FACULTY OF MEDICINE

STUDY PROGRAM 0912.1 MEDICINE

NICOLAE TESTEMITANU CHAIR OF SOCIAL MEDICINE AND HEALTH MANAGEMENT

APPROVED	APROBATĂ
at the meeting of the Commission for Quality Assurance and Evaluation of the Curriculum faculty Medicine	at the Council meeting of the Faculty Medicine 2
Minutes No. 1 of 13.01.2020	Minutes No. 3 of 25.02.2020
Chairman dr.hab.șt.med., prof. universitar	Dean of Faculty dr.șt.med., conf.universitar
SUMAN SERGHEI_____	BEȚIU MIRCEA_____

APPROVED

at the meeting of the Nicolae Testemitanu Chair of
Social Medicine and Health Management

Minutes nr. 1 din 30.08.2019

Head of chair dr. hab.șt.med., conf. universitar

RAEVSCHI ELENA _____

SYLLABUS

DISCIPLINE MEDICAL INFORMATION SYSTEM

Integrated studies/ Cycle I, License

Type of course: **Optional course**

Chisinau, 2019

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

It is known that, at present, one of the most dynamic developments is recorded by Information Technology. All domains of activity are constrained to react to the new demands of the society in real time to amplify or to restructure their activity processes and to manage them with greater efficiency.

The degree of computer data processing increased, a number of decision-making processes were automated, and integrated solutions are adopted on a large scale. Information and communication technologies are playing an increasingly important role in all spheres of life.

Modern information technologies are transformed into convenient working tools that contribute to increasing the efficiency and profitability of medical institutions. Information and communication technologies serve as management, control and can be used in research, most often taking the form of information systems.

Health information systems can be defined as information systems whose purpose is to facilitate the management of all medical and administrative information in medical institutions, in order to improve the quality of treatment and health care provided to the population. They are intended for the collection, updating and analysis of data on the events occurring in the health system and their transformation into information used in the decision-making process regarding disease prophylaxis, treatment and rehabilitation of patients, efficient management of all activities in medical and pharmaceutical institutions. Information and communication technologies play an important role in reshaping the health system.

The optional course "Medical Information System" represents an important component in developing the skills of using information systems in the health field. It is an interdisciplinary course and requires a broad spectrum of knowledge both in the field of medicine and in the use of information technologies.

- Mission of the curriculum (aim) in professional training:
  The main objectives of the course are:
  - ✓ Training and deepening of the basic notions in the field of application of information technologies and familiarization of specialists with the information systems used in medical practice in hospital and primary medicine institutions.
  - ✓ To accumulate the necessary knowledge to use modern information systems in medical practice, to assimilate some theoretical elements of the requirements to the information systems, used in the practical work with patients.
  - ✓ Use of information technologies as a support for patients' health care activities.

- Language (s) of the course: Romanian, Russian, English.
- Beneficiaries: students of the IV year, faculty Medicine I and II.

II. MANAGEMENT OF THE DISCIPLINE

Code of discipline		**S.07.A.068**	
Name of the discipline		**Medical Information System**	
Person(s) in charge of the discipline		**Piua R., Poliudov S.**	
Year	**IV**	Semester/Semesters	**VII**
Total number of hours, including:			**30**
Lectures	**10**	Practical/laboratory hours	**10**
Seminars		Self-training	**10**
Clinical internship			
Form of assessment	**CD**	Number of credits	**1**

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:*
1. to know the basic concepts of the functioning of computer systems in medicine;
2. to know the destination, objectives and basic principles of the integrated medical information system;
3. to know the technological methods and techniques used in computer systems;
4. to know and understand the organization of the information management system regarding the treatment of patients using the computer;
5. to understand the correlation between the components of the information systems of different levels applied in the process of treating patients and the collection of statistical data for different purposes of health management;
6. to conceive the possibilities of analysis and interpretation of the data accumulated in the information systems, in the patient's electronic file, as well as the restrictions on the use of computers in medical practice;
7. to know and understand the importance of confidentiality and security of medical data as well as the notion of interoperability in the field of health;
8. to understand the method and principles necessary for the realization of a medical software project, with the identification of the potential and the limits of the project, with the correct evaluation of the work volume, the necessary and available software resources.
- *at the application level:*
1. to properly use the framework of notions, theoretical and practical models of the use of computer systems in medicine;
2. apply the techniques and methods assisted by the computer in the process of treating patients;
3. demonstrate the ability to estimate and analyze, interpret and present the results provided by the computer;
4. to apply the basic knowledge about the information technologies needed to understand the functioning of the information systems in medicine;
5. possess the language and terminology used in the field of application of information systems;
6. be able to use the techniques of working with the information systems of the medical institution, in which the future doctor will activate;
7. to facilitate the doctor-informatician dialogue in the creation of a new medical software.
- *at the integration level:*
1. to appreciate the possibilities of the information systems provided by the medical institutions;

2. to understand the integration of the information systems applied in the treatment process of patients;
3. to perform the classification of the data extracted from databases and their transmission in networks within the management of health systems.

