3. Laboratory Session Topics (LAB)		
LAB1	Determination of aflatoxins in food products	2
LAB2	Determining the presence of potato disease in bread and flour	2
LAB3	Determining the transparency and odor intensity of water	2
LAB4	Determination of nitrates and nitrites in milk and dairy products	2
LAB5	Determination of impurities and antibiotics in milk and dairy products	2
LAB6	Bioactive food additives (natural colorants). Determination of colorants in food products	2

LAB7	Bioactive additives (carbohydrates) used in food. Extraction of pectin by precipitation from fruits and vegetables rich in pectin	2
LAB8	Methods for identifying and detecting counterfeit products	2
	Total	16

2.4. Independent Work Topics (SR)		
SR1	Prepare a summary on the topic "Composition of food products: compounds of fundamental importance - nutrients; non-nutritive substances (ballast substances, protective food components, flavoring and aromatic substances, anti-nutritional components; foreign, potentially hazardous compounds of anthropogenic or natural origin - contaminants, xenobiotics, foreign chemical substances (FCS) "	6
SR2	Prepare a report on the topic "Definition, classification (bio-, chemo-, radio-) of xenobiotics. Main pathways of contamination of food products and food raw materials with xenobiotics."	6
SR3	Prepare a report on the topic "Contamination of food products by helminths. Basic terms, types of helminths, routes and modes of human infection. Characteristics of specific types of food-borne helminthiases (ascariasis, trichocephalosis, hymenolepiasis, enterobiasis) "	6
SR4	Prepare a report on the topic "Plant growth regulators. Natural and synthetic PGRs. Mechanism of action. Contamination prevention. Fertilizers: nitrogen, phosphorus, potassium, micronutrient fertilizers, complex fertilizers, organic fertilizers"	6
SR5	Prepare an essay on the topic "The harmful effects of synthetic food products and packaging materials, methods for their protection"	6
SR6	Prepare a report on the topic "The role of genetically modified food sources in the present day"	6
SR7	Prepare a report on the topic "Contamination of food products with substances used in animal husbandry"	6
SR8	Prepare a presentation on the topic "Contaminants subject to control in milk and dairy products: pesticides, antibiotics, toxic elements, aflatoxin M1, polychlorinated biphenyls, polychlorinated dibenzodioxins and dibenzofurans"	8
SR9	Prepare a report on the topic "Contaminants subject to control in vegetables, fruits, potatoes: pesticides, nitrates, patulin"	6
SR10	Prepare a report on the topic "Mycotoxins (aflatoxin B), deoxynivalenol (vomitoxin), zearalenone, T-2 toxin, patulin - their regulation in food raw materials, plant-based food products, aflatoxin M in milk and dairy products"	6

SR11	Prepare notes on the topic "Safety indicators of flour, cereal products, confectionery, and flavoring products: - flour and cereal products (flour, bread, cereals); - flavoring products (tea, coffee, table salt, vinegar, spices) "	6
SR12	Prepare notes on the topic "Safety indicators of fruits, vegetables, mushrooms, and their processed products; canned goods. Quality control of canned goods (for sterility, industrial sterility, spoilage agents, presence of pathogenic and toxigenic microorganisms) "	6
	Total	74

III. LIST OF RECOMMENDED LITERATURE	
Main literature	
1.	L.V. Dovchenko, V.D. Nadykta "Food Product Safety." Moscow: DeLi print. 2007.
2.	V.M. Pozdnyakovsky "Hygienic Foundations of Nutrition, Safety and Examination of Food Products." Textbook. 2nd ed., revised and supplemented. - Novosibirsk, 1999. - 448 p.
3.	I.A. Rogov, N.I. Dunchenko, et al. Safety of Food Raw Materials and Food Products. Study Guide. Novosibirsk, 2007.
4.	A.P. Nechaev, I.S. Vitol. Food Safety. Textbook: M., 1999.
Additional literature	
5.	Babanskaya N.G., Vasilyeva S.B., Poznyakovsky V.M. Safety of Food Raw Materials and Food Products: Textbook - / Kemerovo Technological Institute of Food Industry. - Kemerovo, 2005. - 140 p.
6.	Hoffman V.R. Environmental and Social Aspects of Food Raw Materials and Food Safety: Textbook. - Chelyabinsk: South Ural State University Publishing, 2004. - 551 p.
7.	Grigoryeva R.Z. Safety of Food Raw Materials and Food Products: Textbook. - Kemerovo Technological Institute of Food Industry. - Kemerovo, 2004. - 86 p.
8.	Temerbayeva M.V. Food Safety: Textbook. - Pavlodar: Innovative Eurasian University, 2012. - 268 p.

