

COURSE SYLLABUS

Course:	Methodology of Biomedical Research	
Study programme:	General medicine	Type of study: daily
Course type:	Elective	Year: 4 th year WT
Content:	Lectures / Practices	Length of course: 14 / 14
Evaluation:	Obtained credits	Credits: 2

<i>Week</i>	<i>Lectures</i>	<i>Practices</i>
1.	Scientific research Basic terminology in research. Sources of knowledge. Objectives of science. <i>Dr. Zuzana Katreniaková, PhD.</i>	Research planning. The main stages of the research process: preliminary, planning, empirical, analytical, dissemination.
2.	Preliminary research steps Conceptual and theoretical context of a scientific research. Selection and definition of research problems. <i>Dr Iveta Nagyova</i>	Literature review. Search in electronic databases (MEDLINE, EMBASE, SCOPUS, Web of Science).
3.	Variables and hypotheses. Defining the concept of variable. Categorization and types of variables. Internal validity and external validity.. <i>Dr. Vladimíra Timková</i>	Hypotheses. Typology and characteristics. Formulating and testing hypotheses.
4.	Research designs I. Overview of basic types of research designs. Characteristics of a good research design. <i>Dr Iveta Nagyova</i>	Relevance of the design with regard to the research question. Quantitative/qualitative, structured/ flexible, cross-sectional/ longitudinal, retrospective/prospective.
5.	Research designs II. Experiments, quasi-experiments, non-experimental research designs. Basic characteristics, advantages vs. disadvantages. <i>Dr Iveta Nagyova</i>	Randomisation. Manipulation with the independent variables. Experimental control.
6.	Qualitative studies Theoretical model. Overview of basic techniques of qualitative data analysis. <i>Dr. Vladimíra Timková</i>	Examples of qualitative studies: case study, focus group, EMA project.
7.	Data collection methods I. Biophysiological measurements, analyses of medical records, observation, cognitive and neuropsychological tests. <i>Dr Iveta Nagyova</i>	Routinely collected data. Health indicators. Examples of databases: NCZI, WHO, OECD, HEIDI/ECHI.

8.	Data collection methods II. Diagnostic interview. Questionnaires. Self-reports and standardized rating scales. <i>Dr Iveta Nagyova</i>	Examples of work with specific rating scales and self-reports.
9.	Sampling designs. Representativeness. Types of sampling designs. Probability and non-probability sampling. <i>Dr. Pavol Mikula</i>	Sampling biases. Calculation of a sample size. Power calculations, NNT.
10.	Communication of research results I. Types of research reports. Recommendations for designing research and writing research reports: CONSORT, STROBE, PRISMA. <i>Dr. Vladimíra Timková</i>	The basic structure of the scientific publications: Introduction, Methods, Results, Discussion. Tips for effective writing and publishing. Critical evaluation of research.
11.	Communication of research results II. Preparation of oral (MS PowerPoint) and poster presentations: graphic design, fonts, colours, tables, charts, figures. <i>Dr. Vladimíra Timková</i>	Planning and preparation of a concrete presentation. Analysis of most common mistakes in oral and poster presentations.
12.	Psychometrics Criteria for selection and evaluation of measuring instruments. Reliability. Validity. Specificity and sensitivity. Responsiveness. <i>Dr. Pavol Mikula</i>	Translation and cultural adaptation of a measuring instrument (model example). Psychometrics in SPSS. Deadline for course assignment: research paper.
13.	Knowledge translation Utilisation of medical research. Barriers to knowledge translation. <i>Dr Iveta Nagyova</i>	Presentation of course assignments (PowerPoint/Poster).
14.	Ethical aspects of scientific research Preparation of documents for the Ethics Committee. Informed consent. <i>Dr Iveta Nagyova</i>	Written test. Evaluation of Course assignments.

Recommended literature

1. Trochim, W. M. K. "Structure of Research" Research Methods Knowledge Base 2nd Edition. [URL: <http://www.socialresearchmethods.net/kb/contents.php>]
2. Booth W, Colomb G, Williams J (eds) In The Craft of Research. Chicago: University of Chicago Press, 2008
3. Polit DF, Hungler BP. Nursing Research: Principles and Methods. J. B. Lippincott Company, Philadelphia 1991
4. Alley M. The Craft of Scientific Presentations: Critical Steps to Succeed and Critical Errors to Avoid, New York, NY: Springer, 2003

Requirements for the final evaluation

1. At minimum 80% attendance at practices. Non-participation in practical exercises and seminars shall be properly excused with the teacher, who shall determine a substitute in the corresponding form. The student may replace the excused practical exercises within three weeks at most during the semester (UPJS FM Study rules, Internal regulation No. 3/2016, Art. 12,7).
2. Course assignment (Paper and PowerPoint/Poster).
3. Final test.

EVALUATION

	Deadline	Minimum	Maximum	Final evaluation	
Course assignment – paper	12. week	15	30	A	91 – 100
Presentation	13. week	14	30	B	81 - 90
Written test	14. week	21	40	C	71 - 80
Cumulative points		51	100	D	61 - 70
				E	51 – 60

COURSE ASSIGNMENT

Number of points: in total 60 points

The aim of the Course assignment is to practice the work on a Research paper. The Course assignment should be presented at practices as PowerPoint/poster presentation (30 points) as well as submitted to a course supervisor in a written form (30 points) according to criteria below:

Content

The structure should be as follows:

- Page 0: Students' names, Title of paper, Abstract (max 200 words)
- Pages 1-2: Theoretical part: A literature overview. Research question.
- Pages 3-5: Practical part: Hypotheses, Methods (sample and procedure, measures, intervention, statistical analyses), Results, Discussion.
- Page 6: List of references cited according the STN ISO 690: 2012 system for references (at least 5 references should be cited)

Formal aspects

Length of the document: up to 5 pages (List of references are not counted into total number of pages).

Line spacing: max 1.5

Font: Times New Roman 12 - for text as well as headings

Formal aspects of PowerPoint presentation:

Number of slides: 7-10, 5 min speech

Good quality graphic design: using bullets instead of lengthy texts, pictures, graphs

In total 30 points; of which content is for 15 points, formal aspect is for 15 points.

HOW TO CITE LITERATURE SOURCES? - Norm STN ISO 690 2012

Books/Textbooks

KELLEY, W.N, HARRIS, E.D., RUDDY, S., SLEDGE, C.B. 1997. *Textbook of rheumatology*. W.S. Saunders Company, Philadelphia, ISBN: 80-969224-3-2

Scientific articles

PEYROT, S.M., MARTIN, B.M. a HARLAND, R.M. 2010. Lymph heart musculature is under distinct developmental control from lymphatic endothelium. In: *Developmental Biology*. Vol. 339, iss. 2, p. 429-438. ISSN 0012-1606

Internet sources

SPEIGHT, J. G. 2005. *Lange's Handbook of Chemistry* [online]. London: McGraw-Hill, ISBN 978-1-60119-261-5.

http://www.knovel.com/web/portal/basic_search/display?_EXT_KNOVEL_DISPLAY_bookid=1347&_EXT_KNOVEL_DISPLAY_fromSearch=true&_EXT_KNOVEL_DISPLAY_searchType=basic
[Accessed: 2009-06-10]

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