MEDICAL INFORMATICS
(7 pages)

University of Rijeka
Faculty of Medicine

Course: Medical Informatics
Course coordinator: Lidija Bilić-Zulle, PhD, Specialist in Medical Biochemistry, Associate Professor
Department: Department of Medical Informatics
Study program: Integrated Undergraduate and Graduate University Study of Medicine in English
Year: 2nd year
Academic year: 2020/2021

SYLLABUS

Course information (brief course description, general guidelines)

The course "Medical Informatics" is attended during the 2nd turn of the 2nd year of study of medicine, with a total duration of 20 school hours. Students are divided into 2 seminar groups for seminar classes. Each seminar group is in two training subgroups for practicals, and has 10-14 students. Teaching is held in lecture halls of the Faculty's main building and in the Computer Classroom (ground floor, left). Part of the seminar course is held for all students as demonstration lessons.

The student computer classroom is equipped with fifteen personal computers, and the practicals cover work with programs running in the Windows 7 operating environment. All computers are networked and connected to the Internet and equipped with headphones. During the practical each student is working independently on the computer.

Course content:
Basic IT concepts, medical data management, theory and information processing and communication. Application of medical informatics procedures. Importance, organization and use of medical language, coding and classification. The structure and importance of electronic health records. Computer analysis of biological signals and medical images. The construction and use of medical databases and databases with biomedical scientific papers. Strategies of Management and Classification of Medical Knowledge. Evidence-Based Medicine. Health Information Systems in Primary and Hospital Health Care. Clinical decision support system and their use in treating patients and in acquiring, processing and displaying medical knowledge. The role and role of medical models, modeling and simulations. Safety and confidentiality of medical data.

Assessment method:
Students are evaluated during each class at each seminar and practical unit. During the seminars, each student is assessed on the basis content from the textbooks and selected online content. Students prepare final seminar work on the given topics and present them in the lesson. The content, scope and knowledge of the topic of the final seminar, the presentation and the quality of the presentation are evaluated. The total number of score points for seminars is 20 points. Practicals are organized in 5 units. Accuracy and quality of the practical assignment are evaluated on each practical. Practicals are performed in the computer classroom and each student independently prepares assignments on the computer.

A maximum of 30 score points is achieved on the practicals.
The maximum number of score points achieved in class is 50.

Student Assessment method

	Topics	Credits
S1	Introductory seminar	-
S2	Structure of medical data	4
S3	Basic concepts and medical classifications	4
S4/5	Application of information technology in medicine, student presentations	12
P1	Electronic health record in primary care	3
P2	Medical content and network communication	3
P3	Evidence-based medical decision making	3
P4	Hospital Information System (HIS)	3
P5	Management and display of medical data - final exercise	18
S6	Concluding Considerations on Medical Informatics	-
	Total score:	50

Assigned reading:

- Coiera E. Guide to health informatics. Boca Raton: Taylor & Francis Group, (3rd edition), 2015.

Optional / additional reading:

- Shortlife EH, Perreault LE. Medical Informatics. New York - Tokyo: Springer, (2nd edition), 2001.
- van Bemmel JH, Musen MA.Handbook of Medical informatics. New York - Tokyo: Springer,1997.
- Degoulet P, Fieschi M. Introduction to clinical informatics. New York-Tokyo: Springer, 1997.
Warner HR, Sorenson DK, Bouhaddou O. Knowledge engineering in health informatics. New York-Tokyo: Springer, 1997.
- Kern J, Petrovečki M, ur. Medicinska informatika. Medicinska naklada: Zagreb; 2009.

Course teaching plan:

List of seminars (with titles and description):

S1 Introduction to Medical Informatics
Seminar 1 is an introductory course seminar. The students will receive basic information about the course, schedule, teaching and assessment. They are acquainted with the definition and emergence of informatics as a scientific discipline and medical informatics as its derivative. Students are familiarized with the structure and scope of the topics covered by the course.

S2 Structure of medical data
Learning Outcomes: Understand the basic concepts that define the structure of medical data. Explain the purpose and use of non-medical data in medicine. Learn the basics of communication in computerized systems. Learn the structure and use of basic medical documents. Identify and list the basic standards and quality system in health care.

