FACULTY OF PHARMACY

STUDY PROGRAM 0916.1 PHARMACY

CHAIR OF SOCIAL PHARMACY "VASILE PROCOPISIN"

APPROVED
at the meeting of the Commission for Quality Assurance and Evaluation of the Curriculum, Faculty of Pharmacy,
Minutes no. **2** of **21'Th December 2017**
Chairman, PhD, assoc. prof.
UNCU Livia _____

APPROVED
at meeting of the Council of the Faculty of Pharmacy,
Minutes no. **2** of **22'Th December 2017**
Dean of Faculty, PhD, assoc. prof.
CIOBANU Nicolae _____

APPROVED
at the meeting of the chair of social pharmacy „Vasile Procopisin",
Minutes no. **3** of **01'Th November 2017**
Head of chair, PhD, assoc. prof.
BRUMAREL Mihail _____

SYLLABUS

DISCIPLINA: **INFORMATIONAL SYSTEMS AND PHARMACEUTICAL CARE**

Integrated studies

Type of the course: **Compulsory discipline**

Chisinau, 2017

I. INTRODUCTION

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

Pharmaceutical Information and Information Technologies is a discipline that studies the methods of processing pharmaceutical and medical information using computing and organizational techniques, contemporary information technologies and their use in the field of pharmaceutical activity.

The subject of pharmaceutical information is: technology and stages of information development, functional analysis of the object, algorithmic rendering of the problem, its programmed realization with different instrumental sources, such as technical software packages.

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

The main goal of discipline is to create a modern cultural informational foundation, acquiring of PC skills in local and global networks and principles of selection of professional information about medicines from different sources, organization of storage, processing and informational assistance of different users (doctors, pharmacists, public), assurance of the qualitative, efficient, safe, accessible and affordable pharmaceutical assistance.

- ***Languages of teaching the discipline:*** Romanian, English
- ***Beneficiaries***: students of the 5th year, faculty of Pharmacy, specialty Pharmacy

II. ADMINISTRATION OF THE DISCIPLINE

Code of discipline		**S.09.O.092** **S.10.O.098**	
Name of discipline		**Informational systems and pharmaceutical care**	
Responsible for the discipline		**Stela Adauji,** PhD., associate professor	
Year	**V**	Semesters	**IX, X**
Total number of hours, including:			**120**
Lectures	**15**	Practical/laboratory hours	**57**
Seminars	**-**	Self-training	**48**
Form of assessment	**DC**	Number of credits	**4**

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:

- ✓ to know types and destination of computer programs: assurance with system and applicative programs;
- ✓ to define types and sources of pharmaceutical information;
- ✓ to know particularities and requirements for the medicines information and their publicity;
- ✓ to know the content of information about medicines for healthcare specialists and public;
- ✓ to define pharmaceutical care: principles, necessity of emergence;
- ✓ to understand patient compliance to the medication;
- ✓ to define the role of pharmacist in compliance;
- ✓ to know groups of patients which need more attention from pharmacist;
- ✓ to know OTC and Rx medicines;
- ✓ to understand pharmacist competence regarding OTC and Rx medicines.

at the application level:

- ✓ to apply the Automated Evidence System for evidence of pharmaceuticals and medical products movement in wholesale and retail pharmaceutical companies;
- ✓ to appreciate medicines place in existent systems of classification and determination of ATC codes of medicines;
- ✓ to work with primary and secondary documents of literature sources of pharmaceutical information;
- ✓ to use some servers containing pharmaceutical and medical information;
- ✓ to elaborate medicines instructions for healthcare specialists and consumers;
- ✓ to select necessary volume of information for instruction development;
- ✓ to offer pharmaceutical care in community pharmacy practice;
- ✓ to appreciate symptomatology in gastrointestinal illnesses: constipation, hyperacidity, diarrhea, flatulence, dysbacteriosis, alimentary intoxication, hepato-biliary disorders, gastritis, peptic and duodenal ulcer, helminths prophylaxis and hemorrhoids.
- ✓ to appreciate symptomatology in colds and flu: sore throat, rhinitis, cough, fever;
- ✓ to apply different methods of colds and flu prevention;
- ✓ to appreciate symptomatology of dermatological disorders – herpes, acne, mycosis, seborrhea, dandruff. Medicines use in symptomatic treatment;
- ✓ to offer pharmaceutical care in microtrauma (skin lesions, shots, scratch) and combustion, frostbite;
- ✓ to appreciate symptomatology of central nervous disorders – headaches, anxiety, asthenia.;
- ✓ to prevent CNS disorders;
- ✓ to appreciate symptomatology of avitaminosis, anemia and hypoiodism;
- ✓ to prevent avitaminosis;
- ✓ to appreciate symptomatology of musculoskeletal system disorders – arthralgia, mialgia, osteoarthritis, osteoporosis;
- ✓ to appreciate risk groups for musculoskeletal disorders;
- ✓ to prevent musculoskeletal disorders.

