

Subject name MEDICAL COMPUTER SCIENCE AND BIOSTATISTICS	ECTS Code																				
Name of unit teaching the subject THE ZBIGNIEW RELIGA FACULTY OF MEDICAL SCIENCES IN ZABRZE, THE UNIVERSITY OF TECHNOLOGY IN KATOWICE																					
Studies <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 25%;">Field of study</th> <th style="width: 25%;">degree</th> <th style="width: 25%;">mode</th> <th style="width: 25%;">major</th> <th style="width: 25%;">specialization</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">medical</td> <td style="text-align: center;">Uniform Master's</td> <td style="text-align: center;">stationary</td> <td></td> <td></td> </tr> </tbody> </table>		Field of study	degree	mode	major	specialization	medical	Uniform Master's	stationary												
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Type of class, method of implementation and specified number of hours <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 50%; padding: 5px;"> A.Type of class <ul style="list-style-type: none"> • lecture, • exercise classes, • clinical courses, • laboratories, • lectureship, • diploma seminar, • professional internship.* * mark where applicable </td> <td style="width: 50%; padding: 5px;"> B.Method of implementation <ul style="list-style-type: none"> • classes in a didactic room </td> </tr> <tr> <td colspan="2" style="padding: 5px;"> C.Amount of hours in accordance with the approved curriculum Lecture 15 hours Exercise classes 40 hours </td> </tr> </table>	A.Type of class <ul style="list-style-type: none"> • lecture, • exercise classes, • clinical courses, • laboratories, • lectureship, • diploma seminar, • professional internship.* * mark where applicable	B.Method of implementation <ul style="list-style-type: none"> • classes in a didactic room 	C.Amount of hours in accordance with the approved curriculum Lecture 15 hours Exercise classes 40 hours		Amount of ECTS points Description of awarding ECTS points: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 70%;">Activity</th> <th style="width: 30%;">Student workload</th> </tr> </thead> <tbody> <tr> <td>Participation in lectures</td> <td style="text-align: center;">15 hours</td> </tr> <tr> <td>Participation in practical classes</td> <td style="text-align: center;">40 hours</td> </tr> <tr> <td>Preparation for practical classes and colloquiums</td> <td style="text-align: center;">15 hours</td> </tr> <tr> <td>Examination preparation</td> <td style="text-align: center;">15 hours</td> </tr> <tr> <td>Consultations</td> <td style="text-align: center;">5 hours</td> </tr> <tr> <td>Total number of hours</td> <td style="text-align: center;">90 hours / 30</td> </tr> <tr> <td>Amount of ECTS points per module</td> <td style="text-align: center;">..... ETCS</td> </tr> </tbody> </table>	Activity	Student workload	Participation in lectures	15 hours	Participation in practical classes	40 hours	Preparation for practical classes and colloquiums	15 hours	Examination preparation	15 hours	Consultations	5 hours	Total number of hours	90 hours / 30	Amount of ECTS points per module ETCS
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Didactic cycle 1 year, semester 01 (winter)																					
Subject status <ul style="list-style-type: none"> • mandatory / facultative 	Language of instruction Polish																				
Didactic methods expository methods problem-focused methods programmed and practical methods	Forms and methods of passing and general grading criteria or examination requirements <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="padding: 5px;"> A. Method of passing <ul style="list-style-type: none"> • examination - lecture • passing with a grade – exercise classes* * mark where applicable </td> </tr> <tr> <td style="padding: 5px;"> B. Forms of passing: <ul style="list-style-type: none"> • written examination: test / with open questions (exercises)/longer written statement • oral examination • oral test/colloquium • completion of a semester assignment: preparation of a design or presentation/conducting research and presenting its results(written/oral)/completion of a specified practical work • agreeing on a passing grade based on partial grades received during the course of the semester* * mark where applicable </td> </tr> </table>	A. Method of passing <ul style="list-style-type: none"> • examination - lecture • passing with a grade – exercise classes* * mark where applicable	B. Forms of passing: <ul style="list-style-type: none"> • written examination: test / with open questions (exercises)/longer written statement • oral examination • oral test/colloquium • completion of a semester assignment: preparation of a design or presentation/conducting research and presenting its results(written/oral)/completion of a specified practical work • agreeing on a passing grade based on partial grades received during the course of the semester* * mark where applicable																		
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C. Basic grading criteria
5.0 – exhibits knowledge of all curriculum content on a level of 90%-100%
4.5 - exhibits knowledge of all curriculum content on a level of 84%-89%
4.0 - exhibits knowledge of all curriculum content on a level of 77%-83%
3.5 - exhibits knowledge of all curriculum content on a level of 70%-76%
3.0 - exhibits knowledge of all curriculum content on a level of 60%-69%
2.0 - exhibits knowledge of all curriculum content on a level of below 60%

Definition of preparatory subjects and initial requirements

Initial requirements knowledge in the field of computer science and mathematics on a secondary school level

Subject aim

C1 Mastering the theoretical basis as well as acquiring practical skills in the field of IT technologies used in medicine.
 C2 Acquiring the basic knowledge and skills in the field of medical statistics as well as scientific research planning
 C3. Becoming familiar with modern computer techniques to solve problems of data analysis and data optimization and presentation.

Curriculum

A. Lecture content

- Medical computer science and biostatistics – introduction
- Medical databases
- Basics of computer graphics and its use in medicine
- Safety in IT systems
- Medical applications of computer science – integrated IT systems for healthcare facilities
- Elements of telemedicine
- Basics of statistics
- Planning and conducting of scientific research

B. Content of exercise classes/tutorials/laboratories

- Medical databases, online resources
- Microsoft Excel spreadsheets – entering data and formulas; arithmetic and statistical calculations in a spreadsheet, graphic data representation
- Types of variables, analysis of distribution, statistical hypotheses, significance tests
- Analysis of statistical data, approaching a research problem
- Databases – basics of functions
- Hospital IT systems
- Electronic medical documentation

Literature

A. Literature required to receive a final credit for classes (pass an exam):

A.1. used in class- none

A.2. studied independently by the student– Przystępny kurs statystyki na przykładach z medycyny, Stanis A. Statsoft Polska Sp. z o.o., Kraków 1998.

