

**Teaching Program for the students of the Faculty of Medicine & Dentistry
5-year English Program at the Pomeranian Medical University in Szczecin**

Course: *COMPUTER SCIENCE AND MEDICAL STATISTICS*

Name and address of Department:

Department of Medical Informatics and Education Quality Assessment

Head of the Department:

Dr inż. Jerzy Pastusiak

Person responsible for the didactics: *Dr inż. Jerzy Pastusiak*

Total hours: *30 hours of practical classes*

ECTS points: 1

Aim/s of the course:

Objectives are to learn or reinforce basic computer skills and biostatistical methods; manipulation and analysis of scientific data using the available programs; searching Medical Database on the Net - database management; learn about the World Wide Web: how it works, what's out there and how to find it; learn about computer applications in medicine.

Teaching Program:

Topics in Medical Informatics

1. Biosignal processing methods

- *Medical imaging - image processing and analysis*
- *Medical knowledge and decision support*
- *Pattern recognition*
- *Information and cybernetics - information content of a biological signal*

2. Data and information - data from patients

- *Acquiring, storing and processing*
- *Medical data in a computer*
- *An introduction to database systems*
- *Computer aided diagnosis*

3. Hospital information systems

- *Security in medical information systems*
- *Costs, benefits and limitations of medical information systems*

4. Networking and medical information system

- *Telecommunication, networking and integration*
- *Telematics and electronic data interchange*
- *Virtual reality in health care*

5. World Wide Web

- *Medical internet*
- *e-Health*
- *e-Learning*
- *Electronically available information resources*

Topics in Medical Statistics

1. Basic concepts

- *Measures of central tendency*
- *Measures of dispersion*

2. Estimation

- *Introduction*
- *Confidence interval for a population mean*
- *The t distribution*
- *Confidence interval for the difference between two population means*
- *Confidence interval for a population proportion*
- *Confidence interval for the difference between two population proportions*

3. Hypothesis testing

- *Introduction*
- *Hypothesis testing: a single population mean*
- *Hypothesis testing: the difference between two population means*
- *Paired comparisons*
- *Hypothesis testing: a single population proportion*
- *Hypothesis testing: the difference between two population proportions*
- *Hypothesis testing: the ratio of two population variances*

Simple linear regression and correlation

- *Introduction*
- *The regression model*
- *The sample regression equation*
- *Using the regression equation*
- *The correlation model*
- *The correlation coefficient*

The chi-square distribution and the analysis of frequencies

- *Introduction*
- *Tests of goodness – of – fit*
- *Tests of independence*
- *The Fisher exact test*

Forms of activities:

The course utilizes IBM PC compatible and Unix systems and programmes.

Evaluation :

In order to obtain the final credit student should attend all classes, and get positive mark on every exercise.

Obligatory booklist:

- *Handbook of Medical Informatics by J.van Bommel (Editor), M.A. Musen (Editor), Springer; 2002*

- *Wayne W. Daniel. Biostatistics. A Foundation for Analysis in the Health Sciences. Sixth edition. New York, Chichester, Brisbane, Toronto, Singapore. Copyright 1995, by John Wiley & Sons. Inc. 2*

Optional booklist:

- *Introduction to Medical Informatics, Online Lecture Notes, Robert A. Jenders, George Hripcsak, Robert Sideli, Department of Medical Informatics, Columbia University*
 - <http://www.dbmi.columbia.edu/~hripcsak/textbook>

- *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*

**Head of Department
Dr inż. Jerzy Pastusiak**

Signature

Rules and Regulations

**DEPARTMENT OF MEDICAL INFORMATICS AND EDUCATION QUALITY
ASSESSMENT**

COMPUTER SCIENCE AND MEDICAL STATISTICS

At the beginning of the course students are required to participate in the training for safety regulations, and are notified of the internal regulations and course requirements.

Students are required to attend all classes at a scheduled date and time and will be asked to sign an attendance register.

Classes that were missed with an acceptable excuse, are needed to be worked out with another subject-related group (with a permission of assistant) or according to the specified time schedule, and in an order established by the Department.

In order to obtain the final credit student should attend all classes, and get positive mark on every exercise.

Head of Department
Dr inż. Jerzy Pastusiak

Signature