

CURRICULUM OF THE COURSE

Subject: Medical Informatics

Prerequisites:

Study programme: General medicine

Category: compulsory

Teaching form: practicals

Evaluation: obtained credits

Form of study: daily

Study period: 1

Range: 2 hour(s) / week

Credits: 2

Week	Practical lesson
1.	Basic terms. Informatics, information technologies, use of information technology in medicine, medical informatics, eHealth, electronic health record, electronic healthcare services, information systems in healthcare facilities, AI in healthcare, telemedicine, bioinformatics, eLearning in medicine. Cyber and information security, authentication, passwords, multi-factor authentication (MFA), malware, phishing, ransomware, data backup, asset, threat, vulnerability, risk, security measures, protection of personal data and copyright. Social engineering, target groups, techniques.
2.	Database systems. Databases, data processing, operation principle, principles of databases. Getting started with database system, adjusting of main settings, working with database system. Design of relational database tables, table views, creation of database table fields.
3.	Database table fields, data types, and general properties of database fields, definition of primary keys. Relations between database tables, referential integrity, data registration and modification, calculations, data import and export, datasheet formatting options.
4.	Editing data in database tables, calculation of values, data import and export, datasheet formatting options, and specification of subdatasheets in a relational database tables, adding and changing subdatasheets.
5.	Creation of database forms, visual design, adding and removing form fields, editing and entering data via forms, navigation within forms, and form controls. <i>Written test.</i>
6.	Creation of subforms, linked forms, and navigation forms, visual design, field customization, data editing via subforms, linked forms, and navigation forms.
7.	Working with data in the database, searching for information, records filtering and sorting, advanced filters, creation of queries (selective, crosstab, find duplicates and find unmatched queries), selection criteria, calculated fields and summaries in queries, creating expressions using operators and functions.
8.	Database reports, generation and editing of print reports, report header, page header, group header, details, group footer, page footer, report footer.
9.	Summary of findings from databases. Design of new database objects. <i>Practical test.</i>
10.	Introduction to biomedical statistics. Data organization, sorting and filtering, functions, calculations, and summaries. Basic statistical description of data, contingency tables, and graphical presentation of data. Descriptive statistics, mean, median, mode, range, variance, standard deviation, and coefficient of variation.
11.	Frequency, relative frequency, cumulative frequency, frequency table, histograms and frequency distributions, normal distribution, skewness, kurtosis, correlation coefficient as a measure of the strength of a linear relationship.
12.	Evidence-based medicine. The importance of systematic reviews for evidence-based medicine, fundamental principles, formulation of clinical questions, and literature search methodology. Tools for the critical appraisal of search results, the hierarchy of evidence, clinical studies and review articles, and systematic review databases. Searching for evidence in electronic resources. <i>Practical test.</i>

13.	Processing of findings from scientific studies and scientific information to address a clinical question. Evaluation of the significance of systematic reviews for evidence-based medicine. <i>Presentation of clinical studies (practical test).</i>
14.	Information systems in healthcare. Demonstrations of selected healthcare information systems: radiology/PACS, hospital information systems, and laboratory information systems. Operating principles, advantages, applications, and modules. <i>Knowledge evaluation.</i>

Requirements to complete the course:

1. 100% attendance and active participation
2. A minimum score of 60% in each test during the semester.
3. Completion of all assigned coursework.

Recommended literature:

1. Majerník J., Kačmariková A.: Introduction to MS Access - Databases not only for medical students, UPJŠ, ŠafárikPress Publishing, 2025, ISBN 978-80-574-0425-5, DOI: <https://doi.org/10.33542/IMA-0425-5>.
2. Majerník J.: Medical Informatics. Multimedia support in the education of clinical and health care disciplines :: Portal of Faculty of Medicine [online], Available from WWW: <<http://portal.lf.upjs.sk/articles.php?aid=243>>. ISSN 1337-7000.
3. Majerník J.: Databases in MS Access. Multimedia support in the education of clinical and health care disciplines :: Portal of Faculty of Medicine [online], Available from WWW: <<http://portal.lf.upjs.sk/articles.php?aid=85>>. ISSN 1337-7000.
4. Majerník J.: Introduction to (bio)statistics. Multimedia support in the education of clinical and health care disciplines :: Portal of Faculty of Medicine [online], Available from WWW: <<http://portal.lf.upjs.sk/articles.php?aid=82>>. ISSN 1337-7000.
5. User manuals for healthcare information systems.
6. Practical session handouts and notes.

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