

Faculty of Medicine / MEDICINE / MEDICAL INFORMATICS

Course:	MEDICAL INFORMATICS			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
7928	Mandatory	1	10	3+1+0
Programs	MEDICINE			
Prerequisites	None			
Aims	The primary educational objectives are to introduce and work with specific software packages and to familiarize students with information systems and information technology used in biomedicine, healthcare, and scientific research. Knowledge: Familiarity with healthcare, hospital, and other information systems; expert systems; artificial intelligence, neurocomputers, databases, and information and communication technologies relevant to biomedicine, healthcare, and biomedical sciences. Skills: Training students to: engage in specific healthcare information systems, use information and communication technology for professional purposes; independently search databases and electronic sources of information and literature; use specific programs for writing and presenting professional and scientific papers.			
Learning outcomes	After passing this exam, the student will be able to: Use various sources and citation databases for scholarly research Differentiate categories of scientific papers Demonstrate the advantages of digitalization in various aspects of healthcare Explain methods of acquiring medical data using modern devices Understand ways of storing digital patient data and medical history Understand information systems used in different healthcare fields Explain the role of artificial intelligence and expert systems in healthcare Explain the role of robotics and telemedicine			
Lecturer / Teaching assistant	Prof. dr Ljubiša Stanković (professor), Doc. dr Anđela Draganić (assistant)			
Methodology	Lectures and exercises. Individual and group work with raw statistical data. Lectures and exercises. Individual and group work with raw statistical data. Lectures and exercises. Individual and group work with raw statistical data.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	History of Computing. Digitization in Medical Practice. Types of Medical Data. Digital Records of Medical Data.			
I week exercises	History of Computing. Digitization in Medical Practice. Types of Medical Data. Digital Records of Medical Data.			
II week lectures	Collecting and Analyzing Digital Data. Analysis of Medical Images. History of Computerized Tomography and Magnetic Resonance Imaging. Modern Devices for Capturing and Processing Medical Images.			
II week exercises	Collecting and Analyzing Digital Data. Analysis of Medical Images. History of Computerized Tomography and Magnetic Resonance Imaging. Modern Devices for Capturing and Processing Medical Images.			
III week lectures	Biomedical scientific informatics and biomedical scientific information. Citation databases. Biomedical scientific information system. Studying literature and measuring the quality of papers and journals.			
III week exercises	Biomedical scientific informatics and biomedical scientific information. Citation databases. Biomedical scientific information system. Studying literature and measuring the quality of papers and journals.			
IV week lectures	Searching databases and library information system COBISS. Primary, secondary, and tertiary publications. Searching indexing and citation databases: Medline, Web of Science, Scopus, Serbian Citation Index, Hrčak databases, and others. Searching full-text databases.			
IV week exercises	Searching databases and library information system COBISS. Primary, secondary, and tertiary publications. Searching indexing and citation databases: Medline, Web of Science, Scopus, Serbian Citation Index, Hrčak databases, and others. Searching full-text databases.			
V week lectures	Citation analyses, evaluation of scientific work, evidence-based medicine and practice, meta-analysis based on published research results.			
V week exercises	Citation analyses, evaluation of scientific work, evidence-based medicine and practice, meta-analysis based on published research results.			
VI week lectures	Health information systems. Hospital information systems. Pharmaceutical information system and pharmacoinformatics in the context of modern information technology application. Laboratory information system. Modern information technologies in the management system of medical documentation, electronic records, software for clinic and office management.			

VI week exercises	Health information systems. Hospital information systems. Pharmaceutical information system and pharmacoinformatics in the context of modern information technology application. Laboratory information system. Modern information technologies in the management system of medical documentation, electronic records, software for clinic and office management.
VII week lectures	Application of information and communication technology in specific biomedical scientific fields.
VII week exercises	Application of information and communication technology in specific biomedical scientific fields.
VIII week lectures	Expert systems. Artificial intelligence and neural networks in biomedicine.
VIII week exercises	Expert systems. Artificial intelligence and neural networks in biomedicine.
IX week lectures	Decision-making in clinical practice. Application of specialized software tools for decision support.
IX week exercises	Decision-making in clinical practice. Application of specialized software tools for decision support.
X week lectures	Robotics in medicine.
X week exercises	Robotics in medicine.
XI week lectures	Telemedicine.
XI week exercises	Telemedicine.
XII week lectures	Application of information technology in modeling parts of the human body and prosthetic components.
XII week exercises	Application of information technology in modeling parts of the human body and prosthetic components.
XIII week lectures	Application of information technology and digital innovations in diagnostics and therapy.
XIII week exercises	Application of information technology and digital innovations in diagnostics and therapy.
XIV week lectures	Mobile applications for monitoring key health parameters of patients. Processing and analysis of collected data. Remote consultations.
XIV week exercises	Mobile applications for monitoring key health parameters of patients. Processing and analysis of collected data. Remote consultations.
XV week lectures	Final exam.
XV week exercises	Final exam.
Student workload	Additional work for exam preparation in the retake exam period, including taking the retake exam from 0 to 30 hours (remaining time from the first two items to the total workload for the course) 60 hours and 0 minutes Load structure: 213 hours and 20 minutes (teaching), 26 hours and 40 minutes (preparation), 60 hours and 0 minutes (additional work)
Per week	Per semester
10 credits x 40/30=13 hours and 20 minuts 3 sat(a) theoretical classes 0 sat(a) practical classes 1 excercises 9 hour(s) i 20 minuts of independent work, including consultations	Classes and final exam: 13 hour(s) i 20 minuts x 16 =213 hour(s) i 20 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 13 hour(s) i 20 minuts x 2 =26 hour(s) i 40 minuts Total workload for the subject: 10 x 30=300 hour(s) Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) 60 hour(s) i 0 minuts Workload structure: 213 hour(s) i 20 minuts (courses), 26 hour(s) i 40 minuts (preparation), 60 hour(s) i 0 minuts (additional work)
Student obligations	Students are required to attend lectures, complete practical tasks during exercises, and prepare seminar papers that they publicly present.
Consultations	
Literature	Edward H. Shortlie, James J. Cimino, "Biomedical Informatics-Computer Applications in Health Care and Biomedicine", Springer ISBN 978-1-4471-4473-1.
Examination methods	Attendance at lectures 5, the presence on the exercises 5, essay (written version + oral presentation) 30, PowerPoint presentation 10, exam - test 50 points, a total of 100 points Passing grade can be obtained if the cumulative gathering is min 50 points
Special remarks	

Comment						
Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points