B. Supplementary literature

Rudowski R. (Red.), Informatyka Medyczna, Wydawnictwo Naukowe PWN, Warszawa 2003

Educational effects:

Effect no	Description of an educational effect	Reference to field of study related effects	Reference to areas of effects
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Knowledge:					
W1	Student knows the basic IT and biostatistics tools used in medicine, including medical databases, spreadsheets and basics of computer graphics;			B.W26	
W2	Student knows the basic methods of statistical analysis used in population and diagnostic tests;			B.W27	
W3	Students is familiar with the capabilities of contemporary telemedicine as a tool aiding the work of a doctor;			B.W28	
W4	Student knows the principles of conducting scientific, observation and experimental research as well as <i>in vitro</i> tests which serve the development of medicine.			B.W29	
Abilities:					
U1	Student is able to select the appropriate statistical test, conduct basic statistical analysis, use the appropriate methods of presenting results, interpret meta-analysis results and conduct survival analysis;			B.U11	
U2	Student can explain the differences between prospective and retrospective studies, randomized and case-control studies, case studies, and experimental studies and list them according to their credibility and scientific evidence;			B.U12	
U3	Student is able to plan and perform simple scientific studies as well as interpret their results and draw conclusions.			B.U13	
Social competencies:					
K1	Student exhibits creativity, can work in a team and manage its work, adheres to the established rules, can plan work and predict its effects				
Methods used in the verification of educational effects					
Educational effect	Type of grade				
	colloquiums	Solving problems during exercise classes	Solving problems in groups	Oral examination	Written examination
W1					x
W2					x
W3					x
W4					x
U1	x	x			
U2	x	x			
U3	x	x			
K1			x		

Criteria of evaluating educational effects			
Educational effect	For a grade of 3	For a grade of 4	For a grade of 5

W1	Student participates in classes, recognizes with numerous mistakes the basic IT and biostatistics tools used in medicine, including medical databases, spreadsheets and basics of computer graphics;	Student actively participates in classes, with little help from the instructor recognizes the basic IT and biostatistics tools used in medicine, including medical databases, spreadsheets and basics of computer graphics;	Student actively participates in classes, flawlessly recognizes the basic IT and biostatistics tools used in medicine, including medical databases, spreadsheets and basics of computer graphics;
W2	Student participates in classes, recognizes with numerous mistakes the basic methods of statistical analysis used in population and diagnostic tests;	Student actively participates in classes, with little help from the instructor recognizes the basic methods of statistical analysis used in population and diagnostic tests;	Student actively participates in classes, flawlessly recognizes the basic methods of statistical analysis used in population and diagnostic tests;
W3	Student participates in classes, recognizes with numerous mistakes the capabilities of contemporary telemedicine as tools aiding in the work of a doctor;	Student actively participates in classes, with little help from the instructor recognizes the capabilities of contemporary telemedicine as tools aiding in the work of a doctor;	Student actively participates in classes, flawlessly recognizes the capabilities of contemporary telemedicine as tools aiding in the work of a doctor;
W4	Student participates in classes, recognizes with numerous mistakes the principles of conducting scientific, observation and experimental research as well as <i>in vitro</i> tests which serve the development of medicine;	Student actively participates in classes, with little help from the instructor recognizes the principles of conducting scientific, observation and experimental research as well as <i>in vitro</i> tests which serve the development of medicine;	Student actively participates in classes, flawlessly recognizes the principles of conducting scientific, observation and experimental research as well as <i>in vitro</i> tests which serve the development of medicine;
U1	Student, with a lot of help from the instructor is able to select the appropriate statistical test, conduct basic statistical analysis, use the appropriate methods of presenting results, interpret meta-analysis results and conduct survival analysis;	Student, with little help from the instructor is able to select the appropriate statistical test, conduct basic statistical analysis, use the appropriate methods of presenting results, interpret meta-analysis results and conduct survival analysis;	Student flawlessly, is able to select the appropriate statistical test, conduct basic statistical analysis, use the appropriate methods of presenting results, interpret meta-analysis results and conduct survival analysis;
U2	Student, with a lot of help from the instructor can explain the differences between prospective and retrospective studies, randomized and case-control studies, case studies, and experimental studies and list them according to their credibility and scientific evidence;	Student, with little help from the instructor can explain the differences between prospective and retrospective studies, randomized and case-control studies, case studies, and experimental studies and list them according to their credibility and scientific evidence;	Student flawlessly can explain the differences between prospective and retrospective studies, randomized and case-control studies, case studies, and experimental studies and list them according to their credibility and scientific evidence;
U3	Student, with a lot of help from the instructor is able to plan and perform simple scientific studies as well as interpret their results and draw conclusions	Student, with little help from the instructor is able to plan and perform simple scientific studies as well as interpret their results and draw conclusions	Student flawlessly is able to plan and perform simple scientific studies as well as interpret their results and draw conclusions

K1	Student exhibits little creativity, has difficulty working in a team, cannot manage its work, adheres to the established rules, badly plans work and cannot predict its effects	Student exhibits creativity, can work in a team, and tries manage its work, adheres to the established rules, can with few mistakes plan work and predict its effects	Student exhibits creativity, can work in a team, and manage its work, adheres to the established rules, can plan work well and predict its effects
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