IV. ASSESSMENT OF STUDENTS' KNOWLEDGE

Assessment of students' knowledge is carried out in accordance with the Appendix to the Order of the Minister of Higher and Secondary Specialized Education of the Republic of Uzbekistan No. 19-2018 dated August 9, 2018 "Regulations on the System of Assessing Student Knowledge in Higher Educational Institutions." ([Regulations -https://lex.uz/docs/3916793](https://lex.uz/docs/3916793)).

V. TRAINING HOURS

The curriculum for this subject is designed for the 4th semester, and the teaching hours are as follows:

Semester	Number of weeks	Lectures	Practical classes	Laboratory classes	Classroom hours	Independent work	Total	Number of credits
4	15	16	14	16	46 (3 hours per week)	74	120	4
Total	15	16	14	16	46	74	120	4

VI. TYPES OF ASSESSMENT

6.1. In this semester, students' knowledge of the subject is assessed through interim and final examinations.

6.2. The interim exam is conducted once during the 7th-8th week of the 4th semester, during regular class sessions, to assess the student's knowledge and skills.

6.3. Assessment of the student's performance in practical and independent learning tasks, as well as their progress in these types of activities. The assessment will be based on the criteria outlined in Section VII.

If the educational process is carried out in the form of distance learning, then the student's practical (seminar) classes and independent study assignments, as well as their participation in these classes, are assessed in the Moodle system (<http://dl.urdu.uz>) and are evaluated based on the completion of tests or practical assignments for each subject in the system;

Type of classes	Number of assessments (evaluation)
Practical	1 time
Laboratory	1 time
Independent	1 time

- the results of the independent work are displayed in the "Independent Work Assignment" section of the system for the specified period, and assessment is conducted based on the criteria outlined in Section VII.

6.4. Student assessment in the form of an interim exam is based on the average score (calculated using the criteria given in Section VII) and is conducted in writing with 3-4 questions, followed by an oral defense of the answers.

If the educational process is carried out in the form of distance learning, then the interim student assessment is conducted as follows:

- based on the results of answers to 30 theoretical and practical test questions in the Moodle system (<http://dl.urdu.uz>);
- during the semester, taking into account the assessment of task completion worth 1.3 points, it is graded as "2," "3," "4," and "5."

6.5. The final assessment will be conducted at the end of the semester in written form with 3 questions to determine the extent to which students have mastered the theoretical knowledge and practical skills in this subject. The student will orally present their answers to the questions (criteria in section VII):

Question 1: theoretical;

Question 2: theoretical;

Question 3: practical.

Additionally, in the form of a test consisting of 30 questions.

If the educational process is carried out in the form of distance learning, the final assessment will be conducted in the Moodle system (<http://dl.urdu.uz>), in the form of a test consisting of 30 questions.

Furthermore, the average grade of the final assessment includes evaluation of the student's knowledge based on the completion of laboratory work, independent work, and the degree of completion of practical assignments.

VII. CRITERIA FOR ASSESSING STUDENTS' KNOWLEDGE

Students' knowledge is evaluated based on the following criteria:

- The student can make independent judgments and decisions, think creatively and independently, apply acquired knowledge, understand the essence of the subject (s), and demonstrate knowledge of the subject itself, as well as when using the test, the number of correct answers is 26-30 - grade - 5 (excellent);

A student who can independently observe, apply acquired knowledge, understands and knows how to express and explain the essence of the subject, demonstrates understanding of the subject, and when tested, achieves 22-25 correct answers - receives a grade of 4 (good);

A student who is able to apply acquired knowledge, understands, knows, and expresses the essence of the subject (s) and has a grasp of the subject (topic), and when tested, achieves 18-21 correct answers - receives a grade of 3 (satisfactory);

A student who has not mastered the academic program, does not understand the nature of the subject, has no concept of the subject, and when tested, achieves fewer than 18 correct answers - receives a grade of 2 (unsatisfactory).

Information about the course instructor:

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This work program was approved by Protocol No. __ of the University's Academic and Methodological Council meeting on ____ August 2025.

This work program was discussed at the meeting of the Faculty Council of "Chemical Technology" and approved by Protocol No. ____ on ____ August 2025.

This work program was approved by Protocol No. __ of the "Food Technology" Department meeting dated ____ August 2025.

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