

DESCRIPTION/Syllabi of Curricula/Module

Short Name of the University/Country code Date (Month / Year)	DSEA/ P11 Sept 2020
TITLE OF THE MODULE	Code
Methods of mathematical processing of medical biological data	

Teacher(s)	Department
Coordinating: Iryna Getman, PhD	Department of Computer and Information Technology (CIT)

Study cycle (BA/MA)	Level of the module (Semester number)	Type of the module (compulsary/elective)
BA	4 th semester (second year) for Bachelor	elective

Form of delivery (theory/lab/exercises)	Duration (weeks/months)	Language(s)
lectures, lab	18 weeks 4 th semester	Ukrainian / English

Prerequisites	
Prerequisites: the study of the disciplines "Probability theory, probability processes and mathematical statistics", "Digital Processing of Biomedical Signals"	Co-requisites (if necessary):

ECTS (Credits of the module)	Total student workload hours	Contact hours	Individual work hours
5	150	72	78
Aim of the module (course unit): competencies foreseen by the study programme			
<p>The student must be able to:</p> <ul style="list-style-type: none"> - complex analysis of data from biomedical research using modern regression analysis tools; - constructing a qualitative prediction model of survival analysis; - checks built analytical models on the adequacy; - ability to interpret simulation results 			
Learning outcomes of module (course unit)	Teaching/learning methods (theory, lab, exercises)	Assessment methods (written exam, oral exam, reports)	
<p>Knowledge:</p> <ul style="list-style-type: none"> - basic concepts and terms of medical statistics; - the role of statistical methods in medicine; - features of application of application software for medical data processing; - principles of application of statistical methods in processing the results of medical and biological research; - analysis of variance of the influence of factors on the studied trait; - basics of linear correlation analysis; - basics of regression analysis 	Working with lecture notes and basic literature on relevant topics	Knowledge test	
<p>Skills:</p> <ul style="list-style-type: none"> - to build adequate regression linear equations, to monitor them and give a qualitative interpretation of the simulation results; - to build adequate binary regression models and to interpret simulation results; - to perform ROC analysis, to calculate specificity and sensitivity; - to construct different regression models of survival, to check their adequacy of the real model of a possible process; - to apply modern information tools for the analysis of medical and biological data 	Lectures, practical training, consultations	Active attendance of lectures, individual project and presentation	
<p>Competences:</p> <p>study subject literature, share knowledge, work in groups</p>	Lectures, practical training, consultations	Individual project and presentation	

Themes	Contact work hours							Time and tasks for individual work	
	Lectures	Consultations	Seminars	Practical work	Laboratory work	Placements	Total contact work	Individual work	Tasks
1 Fundamentals of statistical methods of medical and biological data processing	6				6		12	13	Reply of laboratory work
2 Statistical evaluation of distribution parameters	6				6		12	13	Reply of laboratory work
3 Statistical testing of hypotheses	6				6		12	13	Reply of laboratory work
4 Correlation analysis	6				6		12	13	Reply of laboratory work
5 Regression analysis	6				6		12	13	Reply of laboratory work
6 Analysis of variance	6				6		12	13	Reply of laboratory work
Total	36				36		72	78	

Assessment strategy	Weight in %	Deadlines	Assessment criteria
Written theory exam	40%	during the semester / exam	good response to questions
Practical exam on a computer	60%	during the semester / exam	the work is done completely without mistakes or minor errors

Author	Year of issue	Title	No of periodical or volume	Place of printing. Printing house or internet link
Compulsory literature				
A. Glanz	1998	Primer of IOSTATISTICS		Institute for Health Policy Studies University of California, San Francisco
Popechetelev E.P.	1997	Methods of		Zhytomyr: ZhITI

		biomedical research. System Aspects: Tutorial.		
Lopoch C.N., Chubenko A.V., Babich P.N.	2001	Statistical methods in biomedical research using Excel		K., Morion
Additional literature				
Rebrova O. Yu.	2002	Statistical analysis of medical data. Application of the STATISTICA application package		Media sphere
Gojko O.V.	2004	Practical use of the STATISTICA package for the analysis of biomedical data: a tutorial for university students		Kiev, Tutorial for university students (Recommended by MES of Ukraine, ISBN 966-8326-31-8)