FACULTY OF PHARMACY

STUDY PROGRAM 0916.1 PHARMACY

DEPARTMENT OF PHARMACEUTICAL AND TOXICOLOGICAL CHEMISTRY

APPROVED
at the meeting of the Commission for Quality Assurance and Evaluation of the Curriculum, Faculty of Pharmacy
Minutes No. 2 of 21.12.2017
Chairman PhD. associate professor
UNCU Livia

APPROVED
at the Council meeting of the Faculty of Pharmacy
Minutes No. 2 of 22.12.2017
Dean of Faculty PhD. associate professor
CIOBANU Nicolae

APPROVED
at the meeting of the chair of Pharmaceutical and Toxicological Chemistry.
Minutes No. 3 of 03.11.2017
Head of chair PhD. professor
VALICA Vladimir

SYLLABUS

DISCIPLINE: **CHEMISTRY OF FOOD SUPPLEMENTS AND NUTRIENTS**

Integrated studies

Type of course: **Optional**

Chisinau, 2017

I. INTRODUCTION

- **General presentation of the discipline: place and role of the discipline in the formation of the specific competences of the professional / specialty training program**

Chemistry of food supplements and nutrients is a complex discipline, which encompasses the principles of healthy eating, but also those related to nutritional therapy, which is an important component of the treatment of many diseases. The concepts of content, processing, preserving, control of quality of food should be taught by students as a complement to their knowledge of pharmaceutical sciences.

The usefulness of the course ***Chemistry of food supplements and nutrients*** for pharmacist-students is the result of the immense assortment of dietary supplements present on the pharmaceutical market. Due to the content of biologically active substances, the use of supplements must be rational. Also, the food-drugs interactions may occur, that endanger the health and life of the patient. In this context, pharmacists must provide qualitative pharmaceutical assistance. The discipline ***Chemistry of food supplements and nutrients*** provides the opportunity to gain theoretical knowledge and practical skills to ensure an effective patient care.

- **Mission of the curriculum (aim) in professional training**

To provide for students the knowledge of treatment with nutritional and nutraceutical supplements, as well as development of critical analysis skills of the ensemble: diet, dietary supplements and drugs.

- **Language (s) of the course:** Romanian, English.
- **Beneficiaries:** students of the III-th year, faculty of Pharmacy, specialty PHARMACY.

II. MANAGEMENT OF THE DISCIPLINE

Code of discipline		**S.06.A.065**	
Name of the discipline		**Chemistry of food supplements and nutrients**	
Person(s) in charge of the discipline		PhD in pharmaceutical sciences, associate professor **Uncu Livia**	
Year	**III**	Semester	**6**
Total number of hours, including:			**60**
Lectures	**17**	Practical/laboratory hours	
Seminars	**34**	Self-training	**9**
Form of assessment	**C**	Number of credits	**2**

III. TRAINING AIMS WITHIN THE DISCIPLINE

At the end of the discipline study the student will be able to:

- ***at the level of knowledge and understanding:***

– the object of study and the objectives of the discipline;
– the terms nutraceuticals, functional foods, dietary supplements, the influence of processing technologies on the nutritional qualities of foods;
– the specificity of administration of food supplements according to age, associated diseases and individual peculiarities.

- ***at the application level:***

– theoretical knowledge in the practice of professional activity;
– practical skills for solving case studies;
– standardized schemes for the administration of nutraceuticals and dietary supplements;
– responsibility and persistence in pharmaceutical activity.

- ***at the integration level:***

– theoretical knowledge in professional activity;
– basic skills and methods necessary to solve case studies;
– the scientific basis for the correct interpretation and use of food supplements,
– decisions aimed at improving the pharmaceutical system.

IV. PROVISIONAL TERMS AND CONDITIONS

Students will delineate the terms of nutraceuticals, functional foods, dietary supplements; will learn to identify the composition, biological properties and applicative potential of these

products, in the context of an increased demand on the current market. Knowledge of nutrition during pharmaceutical studies is necessary, useful and indispensable to the extent that the pharmacist is a health advisor.