at the integration level:

- ✓ to appreciate the level of pharmaceutical care;
- ✓ to appreciate the patient satisfaction according to different criteria;
- ✓ to determine the need in medicines using data regarding medicines consumption;

- ✓ preparation of demand to supply with pharmaceuticals using Automated Informational System;
- ✓ to store pharmaceutical products according to their physical-chemical and toxicological properties;
- ✓ to assure compliance with ethics and pharmaceutical deontology in professional relations;
- ✓ to be able to manage human, material, financial and informational resources of pharmaceutical companies using computer programs;
- ✓ to register operation and financial management with support of computer system;
- ✓ to develop business plan of pharmaceutical company;
- ✓ to be able to systemize and process data obtained with studied programs;
- ✓ to highlight patient problem with the determination of diagnosis and possibility of OTC medication.

IV. PROVIZIONAL TERMS AND CONDITIONS

Informational systems and pharmaceutical care is a discipline which study methods of pharmaceutical and medical information processing using computer technologies, modern informational technologies and their use in pharmaceutical activity. Indicators which characterize pharmaceutical information are: quantity, accessibility, accuracy, efficiency and truthfulness. Pharmaceutical care is based on special care when consulting patient and OTC medicines dispensing.

Preliminary terms: Having practical skills with personal computer. Use of different external data storage devices. Knowledge of medicines nomenclature and their classification. Knowing of pharmacological action of medicines, of disease nomenclature and use of medicines in their treatment. Mode of price formation for pharmaceutical and medical products. Knowledge of literature sources regarding pharmaceutical and medical information.

V. THEMES AND ESTIMATE ALLOCATION OF HOURS

No	THEME	Number of hours		
		Lectures	Practical hours	Self-training
1.	**General notion of information.** Theoretical bases of information. Concept and types of information. Shannon information. Semantic information. Informatics. Documentary sources of scientific information. Information coding. **Legislation of Republic of Moldova regarding access to information.** Law about access to information (No. 982-XIV dated 11.05.2000). Object and objectives. Access to information. Rights of applicants and suppliers responsibility. General dispositions regarding defense of information right. Consequences of prejudice to access to information. Law about pharmaceutical activity (No. 1456-XII dated 25.05.93), Law about medicines (No. 1409-XIII dated 17.12.97) regarding pharmaceutical and medical products information. Law about informatics (No. 1069-XIV dated 22.06.2000), Law about consumer protection (No. 1453-XII dated 25.05.1993) Law about electronic document and digital signature (No. 264-XV dated 15.07.2004).	-	3	5
2.	**Pharmaceutical information.** Notion of pharmaceutical information. Types of pharmaceutical information. Characteristics of pharmaceutical information. Types of sources of pharmaceutical information. International non-proprietary names of medicines. Principles of organization of INN. General principles of medicines classification, using of codes (ATC). Particularities of information about medicines. Requirements for information about medicines and their pub-	-	3	5

