# Course description

## Part 1

| General information about the course | |
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| **1. Major of study:** medicine | **2. Study level:** unified MSc<br>**3. Form of study:** intramural |
| **4. Year:** II | **5. Semester**: IV |
| **6. Course name:** Biostatistics, epidemiology and public health | |
| **7. Course status:** required | |

**8. Course objectives**

The course curriculum is composed of three subjects: public health, epidemiology and biostatistics. The goals of the course is to teach students:

a) the concepts, role and application of public health programs in health care systems and health policy on national and international levels (health care systems, legislation and regulatory procedures, health monitoring of the population, setting evidence-based priorities for health promotion and prevention, organization, implementation and evaluation of population-based preventive measures and health promotion programs, principles of health economics)

b) the concepts, role and application of epidemiology in health research and public health programs (history and current scope of epidemiology, role of epidemiology in the development of medical sciences, goals and scientific tools of descriptive epidemiology, goals and scientific tools of analytical epidemiology, definition of risk and confounding factors, assessment of cause-effect relationships, subject-oriented epidemiology, clinical epidemiology)

c) the concepts, role and application of biostatistics in medical research (the concept of between-subject and within-subject variability and co-variability in analysis of biomedical data; control of confounding in data analysis; summarizing, collecting, presenting and interpreting data generated within medical research; choice of a proper method of data analysis including testing hypotheses; application of basic models of multivariate analysis including survival analysis)

**Learning outcomes / reference to learning outcomes indicated in** (underline as appropriate):

education standards (Regulation of the Ministry of Science and Higher Education) / Resolution of the Senate of the Medical University of Silesia (indicate terms specified in education standards / signs of learning outcomes approved by the Resolution of the Senate of the Medical University of Silesia)

For knowledge student knows and understands:

G.W4 Concept of public health, its definition and goals, structure and functions of health care systems on national and global levels, impact of economics on health care delivery

G.W5 Legal regulations regarding provision of health care, patients' law, labour law, legal frame of professional activities of physicians, functioning of physicians' self-government

G.W6 Basic legal regulations regarding organization and financing of health care system an general health insurance programs, organization of health delivery institutions

G.W8 Legal regulations and basic methods of medical experiments and other medical research projects, including basic methods of data analysis

G.W1 Methods of assessment of health on individual and population level , various classifications of disease and medical procedures

G.W2 Method of investigations of risk factors, strengths and weaknesses of various schemes of epidemiological studies, measures suggestive of the presence of cause-effect relationship

G.W3 Epidemiology of infectious and chronic diseases, preventive measures reflecting various stages of the natural history of diseases, role of health surveillance

B.W27 Principal methods of statistical analysis used in population based research and clinical research

For skills student can do :

G.U1 Describe demographic structure of the population and apply results thereof in the assessment of

health problems of populations
G.U2 Collect information on the occurrence of risk factors of infectious and chronic diseases and design preventive measures, on various levels of prevention
G.U3 Interpret measures of prevalence of diseases and disabilities
G.U4 Assess the epidemiological situation regarding common diseases in Republic of Poland and on the global scale
B.U11 Choice of a pertinent statistical test, application of basic statistical analyses, implementation of appropriate methods of presentation of the results, interpretation of the results of metaanalysis, implementation of survival analysis
B.U12 Explain differences between prospective and retrospective study designs, randomized studies, case-control studies, case reports and experimental projects, scientific evidence-based ranking of reliability and power of proof of different study designs
B.U13 Plan and implement basic medical research project, interpret its results and formulate conclusions
For social competencies student is ready to:
collaborate with other health professionals in teams active in the field of health promotion, health prevention and in scientific teams implementing medical research study, participate in a research report preparation.

| **9. Number of hours for the course** | **40** | **10. Number of ECTS points for the course** | **5** |
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**11. Form of evaluation:** exam

**12. Methods of verification and evaluation of learning outcomes**

| Learning outcomes | Methods of verification | Methods of evaluation*/ credit |
|---|---|---|
| **Knowledge** | Written evaluation – open questions<br>Grade credit – MCQ | * |
| **Skills** | Report<br>Observation<br>Practical exam | * |
| **Competencies** | Observation | * |

***** For exams and grade credits the following evaluation system has been assumed:

**Very good (5,0)** – the assumed learning outcomes have been achieved and significantly exceed the required level
**Better than good (4,5)** – the assumed learning outcomes have been achieved and slightly exceed the required level
**Good (4,0)** – the assumed learning outcomes have been achieved at the required level
**Better than satisfactory (3,5)** – the assumed learning outcomes have been achieved at the average required level
**Satisfactory (3,0)** – the assumed learning outcomes have been achieved at the minimum required level
**Unsatisfactory (2,0)** – the assumed learning outcomes have not been achieved