S3 Basic Terms and Medical Classification
Learning outcomes: Learn the meaning and application of basic IT concepts (information, knowledge, system, medical language, information theory, overwhelming, cybernetics). Understand classification systems and identify and define the most common medical classification (MKB-10, MKB-O, SNOMED, ATK, MeSH, DTS).

S4 / 5 Application of information technology in medicine
Learning outcomes: Learn and understand the basics of applying IT technology in medicine, especially in the field of collecting and processing biomedical signals, social network in medicine, modeling and simulation, telehealth and mobile health.

S6 Final Considerations on Medical Informatics
The seminar is interactive discussion, students and teacher are gathered together at the end of the course, guidance for further learning and development in the application of information technology in medicine are provided.

List of practicals with description:

Practicals from the course Medical Informatics will be held in the computer classroom of the faculty. Students will acquire knowledge of medical documents management (texts and tables), medical content searches, and presentation of data and hospital information systems.

P1 Electronic health record in primary care
Learning Outcomes: Students will get insight into program support for electronic health records management - Medicus.net (http://www.mcs.hr/en/proizvodi-i-usluge/medicus.net/12). Simple functions in Medicus.net network support for family medicine practitioners will be tought. Students will be able to create health records (anamnesis, referral, prescription, medical report) and browse the electronic health records (history of the disease, prescriptions, referrals, cases, diagnostic-therapeutic procedures (DTP).

P2 Medical Content and Network Communication
Learning Outcomes: Students will understand basic concepts of online databases, understand the organization of scientific literature in medicine, will be able to independently search the Medical Subject Headings (MeSH) and the Medline bibliographic database through PubMed service (https://www.ncbi.nlm.nih.gov/pubmed/), and other online sources of trusted medical contents wil be introduced.

P3 Medical decision-making based on (scientific) evidence
Learning Outcomes: Students will learn about evidence-based medicine and medical decision-making. They will be able to use UptoDate database - clinical decision support resource associated with improved outcomes. They will learn to set up clinical inquiries via online service under the PICO scheme (P – patient, problem or population, I – intervention, C – comparison, control or comparator,O – outcome).

P4 Hospital Information System (HIS)

Learning Outcomes: Students will learn the basic functionalities of HIS (medical, financial and business processes management), familiarize with application features and independently view patient guidance through HIS (electronic health records management, electronic ordering, electronic therapy) and e with the possibilities of integration with external applications (laboratory and radiological information systems).

P5 Managing and displaying medical data - final practical
Learning Outcomes: self-search Medline database using PubMed (using Thesaurus MeSH), and compile search results in Ms PowerPoint. Self-search of UpToDate databse and compile results in in Ms Word's using text formatting instructions (inserting pages, editing font types and fonts, edges, edges, tables, images, literary lists, content editing).

Student Obligations:

- regular attendance
- project work, presentation of seminar work

Final exam

ECTS Grading System:

Student grading will be conducted according to the current Ordinance on Studies of the University of Rijeka (approved by the Senate) and the Ordinance on Student Grading at the Faculty of Medicine in Rijeka (approved by the Faculty Council). Student work will be assessed and graded during the course and on the final exam. During the course, a student may achieve up to 50% of the grade, while at the final exam up to 50% of the grade. Students are graded according to the ECTS credit (A-E) and numeric (1-5) system.Students are obliged to attend all forms of teaching during the course and may be absent from 30% of the classes. If a student is absent for more than 30% of the classes, he will not receive a signature and will have to re-enter the course.

I. Assessment and grading in class
The student must collect at least 25 credits in order to gain access to the final exam. A student who collects less than 25 credits during class is classified as E (unsuccessful) meaning that he did not meet the criteria and must re-enroll the course.
The final exam is a written test, consisting of 21 questions. The number of exact answers on the exam is converted into the credits (shown in the table). The student passed the exam if he answered exactly 11 questions and more.

Number of correct answers on the exam	Credits
<11	0
11	25
12	28
13	31
14	34
15	37
16	40
17	42
18	44

19	46
20	48
21	50

The marks awarded on the exam are summed up with the points earned in the class and the sum represents the total score.