No	THEME	Number of hours		
		Lec-tures	Practical hours	Self-train-ing
	licity. Publicity (advertising) of medicines as a source of information, legal base of publicity. Procedure of publicity notice obtaining. Scientific pharmaceutical information. System of technical-scientific information. Content of information about medicines for healthcare specialists. Content of information about medicines for consumers.			
3.	**Official pharmacotherapeutic documents**. Formulary system. Clinical protocols. Pharmacotherapeutic guideline. Elaboration and management of official pharmacotherapeutical documents. Role of pharmacist in development of OPD. Development of patient information leaflets and summary of product characteristics.	-	3	5
4.	**Use of informational technologies in medication process**: domains, informational systems, general principles of informational systems creation. Medicines Informational centers. Concept and their characteristics. Informational activity of pharmacist.	-	3	5
5.	**Automated informational systems on medicines circulation. Elaboration of documents regarding medicines circulation evidence.** Automated system of medicines circulation evidence in pharmaceutical companies. Structure and functions of system. Working procedures. Development of documents. Automated evidence systems of pharmaceuticals circulation in pharmaceutical company. Structure and functions of system. Working procedure. Development of documents.	-	15	10
6.	**Information system "Evidence of Reimbursed Medicines".** IS ERM modules: upload and file status, reporting recipes; Hash code of the file, tools downloading.	-	6	10
7.	**Databases (BDs) and the importance for practical work.** Categories of data operations. Advantages of using BD. Classification of base systems. Security and data protection. **The Importance of the e-Health Strategy for the Pharmaceutical System.** Objectives and areas of strategy.	-	3	4
8.	**OTC and Rx medicines - regulation**. Criteria for the appreciation of the legal status. Competence of pharmacist regarding OTC and Rx medicines.	-	3	4
9.	**Intermediary assessment. Colloquium.**	-	3	-
10.	**Pharmaceutical care – general aspects.** The role and responsibilities of pharmacist offering pharmaceutical care. Necessity of emergence. Offer of pharmaceutical care in community pharmacy practice. Patient compliance to the medication. Role of pharmacist. Group of patients which need more attention from pharmacist.	2	2	-
11.	**Special pharmaceutical care: colds and flu.** Symptomatology of colds and flu: sore throat, rhinitis, cough, fever. Medicines used in symptomatic treatment of colds and flu. International non-proprietary names, brand names and pharmaceutical forms. Dangerous symptoms of colds and flu, pharmacist activity in those cases. Rational use of medicines for colds. Side effects, interactions, overdose. Prevention of colds and flu.	2	2	-
12.	**Special pharmaceutical care: gastrointestinal conditions.** Symptomatology in gastrointestinal minor ailments: constipation, hyperacidity, diarrhea, flatulence, dysbacteriosis, alimentary intoxication, hepato-biliary disorders, gastritis,	2	2	-

No	THEME	Number of hours		
		Lectures	Practical hours	Self-training
	peptic and duodenal ulcer, helminths prophylaxis and hemorrhoids. Medicines used in symptomatic treatment of gastrointestinal ailments. International non-proprietary names, brand names and pharmaceutical forms. Dangerous symptoms of gastrointestinal ailments, pharmacist activity in those cases. Rational use of medicines for gastrointestinal conditions. Side effects, interactions, overdose.			
13.	**Special pharmaceutical care: dermatologic conditions.** Symptomatology of dermatological disorders – herpes, acne, mycosis, seborrhea, dandruff. General aspects of skin care. Skin allergic reactions. Dangerous symptoms. Pharmaceutical care of microtrauma (skin lesions, shots, scratch) and combustion, frostbite. First medical aid. Dangerous symptoms. Rational use of dermatological medicines. Side effects, interactions, overdosing.	2	2	-
14.	**Special pharmaceutical care: central nervous system conditions.** Symptomatology of central nervous disorders – headaches, anxiety, asthenia. Selfmedication of CNS disorders, levels, advantages and risks. Role of community pharmacist in CNS disorders selfmedication. Side effects of painkillers usage. Risk groups in case of CNS disorders. Prophylaxis of CNS disorders.	2	2	-
15.	**Special pharmaceutical care: avitaminosis.** Symptomatology of avitaminosis, anemia and hypoiodism. Recommended daily doses of vitamins and minerals according to the age, sex, health, life style. Risk groups in case of avitaminosis. Prophylaxis of avitaminosis. Diet. Vitamins. Names and pharmaceutical forms. Health life style promotion. Role of pharmacist.	1	1	-
16.	**Special pharmaceutical care: musculoskeletal conditions.** Symptomatology of musculoskeletal system disorders – arthralgia, mialgia, osteoarthritis, osteoporosis. Risk groups for musculoskeletal disorders. Prophylaxis. Medicines and alimentary supplements used in the medication of musculoskeletal disorders. Side effects, overdosing. Role of pharmacist in rational use of these medicines.	2	1	-
17.	**Special pharmaceutical care: contraception.** Contraceptives. Classification. Pharmaceutical forms. Side effects. Interactions. Contraindications. Patient compliance and rational use of contraceptives. Role of pharmacist in patient education about contraception.	1	1	-
18.	**Special pharmaceutical care: combating excessive use of alcohol, smoking, drug abuse and addiction.** Alcoholism. Causes of emergence. Incidence in Republic of Moldova and globally. Measures to fight. Smoking. Negative effects. Risk groups. Narcotic and toxic substances abuse. Causes of emergence. Risk groups. Role and activities of pharmacist in fight against addictions, preventing negative effects and population education.	1	1	-
19.	**Differentiated colloquium**	-	1	-
Total		15	57	48