V. THEMES AND ESTIMATE ALLOCATION OF HOURS

Lectures, practical hours/ laboratory hours/seminars and self-training

No.	THEME	Number of hours		
		Lectures	Seminars	Self - training
I.	**Psychology and biology of nutrition.**			
1.	Psychology and biology of nutrition. Food management and food safety. Macronutrients and micronutrients.	3	4	-
II.	**Nutraceuticals, functional foods, food supplements, food additives.**			
2.	Isoflavones: sources and metabolism. Lycopene: food sources and properties. Wine and tea polyphenols and their biological role. Food supplements with lycopene, isoflavones, polyphenols.	2	4	1
3.	Conjugated polyunsaturated acids: natural sources. The intake of dietary fiber and their role in health. Food supplements with polyunsaturated acids and fibers.	2	4	1
4.	Supplements with probiotics and prebiotics.	2	2	-
5.	Food supplements with glucosamine, chondroitin, Q coenzyme, lutein, melatonin, carnitine.	1	4	-
6.	**Food additives. Chemistry and toxicology of Es.** *Control assessments.*	1	4	-
III.	**Nutrition in physiological states.**			
7.	Nutrition during pregnancy and lactation. Nutrition of pre-school, adults and elderly children.	2	4	2
IV.	**Nutrition in pathologies.**			
8.	Nutrition in atherosclerosis, heart failure and hypertension. Nutrition in diabetes, hyperlipidemia and obesity.	2	4	2
9.	Nutrition in gastrointestinal pathologies, in hepatobiliary insufficiency and renal failure insufficiency. Nutrition in allergy and asthma. Allergies caused by fruits and vegetables. Nutrition in anemia. Nutrition in cancer. Nutrition in tuberculosis. Nutrition in sexually transmitted diseases: AIDS, syphilis, gonorrhea. *Control assessments.*	2	4	3
Total		**17**	**34**	**9**

VI. REFERENCE OBJECTIVES OF CONTENT UNITS

Objectives	Contents units
Theme (chapter) 1. Psychology and biology of nutrition.	
• to define the fundamental notions of the discipline; • to understand the notion of nutritive value of foods; • to demonstrate abilities to analyze and systematize knowledge. • to apply the criteria for differentiation of normality and abnormality. • to integrate knowledge about promoting healthy lifestyles in everyday life.	Fundamental concepts of the discipline. The object of study of the discipline. Defining the concepts of normality and abnormality in medicine and psychology. Elements of health psychology.
Theme (chapter) 2. Nutraceuticals, functional foods, dietary supplements.	
• to define the notions of nutraceuticals, functional foods, dietary supplements; • to demonstrate abilities to analyze the treatment schedules; • to apply the knowledge gained for case study analysis; • to integrate the knowledge about diet in pharmaceutical practice.	Defining the notions of nutraceuticals, functional foods, dietary supplements. Exemples. Food Management and Food Safety.
Theme (chapter) 3. Nutrition in physiological states.	
• to possess the knowledge of special nutrition, by groups of consumers: children, elderly, pregnant women; • to demonstrate abilities of analysis of dietary; • to know the main strategies for optimizing the diet; • to integrate optimal decisions to ensure a balanced diet for the patient.	Special nutrition. Strategies for optimizing diet.
Theme (chapter) 4. Nutrition in patological states.	
• to know the particularities of the diet in the gastrointestinal pathologies, in hepatobiliary insufficiency and renal insufficiency, in allergy, bronchial asthma; • to know the main strategies for optimizing the diet; • to integrate optimal decisions to ensure a balanced diet for the patient.	Special nutrition. Strategies for optimizing diet. Strategies to ensure the patient compliance with the optimized diet.

VII. PROFESSIONAL (SPECIFIC (SC)) AND TRANSVERSAL (TC) COMPETENCES AND STUDY OUTCOMES

✓ Professional (specific) (SC) competences

- PC1. Identification and use of concepts, principles and theories of ***Chemistry of food supplements and nutrients*** in professional activities.
- PC2. Cognition, understanding and operation with theoretical knowledge and basic practical methods of the subject.
- PC3. Cognition and practical application of psychological knowledge in relation to the patient, taking into account the age and character of the person, the specific of the pathology, in order to ensure the therapeutic compliance.
- PC4. Solving case studies and indicating the optimized measures.
- PC5. Applying the principles and methods of optimization of the diet according to the individual particularities of the patient in the pharmaceutical activity.

