Pomeranian Medical University in Szczecin

SYLLABUS of the MODULE (SUBJECT)

valid from the academic year 2017/2018

General Information

Module title	***Basic computer science with biostatistics***
Module type	*Obligatory*
Faculty	*Faculty of Medicine and Dentistry*
Field of study	*Medicine and Dentistry*
Major	*Not applicable*
Level of study	long-cycle (S2J)
Mode of study	intramural
Year of studies, semester	*Year I, semester 1*
ECTS credits (incl. semester breakdown)	*1*
Type/s of training	*lectures (4h), classes (21h)*
Form of assessment	*non-graded assessment*
Head of the Department/ Clinic, Unit	*dr n. tech. inż. Janusz Paweł Kowalski*
Tutor responsible for the module	*dr n. tech. inż. Janusz Paweł Kowalski* *inf_dept@pum.edu.pl*
Department's/ Clinic's/ Unit's website	*https://edu.pum.edu.pl/edu/*
Language	*English*

Detailed information

Module objectives		*knowledge of contemporary sources of diagnostic data, methods of data digitization, the role of sound and image as a source of information, evaluation and concluding based on the available data, observation data analysis, statistical inference*
Prerequisite /essential requirements	Knowledge	*basis of modern physics, basis of anatomy, basis of physiology, basis of of mathematical analysis*
	Skills	*the use of e-mail, the use of web browsers, the use of the internet knowledge bases, the use of bibliographic sources*
	Competences	*habit of learning, working in a team*

Description of the learning outcomes for the subject /module			
No. of learning outcome	**Student, who has passed the (subject) knows /is able to /can:**	**SYMBOL (referring the standards) ZEK**	**Method of verification of learning outcomes ***
W01	knows imaging techniques of tissues and organs and operating principles of appropriate diagnostic equipment	K_B.W09	open test/ discussion/an essay covering the topic of a class
W02	knows rules of operation, management and informatization of public health institutions and entities	K_G.W08	open test/ discussion/an essay covering the topic of a class
W03	knows population health state indicators and rules of estimation thereof	K_G.W12	open test/ discussion/an essay covering the topic of a class
U01	explains functional importance of certain organs and systems in synthetic manner	K_A.U01	open test/ discussion/an essay covering the topic of a class
U02	interprets physical phenomena going on in stomatognathic system	K_B.U02	open test/ discussion/an essay covering the topic of a class
U03	demonstrates skills of using and processing information incl. of using IT and accessing modern sources of medical knowledge	K_D.U15	open test/ discussion/an essay covering the topic of a class
U04	analyzes reliable data on health state of population	K_G.U01	open test/ discussion/an essay covering the topic of a class
U05	analyzes epidemic data and estimates population health state on basis thereof	K_G.U10	open test/ discussion/an essay covering the topic of a class
U06	interprets basic epidemic indicators, defines and appraises reliability and relevance of tests used in screening examination	K_G.U22	open test/ discussion/an essay covering the topic of a class
K01	shows habit of self-education and lifelong education	K_K01	open test/ discussion/an essay covering the topic of a class

Table presenting learning outcomes of the subject/module in relation to the form of classes									
No.	**SYMBOL (referring the standards) ZEK**	**Type/s of training**							
		Lecture	**Seminar**	**Practical classes**	**Clinical classes**	**…**	**…**	**…**	**Other…**
W01	K_B.W09	x		x					
W02	K_G.W08	x		x					

W03	K_G.W12	x		x					
U01	K_A.U01			x					
U02	K_B.U02			x					
U03	K_D.U15			x					
U04	K_G.U01			x					
U05	K_G.U10			x					
U06	K_G.U22			x					
K01	K_K01			x					

Module (subject) contents no.	**Description of teaching programme**	**No. of hours**	**References to learning outcomes**
1	Hospital Information Systems	4	W02
2	Acquisition and signal processing systems. The analog and digital signal. Analog-to-digital conversion. Sources of digital data. Gray scale, RGB scale	2	W01, U02, U03
3	Properties of sound. The concept of frequency. Analysis of the acoustic spectrum. Formants. The psychoacoustic model of human	2	W01, U01, U02, U03
4	Properties of light. Grayscale images. Colour images. The psycho visual model of human. Colour perception. Illusion.	3	W01, U01, U02, U03
5	Digital image processing. Imaging techniques in medicine	4	W01, U02, U03
6	Subject matter and significance of the medical statistics. Population, random sample, statistical series. Elements of the probability theory. The rectangular, binomial, Poisson, normal distributions	2	W03, U04, U05, U06
7	The characteristics of the location. Measures	2	

	of dispersion and moments of a statistical distribution. Correlation and regression. The linear correlation coefficient. Linear regression. Spearman's correlation coefficient		
8	Estimation and verification of statistical hypotheses	2	W03, U04, U05, U06
9	Parametric tests: U-test for the average population, t - Student test, F-test	2	W03, U04, U05, U06
10	Nonparametric tests: chi-square test, characters test and maximum test. The Wilcoxon test (U Mann-Whitney test)	2	W03, U04, U05, U06

Booklist

Obligatory literature:

1. Introduction to Medical Informatics, Online Lecture Notes, Robert A.Jenders, George Hripcsak, Robert Sideli, Departament of Medical Informatics, Columbia University- http://www.dbmi.columbia.edu/~hripcsa/textbook
2. J.S.Bulman, J.F.Osborn.Statistics In Dentistry. Copyright British Dental Journal, First printing 1989, Reprinted 1997. Printed in Great Britain by Biddles Ltd, Guildford and King's Lynn

Supplementary literature:

1. Coiera E. The Guide to Heath Informatics. Arnold, London, October 2003, http://www.coeira.com/aimd.html
2. Handbook of Medical Informatics by J. van Bemmel (Editor), M.A.Musen (Editor), Springer:2002.
3. Wayne W. Daniel. Biostatistics. A.Foundation for Analysis In the Health Sciences. Sixth editio. New York, Chichester, Brisbane, Toronto, Singapore. Copyright 1995, by John Wiley&Sons. Inc.2

Student's workload (balance sheet of ECTS credits)

Form of student's activity (in-class participation; activeness, produce a report, etc.)	Student's workload [h]		
	Tutor	Student	Average
Contact hours with the tutor	25		
Time spent on preparation to seminars/ practical classess	3		
Time spent on reading recommended literature	4		
Time spent on writing report/making project			
Time spent on preparing to colloqium/ entry test			
Time spent on preparing to exam			
Other …..			

Student's workload in total	32		
ECTS credits for the subject (in total)	1		
Remarks			
A student is obliged to respect the Department's Internal Didactic Regulations			

* Selected examples of methods of assessment:
EP – written examination
EU – oral examination
ET – test examination
EPR – practical examination
K – colloqium
R – report
S – practical skills assessment
RZĆ – practical classes report, incl. discussion on results
O – student's active participation and attitude assessment
SL – lab report
SP – case study
PS - assessment of student's ability to work independently
W – entry test
PM – multimedial presentation
other…