VI. REFERENCE OBJECTIVES AND CONTENTS UNITS

Objectives	Contents units
Chapter 1. General notion of information. Legislation of Republic of Moldova regarding access to	

Objectives	Contents units
information. Pharmaceutical information.	
• to know the concept and types of information; • to define scientific sources of scientific information; • to clarify the encoding and decoding of the information;	General notion of information. The theoretical basis of information. Pharmaceutical scientific information. The technical-scientific information system.
• to know regulation through access of information: Law no. 982-XIV dated 11.05.2000; Law no. 1456-XII dated 25.05.1993; Law no. 1409-XIII dated 17.12. 1997; Law no. 1069-XIV dated 22.06.2000, Law no. 1453-XII dated 25.05.1993; Law no. 264-XV dated 15.07.2004.	Legislation of Republic of Moldova regarding access to information.
• to know the types of pharmaceutical information and its characteristics; • to explain the principles of organizing the DCI; • to explain the principles of code use (ATC); • to be familiar with the requirements for information on medicines and their advertising;	Pharmaceutical information. Advertising of medicines. The procedure for obtaining the advertising notice. The content of the medicine information for specialists.
• to know the formulary system and its importance; • to use clinical protocols and pharmacotherapy guidelines; • to develop drug instructions for specialists and users;	Official pharmacotherapeutic documents.
Chapter 2. Automated informational systems in the pharmaceutical activity.	
• To know the fields of use of information systems in medicine and pharmacy; • To know the role of information centers on medicines in pharmaceutical care; • to know and apply the pharmacist's information work in the pharmacy;	Use of informational technologies in medication process.
• to know the structure and functions of AIS; • to have practical skills in using AIS to the movement of documents in pharmaceutical companies, • to make inputs and outputs with the use of AIS and draw up various reports;	Automated informational systems in the pharmaceutical activity. Structure and functions of the system. Work procedures.
• to possess IS ERM; • to be able to upload files on the platform www.mc.cnam.md; • to be able to download tools from the platform to update IS ERM;	Information system "Evidence of Reimbursed Medicines" IS ERM
Chapter 3. Pharmaceutical care – general aspects. Special pharmaceutical care.	
• to know Group of patients which need more attention from pharmacist; • to apply pharmaceutical care in community pharmacy practice;	The role and responsibilities of pharmacist offering pharmaceutical care. Patient compliance to the medication. Group of patients which need more attention from pharmacist.
• to appreciate the symptoms in cold conditions - sore throat, rhinitis, cough, weakness, fever; • to apply various methods of prophylaxis of cold conditions; • to know the medicines used for the symptomatic	Special pharmaceutical care: colds and flu. Symptomatology of colds and flu: sore throat, rhinitis, cough, fever. Dangerous symptoms of colds and flu, pharmacist activity in those cases. Rational use of medicines for colds. Side effects, interac-

