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

URGENCH STATE UNIVERSITY

«APPROVED»
Rector of Urganch State University
_____ B. Abdullayev
20___ year «___»_____

«TECHNICAL CHEMICAL CONTROL» SCIENCE CURRICULUM

Field of knowledge:	**700000 - Production and technical field**
Educational area:	**720000 - Manufacturing technology**
Code and name of educational division:	**60720100 – Food technology (Food Safety)**

Urgench – 2024

Subject/module code B66TCHC	Academic year 2024-2025	Semester 7	ECTS - Credits 5	
Subject/module type Choice is science	Language of education English		Class hours per week 6	
	Subject name	Studies in auditorium (hours)	Independent (hours)	Total (hours)
1.	Technical chemical control	60	90	150

2.

I. The content of science

The purpose of teaching science is to properly control all technological processes, from the reception of raw materials in production enterprises, to storage, production, placing of production and finished products in warehouses and their delivery to consumers. teaches the correct analysis of quality indicators of raw materials, semi-finished and finished products.

The task of science is to introduce students to the theoretical basis of types, classes of food products and their preparation technologies. In addition, theoretical knowledge, practical skills, a methodical approach to changes in the field and the formation of a scientific worldview, to know the content and essence of the laws related to education, to reveal the importance of a person's place in life by forming a personal attitude towards them. Knowledge of normative documents of the higher education system, organization of the educational process in the credit-module system, higher education technologies and interactive education methods; teaches the system of disciplines and personnel requirements of customers in the canning industry specialty.

II. The main theoretical part (lecture sessions)

II.I. The subject includes the following topics:

Topic 1. Introduction. Establishment of technical and chemical control in the food industry and its tasks. The purpose and tasks of science. The role of technological and physical- chemical control in production. Raw material standardization system. The main indicators of product quality. Results of socio-economic reforms in our republic, territorial problems and achievements of science, technology and technology

Topic 2. Product quality improvement. Determining product quality and evaluating its level. Standardization of product quality. Product quality management and assessment methods. Complex systems in product quality management. Types of product quality control. Checking the quality of food products . Technical and chemical control during the production process. Production technological laboratory (ICHTL) organization and its tasks. State of the laboratory and its duties . Establishment of a factory laboratory . Technical and chemical control and transfer during the production process. Determining product quality and evaluating its level . Product quality indicators. Food quality management. Product quality development and management system.

Topic 3. Methods of obtaining samples for product analysis and their analysis . The main indicators of product quality and their determination methods. Determining the

conformity of the quality of products with standard requirements . Selection of samples for determination of product quality and chemical analysis . Sampling during reception, storage and processing of raw materials. Potentiometry method. Determination of pH by potentiometric method. Potentiometric titration method . Calorimetry method . Refractometry method .

Topic 4. Determination of meat quality by physico-chemical method. Organization of control in the meat products production industry Meat raw materials and their types.

Topic 5. Canned meat techno-chemical control during the production process. Methods of determining the division of meat into categories and varieties.

Topic 6. Quality control of sausage products. Quality control of sausage products. Determination of quality indicators of sausage products. Determination of the quality of sausage products in laboratory conditions. Quality control of canned meat products . Requirements for the quality of raw materials, containers and finished products. Processing of the production process through technological stages.

Topic 7. Quality control of canned meat products. Determination of meat quality by physico-chemical method. Determination of meat quality by bacterioscopic and microbiological methods. Meat processing by cooling.

Topic 8. Milk and technical and chemical control during the production of dairy products . Milk Place of technical and chemical control in the production process. Chemical composition of milk . Milk protein, sugar , mineral salts, vitamins, acids and their properties . Analysis of milk . Quality control of milk separation and cream preparation . Examination of the coagulation duration of milk by means of coagulating enzymes . Organoleptic assessment of milk quality.

Topic 9. Quality control of dairy products . Control of cream production. Quality control of dairy products. Control of cream and cream production. MTX requirements for cream paste and sour cream . Requirements for the quality of raw materials. Control of the technological process of cream and cream production. Preparation for sampling and analysis. Finished product quality control.

Topic 10. Control of cheese production Control of cheese preparation. Control of ice cream production. Control of canned milk production.