# Course description

## Part 2

| **Other useful information concerning the course** | | |
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| **13. Department conducting the course, address, e-mail address:**<br>Department of Epidemiology, 18 Medyków St., 40-752 Katowice, epikat@sum.edu.pl | | |
| **14. Course Coordinator:**<br>Professor Grzegorz Brożek, MD, PhD | | |
| **15. Prerequisites in terms of knowledge, skills and other competences:**<br>No requirements for prior skills and/or competencies | | |
| **16. Group size** | In accordance with the SUM Senate Resolution | |
| **17. Teaching materials** | Presentation, recommended books | |
| **18. Location of classes** | 18 Medyków St., 40-752 Katowice<br>Building c3, IV floor, classroom 412 | |
| **19. Location and time of office hours** | Building C3, IV floor, 9.00 – 12.00 | |
| **20. Learning outcomes** | | |
| Number of the course learning outcome | Course learning outcomes | Reference to the learning outcome included in the standards |
| In terms of knowledge: | | |
| C_K01 | Concept of public health, its definition and goals, structure and functions of health care systems on national and global levels, impact of economics on health care delivery | G.W4 |
| C_K02 | Legal regulations regarding provision of health care, patients' law, labour law, legal frame of professional activities of physicians, functioning of physicians' self-government | G.W5 |
| C_K03 | Basic legal regulations regarding organization and financing of health care system an general health insurance programs, organization of health delivery institutions | G.W6 |
| C_K04 | Legal regulations and basic methods of medical experiments and other medical research projects, including basic methods of data analysis | G.W8 |
| C_K05 | Methods of assessment of health on individual and population level , various classifications of disease and medical procedures | G.W1 |
| C_K06 | Method of investigations of risk factors, strengths and weaknesses of various schemes of epidemiological studies, measures suggestive of the presence of cause-effect relationship | G.W2 |
| C_K07 | Epidemiology of infectious and chronic diseases, preventive measures reflecting various stages of the natural history of diseases, role of health surveillance | G.W3 |
| C_K08 | Principal methods of statistical analysis used in population based research and clinical research | B.W27 |
| In terms of skills: | | |
| C_S01 | Describe demographic structure of the population and apply results thereof in the assessment of health problems of populations | G.U1 |
| C_S02 | Collect information on the occurrence of risk factors of infectious and chronic diseases and design preventive measures, on various levels of prevention | G.U2 |

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|---|---|---|
| C_S03 | Interpret measures of prevalence of diseases and disabilities | G.U3 |
| C_S04 | Assess the epidemiological situation regarding common diseases in Republic of Poland and on the global scale | G.U4 |
| C_S05 | Choice of a pertinent statistical test, application of basic statistical analyses, implementation of appropriate methods of presentation of the results, interpretation of the results of metaanalysis, implementation of survival analysis | B.U11 |
| C_S06 | Explain differences between prospective and retrospective study designs, randomized studies, case-control studies, case reports and experimental projects, scientific evidence-based ranking of reliability and power of proof of different study designs | B.U12 |
| C_S07 | Plan and implement basic medical research project, interpret its results and formulate conclusions | B.U13 |
| In terms of social competencies: | | |
| C_C01 | For social competencies student is ready to:<br>collaborate with other health professionals in teams active in the field of health promotion, health prevention and in scientific teams implementing medical research study, participate in a research report preparation. | |

| **21. Forms and subjects of classes** | **Number of hours** |
|---|---|
| **21.1. Lectures** | **10** |
| Introduction to Public Health | 2 |
| Epidemiology and its contribution to medical research | 2 |
| Population – based prevention and health promotion | 2 |
| Introduction to biostatistics – Part I | 2 |
| Introduction to biostatistics – Part II | 2 |
| **21.2. Seminars** | **0** |
| **21.3. Labs** | **30** |
| Public Health, historical background, the main targets and tasks | 2 |
| Assessment of population health status – descriptive epidemiology (basic measures of health and disease) | 2 |
| Types of variables, distribution, analysis of correlations | 2 |
| Evidence Based Medicine | 2 |
| Epidemiology of infectious diseases | 2 |
| Standardization: direct age–adjustment of mortality rates | 2 |
| Assessment of population health status | 2 |
| Association and causation in medicine. Hill's Criteria | 2 |
| Randomized controlled clinical trial | 2 |
| Evaluating a diagnostic/screening test | 2 |
| Bias and confounders in epidemiological studies | 2 |
| Tests of statistical significance (continuous and categorical variables) | 2 |
| Assessment of population health status – analytical epidemiology (types of epidemiological studies – ecological and cohort) | 2 |
| Assessment of population health status – analytical epidemiology (types of epidemiological studies – case-control, RR, OR) | 2 |
| Environmental burden of disease | 2 |

**22. Literature**

**Required literature:**

Frumkin H.: Environmental Health: From Global to local, John Wiley and Sons. ISBN: 9781118984765

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| WHO, Beaglehole R.: Basic Epidemiology, 2006<br>**Supporting literature:**<br>Centers of Disease Control and Prevention (CDC.gov) resources |
| **23. Assessment criteria - details** |
| Final exam – MCQ test |