Objectives	Contents units
treatment of cold conditions (DCI, trade names and pharmaceutical forms); • to promote cold prophylaxis;	tions, overdose. Prevention of colds and flu.
• to appreciate Symptomatology in gastrointestinal minor ailments: constipation, hyperacidity, diarrhea, flatulence, dysbacteriosis, alimentary intoxication, hepato-biliary disorders, gastritis, peptic and duodenal ulcer, helminths prophylaxis and hemorrhoids; • to know medicines used in symptomatic treatment of gastrointestinal ailments.	Special pharmaceutical care: gastrointestinal conditions. Symptomatology in gastrointestinal minor ailments. International non-proprietary names, brand names and pharmaceutical forms. Dangerous symptoms of gastrointestinal ailments, pharmacist activity in those cases. Rational use of medicines for gastrointestinal conditions. Side effects, interactions, overdose.
• to appreciate symptomatology of dermatological disorders – herpes, acne, mycosis, seborrhea, dandruff; • to know medicines used in symptomatic treatment; • to offer pharmaceutical care of microtrauma (skin lesions, shots, scratch) and combustion, frostbite; • to promote the rational use of dermatological medicines;	Special pharmaceutical care: dermatologic conditions. Symptomatology of dermatological disorders – herpes, acne, mycosis, seborrhea, dandruff. General aspects of skin care. Skin allergic reactions. Dangerous symptoms. Pharmaceutical care of microtrauma (skin lesions, shots, scratch) and combustion, frostbite. First medical aid. Dangerous symptoms. Rational use of dermatological medicines. Side effects, interactions, overdosing.
• to appreciate symptomatology of central nervous disorders – headaches, anxiety, asthenia; • to prevent CNS disorders and to apply the responsible self-medication; • to know risk groups in CNS disorders;	Special pharmaceutical care: central nervous system conditions. Selfmedication of CNS disorders, levels, advantages and risks. Role of community pharmacist in CNS disorders selfmedication. Side effects of painkillers usage.
• to appreciate symptomatology of avitaminosis, anemia and hypoiodism.; • to prevent avitaminosis; • to recommend the diet and products rich in vitamins; • to know medicines used in avitaminosis; • to promote a healthy lifestyle.	Special pharmaceutical care: avitaminosis. Recommended daily doses of vitamins and minerals according to the age, sex, health, life style. Risk groups in case of avitaminosis. pharmaceutical forms. Health life style promotion. Role of pharmacist.
• to appreciate symptomatology of musculoskeletal system disorders – arthralgia, mialgia, osteoarthritis, osteoporosis; • to appreciate risk groups for musculoskeletal disorders; • to prevent musculoskeletal disorders.	Special pharmaceutical care: musculoskeletal conditions. Medicines and alimentary supplements used in the medication of musculoskeletal disorders. Side effects, overdosing. Role of pharmacist in rational use of these medicines.
• to know contraceptives, classification, pharmaceutical forms, side effects, interactions, contraindications. • to determine patient compliance and rational use of contraceptives;	Special pharmaceutical care: contraception. Role of pharmacist in patient education about contraception.
• to know the consequences of alcoholism and measures to prevent it; • to promote the fight against smoking; • to know the harmful effects and risk groups; • to promote the fight against drug addiction; • to know the causes of occurrence, risk groups and control measures.	Special pharmaceutical care: combating excessive use of alcohol, smoking, drug abuse and addiction. Role and activities of pharmacist in fight against addictions, preventing negative effects and population education.

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

Professional (specific) (SC) competences:

PC1: Knowledge of ISPC theoretical bases, general principles in the elaboration, analysis and registration of pharmaceutical products, in drawing up the leflet for the drug user; knowledge of the general principles for the use in the pharmaceutical practice of information technologies and automated information systems;

PC2: forecasting of basic economic indices of pharmacy: achievements, determination of stocks of pharmaceuticals using AIS for the bookkeeping of the circulation of these products; assessing trends in the development of population assistance with medicines; knowledge of the drug in terms of action, indications, contraindications, adverse effects, mode of administration and their interactions; the practical implementation of patient counseling and pharmaceutical assistance;

PC3: use and adaptation of theoretical knowledge in the field of pharmacy to practical work situations; streamlining professional activity by introducing innovative elements: information technologies, information systems, on-line platforms, etc.; applying the requirements of pharmaceutical legislation in practice; possessing the computer as a working tool in the theoretical and practical pharmaceutical activity; establishing the correlation between the components of the pharmaceutical business process and the healthcare system of the population; continuous efficiency of pharmaceutical activity by introducing innovations and implementing inventions in the field;

PC4: diagnosing the organizational features and culture of the institution in the pharmaceutical system where the specialist is working; elaboration of various documents according to the type of the pharmaceutical enterprise / institution; demonstrating the ability to make decisions aimed at improving patient-oriented pharmaceutical assistance;

PC5: the determination and application of the criteria for assessing the effectiveness of the pharmaceutical undertaking and the use of AIS; identifying problems and solving them through pharmaceutical information;

PC6: adoption of messages in various socio-cultural environments in the process of providing specialized pharmaceutical care, including through communication in several foreign languages; the use of problem-solving capabilities in the controlled self-medication process in collaboration with physicians; promoting principles of tolerance and compassion for patients; the use of information technology (and computer) in pharmaceutical activity;

Transversal competences (TC):

TC1: Promoting logical reasoning, practical applicability, compliance with pharmaceutical ethics and deontology rules to the dispensing of pharmaceuticals and parapharmaceuticals to the population and medical institutions;

TC2: Identifying training needs according to the evolution of the pharmaceutical system, including the use of AIS and information technologies in pharmaceutical practice; determining the priorities in the continuing professional education of the pharmacist; the appreciation of changes in the pharmaceutical system as a condition of its functionality;

TC3: Performing activities and exercising the roles specific to team work. Promoting the spirit of initiative, dialogue, cooperation, positive attitude and respect for others, empathy, altruism and continuous improvement of our own activity.

