SYLLABUS

Concerning the cycle of education *2025- 2031*

Academic year 2025/2026

1. BASIC INFORMATION CONCERNING THIS SUBJECT

Subject / Module	**Information Technology and Biostatistics**
Course code*	**IB/B**
Faculty (name of the leading faculty)	**Faculty of Medicine, University of Rzeszow**
Department Name	**Department of Photomedicine and Physical Chemistry**
Field of study	**Medicine**
Level of education	**Uniform master studies**
Profile	**General academic**
Form of study	**Stationary / non-stationary**
Year and semester	**Year I, semester 1**
Type of course	**Obligatory**
Language	**English**
Coordinator	**Assoc. Prof. David Aebisher, University of Rzeszów**
Name(s) of the instructor(s)	**Assoc. Prof. David Aebisher, University of Rzeszów**

* -optional, as agreed in the Unit

1.1. Forms of classes, number of hours and ECTS points

Semester No.	Lecture	Exercise	Conversation	Laboratory	Seminar	ZP	Practical	Others	Number of points ECTS
1	10	20							2

1.2. The form of class activities
☒ Classes are conducted in a traditional format
☐ Classes are implemented using methods and techniques of distance learning

1.3. FormS of course credit (in progress) (exam, pass with grade, pass without grade)

2. REQUIREMENTS

BASIC OPERATIONS ON DIRECTORIES AND FILES.
SKILLS TO RECOGNIZE BASIC COMPUTER PROGRAMS.

3. OBJECTIVES, LEARNING OUTCOMES, PROGRAM CONTENT AND TEACHING METHODS

3.1 Objectives of this course

C1	Mastering theoretical foundations and gaining practical skills in the field of information technologies and their application in medicine.
C2	Acquiring basic knowledge in the field of medical statistics and mastering the theoretical basis of various statistical methods.
C3	Gaining practical skills, performing medical statistics and its analysis.

3.2. Outcomes for the course

EK (learning outcome)	Content of the learning outcome defined for the subject	Reference to directional effects [1]
EK_01	knows the basic IT and biostatistical methods used in medicine, including medical databases, spreadsheets and basics of computer graphics	B.W31
EK_02	knows the basic methods of statistical analysis used in population and diagnostic studies	B. W32
EK_03	knows the possibilities of modern telemedicine as a tool to support the work of a doctor	B. W33
EK_04	uses databases, including websites, and searches for the necessary information using the available tools	B. U11
EK_05	selects the appropriate statistical test, conducts basic statistical analyses and uses appropriate methods of presenting the results; interprets the results of the meta-analysis, and also analyzes the likelihood of survival	B. U12
EK_06	explains the differences between prospective and retrospective, randomized and case-control studies, case reports and experimental studies	B. U13
EK_07	plans and performs simple research and interprets its results and draws conclusions	B. U14

3.3 Programme content

    A. Topics of the lecture

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[1] *In the case of an educational path leading to teaching qualifications, also include the learning outcomes from the standards for teacher training.*

Course content
1. Work in a computer network. User's mobile profile.
2. Using network resources. Data, information, knowledge. The amount of information, units.
3. Computer networks - types, construction, ISO / OSI model.
4. Microsoft Word editor. The rules of correct document formatting. Advanced editing functions.
5. Microsoft Excel spreadsheet. Data entry and formulas.

     B. Topics of seminars, exercises, laboratories, and practical classes

Course content
Work in a computer network. User's mobile profile. Using network resources. Data, information, knowledge. The amount of information, units.
Computer networks - types, construction, ISO / OSI model.
Microsoft Word editor. The rules of correct document formatting. Advanced editing functions.
Microsoft Excel spreadsheet. Data entry and formulas. Data types. Formatting the sheet. Arithmetic and statistical calculations on the sheet.
PowerPoint - the basics of creating presentations.
Graphical representation of data.
Sheet as a simple database. Sorting and selection of data.
Medical databases in UR network resources.
IT systems in health care.
The essence of data compression. Usage. Types of compression (quantitative and qualitative, static and dynamic).
Security of information systems. Information protection.
Computer viruses and other threats - types of threats, protection methods.
Data encryption. Digital signature.
Probability distributions: binomial, Poisson and normal. Types of variables. Parametric and non-parametric significance tests.
Statistical hypotheses.
Types of variables in medicine - analysis of dispersion Hypotheses.
Testing hypotheses.
Type I and type II errors Statistical analysis of test results (algorithm).

3.4. Teaching methods

Lecture with multimedia presentation; practical exercises in the computer lab.

4. ASSESSMENT METHODS AND CRITERIA

4.1. Methods of assessing learning outcomes

Symbol of effect	Methods of assessing learning outcomes (e.g.: colloquium, oral exam, written exam, project, report, observation during classes)	Form of classes (Exercises, Lectures…)
EK_ 01 – EK_07	Lectures - final written test. Seminars - final assessment including student skills, attendance, and ability to work on a computer.	L, E

4.2 Conditions for passing the course (assessment criteria)

EK_ 01 - EK_07 Lectures - final written exam

Exercise - final credit with an assessment of the ability to work on computer LECTURES, EXERCISE

Knowledge assessment:

<u>Written test</u>

5.0 - has knowledge of each of the contents of education at the level of 90% -100%

4.5 - has knowledge of each of the content of education at the level of 84% -89%

4.0 - has knowledge of each of the content of education at the level of 77% -83%

3.5 - has knowledge of each of the content of education at the level of 70% -76%

3.0 - has knowledge of each of the content of education at the level of 60% -69%

2.0 - has knowledge of each of the contents of education below 60%.

<u>Skill assessment</u>

5.0 - the student actively participates in classes, correctly identifies and uses computer programs, and demonstrates proficiency in basic IT techniques

4.5 - the student actively participates, identifies and uses computer programs with minimal guidance, and uses basic IT techniques well

4.0 - the student participates actively, with minor corrections, demonstrates correct use of

computer programs and IT techniques

3.5 - the student participates, requires guidance and corrections, and occasionally makes mistakes in using computer programs and IT techniques

3.0 - the student participates, often requires guidance, and makes frequent mistakes when using computer programs and IT techniques

2.0 - THE STUDENT PARTICIPATES PASSIVELY, MAKES SIGNIFICANT ERRORS IN IDENTIFYING AND USING COMPUTER PROGRAMS, AND MISUSES IT TECHNIQUES

5. TOTAL STUDENT WORKLOAD REQUIRED TO ACHIEVE THE INTENDED LEARNING OUTCOMES IN HOURS AND ECTS CREDITS

Form of activity	Average number of hours required to complete the activity
Hours of classes according to plan with the teacher	30
Preparation for classes	10
Participation in the consultations	3
The time to write a paper / essay	5
Preparation for tests	-
Participation in colloquia	2
Other (e-learning)	-
SUM OF HOURS	50
TOTAL NUMBER OF ECTS	**2**

* Please note that 1 ECTS point corresponds to 25–30 hours of total student workload.

6. WORKSHOP PRACTICE WITHIN THE SUBJECT

Number of hours	-
Rules and forms of internships	-

7. LITERATURE

Basic literature: 1. Jekel's Epidemiology, Biostatistics, Preventive Medicine and Public Health. Fourth Edition, Elsevier
Additional literature: Ramona Nelson, Nancy Staggers. Health Informatics: An Interprofessional Approach. 2nd edition, Elsevier

Approved by the Head of the Department or an authorised person