Grade	Credits
A (excellent, 5)	90-100
B (very good, 4)	75-89,99
C (good, 3)	60-74,99
D (sufficient, 2)	50-59,99
F (unsufficient, 1)	0-49,99

Other information:

Teaching contents and all notices related to the course as well as test terms can be found on the web pages of the Department of Medical Informatics (http://mi.medri.hr/indexeng.htm).

COURSE SCHEDULE (for academic year 2020/2021)

Date	Lectures (time and place)	Seminars (time and place)	Practicals (time and place)	Instructor
24/11/2020		S1 (all) (11:00-11:45) (Lecture room 8) Online		Lidija Bilić-Zulle, Associate Professor
25/11/2020			P1g3 (8:30-10:00) (Lecture room 3) Online	Ksenija Bazdaric, Asst Prof
25/11/2020			P1g4 (12:00-13:30) (Lecture room 3) Online	Ksenija Bazdaric, Asst Prof
26/11/2020			P1g2 (8:30-10:00) (Lecture room 3) Online	Ksenija Bazdaric, Asst Prof
26/11/2020			P1g1 (12:00-13:30) (Lecture room 3) Online	Ksenija Bazdaric, Asst Prof
30/11/2020		S2g2 (11:00-12:30) Lecture room 3		Ksenija Bazdaric, Asst Prof
3/12/2020		S2g1 (12:00-13:30) Lecture room 3		Ksenija Bazdaric, Asst Prof
14/12/2020		S3g1 (8:00-9:30) Lecture room 4		Martina Mavrinac, Asst Prof
14/12/2020		S3g2 (11:00-12:30) Lecture room 9		Martina Mavrinac, Asst Prof
15/12/2020			P2g3 (9:00-10:30) Lecture room 3	Martina Mavrinac, Asst Prof
15/12/2020			P2g4 (12:00-13:30) Lecture room 3	Martina Mavrinac, Asst Prof
16/12/2020			P2g2 (9:00-10:30) Lecture room 3	Martina Mavrinac, Asst Prof
17/12/2019			P2g1 (9:00-10:30) Lecture room 3	Martina Mavrinac, Asst Prof
22/12/2020			P3g1 (8:30-10:00) Lecture room 3	Ksenija Bazdaric, Asst Prof
22/12/2020			P3g2 (10:00-11:30) Lecture room 3	Ksenija Bazdaric, Asst Prof
23/12/2020			P3g3 (9:00-10:30) Lecture room 3	Ksenija Bazdaric, Asst Prof
23/12/2020			P3g4 (12:00-13:30) Lecture room 3	Ksenija Bazdaric, Asst Prof
7/01/2021			P4g1 (8:00-9:30) Computer classroom CHC Rijeka	Vesna Supak Smolcic, Associate
7/01/2021			P4g2 (9:30-11:00) Computer classroom CHC	Vesna Supak Smolcic, Associate

			Rijeka	
8/01/2021			P4g3 (8:00-9:30) Computer classroom CHC Rijeka	Vesna Supak Smolcic, Associate
8/01/2021			P4g4 (12:00-13:30) Computer classroom CHC Rijeka	Vesna Supak Smolcic, Associate
13/01/2021		S4/5g2 (13:00-16:00) (Lecture room 9) Online		Martina Mavrinac, Asst Prof
14/01/2021		S4/5g1 (12:00-15:00) (Lecture room 5) Online		Ksenija Bazdaric, Asst Prof
18/01/2021			P5g2 (10:00-11:30) Lecture room 3	Martina Mavrinac, Asst Prof
18/01/2021			P5g3 (11:30-13:00) Lecture room 3	Martina Mavrinac, Asst Prof
19/01/2021			P5g1 (9:00-10:30) Lecture room 3	Ksenija Bazdaric, Asst Prof
19/01/2021			P5g4 (12:00-13:30) Lecture room 3	Ksenija Bazdaric, Asst Prof
22/01/2020		S6 (all) (11:00-11:45) (Lecture room 8) Online		Lidija Bilić-Zulle, Associate Professor

	FINAL EXAM DATES
1.	30/01/2021
2.	12/02/2021
3.	6/07/2021
4.	17/09/2021