✓ Transversal competences (TC)

- TC1. Apply rigorous and efficient work rules, manifest a responsible attitude towards the scientific and didactic field, optimally and creatively exploit their own potential in specific situations, observing the principles and norms of professional ethics in relation to the patient regarding the recommendation of dietary supplements.
- TC2. Ensure effective deployment and effective engagement in team activities.
- TC3. Identifying opportunities for continuous training and efficient use of learning resources and techniques for their own development.

✓ Study outcomes

At the end of the course the student will be able to:

- know the definitions of: nutraceuticals, functional foods, dietary supplements; the influence of processing technologies on the nutritional qualities of foods;
- know the specifics of administration of dietary supplements according to age, associated diseases and individual particularities;
- be able to identify the main types of mistakes most commonly encountered in setting up the diet;
- to formulate optimal decisions in optimizing the diet;
- apply methods of psychological knowledge of people in professional activity and everyday life to ensure their compliance with the recommendations of the pharmacist.

VIII. STUDENT'S SELF-TRAINING

No.	Expected product	Implementation strategies	Assessment criteria	Implementation terms
1.	Working with course material, electronic resources	Work systematically in the library and mediate. Exploring the current electronic sources on a topic under discussion.	1. Quality of formed judgments, logical thinking, flexibility. 2. The quality of the systematization of the informational material obtained by their own activity.	During the semester
2.	Essay and PPT presentation	Analysis of relevant sources on the topic of the essay. Analysis, systematization and synthesis of information on the proposed theme. Essay composition in accordance with the current requirements and presentation at the department.	1. The quality of systematization and analysis of the informational material obtained by their own activity. 2. Concordance of information with the proposed theme.	During the semester
3.	Analysis of case studies	Selection and description of the case study. Analysis of the causes of the issues of a case study. Prognosis of the case investigated. Deduction of the expected outcome of the case.	1. Analysis, synthesis, generalization of data obtained by their own investigation. 2. Formation of an algorithm of knowledge based on the obtained conclusions.	During the semester
4	Thematic conference	Detailed investigation of a topic of major importance within the discipline, with the exteriorization of the subject.	Quality and depth of approach to the problem; ability to extrapolate knowledge and apply them.	At the end of the semester

IX. METHODOLOGICAL SUGGESTIONS FOR TEACHING-LEARNING-ASSESSMENT

- ***Teaching and learning methods used***

Exposure, interactive lecture, group work, individual study, work with methodical guidelines and scientific text, debate, problem solving, role play, simulation, interactive listening.

- ***Applied teaching strategies / technologies*** *(specific to the discipline)*

Inductive, deductive strategies, teaching and learning strategies are developed using models (analogue strategies), algorithmic strategies: explicative-demonstrative, intuitive, exponential, imitative and algorithmic; heuristic strategies - to develop knowledge through own thinking, using problem-solving, discovery, modeling, hypothesis formulation, heuristic dialogue, investigative experiment, assault of ideas, with the effect of stimulating creativity.

- ***Methods of assessment*** *(including the method of final mark calculation)*

Current: frontal or/and individual control via:

(a) analysis of case studies;
(b) application of docimological tests;
(c) control assesments - 2;
(d) solving problems/exercises;
(e) thematic essays;
(f) thematic conference;
(g) the current assessment self-training at the end of the semester.

Final*:* Colloquium, the qualification "pass" – test-control and oral answer.

The final grade at *the colloquium* will be composed of the average score during the semester (50%), the test-control and oral answer (50%).

X. RECOMMENDED LITERATURE:

A. Compulsory:

1. Course support.
2. Wildman R.E.C. Handbook of Nutraceuticals and Functional Foods, Ed. a 2-a, CRC Press, 2007 – pe CD.
3. Methodical indications.

B. Additional

1. Kramer K., Hoppe P., Packer L. Nutraceuticals in health and disease prevention, Marcel Dekker Inc., 2001.
2. Lockwood B. Nutraceuticals, Ed. a 2-a, Pharmaceutical Press, 2007.
3. Vasson M.P., Jardel A. Principes de nutrition pour le pharmacien, Lavoisier, 2005.
4. Matcovschi C., Safta V. Ghid farmacoterapeutic (medicamente omologate în Rep. Moldova) – Ch.: „Vector V-N" SRL, 2010.
5. Segal R. Principiile nutriţiei, Ed. Academica, Galaţi, 2002.
6. Stoll A.L. Factorul Omega-3. Dieta revoluţionară omega-3 pentru sănătatea creierului şi împotriva depresiei, Elena Francisc Publishing, 2005.