Topic 11: Techno-chemical control in grain and grain products processing enterprises

Topic 12: Techno-chemical control in flour mills

Topic 13: Techno-chemical control in cereal factories

Topic 14. Techno-chemical control in feed processing enterprises

Topic 15. Technical chemical control in pasta production

III. Laboratory training instructions and recommendations
The following topics are recommended for laboratory training:

1. Technical safety rules in technochemical laboratories
2. Determining the mass fraction of moisture in canned meat and determining the physicochemical methods of quality assessment
3. Sausage quality control and moisture determination
4. Determining the amount of table salt in sausage products
5. Determination of nitrate content in meat products
6. Meat quality control.semi-finished products: qualitative determination of filler in meat, natural minced meat, determination of the mass fraction of minced meat filling in semi-finished products in frozen dough
7. Determination of moisture content in semi-finished products
8. Determination of acidity of cottage cheese and cottage cheese products
9. Determining the mass fraction of fat in ice cream
10. Determination of mass fraction of moisture in cheeses
11. Methods of technical chemical control of butter
12. Determining the mass fraction of dry non-fat milk residue (somo) in butter
13. Determination of the acidity of butter using the titrometric method
14. Confectionery analysis. Methods of determining the quality of honey
15. Checking the quality of bread and bakery products

IV. Independent education and independent work

Recommended topics for independent study:

It is recommended to prepare abstracts and present them by students on independent learning topics.

1. Technical chemical control in the production of meat and dairy products.
2. Technical chemical control in the production of grain products.
3. Methods of obtaining and analyzing samples for analysis.
4. Organization of technical chemical control in food enterprises.
5. Requirements for the quality of raw materials, finished and semi-finished products and their standardization procedure.
6. Automation of techno-chemical control.
7. Quality control of meat, animal fats.
8. Technical and chemical control in production of sour dairy products, cooked sausages, semi-smoked sausages
9. Grain receiving enterprises. The scheme of analysis of seeds in the laboratory
10. Wheat grain quality analysis scheme. Report on the quality of storage of grain products
11. Poultry preparation and storage technology
12. Technology of preparation of semi-finished meat products
13. Technology of making smoked meat products
14. Quality control of meat products
15. Prevention of falsification of meat products

	V. Learning outcomes of the subject - Formed Competencies (FC) ***As a result of mastering the subject, the student should be able to apply:*** • - The student is able to take samples of the raw materials given to the processing and the finished and semi-finished product formed in its processing, as well as waste, plan and correctly determine whether the results obtained meet the standard requirements; • it is necessary to have the skills to properly conduct the technological and physico-chemical control of the processes of processing, storage and production of meat-milk and cereals
	VI. Educational technologies and methods: • lectures • individual tasks • working in groups • showing presentations • individual projects • teamwork and project protection
	VII. Requirements for obtaining credits: Full knowledge of theoretical and methodological concepts of science, the ability to solve small practical problems, independently create methods, structures and perform tasks and tasks in the current, intermediate forms of control, submission of written works for final control.
	VI. List of recommended literature
	Main literature
1	Алимарданова М. Технохимический контроль мясных продуктов. Практикум. — Астана: Фолиант, 2010. — 224 с.
2	Антипова Л.В., Глотова И.А., Рогов И.А. Методы исследования мяса и мясных продуктов.М.: Колос, 2001. — 376 с: ил. (Учебники и учеб. пособия для студентов высш. учеб. заведений).
3	PJ Fellows. Food Processing Technology. /Woodhead Publishing Series in Food Science, Technology and Nutrition Principles and Practice./Fourth Edition./ ISBN: 978-0-08-101907-8 (print). ISBN: 978-0-08-100523-1 (online) © 2017, 2009, 2000 Elsevier Ltd. All rights reserved. First Edition copyright: 1988, Ellis Horwood Ltd. 1226 p.
4	Food Analysis. Fifth Edition. Edited by S. Suzanne Nielsen. Purdue University West Lafayette, IN, USA. ISSN 2214-7799 (electronic). ISBN 978-3-319-45776-5 (eBook). © Springer International Publishing 2017. 644 p.
5	Manuals of food quality control. Food and Agriculture Organization of the United Nations. Rome 1986. Reprinted 1997. 338 p.
6	Bekboev S. and others. State control over the quality of grain products in Uzbekistan. Tashkent "Shark". 2002 y.
7	Tursunkho'jaev P.M. and others. Determining the quality of grain and settlement procedure with grain processing enterprises . Tashkent "Talkin". 2005
8	S Horiev AJ Dodayev QO Technical and chemical control in food production. Study guide for undergraduate students of Higher Education Institution. TKTI, 2014. 122b.
	Additional literature
1	Н.И.Назаров и другие. Общая технология пищевых производств.Учебник.-М. Легкая и пищевая промышленность. 1985
2	Romeo T. Toledo • Rakesh K. Singh •Fanbin Kong. Fundamentals of Food Process Engineering. Fourth Edition. / ©Springer International Publishing AG, part of Springer