IV. PROVISIONAL TERMS AND CONDITIONS
1. Language requirements (intermediary level);
2. Basic computer skills (MS Office Word, EXCEL, PowerPoint);
3. Ability to work in a team;
4. Non-work related activities are strictly forbidden, disconnected mobile phones;
5. Lateness is not tolerated.

V.   THEMES AND ESTIMATE ALLOCATION OF HOURS
Lectures, practical hours/ laboratory hours/seminars and self-training

Nr. d/o	THEME	Number of hours		
		Lectures	Practical hours	Self-training
1.	General notions about medical information, information technologies, information system. Classification of medical information. General notions about databases. Types of databases.	2	2	2
2.	Health information systems. Definitions, generalities. Resource flows of information systems (human, material, technical, financial, informational). Confidentiality, data protection and security.	2	2	2
3.	Integrated Medical Information System. Objectives and basic principles.	2	2	2
4.	Medical information systems for national and international hospital institutions. Structure of hospital medical systems. The automated information system "Hospital Medical Assistance". Accumulation and processing of medical statistical information.	2	2	2
5.	National and international computer systems for primary medicine. Structure of medical systems for primary medicine. The automated information system "Primary Health Care". Accumulation and processing of medical statistical information.	2	2	2
Total		**10**	**10**	**10**

VI. REFERENCE OBJECTIVES OF CONTENT UNITS

Objectives	Content units
Theme (<u>chapter</u>) 1. General notions about medical information, information technologies, information system. Classification of medical information. General notions about databases. Types of databases.	

Objectives	**Content units**
- *To know* general notions about medical information, information technologies and information system. - *To define* the classification of medical information. - *To apply* the ability to use information technology of the computing technology and telecommunications in order to improve the medical services. - *To demonstrate* skills in using databases. - *To integrate* the knowledge about the informational systems in the medical activity.	1. General notions and definitions of medical information, information technologies and information systems. 2. Notions about computer science, computerization, medical informatics, means and information technologies; 3. General notions of databases and types of databases. 4. Information on the use of information systems, computing techniques and telecommunications in the provision of medical services, in research and education. 5. Creation and implementation of structures and algorithms useful in transmitting, understanding and organizing information in the medical field.

Theme (chapter) 2. Health information systems. Definitions, generalities. Resource flows of information systems (human, material, technical, financial, informational). Confidentiality, data protection and security.

- *To define* the basic concepts of health information systems. - *To know* the necessity and purpose of notions such as confidentiality, data protection and security. - *To demonstrate* the ease of use of health information systems. - *To apply* the information systems in the health system. - *To integrate* the resource flows of information systems.	1.Definitions from information system and information system. 2.The destination of the information systems in the field of health protection and social protection. 3.Diversity of information systems and their role, 4.Training objectives within the discipline. The objectives of the training in the field of health services management. 5.The management of the medical institution and the realization of the collection and efficient processing of information. 6.Problems in the field of medical informatics. 7.Resource flows of information systems (human, material, technical, financial, informational). 8.Confidentiality, protection and data security. Data security levels.

Theme (chapter) 3. National and international medical information systems. Integrated Medical Information System. Objectives and basic principles.

- *To define* the basic objectives and principles of the Integrated Medical Information System. - *To know* the structure of the integrated medical information system. - *To demonstrate* skills in using medical information systems. - *To apply* the medical information system integrated in the health system. - *To integrate* the flows of medical information into the integrated medical information system.	1.Definition and structure of the integrated medical information system. 2.The objectives of training, equipping and maintaining the integrated medical information system. 3.The flows of medical information of the integrated medical information system. 4.The basic functions of the integrated medical information system. Continuity of medical care. 5.The tasks of the integrated medical information system.

Objectives	Content units
	6.Online medical information and health networks.

Theme (chapter) 4. Medical information systems for national and international hospital institutions. Structure of hospital medical systems. The automated information system "Hospital Medical Assistance". Accumulation and processing of medical statistical information.

Objectives	Content units
- *To define* the basic concepts of health information systems. - *To know* the necessity and purpose of notions such as confidentiality, data protection and security. - *To demonstrate* the ease of use of health information systems. - *To apply* the information systems in the health system. - *To integrate* the resource flows of information systems.	1. The principles of the functioning of hospital information systems. The components, terminology and classification of hospital information systems. 2. Requirements regarding the completeness and content of the hospital medical documentation. 3. Compatibility of components and correlations between different national and international information systems for hospital institutions. 4. Use of information systems in order to provide information on medical evaluation, accreditation and benefits in medical units. 5. Statistical Reports. Types of statistical reports. 6. The automated information system "Hospital Medical Assistance".

Theme (chapter) 5. National and international computer systems for primary medicine. Structure of medical systems for primary medicine. The automated information system "Primary Health Care". Accumulation and processing of medical statistical information.