Study outcomes:

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

- ✓ Acquisition of working skills in local networks and the Internet on remote access in the automated information system and evidence-based information.
- ✓ Study of the theoretical basis of information, medical and pharmaceutical information system. Acquisition of the legislation of the Republic of Moldova regulating the access to information.
- ✓ Acquisition of working skills with the sources of literature on pharmaceutical and medical information, selection of the necessary information on medicines in order to develop instructions for specialists and consumers.
- ✓ Acquiring the way of processing the pharmaceutical information at different levels and stages: the circulation of drugs in the Automated Information System "State Drug Nomenclature".
- ✓ Assimilation of the principles and modalities of application of the pharmaceutical guardianship and the provision of primary care services in the pharmacy for the diseases, the symptoms of which can be eliminated with the use of OTC drugs;
- ✓ Knowing the concept, the OTC list particularities and the pharmacist's responsibilities for the rational use of the drugs included in this list;

VIII. THE STUDENT'S SELF-TRAINING

No.	Expected product	Strategies for achieving	Evaluation criteria	Deadline
1.	Working with information sources	Read the lecture or the material in the manual on the subject. Reflection on the topic in the questions. Know and select additional information sources on the topic. Read the text carefully and describe the essential content. Wording of generalizations and conclusions regarding the importance of the theme / subject.	The ability to extract the essentials. Interpretative skills. Analysis capacity.	During the semester
2.	Solving the problems of the situation	Solving problems by arguing the conclusions at the end of each practical work. Verification of the finalities and appreciation of their achievement. Selection of additional information, using electronic addresses and additional bibliography.	The quality of problem solving, the ability to formulate conclusions. Ability to analyze selected information from national and international professional websites.	During the semester
3.	Applying NPL in pharmaceutical activity	Extract the National Price List (NPL) in EXCEL format on the WEB page of MMDA and analyze it by price groups. Comparative analysis of SNM drugs with NPL.	Determining the number of drugs in each group and graphical representation. Graphical presentation of drugs in the NPL compared to SNM	During the IXth semester
4.	Elaboration of the report on the nominated	Each student will present the Power Point report in accordance with the implementation plan, highlight-	Quality of presentation and exposure. Compliance with require-	During the Xth semester

No.	Expected product	Strategies for achieving	Evaluation criteria	Deadline
	themes	ing the relevant information, analyzing and synthesizing the information and conclusions	ments for presenting the report.	
5.	Analysis of difficult cases in controlled self-medication	During the undergraduate practice, the student will record the most outstanding cases from the community pharmacy in the process of offering the essential service "Controlled Self-medication"	Each student is required to submit 5-7 cases. Quality of presentation and exposure.	During the Xth semester

IX. METHODOLOGICAL SUGGESTIONS FOR TEACHING-LEARNING-ASSESSMENT

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

Course, practical work, individual work, didactic practice. Courses are held in semester X by the course holder. Students can access the lectures in PDF format on the department's website. Practical work has been done with the use of computing, all assignments are customized and are accomplished using one of the Microsoft Office suite programs: Word, Excel, Power Point, and various Automated Information Systems used in the drug registration process. At the end of the practical classes, each student must present the work done and the files are sent by the students by e-mail, based on which the practical skills are subsequently assessed. During the semester X each student has to present a thematic essay, which is part of the studied topics. For the assessment of practical knowledge and skills, various interactive learning processes are used.

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

Individual frontal activity, brainstorming sessions, group discussions, case studies in community pharmacies using information systems used in pharmaceutical care, case study, comparative analysis.

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

Current: frontal and / or individual control of the preparation level for laboratory by testing, control papers, group discussions, case study analysis. During the laboratory work - solving problems and exercises, performing role-playing games to completed topics, checking the results of the laboratory work performance.