	Nature 2007, 2018.2nd edition ©Aspen Publishers, Inc. 1999. ISSN 2214-7799 (electronic). ISBN 978-3-319-90098-8 (eBook). 463 p
3	Food technology: applied research and production techniques/edited by Murlidhar Meghwal, PhD, Megh R. Goyal, PhD, PE, Mital J. Kaneria, PhD. International Standard Book Number-13: 978-1-77188-509-6 (Hardcover) International Standard Book Number-13: 978-1-315-36565-7 (eBook) © 2018 by Apple Academic Press, Inc. 413 p.
4	Handbook of Food Science and Technology 1. *Food Alteration and Food Quality. Edited by* Romain Jeantet Thomas Croguennec Pierre Schuck Gérard Brulé. © ISTE Ltd 2016. ISBN 978-1-84821-932-8
5	A complete Course in Canning and Related Processes-13 th Edition. Revised and Enlarged by Donald L. Downing. Geneva, New York, 1996. ISBN 0-930027-25-6 (Set); ISBN 0-930027-26-4 (BK I); ISBN 0-930027-27-2 (BK II); ISBN 0-930027-28-0 (BK III).
6	Food Canning Technology/edited by Jean Larousse and Bruce E. Brown. ISBN 0-471-18610-4. 1997 Wiley-VCH.Inc. Walstra, Pieter. Dairy science and technology / Pieter Walstra, Jan TM Wouters, TJ Geurts.--2nd ed. Includes bibliographical references. ISBN 0-8247-2763-0 (alk. paper). © 2006 by Taylor & Francis Group, LLC. 768 pages.
7	Walstra, Pieter. Dairy science and technology / Pieter Walstra, Jan TM Wouters, TJ Geurts.--2nd ed. Includes bibliographical references. ISBN 0-8247-2763-0 (alk. paper). © 2006 by Taylor & Francis Group, LLC. 768 pages.
8	Thermal Food Processing Edited by Da-Wen Sun. International Standard Book Number-10: 1-57444-628-2 (Hardcover), International Standard Book Number-13: 978-1-57444-628-9 (Hardcover), Library of Congress Card Number 2005048598. © 2006 by Taylor & Francis Group, LLC
9	А.А.Соколов, «Технохимический контрол в мясной промышленности» М.:, «Пищепромиздат» 1953.
10	А.Т.Марх, Р.В.Кржевова. «Химико-технический контроль консервного производства» Учебник. –М.:Пищепромиздат, 1992. -435 с.
11	Amonova Z.M. Sut va sut mahsulotlari texnologiyasi asoslari, darslik. Toshkent 2008
	Information and electronic resources 1. http//www.ziyonet.uz. 2. http//www.tan.com.ua 3. http//www.cimbria.com 4. www .twirpx.com 5. http://slavoliya.ua 6. www.molbio.ru 7. www.biokim.ru 8. www.tcti.uz 9. www.urdu.uz – Urganch davlat universiteti sayti 10. http://dl.urdu.uz/ – UrDU elektron ta'lim tizimi
	This curriculum was approved by the minutes of the meeting no. 1 of the Department of «Food Technology» dated 26 – August 2024 and the minutes of the Educational and Methodological Council of the Faculty of Chemical Technologies no. 1 dated 29 - August 2024.
	Responsible for the module/subject: Ruzmetova D.T. Associate Professor of the Department of «Food Technology», PhD., docent
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