Objectives	Content units
- *To define* the principles of the functioning of information systems for primary medicine. - *To know* the flow of information from information systems for primary medicine in order to create statistical reports. - *To demonstrate* knowledge in working with the Automated Information System "Primary Health Care". - *To apply* the requirements to the medical documentation used in the AMP service. - *To integrate* knowledge in working with computer systems for primary medicine.	1. The principles of functioning of information systems for primary medicine. 2. Requirements regarding the completeness and content of the medical documentation in primary medicine. 3. Compatibility of components and correlations between different national and international computer systems for primary medicine. 4. Use of information systems in order to provide information on medical evaluation, accreditation and benefits in medical units. 5. Statistical Reports. Types of statistical reports. 6. The automated information system "Primary Health Care".

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

✓ **Professional (specific) (SC) competences**
  Not the case
✓ **Transversal competences (TC)**
  Not the case

✓ **Study outcomes**
The student at the end of the course will be capabill:

- To know the particularities of organization and functioning of medical information systems;
- To know the principles of realization and to model the working processes in the use of medical information technologies;
- To understand the basic processes that ensure the competences and abilities to use information technologies;
- To know the basics and the practical role of medical information systems;
- To be able to use the knowledge accumulated in the practical activity;
- To be able to implement the knowledge accumulated in the research activity;
- To be competent to use critically and confidently the scientific information obtained using the new information and communication technologies.

Note. Study outcomes (are deduced from the professional competencies and formative valences of the informational content of the discipline).

VIII. STUDENT'S SELF-TRAINING

No.	Expected product	Implementation strategies	Assessment criteria	Implementation terms
1.	Working with information sources	- Reading the lecture or the material from the textbook on the topic. - Reading the questions in the topic, which requires a reflection on the subject. - Select additional sources of information on the topic. - To be acquainted with the additional information sources on the topic. - Formulation of generalizations and conclusions regarding the topic.	- The ability to extract the essentials, the ability to interpret and present the material. - The ability to distinguish the possibilities, advantages and disadvantages of medical information systems	During the semester

IX. METHODOLOGICAL SUGGESTIONS FOR TEACHING-LEARNING-ASSESSMENT

- *Teaching and learning methods used*

Within the discipline of the theoretical lessons, both the traditional methods (lesson-exposition, lesson-conversation, synthesis lesson) and modern ones (lesson-debate, lesson-conference), oriented towards the efficient learning and application of the objects of the didactic process.

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

The course uses information communication technologies: PowerPoint presentations.

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

Current:

 Midterm test 1 (grid-test)

 Midterm test 2 (grid-test)

 The semester mark is calculated as the average of the two midterm tests.

Final: differentiated colloquium.

 The differentiated colloquium represents the test-grid test which includes 30 random questions from each of the studied themes. The test-grid covers 40% single-choice questions and 60% multiple-choice questions. The student has at his/her disposal 30 minutes to answer to the grid-test.

 Those students who have the semester mark less than 5.0 and / or did not recover their absence(s) for the practical seminars (no absences are admitted for the practical seminars) are not admitted to the differentiated colloquium by the Department.

 The **final mark** is calculated as the average of the semester mark and the mark for the test-grid obtained at the differentiated colloquium.

Method of mark rounding at different assessment stages

Intermediate marks scale (annual average, marks from the examination stages)	National Assessment System	ECTS Equivalent
1,00-3,00	**2**	**F**
3,01-4,99	**4**	**FX**
5,00	**5**	**E**
5,01-5,50	**5,5**	
5,51-6,0	**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**	

 The average annual mark and the marks of all stages of final examination (computer assisted, test, oral) - are expressed in numbers according to the mark scale (according to the table), and the final mark obtained is expressed in number with two decimals, which is transferred to student's record-book.

Absence on examination without good reason is recorded as "absent" and is equivalent to 0 (zero). The student has the right to have two re-examinations.

X. RECOMMENDED LITERATURE:

A. Compulsory:

1. **Puia R., Poliudov S.** Sistemul Informaţional Medical (Power Point prezentări pentru studenţi), 2019.
2. **Tintiuc D, Grossu Iu**., et al., 2007. Sănătate Publică şi Management. Editura „Tipografia Centrală", Chişinău, 895 p.

B. Additional

1. **Purcărea V. L.**, Managementul sistemului informaţional spitalicesc, Editura Universitară „Carol Davila", Bucuresti, 2007
2. **Bolun I., Covalenco I.**, Bazele informaticii aplicate, Editura ASEM, Chişinău, 2006.
3. Evaluarea sistemului informaţional de sănătate din Republica Moldova, Chişinău 2007, http://www.who.int/healthmetrics
4. http:// www.scritube.com/Medicina/Sistemul-informational-si-relational-in-medicina-de-familie
5. http://www.danvasilache.info/eGCap4.pdf
6. https://en.wikipedia.org/wiki/Health_informatics
7. Hotărîrea Guvernului nr.1128 din 14 octombrie 2004 „Cu privire la aprobarea Concepţiei Sistemului Informaţional Medical Integrat", 29.10.2004, Monitorul Oficial nr.193-198, art nr.1333
8. Hotărîrea Guvernului nr.586 din 24.07.2017 pentru aprobarea Regulamentului privind modul de ţinere a Registrului medical", 04.08.2017, Monitorul Oficial nr.277-288, art nr.703