Intermediate. Semester IX is finalized with a colloquium. The mark for the colloquium is calculated based on marks for control assessment, practical skills and mark for current assessment and student individual work.

At the end of study year average annual mark is calculated, based on marks that consists of mark for semester IX and marks for report and student individual work accomplished in semester X.

Final: differentiated colloquium in 2 stages: practical skills based on situation and written questions. Final mark – weighted is calculated on the basis of positive marks (≥5) and includes the average annual mark, calculated at the end of the discipline study – 50%, mark for the practical skills – 20%, mark for the written answer – 30%. The average annual mark and the marks of all stages of the final examination (practical skills and written answer) - are expressed in numbers according to the grading scale (according to the table).

Final mark obtained will be expressed in number with two decimal that will be transferred to the student record book.

Method of marks rounding at the assessment stages

Grille of intermediate marks (annual average, marks for the differentiated colloquium stages)	National scoring system	Equivalent ECTS
1,00-3,00	**2**	**F**
3,01-4,99	**4**	**FX**
5,00	**5**	**E**
5,01-5,50	**5,5**	
5,51-6,00	**6**	
6,01-6,50	**6,5**	**D**
6,51-7,00	**7**	
7,01-7,50	**7,5**	**C**
7,51-8,00	**8**	
8,01-8,50	**8,5**	**B**
8,51-8,00	**9**	
9,01-9,50	**9,5**	**A**
9,51-10,0	**10**	

Remark: *Unreasonable absence at exam is registered as "absent" and is equivalent with 0 (zero). Student has the right for 2 repeated sustaining of not passed exam.*

X. RECOMMENDED LITERATURE:

A. Compulsory:

1. Safta Vladimir, Brumărel Mihail, Ciobanu Nadejda, Adauji Stela - Management şi legislaţie farmaceutică, - F.E.P. „Tipografia Centrală", - Chişinău, 2012, 800 p.
2. Adauji Stela. Sub redacţia Brumărel Mihail. Sisteme informaţionale în activitatea farmaceutică. Indicaţii metodice. F.E.P. „Tipografia Centrală", - Chişinău, 2014, 128 p.
3. Adauji Stela, Bezverhni Zinaida, Priscu Vitalie. Sub redacţia Brumărel Mihail. Asistenţă farmaceutică specializată în farmaciile comunitare. Indicaţii metodice. F.E.P. „Tipografia Centrală", - Chişinău, 2014, 108 p.
4. Safta Vladimir, Brumărel Mihail, Adauji Stela, Zinaida Bezverhni – Farmacie socială, - F.E.-P. „Tipografia Centrală", - Chişinău, 2011, 376 p.
5. В. Прокопишин, В. Сафта, М. Брумэрел – Основы фармацевтической деятельности, - ИПФ. „Tipografia Centrală", - Кишинэу, 2003. – 488 с.

B. Additional:

1. Bolun Ion, Covalenco Ion. Bazele informaticii aplicate. Chişinău, Editura ASEM. – 1999. – 521 p.
2. Dimitriu Gabriel, Doloca Adrian. Introducere în informatică. Iaşi, Editura U.M.F. – 1999. – 303 p.
3. Ghid farmacoterapeutic=фармакотерапевтический справочник/C. Matcovschi, V. Procopişin, B. Parii. - Ch.: Î.S. F.E.-P. „Tipografia Centrală". 2006. 1424 p.
4. Spircu Tiberiu, Ţigan Ştefan. Informatica în medicină. Teora, 1995, 368 p.
5. Drăgănescu Doina, Internetul pentru farmacişti, - Editura militară, Bucureşti, 2004, 164 p.
6. Давыдова О.Н., Дорофевв В.Л. Руководство к практическим занятиям по фармацевтической информации. – Москва, «Вилар-М». – 2000. – 78 с.
7. Чубарев В.Н. Фармацевтическая информация. – Москва, «Вилар-М». – 2000. – 442 с.
8. Зупанец И.А., Черных В.П., Попов С.Б. и др. Фармацевтическая опека. Харьков. „Фармитэк". 2006. 536 с.
9. Зекий О. У., Румянцев А.С. Обращение лекарственных средствю. – Из. «Русский врач», Москва, 2005 г. 295 с.
10. Фигурнов В.Э. IBM PC для пользователя. Изд. 6-ое, перераб. и доп.- М.: ИНФРА - М., 1995, 432 с.